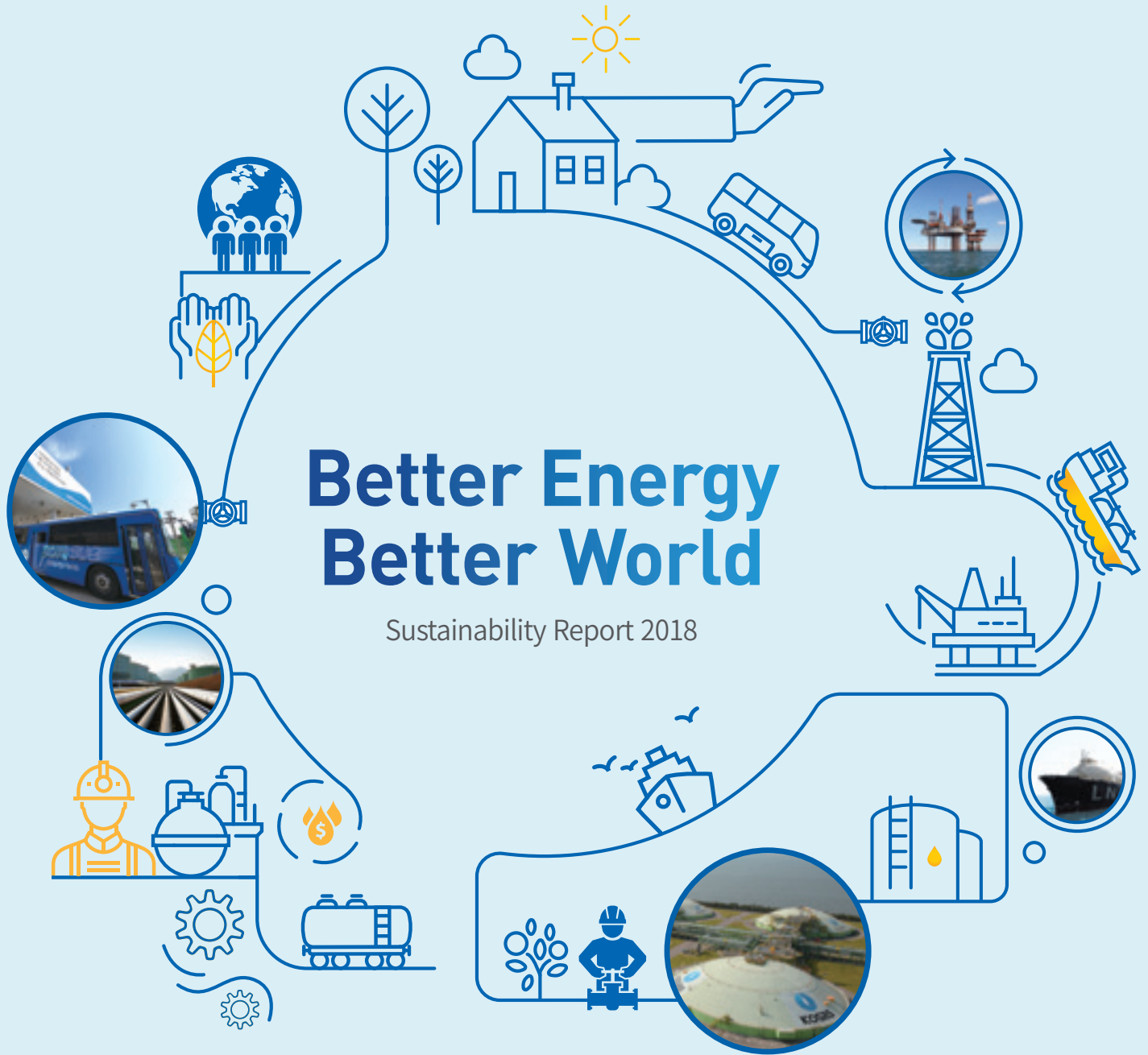


NEXT Energy, with KOGAS



# Better Energy Better World

Sustainability Report 2018

# Better Energy Better World

Sustainability Report 2018

## About this Report

Korea Gas Corporation (KOGAS) is a clean energy company that contributes to people's lives by supplying natural gas in a safe and stable manner and that grows with stakeholders through corporate management to fulfill our social responsibilities. We emphasize on the balanced pursuit of economic, environmental, and social values while performing our business and transparently disclosing results through Annual Reports. This report is KOGAS's 12th Sustainability Report.

## Reporting Scope and Period

This report was written based on sustainability performance data from January through December 2017. Data from the first half of 2018 regarding certain quantitative performance considered to be of significance for disclosure is included in the report. Certain quantitative performance of the past three years since 2015 has been disclosed to identify trends. There was no critical change in corporate scale, corporate governance, or ownership structure during the reporting period. The scope of this report encompasses KOGAS' headquarters, regional business locations, and R&D centers. Performance and information for overseas businesses were also included as necessary.

## Changes from the Previous Year

If there were any changes in disclosed data in the previous report, the reasons for the changes were indicated on the relevant page. In addition, certain performance and information where there has been no change after the previous reporting were explained again for readers to better understand the content.

## Writing and Assurance Standards for the Report

This report was written in accordance with the Core option of the international GRI (Global Reporting Initiative) Standards. To secure credibility and quality, independent third-party assurance was conducted and the results are stated in the Appendix.

## Additional Information of the Report

More detailed information is available on KOGAS' website, and the contact information below is available for inquiries regarding KOGAS' sustainability activities and feedback on this report.

**Website** <http://www.kogas.or.kr>  
**Address** 120, Cheomdan-ro, Dong-gu, Daegu, Korea (41062)  
**Department** Corporate Strategy Dept.  
**E-mail** [asseo@kogas.or.kr](mailto:asseo@kogas.or.kr)  
**Tel** +82-53-670-0205  
**Fax** +82-53-670-6349





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# CEO Message



## KOGAS is committed to making a better energy world through sustainable management.

### Dear distinguished stakeholders!

Since our foundation in 1983, thanks to the warm interest and support from the public and customers, for the past 34 years, KOGAS has built and operated gas pipelines reaching a total length of 4,790km and 72 11,470,000kℓ-volume storage tanks in four terminals to provide clean energy – natural gas to the public, accomplishing at natural gas distribution rate of 91% to local governments nationwide. We also conducted 24 projects to develop and produce natural gas and crude oil in 13 countries worldwide to obtain necessary resources and to secure human and technological capacity to grow into a global natural gas provider.

We have been able to realize energy welfare through the supply of cost-effective, clean, and convenient natural gas to all over the country through now, but it is also true that we are in a rather tough situation, due to environmental changes and supply and demand conditions surrounding us. Despite these conditions, KOGAS promises to make the following efforts to create sustainable growth and value for our stakeholders.

First of all, we will do our utmost to stabilize the supply and demand of natural gas by focusing on the economic feasibility, flexibility, and diversification of import sources in response to increases in fluctuations of natural gas demand due to the frequent occurrence of abnormal weather events.

Secondly, we will lead the growth of the gas industry and create new future value by taking the lead in technology-based new growth businesses, including fuel cell-based distributed power generation to resolve environmental issues such as ultrafine dust and the advent of a post - 2020 new climate system, as well as LNG bunkering project to address intensified regulations in the marine environment.

Thirdly, we will actively promote various innovation and communication activities to be reborn as a public corporation that is trusted by the public through establishing a culture of ethics and integrity and reorganizing our corporate culture. In particular, we, as a public corporation, will expand the scope of natural gas supply to the marginalized communities to create social value, and we will build a variety of win-win cooperation models such as packages for joint overseas projects with our suppliers to contribute to the growth of communities and build a healthy ecosystem in the gas industry.

### Dear stakeholders!

KOGAS has established close relationships with governments around the world as well as with the global gas industry and is fully prepared to successfully host the World Gas Conference 2018 – a festival for people of the gas industry in Daegu. Going forward, under the vision of 'Next Energy, with KOGAS,' we will open up a world of safe and clean future energy, while giving top priority to the interests of shareholders and citizens, ensure that local communities and the gas industry grow together harmoniously, contribute to developing the national energy industry, and become a company respected by the people. Once again, I would like to ask you for your continued interest and encouragement to our commitment and various efforts to achieve sustainable management.

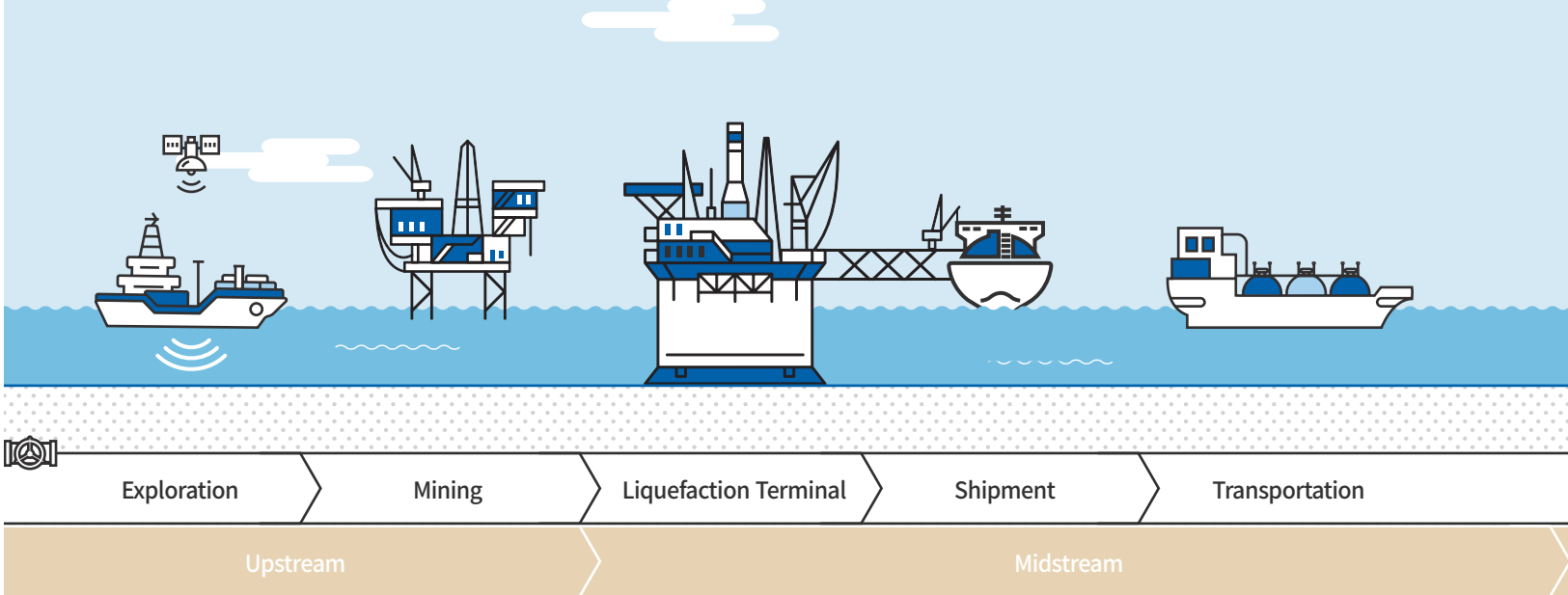
Thank you.

June, 2018  
Cheong, Seung-Il  
President, Korea Gas Corporation



# KOGAS Business

The natural gas industry is segmented into upstream, midstream, and downstream, depending on the scope of activities: upstream prior to liquefaction, midstream for the liquefaction and transportation stage, and downstream for the post-transportation stage. KOGAS has established the entire business scope, covering from overseas resource exploration and development to introduction and transportation of natural gases to Korea to production, supply, and sales.



## Overseas Resource Exploration Projects

KOGAS conducts overseas resource exploration through international bidding and stake acquisition, identifies the most promising geological structures of oil and gas fields using extensive geological surveys and various exploration methods, and confirms the existence of resources through drilling.

- Krueng Mane Sea-based Minefield, Indonesia
- E Sea-Based Minefield, East Timor
- Sea-Based Minefields #2, 3 and 9, Cypress

## Overseas Resource Development and Production Business

KOGAS establishes development plans based on results from reviewing the business feasibility of resource volume discovered by exploration, and performs the development process required for production, such as ground production facility installation and underground production well drilling.

- Horn River/West Curbank Development Project, Canada
- Umiak Minefield Development Project, North Pole of Canada
- A-1/A-3 Development and Production Project, Myanmar
- Senoro Toili Development and Production Project, Indonesia
- Zubair Oilfield Development and Production Project, Iraq
- Badra Oilfield Development and Production Project, Iraq
- Mansuriya Gas Field Development and Production Project, Iraq
- Akkas Gas Field Development and Production Project, Iraq
- Surgil Gas Field Development and Production Project, Uzbekistan

## Business Related to LNG Supply

KOGAS invests in acquiring stakes in operation companies that perform development and production to secure a stable LNG supply volume.

- GLNG Project, Australia
- Prelude FLNG Project, Australia
- DSLNG Project, Indonesia
- RASGAS Project, Qatar
- LNG Project, Oman
- LNG Project, Yemen
- LNG Canada Project, Canada
- Coral FLNG Project, Mozambique

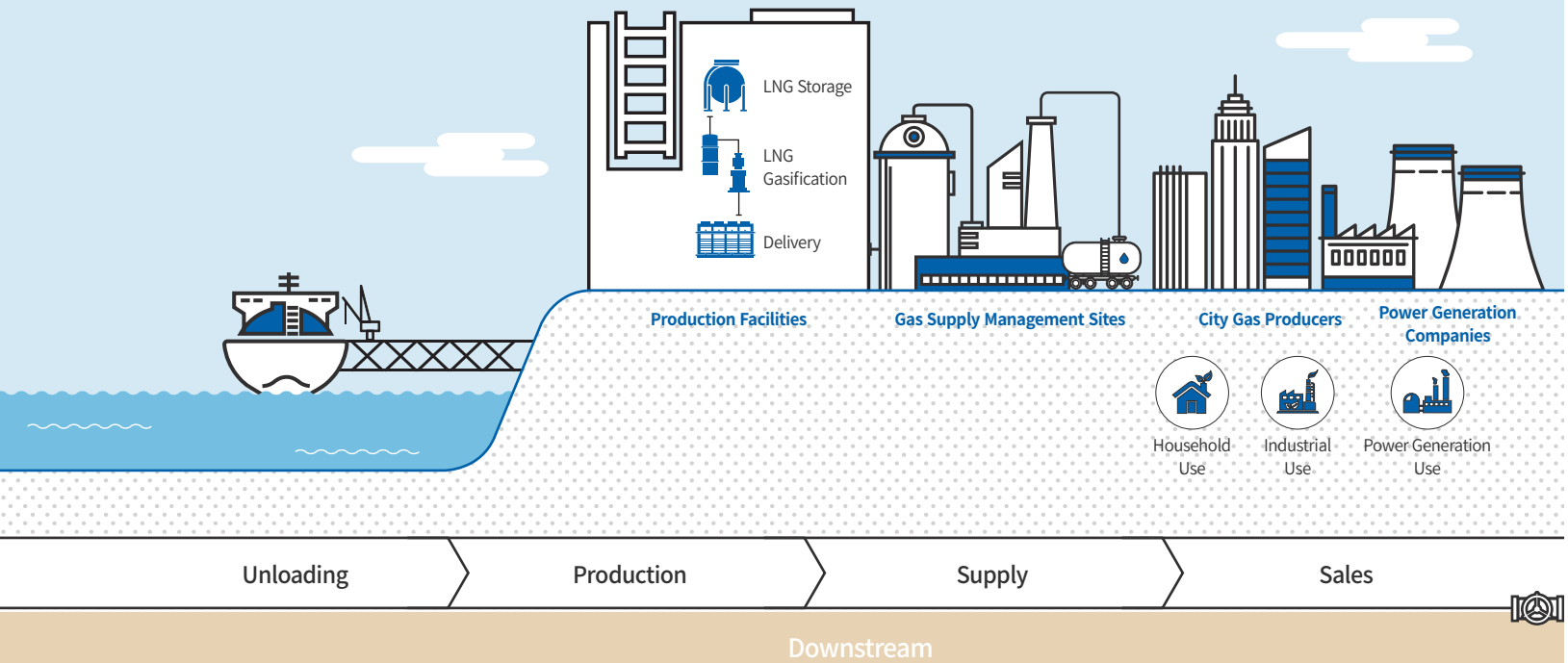
## Import and Transportation

In order to secure a stable natural gas supply that may be obtained in a timely manner and in sufficient LNG volume to respond to the surge in LNG demand, KOGAS is diversifying our supply lines to Brunei, Qatar, Oman, and the United States beyond the Southeast Asian market. In addition, we have advanced our business with Korean flag LNG carriers, which require highly sophisticated technologies, and have utilized national flag carriers for LNG transport since 1994. Currently, we operate 27 national flag carriers for LNG transport and an additional 2 ships are under construction.



Import Volume for 2017

**33,063** thousand tons





### Production and Supply Business

Imported LNG is unloaded in local LNG terminals, stored in large storage tanks, re-gasified, and delivered through the nationwide pipeline network.

	Capacity
Pyeongtaek Terminal Division	4,636 tons/hour
Incheon Terminal Division	4,940 tons/hour
Tongyeong Terminal Division	3,030 tons/hour
Samcheok Terminal Division	1,320 tons/hour

(as of the end of 2017)

 LNG Storage Capacity  
**11.47** million kℓ  
 (as of the end of 2017)

 Total Extension of Pipeline Network  
**4,790** km  
 (as of the end of 2017)

### Sales Business

The sales volume of natural gas has increased by approximately 24 times during the past 30 years since its first supply in 1987 and is sold to various sectors for household, industrial, and power generation usage.

 LNG Sales Volume in 2017  
**32,162** thousand tons

### Overseas Downstream Infrastructure Business

KOGAS engages in various downstream infrastructure projects such as LNG terminals and pipelines based on technologies we developed and accumulated over many years.

- Training and design of terminal expansion, Singapore
- Maputo pipeline project, Mozambique
- Al Zour terminal project, Kuwait
- Manzanillo LNG terminal project, Mexico

## KOGAS Profile

**Overseas Credit Ratings**

S&P **AA-**    Moody's **Aa2**    FITCH **AA-**

**Domestic Credit Ratings**

Korea Ratings **AAA**    NICE Investors Service **AAA**

## Company Outline

KOGAS is Korea's representative energy corporation established to enhance benefits in people's livelihoods and realize their energy welfare through the safe and stable supply of natural gases.

As of June 2018

Company Name	Korea Gas Corporation (KOGAS)	Type of Corporate Body	Corporation
CEO	Cheong, Seung-Il	Sales	KRW 22.1723 trillion
Establishment Date	August 18, 1983	Net Income	KRW 1.0339 trillion
Foundation for Establishment	Korea Gas Corporation Act (No. 3639, enacted in December 1983)	Earnings per Share	KRW -13,802 (for common stock) KRW -13,802 (diluted earnings per share)
Location	120, Cheomdan-ro, Dong-gu, Daegu, Korea	Number of Employees	3,752**

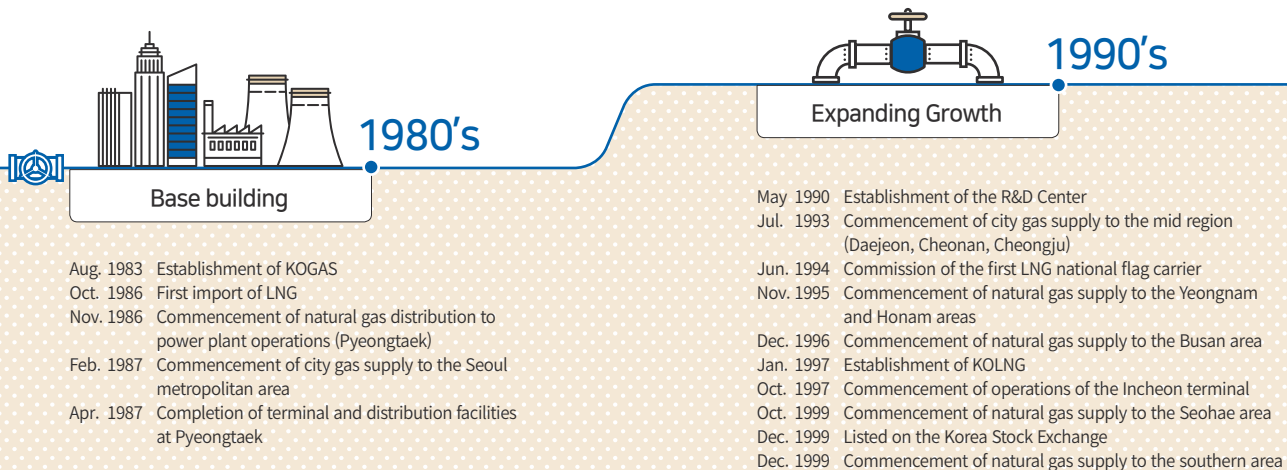
\* Financial items are based on the Consolidated Financial Statements under K-IFRS (as of the end of December, 2017).

\*\* Based on All Public Information In-One as of the end of 2017.

### Key Business Areas

Production/supply of city gas and refinement/sale of byproducts		Construction/operation of bases and supply networks for natural gas	
Development, transport, and ex/import of natural gas		Development and ex/import of Liquefied Petroleum Gas	
Projects on new/renewable energies, clean synthesis fuel, and climate-friendliness using natural gas or its byproducts		Projects commissioned by national or local governments	
Research/technology development in city gas-related projects and auxiliary projects		Exploration/development projects for oil resources and related projects	
Overseas projects related to the above projects			

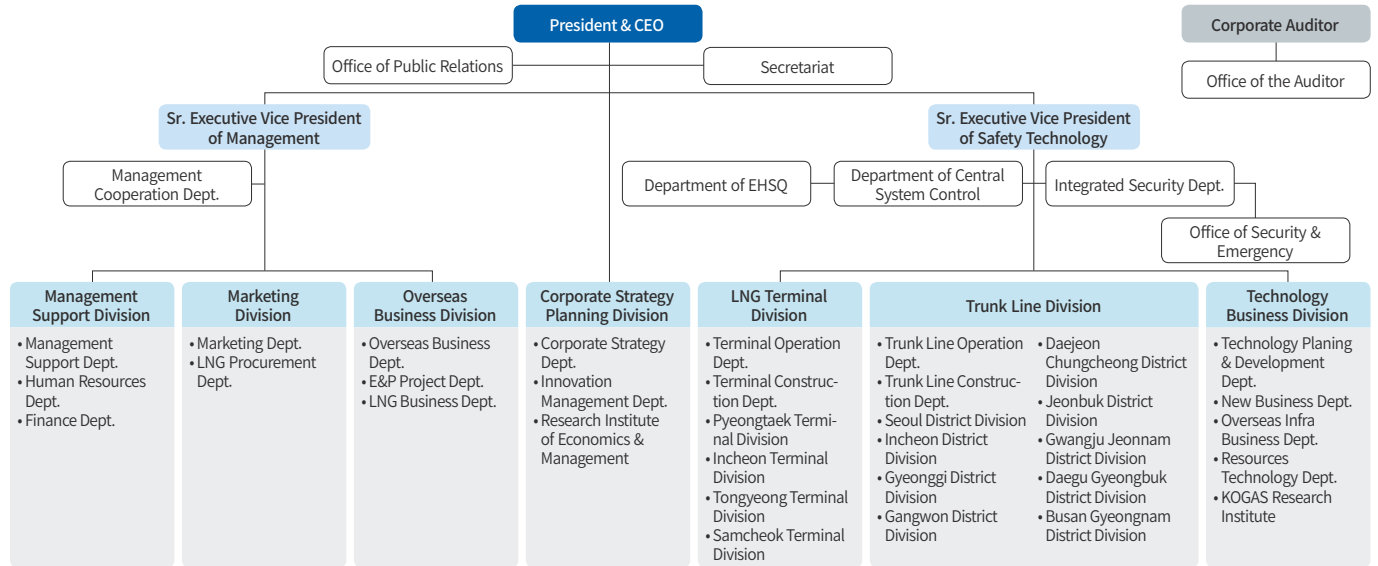
## KOGAS History





## Organization Composition

KOGAS consists of seven divisions: Management Support Division in charge of overall management, Import and Sales Division, Overseas Business Division, Terminal Division in charge of technological matters, Trunk Line Division, Technology Business Division, and Strategic Planning Division in charge of company-wide strategic aspects. Under the divisions are 24 units (headquarters and teams) and 13 divisions (terminal divisions and district divisions).



(As of June 2018)



### Becoming a World Class

#### 2000's

- Mar. 2000 Signed an MOU for the development project of a gas field in the East Sea
- Nov. 2000 Korea, China, and Russia reached an agreement for the co-development of the Irkutsk gas field
- Oct. 2002 Commencement of operations at the Tongyeong terminal
- Nov. 2002 Commencement of natural gas supply to the Gangwon area
- Mar. 2003 Completed sales contract with Australia Liquefied Natural Gas for mid-term LNG
- Jan. 2004 Reached 10 million for the number of households using natural gas
- Aug. 2005 Invested in equity for the A-3 Minefield in Myanmar
- Jul. 2006 The number of natural gas-powered buses exceeded 10,000
- Dec. 2007 Declared 2017 Vision
- Feb. 2008 Signed an agreement to establish a joint investment company for the Surgil Project in Uzbekistan
- Sep. 2008 Signed an MOU for natural gas supply between KOGAS-Gasprom
- Dec. 2008 Inception of the LNG pipeline expansion project
- Jan. 2009 Signed a business partnership MOU with AMEC
- Oct. 2009 Gained interest in the offshore and onshore pipelines for Myanmar gas field



#### 2010's

### Better Energy, Better World

- Jan. 2010 Incheon LNG Terminal surpassed the 100 million tons mark in accumulated production of natural gas
- Jan. 2010 Obtained the development and production rights for the oil and gas fields in Zubair and Badra, Iraq
- Oct. 2010 Gained access to the Akkas and Mansuriya Gas Fields in Iraq
- Mar. 2011 Named as the World's 4th Most Admired Energy Company by Fortune
- Jan. 2013 Agreement signed for the E&P project on three blocks in Cyprus
- Sep. 2013 Additional discovery of a gas well in Area 4 of Mozambique, secured 87Tcf in tTotal
- Sep. 2013 Was incorporated into the DJSI Asia Pacific Level and ranked first in the gas sector
- Mar. 2014 Hosted Gastech 2014 at Kintex
- Oct. 2014 Won the bid to host the 2021 World Gas Conference in Daegu
- Jan. 2016 Declared 2025 Vision ("NEXT Energy, with KOGAS")
- Oct. 2016 Awarded the Prime Ministerial Award on World Standards Day 2016
- Jun. 2017 Initiated full development of Area 4 gas field in Mozambique
- Jun. 2017 Started commercial operation of the three 270,000 S ¥-volume storage tanks (the largest volume) in Samcheok Terminal
- Jun. 2017 Started commercial operation of floating liquefied natural gas (FLNG) for Australian prelude project
- Sep. 2017 Completed construction of the Samcheok LNG production terminal
- Sep. 2017 Achieved DJSI Asia Pacific Level five times in a row
- Sep. 2017 Hosted Asia Pacific Gas Conference (APGC) 2017 in Daegu

# Vision & Strategy

## KOGAS 2025

In order for KOGAS to remain a public corporation with clean energy that contributes to livelihood of the public through the safe and stable supply of natural gases, KOGAS established and announced 'KOGAS 2025,' a new mid- and long-term management plan. KOGAS 2025 consists of four strategy directions and twelve strategy tasks based on the slogan for the vision, 'NEXT Energy, with KOGAS,' meaning that KOGAS will partner with the public for a new, outstanding, and reliable future energy world. We will make 'Better Energy, Better World' under KOGAS 2025.

### KOGAS 2025

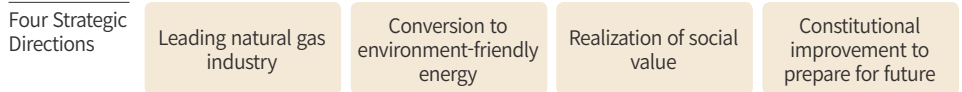
**Purpose of Establishment** We are committed to facilitate public benefits and improve public welfare by securing a long term and stable supply base of gases.

**Corporate Philosophy** Better Energy, Better Tomorrow

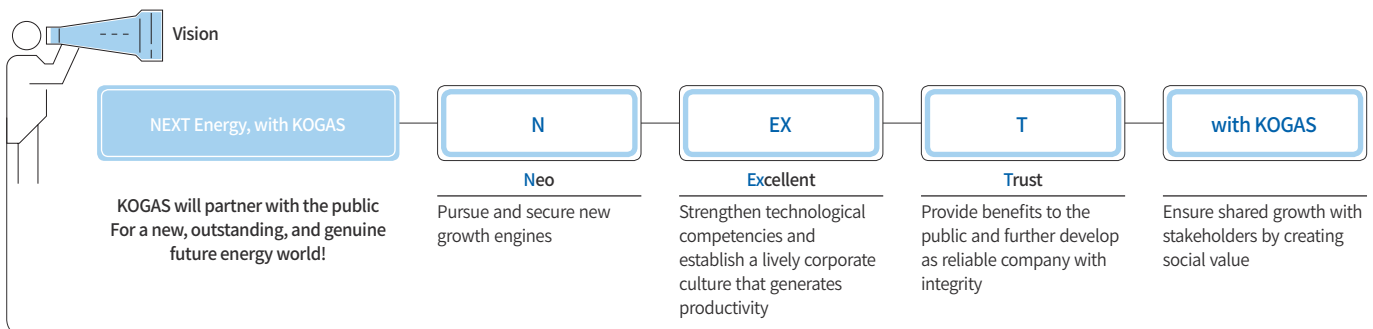


**Vision** Next Energy, with KOGAS

**Vision Goals** Contribution of KRW 10 trillion to the national economy, Energy conversion rate of 20%, Productivity improvement rate of 30%



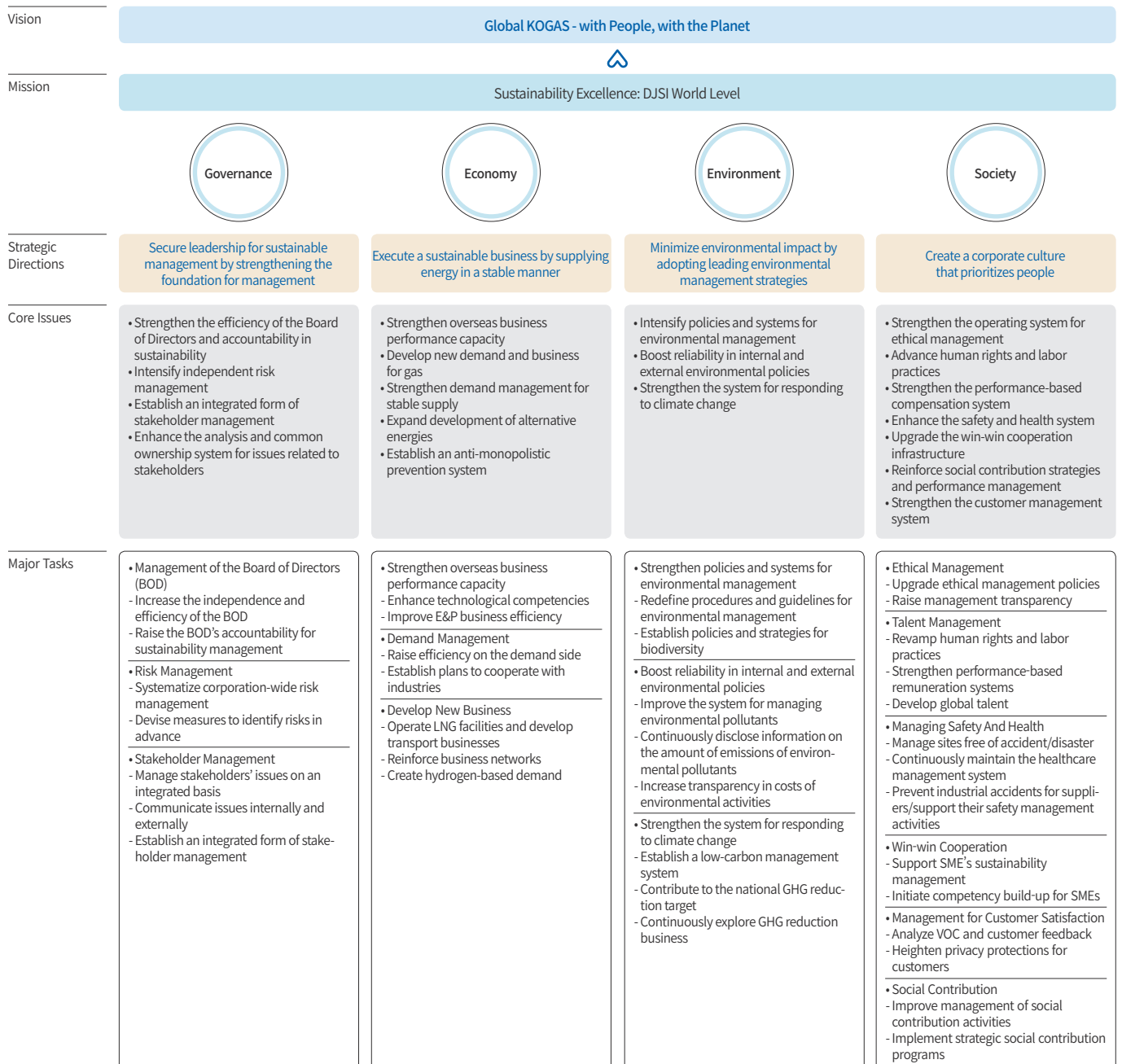
\* 6 main tasks



## Sustainability Management Strategies

As Korea's largest supplier of natural gases, KOGAS is responsible for minimizing the impact of global climate change and our ecological footprint by supplying energy safely and seamlessly. We respect and listen to our stakeholders throughout the world, including the public, local communities, government, customers, and suppliers, when implementing sustainability management. Against this backdrop, we propose 'Global KOGAS - With people, with the Planet' as a vision for sustainability management, and we establish a relevant strategy system. The Future Strategy Team is in charge of matters on sustainability management, and strategy setting and performance results are periodically reported to the Sustainability Management Committee, which reviews key agenda items, then makes decisions.

### System for Sustainability Strategies



# Shared Value with KOGAS



**Social Value Realization**



**Economic Value Realization**



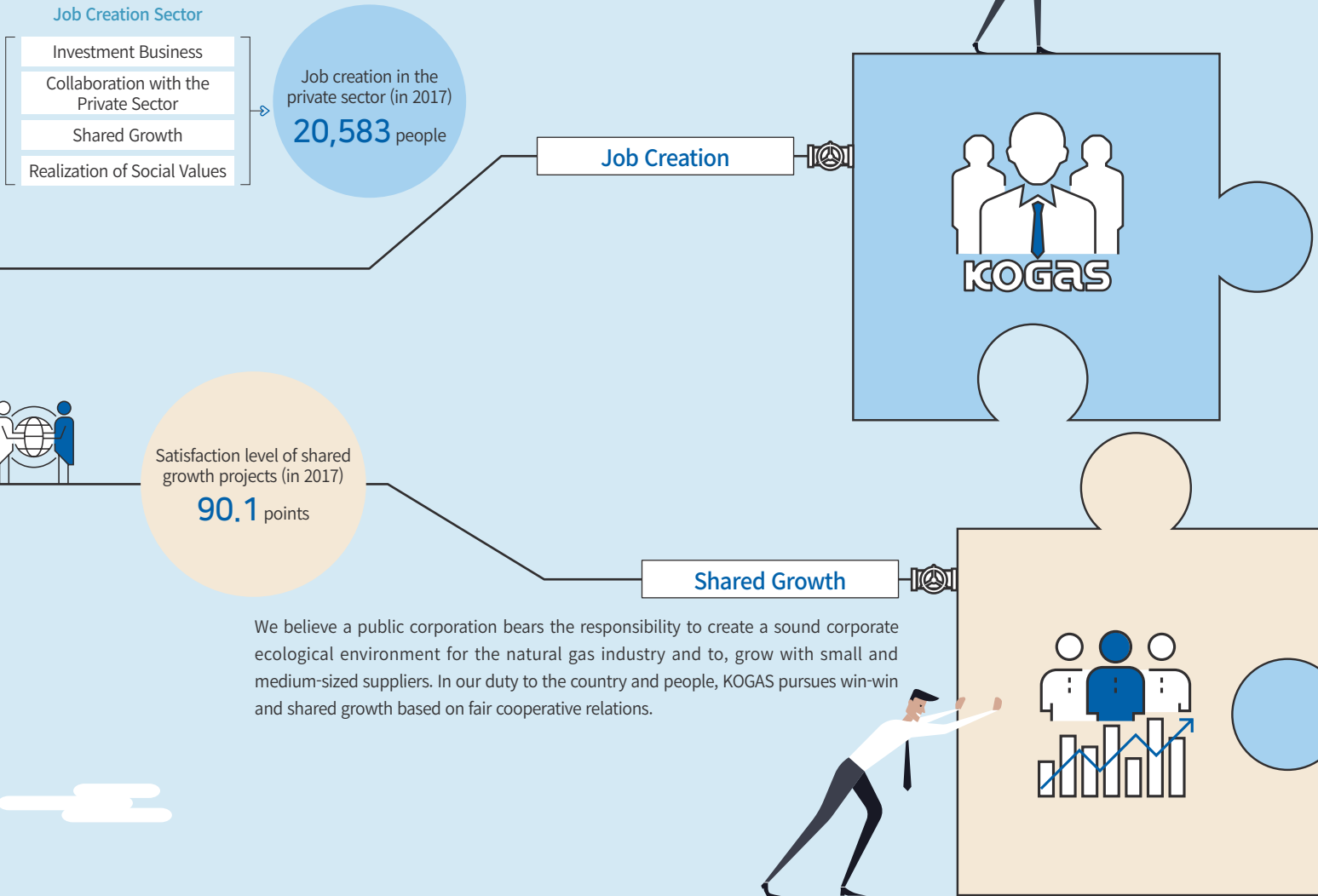
**Environmental Value Realization**

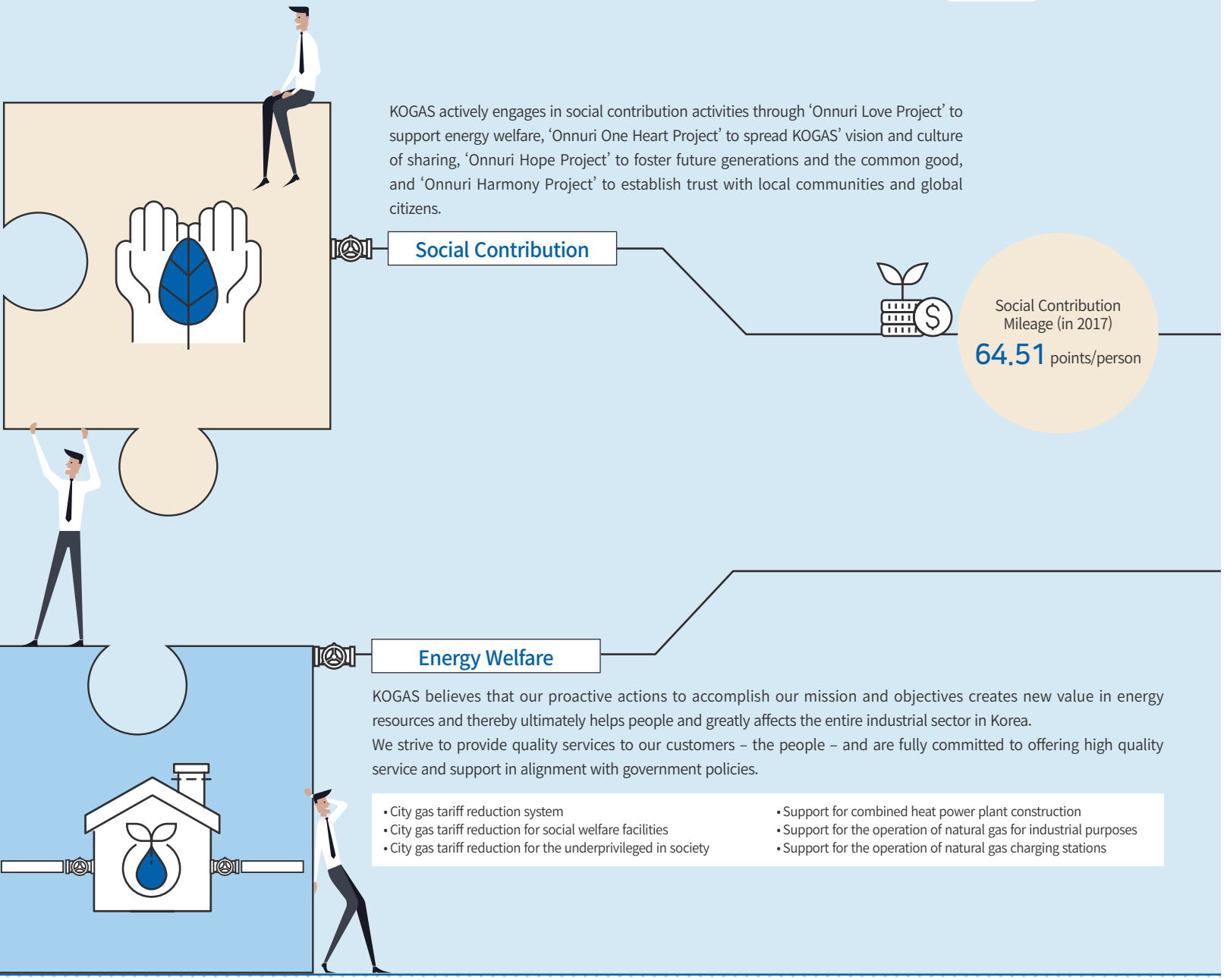


# Social Value Realization

KOGAS is a public energy corporation established with the purpose of promoting public well-being and welfare. As such, we have the mission to contribute to social benefits and to develop local communities and the nation. We pursue sustainable advancement based on common social values through creating quality jobs, protecting labor and human rights, pursuing shared growth with small and medium-sized suppliers to establish a health industrial ecosystem, invest in social contribution by co-existing with local communities, and promoting energy welfare for the underprivileged in society.

KOGAS makes various efforts to provide more job opportunities and establish better job environment based on a job creation vision of 'KOGAS Job Together' for a better society.





KOGAS actively engages in social contribution activities through ‘Onnuri Love Project’ to support energy welfare, ‘Onnuri One Heart Project’ to spread KOGAS’ vision and culture of sharing, ‘Onnuri Hope Project’ to foster future generations and the common good, and ‘Onnuri Harmony Project’ to establish trust with local communities and global citizens.

**Social Contribution**

Social Contribution Mileage (in 2017)  
**64.51** points/person

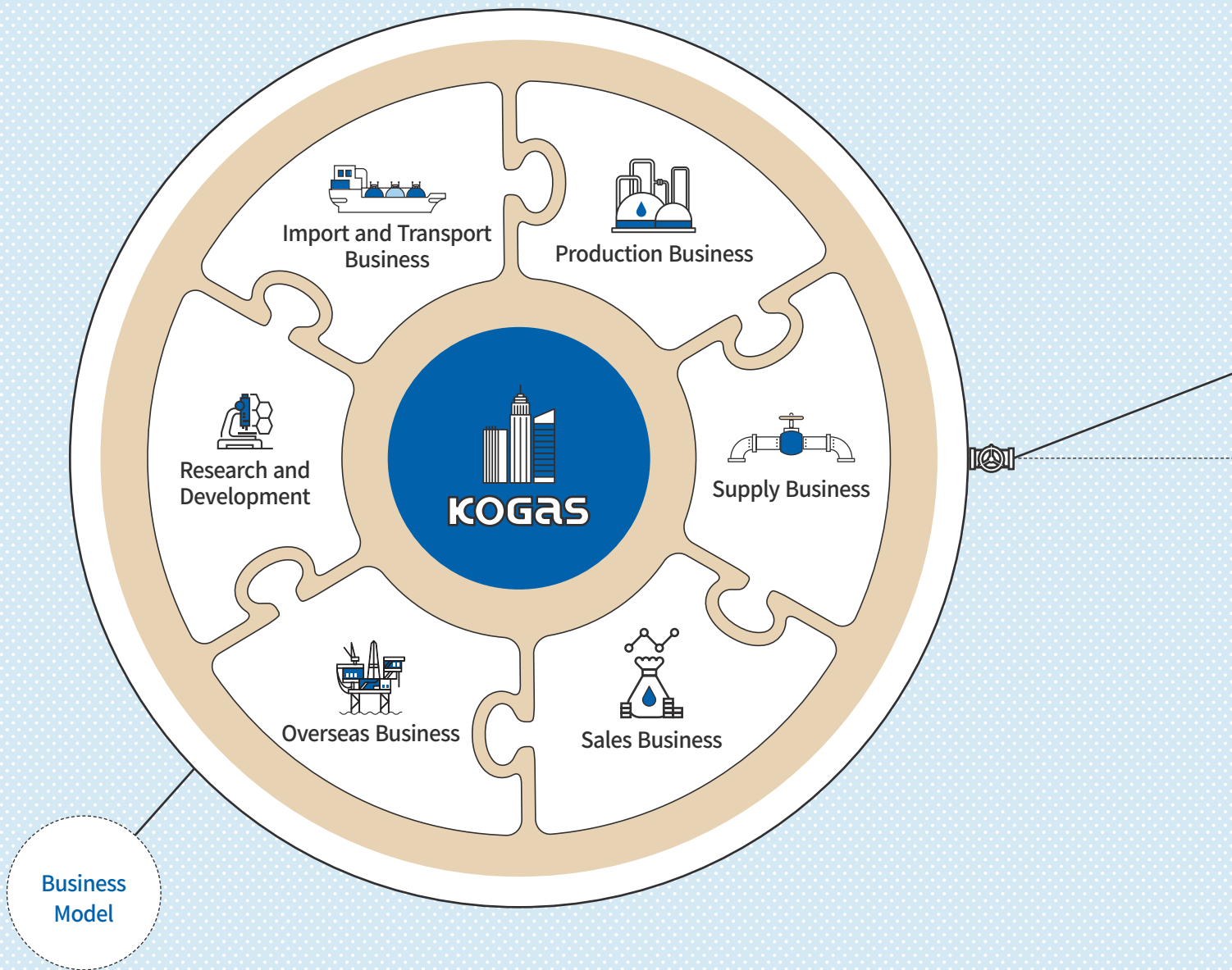
**Energy Welfare**

KOGAS believes that our proactive actions to accomplish our mission and objectives creates new value in energy resources and thereby ultimately helps people and greatly affects the entire industrial sector in Korea. We strive to provide quality services to our customers – the people – and are fully committed to offering high quality service and support in alignment with government policies.

- City gas tariff reduction system
- City gas tariff reduction for social welfare facilities
- City gas tariff reduction for the underprivileged in society
- Support for combined heat power plant construction
- Support for the operation of natural gas for industrial purposes
- Support for the operation of natural gas charging stations

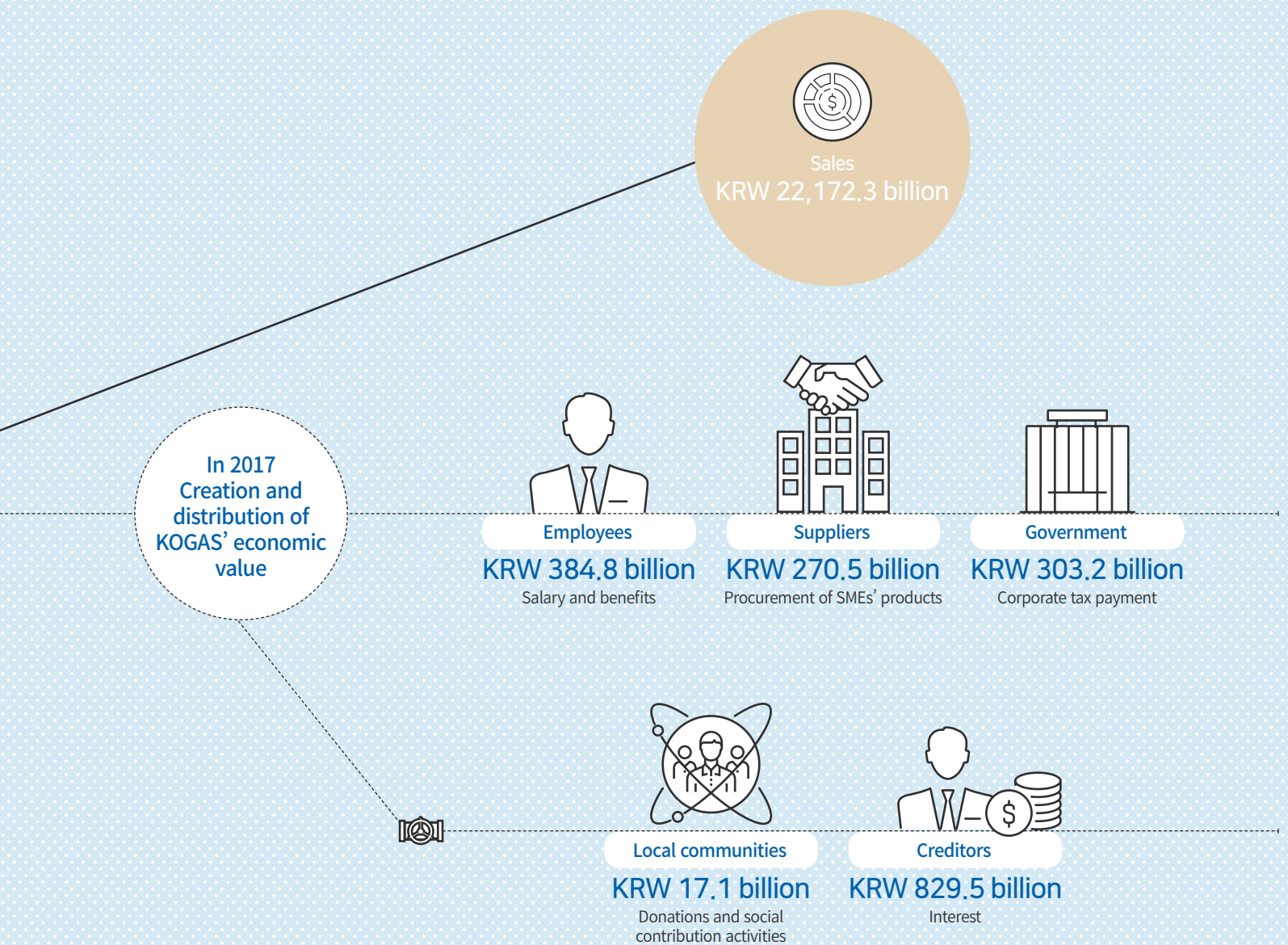
## Economic Value Realization

The world recognizes that securing and developing energy resources is essential to achieve national competitiveness, and the importance of natural gas, a low-pollution clean energy, is increasingly emphasized due to intensified environmental regulations under climate change policies. As the largest wholesaler of natural gas in Korea, KOGAS imports natural gas from foreign countries where it is produced in the form of LNG and supplies the gas after re-gasification directly to large-scale customers such as power plants or to gas retailers





including local city gas suppliers. In the long term, our business scope is gradually expanding to the exploration and development of overseas gas fields in order to keep supply costs low and supply it gas a stable manner, and we are also entering the infrastructure market such as through the construction of overseas terminals and pipelines based on our technology. We share the economic value created through these business activities with various stakeholders.



# Environmental Value Realization

Since our declaration of environment management in 1997, KOGAS has minimized the adverse impact to the environment that inevitably arise in the course of our business activities, and has participated in global climate change actions to manage carbon emissions. We actively manage pollutant emissions by setting our own management targets at a level higher than legal standards, and we create eco-friendly value by installing

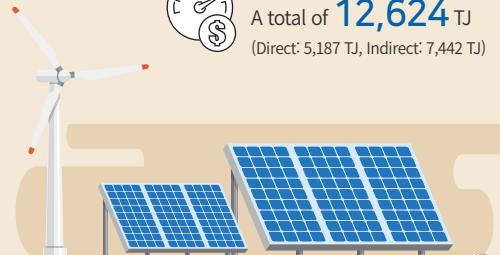
## INPUT



Use of chemicals  
**91,620 kg**  
 (Basic unit: 2.85 kg/thousand tons)

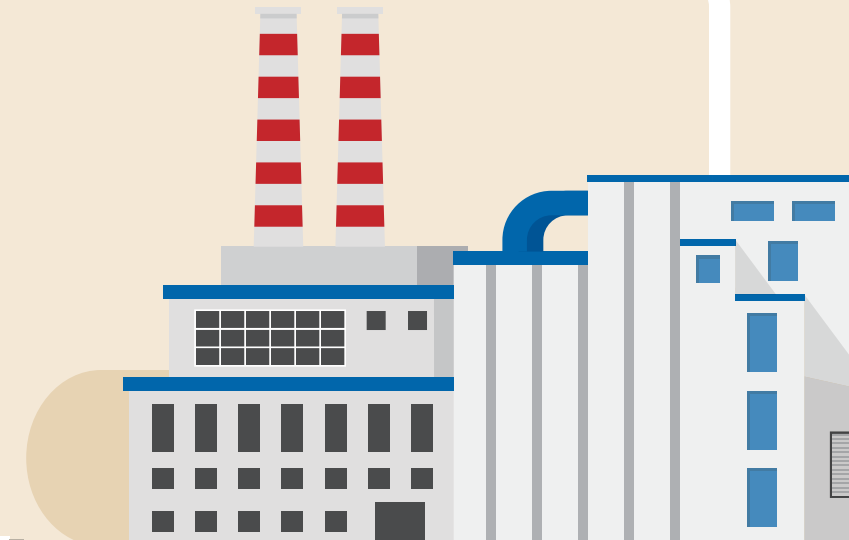


Energy usage  
 A total of **12,624 TJ**  
 (Direct: 5,187 TJ, Indirect: 7,442 TJ)



Water usage  
 A total of **1,241,908 thousand m<sup>3</sup>**

Sea water	Tap water	Underground water
<b>1,241,442 thousand m<sup>3</sup></b>	<b>459 thousand m<sup>3</sup></b>	<b>7.5 thousand m<sup>3</sup></b>



### KOGAS' Environment Management

**ISO 14001**

- Company-Wide

**ISO 50001**

- Entire Terminal Divisions  
 - Entire Supply Divisions

**Green company**

- Incheon Terminal Division

renewable energy facilities and performing greenhouse gas reduction activities. We endeavor to fulfill our environmental responsibilities for local communities, the people, and future generations, contributing to the sustainable development of the nation and society.

\* This page is based on the data of resources used, emitted, and managed during 2017.

## OUTPUT

**GHG emissions**  
A total of **623,639** tCO<sub>2</sub>e  
(Direct: 263,068 tCO<sub>2</sub>e, Indirect: 360,571 tCO<sub>2</sub>e)

**Waste discharge**  
A total of **84,279** tons  
(Basic unit: 2.62 ton/thousand tons)

General	Designated	Construction
<b>547</b> tons	<b>53</b> tons	<b>83,679</b> tons

**Air pollutant emission**

<b>NOx</b> 212,995 kg (Basic unit: 6.62 kg/ thousand tons)	<b>SOx</b> 1,175 kg (Basic unit: 0.04 kg/ thousand tons)	<b>Dust</b> 3,548 kg (Basic unit: 0.11 kg/ thousand tons)
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**Environment activity budget**  
KRW **25,555** million

**Renewable energy** installation  
(GHG reduction in 2017 1,428 tCO<sub>2</sub>e)

**Water pollutant emission**

<b>BOD</b> 55.9 kg (Basic unit: 0.002 kg/ thousand tons)	<b>COD</b> 61.3 kg (Basic unit: 0.002 kg/ thousand tons)	<b>SS</b> 124.5 kg (Basic unit: 0.0039 kg/ thousand tons)
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# KOGAS Sustainability Performance



**Participation of Stakeholders**



**Materiality Test**



**Creating Social Value**



**Creating EHSQ Value**



**Creating Economic Value**

## Participation of Stakeholders

### Definition of Communication with Stakeholders

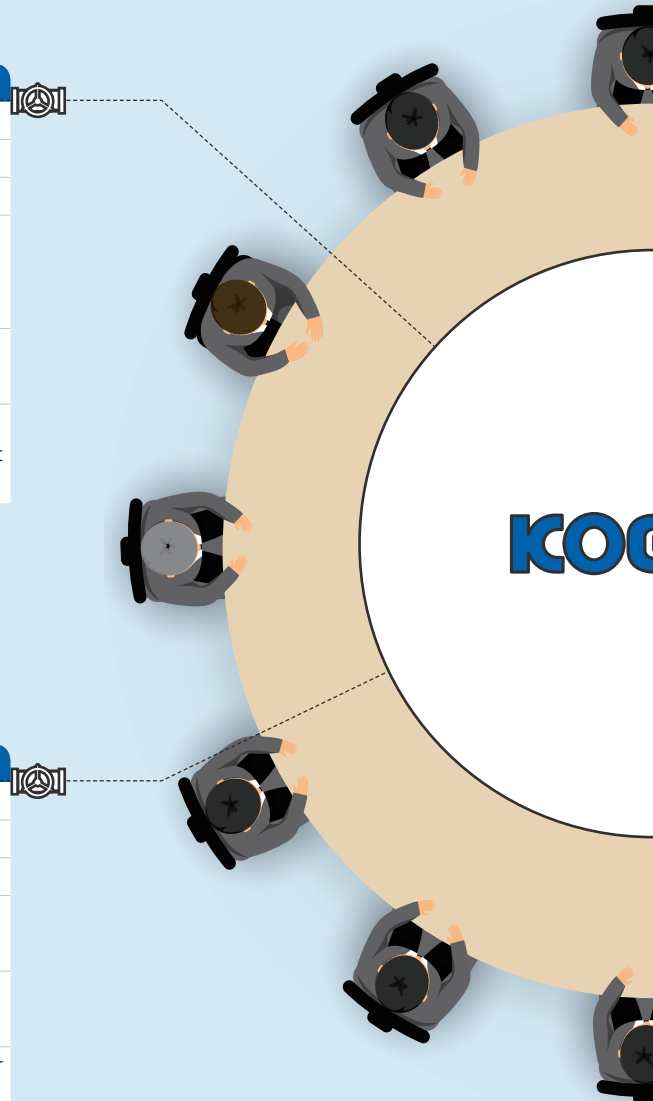
The stakeholders of KOGAS are defined as individuals or organizations subject to critical impact from KOGAS' activities and services, and they are categorized based on a classification system focused on competition and collaboration to raise benefits for the public.



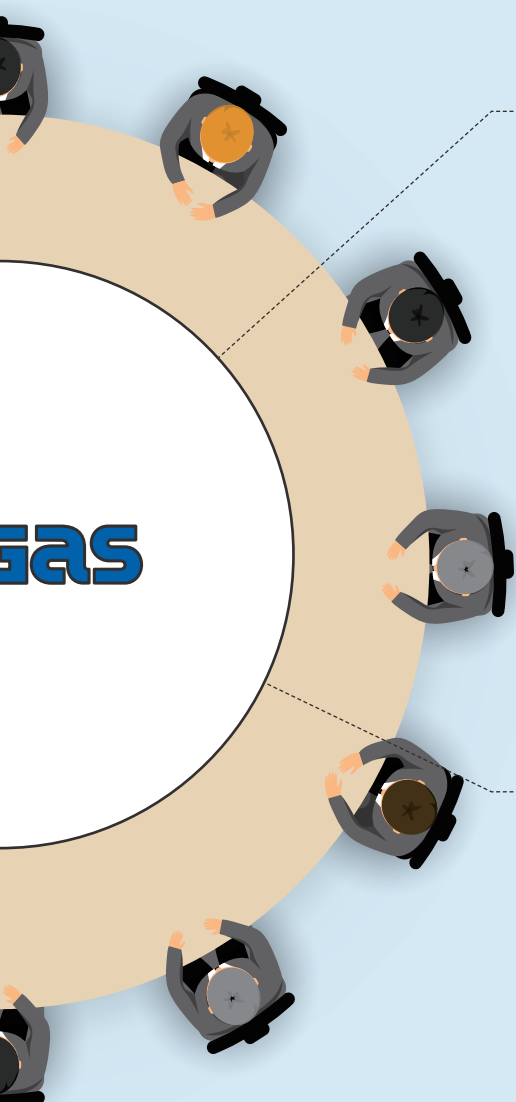
Value Self-Leading Type	
Definition	Provide benefits to the public and drive growth in the gas industry
Stakeholder Group	Employees, labor union
Areas of Interest	Organizational vision, working environment
Communication Channels	<ul style="list-style-type: none"> <li>• Management Committee</li> <li>• Labor-Management Council</li> <li>• KOGAS' Intranet, etc.</li> </ul>
Direction of Communication	<ul style="list-style-type: none"> <li>• Aim to achieve KOGAS' establishment purposes</li> <li>• Internalize core values</li> </ul>
Key Communication Efforts and Performance	<ul style="list-style-type: none"> <li>• Communication meetings between the CEO and employees (7 times)</li> <li>• Strengthen labor-management communication, e.g. organization of a joint labor-management workshop</li> </ul>



Value Cooperative Type	
Definition	Engage in policy coordination for service for the public
Stakeholder Group	Public, government, national assembly
Areas of Interest	Energy fees, energy welfare
Communication Channels	<ul style="list-style-type: none"> <li>• Legislative activities including inspection of the National Assembly</li> <li>• Discuss management objectives and pending issues</li> </ul>
Direction of Communication	<ul style="list-style-type: none"> <li>• Maintain consistency with vision</li> <li>• Improvement the quality of public services</li> </ul>
Key Communication Efforts and Performance	<ul style="list-style-type: none"> <li>• Promoted visiting service of tariff reduction and published a white book for National Assembly inspection</li> <li>• Established a real-time disaster response system in cooperation with 26 local governments (sharing activities)</li> </ul>



We also provide communication channels that are customized for each stakeholder group so stakeholders may take part in KOGAS' management activities. We will intensify our basis for sustainability by attentively listening to stakeholder demands and collaborating with them.



Value Self-Leading Type	
Definition	Contribute to higher benefits through gas supply and form a relationship to share partnership-based growth
Stakeholder Group	City gas producers, importers, communities
Areas of Interest	Generate demand, facilitate local economies
Communication Channels	<ul style="list-style-type: none"> <li>• Business presentations</li> <li>• Seminars to improve customer satisfaction</li> </ul>
Direction of Communication	<ul style="list-style-type: none"> <li>• Pursue values of shared growth</li> <li>• Share development strategies for the gas industry</li> </ul>
Key Communication Efforts and Performance	<ul style="list-style-type: none"> <li>• Establish an integrated demand/supply management system incorporating the private sector with the, government and public sectors and expand supply areas</li> <li>• 'Implement 'Onnuri Heat Efficiency Improvement Project' (50% of business volume in Daegu Gyeongnam)</li> </ul>

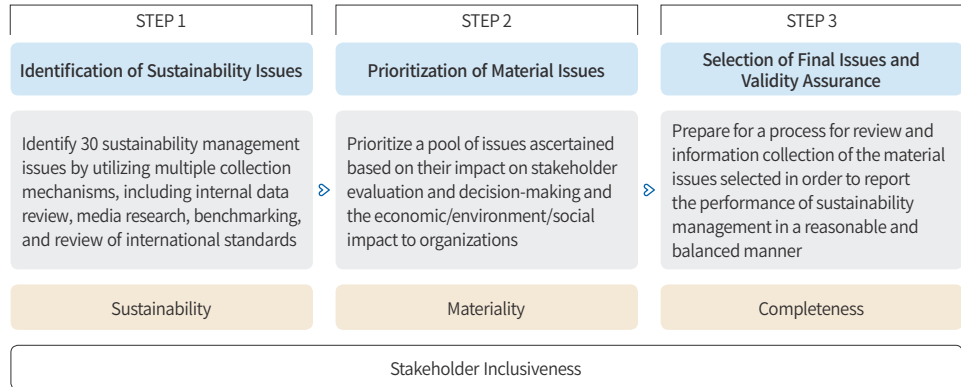


Value Based Type	
Definition	Support and provide the basis to generate performance for growth of the gas industry
Stakeholder Group	Investment companies, countries to which KOGAS has expanded, suppliers
Areas of Interest	Achieve growth in symbiotic relationships, generate national wealth
Communication Channels	<ul style="list-style-type: none"> <li>• Meet for cooperation on resources development</li> <li>• Shared Growth Committee</li> </ul>
Direction of Communication	<ul style="list-style-type: none"> <li>• Establish trust-based partnerships</li> <li>• Share business information in a timely manner</li> </ul>
Key Communication Efforts and Performance	<ul style="list-style-type: none"> <li>• Strengthen communication with the governments of countries into which KOGAS has entered and establish cooperative structures with LNG buyers</li> <li>• Mentor for SMEs' technology development and support their participation in overseas business fairs</li> </ul>

# Materiality Test







## Selection of and Reporting Process for Material Issues

KOGAS regularly collects information on the economic, environmental, and social needs and opinions of our stakeholders to identify priority issues for securing sustainable management activities. We address material issues based on our goals and strategies to manage outcomes, and disclose them via various channels including the Sustainability Report.



### STEP 1 Identification of Sustainability Issues

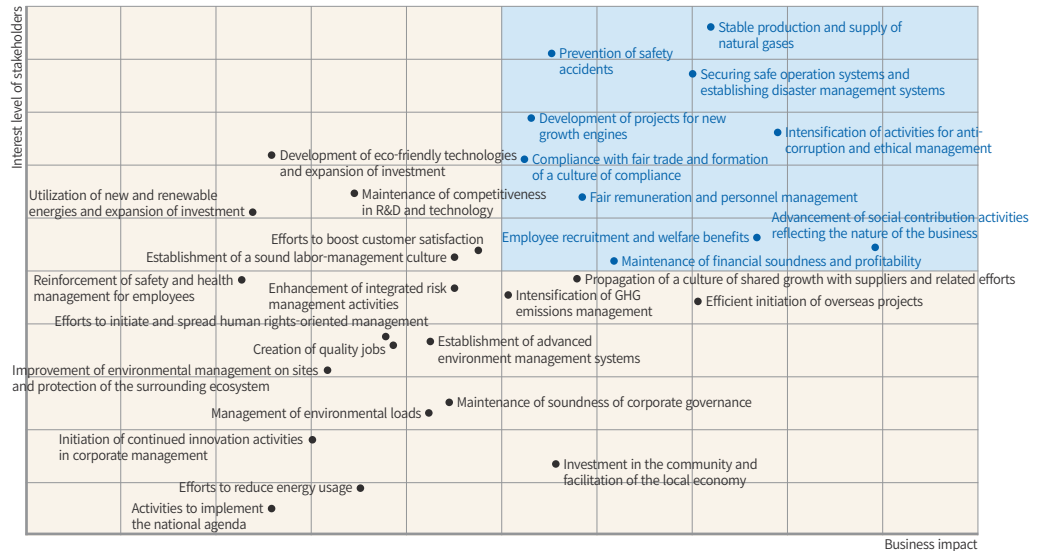
In order to identify the economic, environmental, and social impact of all activities and services, we conducted media analysis, benchmarking of related institutions and the industry KOGAS is engaged in, and review of international reviews and stakeholder surveys, organization of T/F workshops, and analysis of internal data, etc. from January 2017 to the end of December, 2017.

- 
**Media Research**  
 Analyzed news articles on KOGAS' management and activities reported in media coverage from January 2017 to the end of December, 2017
- 
**Benchmarking Analysis**  
 Analyzed best practices and key trends based on reports of the industry at home and abroad and related institutions
- 
**Review of International Standards on Sustainability Management**  
 Identified key issues in international standards related to sustainability management including GRI Standards, DJSI and ISO 26000, UNGC, etc.
- 
**Stakeholder Surveys**  
 Conducted a survey from May 15 to 25, 2018, to determine material issues for stakeholders
- 
**Review of Internal Data**  
 Identified major economic, environmental, and social issues by analyzing management evaluation reports, mid- and long-term management strategies, management disclosures, and various internal reporting data
- 
**T/F Workshop**  
 Organized a workshop to assist those involved in report preparation and managers covering related issues, as well as to openly discuss sustainability management



### STEP 2 Prioritization of Material Issues

We determined issues with a high priority by evaluating the aspects of ‘stakeholder evaluation and decision-making’ and ‘importance of the organizations’ economic, environmental, and social impact’ against the identified sustainability management issues of sustainability management



### STEP 3 Selection of Final Issues and Validity Assurance

We finalized the content to be reported by defining the level of boundary and scope for material aspects to be included in the report based on internal review. In addition, we conducted validity checks to express our sustainability management performance in a rational and balanced manner in order to include both the positive and negative impact of KOGAS.

Ranking	Material Issues	GRI Topic	Issues Boundaries	
			Internal	External
1	Stable production and supply of natural gases	-	KOGAS & Employees	Government, Suppliers, Customers, Shareholders/Investors, Global Stakeholders, Citizens
2	Intensification of activities for anti-corruption and ethical management	Anti-corruption		Government, Citizens
3	Securing safe operation systems and establishing disaster management systems	Occupational Health and Safety		Government
4	Advancement of social contribution activities reflecting the nature of the business	Local Communities		Local Communities, NGO
5	Employee recruitment and welfare benefits	Employment, Training and Education		-
6	Prevention of safety accidents	Occupational Health and Safety		Government
7	Fair remuneration and personnel management	Employment		-
8	Development of projects for new growth engines	-		Government, Shareholders/Investors
9	Compliance with fair trade and formation of a culture of compliance	-		Suppliers, Global Stakeholders
10	Maintenance of financial soundness and profitability	Economic Performance		Government, Shareholders/Investors

# Creating Social Value





Key Issues	Background and Policies from the Perspective of Sustainability	Management Direction	Relevant Stakeholders	Department in Charge
Job Creation	As youth unemployment emerges as an important social issue in Korea, there is a continuous demand for job creation and provision of quality jobs by companies. KOGAS promotes 'Creation of More Jobs,' 'Securing Better Job Environment,' and 'Win-win Management for Living Together' based on strategies and systems for job creation in order to ensure a swift response to this economic paradigm shift 'toward job creation.'	<ul style="list-style-type: none"> <li>To establish mid- and long-term strategies and systems to create jobs.</li> <li>To ensure the timely regularization of irregular workers and a secure workplace without discrimination to establish a better job environment.</li> <li>To create quality and win-win jobs in the private sector.</li> </ul>	The government, communities, and the public	Collaborative Cooperation Department
Mutual Growth	KOGAS considers the creation of a sound corporate environment in the natural gas industry as our responsibility as a public corporation that serves the nation and the public, and we take relevant issues seriously. Maintaining fair cooperative relationships to ensure co-existence and shared growth with small and medium-sized businesses and supporting their growth, KOGAS focuses on sharing our technology and expertise to contribute to the productivity improvement of the natural gas industry.	<ul style="list-style-type: none"> <li>Collaboration to open up new local and overseas markets for SMEs.</li> <li>Support for the enhancement of R&amp;D capacity of SMEs.</li> <li>Expansion of a performance sharing system to make secure a culture of sharing fair gains.</li> </ul>	Suppliers	Shared Growth Division
Customer Services Innovation	Customers of KOGAS are categorized into three groups: first, the general public as end-users of natural gases indirectly provided by KOGAS; second, city gas producers delivering natural gases from KOGAS to consumers; and lastly, large-volume consumers directly provided with services by KOGAS. KOGAS runs a customer satisfaction management network and communicates closely with customers in order to provide products and services that satisfy them.	<ul style="list-style-type: none"> <li>Provide services for the public to experience benefits through innovations in public services.</li> <li>Promote user-oriented management activities.</li> <li>Establish systems to ensure communication and collaboration with clients.</li> </ul>	The Public and Customers	City Gas Sales Department Sales Planning Department
Contribution to Communities	KOGAS considers its responsibility as a public corporation to be to achieve win-win cooperation with local communities, gaining support and trust, while providing plentiful support by communicating proactively with the community and identifying mutual needs because this is the starting point of shaaring value. In addition, we have implemented social contribution activities which pursue creation of both corporate values and community values, expanding social contribution activities through philanthropic one-way support.	<ul style="list-style-type: none"> <li>Promote social contribution activities to create shared value.</li> <li>Achieve substantiality in KOGAS's social brand - 'Onnuri'.</li> <li>Invigorate the local economy.</li> </ul>	Local communities	Collaborative Cooperation Department



# Job Creation

## KOGAS's Strategies to Create Jobs

The issue of job creation has been at the forefront of the government's agenda as youth unemployment continues to be a social issue. In our effort to fulfill our social obligations as a public corporation, KOGAS has set a goal of creating 18,000 jobs annually in the private sector by 2025, and we are implementing strategies and forming organizations to achieve this goal.

### Implementation Strategies for Job Creation

With a vision of 'KOGAS Job Together for a Better Society,' KOGAS established and is implementing three major goals: laying the foundation for sustainable jobs, improving job quality, and creating quality jobs in the private sector.

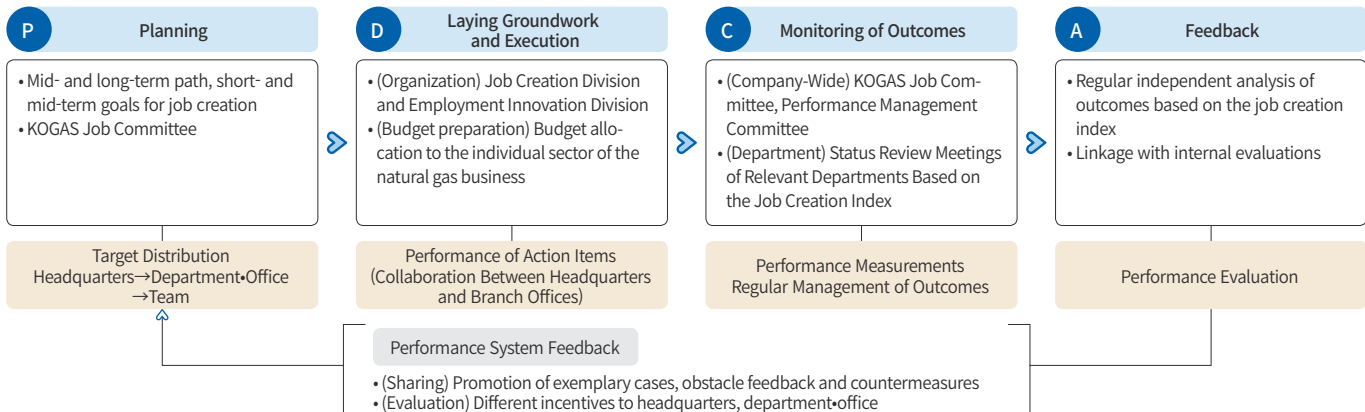
#### Implementation Strategies for Job Creation

Job Vision	'KOGAS Job Together' for a Better Society		
Goal (by 2025)	Create sustainable jobs; 18,000 jobs annually in the private sector		
Goal in 2017	Secure the base of quality job creation; create 19,500 good jobs in the private sector		
Job Creation Direction	Groundwork for Job Creation	Job Quality Improvement	Creating Quality Jobs in the Private Sector
Process for Job Creation	<ul style="list-style-type: none"> <li>Establish strategies for job creation</li> <li>Establish implementation system for job creation</li> </ul>	<ul style="list-style-type: none"> <li>Zero temporary workers</li> <li>Secure the work environment without discrimination</li> <li>Expand job sharing</li> </ul>	<ul style="list-style-type: none"> <li>KOGAS business-based job expansion</li> <li>Foster eco-friendly new businesses</li> <li>Strengthen the competitiveness of suppliers</li> <li>Social value bases</li> </ul>

## Laying the Foundation for Jobs

KOGAS considers the creation of a sustainable job ecosystem where public and shared growth management is secured to be integral to a public corporation's role in boosting employment. We believe the most desirable employment creation model is to build up the foundation for jobs, improve their quality within our organization, and create quality jobs based on shared growth and collaboration with KOGAS in the private sector. To this end, we have identified employment creation processes by shifting the implementation direction of our projects toward 'Job Creation,' and elevated the project's viability by establishing a mid- and long-term roadmap up to 2025 for each action item. In addition, we have already put this project into action by organizing the 'Job Committee' with the President of KOGAS as chairman and have formed consensus between labor and management by sharing practical matters about the process of improving job quality. Furthermore, in 2018, a department dedicated to job-related matters was established and plays a pivotal role in implementing these strategies.

#### Job Creation Strategy Implementation System



## Improvement of Job Quality

### Complete Regularization of Irregular Workers

KOGAS evaluated the qualifications of applicants through an evaluation committee consisting of internal and external experts to regularize our temporary workers. We evaluated candidates against pre-set criteria, including fundamental competency and job-related knowledge based on written opinions on regularization, work performance and plan, and we regularized five temporary employees. In addition, we plan to promote dispatched workers and subcontracted workers to regular full-time workers at the time when their contract ends after the first half of 2018 based on principle.

### Creating a Work Environment Without Discrimination

For formerly irregular workers whose employment has since been regularized, KOGAS gives the same treatment as regular full-time workers without any discriminatory elements. In addition, with the regularization of the temporary and indirectly-employed workers, we are improving their treatment by establishing a task-oriented wage system instead of the uniform salary class system that previously existed. Furthermore, other discriminatory elements have been completely eliminated by applying the same level of salary and welfare benefits to employees with high school diplomas or in permanent contract and by providing continuous benefits to special groups of employees including those who are subject to the salary peak system.

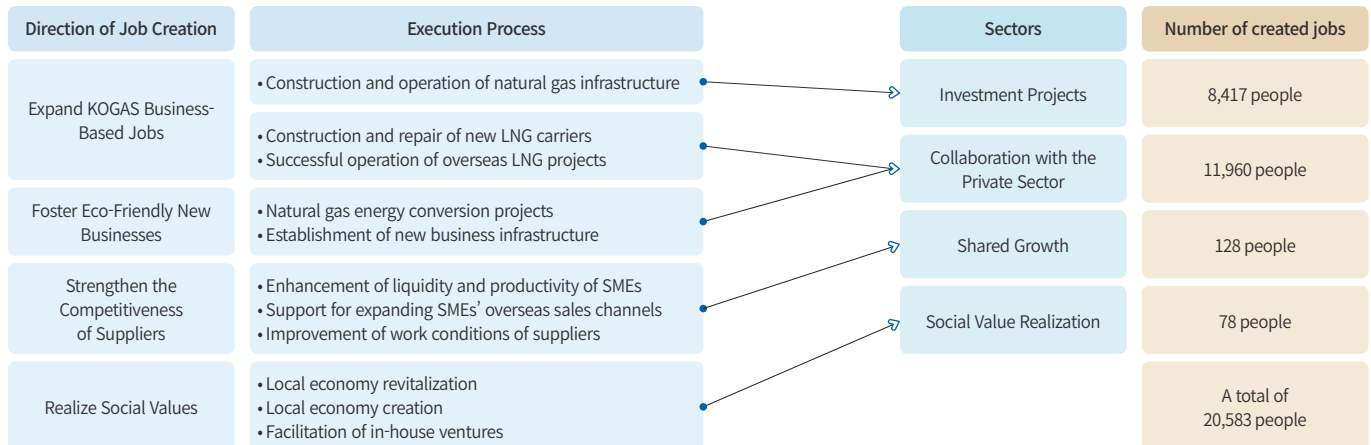
### Expansion of the Scope of Job Sharing

KOGAS is creating a variety of jobs by managing human resources in a practical manner. We have developed management strategies to identify new employment opportunities and eliminate long-hour works by analyzing the maximum number and the current number of employees for individual positions. Following an analysis of stipends for overtime hours and annual leave, we resolved the problem of excessive work hours. Therefore, we were able to increase the number of new employees and build up a foundation for job sharing. In particular, we identified a minimum of 167 to 253 new job opportunities per job type, after we reduced working hours and allowances by improving the work shift system through a collaborative effort by labor and management. We also expect that more than 50 new jobs will be created in 2019 by reducing overtime and encouraging the use of available annual leave.

## Creation of Quality Jobs in the Private Sector

The creation of good jobs in the private sector is implemented in terms of investment projects, private collaboration, shared growth, and social values. In 2017, the total number of jobs created in the private sector was 20,583 with 9,879 regular workers and 10,704 non-regular workers.

Jobs created in the private sector in 2017





# Mutual Growth

Mid- and long-term roadmap for shared growth

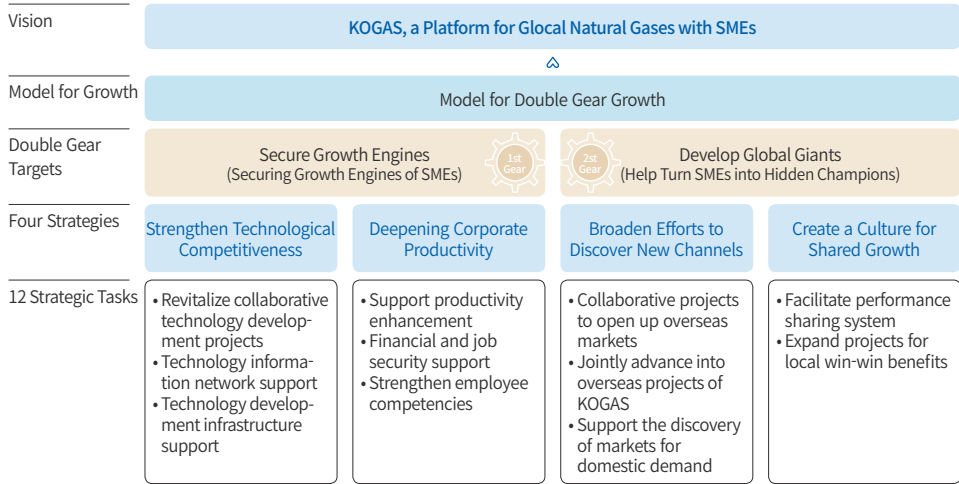
<b>2015~2017</b>	<b>Short- Term</b>
<b>Strengthen the natural gas industry ecosystem</b> <ul style="list-style-type: none"> <li>• Focus on fostering SMEs in direct collaboration</li> <li>• Build and strengthen the export support platform of KOGAS (GASPO)</li> <li>• Establish roadmaps for equipment localization and technology development</li> </ul>	
<b>2018~2020</b>	<b>Mid- Term</b>
<b>Expand the ecosystem to other gas industries</b> <ul style="list-style-type: none"> <li>• Foster small enterprises in similar ecosystems</li> <li>• Stabilize operation of the export support platform of KOGAS (GASPO)</li> <li>• Execute the first stage of equipment localization and technology development                             <ul style="list-style-type: none"> <li>- Operate technology cooperation networks with local universities</li> </ul> </li> </ul>	
<b>2021~2023</b>	<b>Long- Term</b>
<b>Promote shared growth in the ecosystem</b> <ul style="list-style-type: none"> <li>• Expand and advance the natural gas industry ecosystem</li> <li>• Execute the second stage of equipment localization and technology development</li> <li>• Operate GASPO in connection with the localization system</li> </ul>	

## Strategies for a Healthy Industrial Ecosystem

### Implementation System

The type of shared growth that KOGAS desires can be defined as maintaining low-cost and stable natural gas supply bases through the growth of local SMEs, and as SMEs securing long-term and stable growth by accumulating technology and acquiring customers. To this end, KOGAS suggests a double gear growth model to create synergies by fostering the industry throughout the entire industrial eco-system for natural gases and by jointly developing the technical packages of private companies, while also executing activities for win-win cooperation on two axes – securing growth engines in SMEs and turning SMEs into global giants.

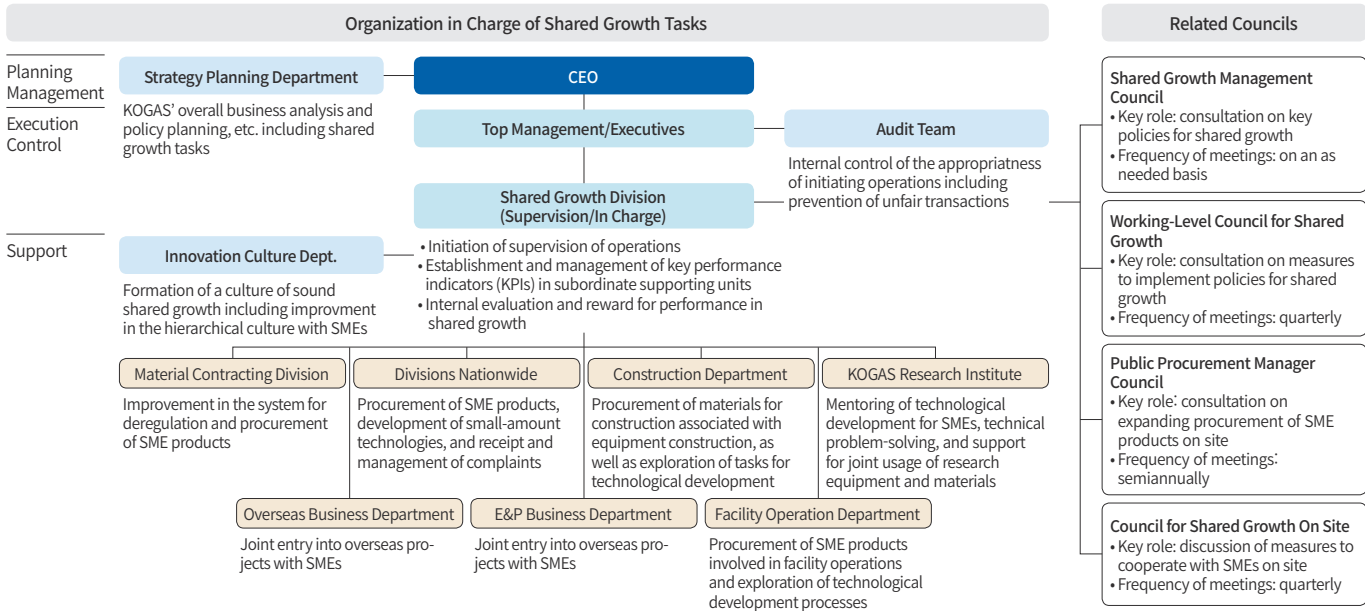
#### Shared Growth Strategy



### Organization in Charge

KOGAS has the Shared Growth Division which supervises and solely manages operations involving shared growth, as well as executes and controls such operations. We discuss major policies and action plans through related councils, including Shared Growth Management Council, Working-Level Council for Shared Growth, Public Procurement Manager Council, and Council for Shared Growth On Site, etc.

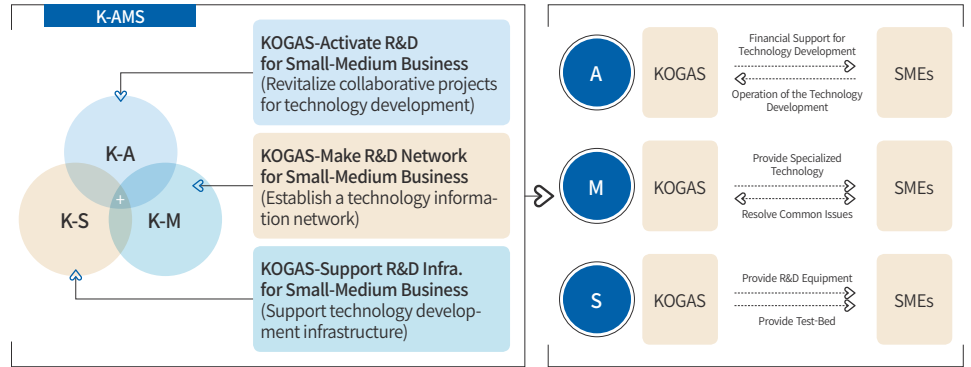
#### Organization in Charge of Shared Growth



## Strengthen Technological Competitiveness

With the purpose of helping SMEs spearhead their technological development and secure an infrastructure of technological development, we developed a specific KOGAS-type technology development model (K-AMS) to strengthen the convergence of R&D capacity between KOGAS and SMEs.

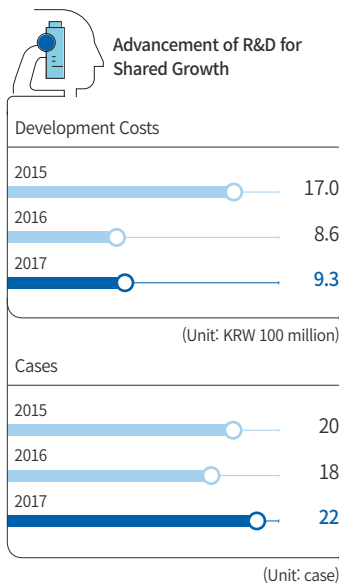
### The Concept of K-AMS Model



### Facilitate a Technology Development Collaboration Project (KOGAS-Activate R&D, K-A)

Given the nature of the natural gas industry and the special requirements for the facilities, local technological capacity for the cryogenic temperature (-162 ° C) and high pressure (7MPa) process industry is insufficient. KOGAS is making various efforts to encourage the localization of key foreign equipment. We also provide support for accumulating development experience and for securing competencies by prompting field-oriented local technology development of primary components of high-pressure pumps, portable natural gas recovery equipment, and main components of gas regulators, thereby reflecting the needs of SMEs. In addition, we are acquiring domestic technological prowess by capturing in advance and cultivating new energy fields such as shipbuilding equipment, LNG bunkering, fuel cells, and hydrogen stations.

	Identifying Tasks (Public Invitation)	Select Tasks	Collaboration	Conduct Processes
Cycle and Department	Half-Yearly and On Demand Working Department (KOGAS)	Half-Yearly and On Demand Process Selection Committee	Half-Yearly and On Demand Shared Growth Team	Quarterly/Half-Yearly/Intermediate/Final Task Management Department (KOGAS)
Description	<ul style="list-style-type: none"> <li>Check Overlapping Tasks</li> <li>Review the substance of processes</li> </ul>	<ul style="list-style-type: none"> <li>Select Individual Processes</li> <li>Discuss Key Development Issues</li> </ul>	<ul style="list-style-type: none"> <li>Agreement Execution</li> <li>Agreement Change Management</li> </ul>	<ul style="list-style-type: none"> <li>Periodic Performance Management</li> <li>Discuss and resolve Issues</li> </ul>



### Establish Technological Networks (KOGAS-Make R&D Network, K-M)

KOGAS has established an industry-academy-research network through which six universities located in the Daegu and Gyeongbuk areas participate based on a business agreement among the participants. We have laid the groundwork for building a technological development infrastructure using a network of talented human resources from participating universities and invite external experts in the process of selecting and evaluating technology development projects. With continuous mentoring support based on the research units of KOGAS, we offer one-on-one matching support for resolving difficulties in developing technology and implementing relevant projects.

### Infrastructure Support for Technology Development (KOGAS-Support R&D Infra, K-S)

KOGAS supports the field installation and patent and technological certification of developed products and other matters to deal with the issue of insufficient technological development infrastructure. We have also conducted a pilot project of the Test-Bed support system, which supports 75% of demonstration expenses of up to KRW 100 million through inviting public participation, and we plan to deliver upon the track record of technological products developed by SMEs and bases with a view toward expanding local and overseas markets and securing global technology competitiveness by improving and fully implementing relevant systems in 2018. The scope of the pilot project is expected to expand to the areas of new growth businesses including hydrogen, fuel cells, LNG bunkering, and shipbuilding equipment.

## Deepening Corporate Productivity

### Strengthening competitiveness through quality

With the purpose of facilitating productivity in small and medium-sized suppliers, KOGAS operates the 'Productivity Innovation Partnership Support Project' to support productivity and export SME improvement using a fund jointly established by public corporations and the government, as well as the 'Industrial Innovation Campaign' to offer consulting services and production facilities to upgrade the work environment and manufacturing processes of SMEs. In addition, with recognition that small and medium-sized suppliers have insufficient opportunities to attend training courses due to challenging management environments and lack of supportive programs, KOGAS provides diverse training and consulting programs to foster practical competencies at production sites and capabilities for job functions. We offer management consulting for executives of SMEs and programs for employees of SMEs to improve their techniques and work capabilities.

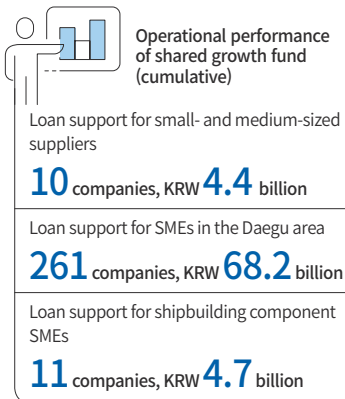
Measures to strengthen the quality competitiveness of small and medium-sized suppliers

Strengthen the productivity of small and medium-sized suppliers	Strengthen employee competency within small and medium-sized suppliers
<ul style="list-style-type: none"> <li>• Productivity innovation partnership support project</li> <li>• SMEs industry innovation campaign project</li> <li>• SME liquidity support project</li> </ul>	<ul style="list-style-type: none"> <li>• Management consulting for SME executives</li> <li>• Upgrade technical and work performance of SME employees</li> </ul>

### Financial and Job Security Support

KOGAS operates a "Shared Growth Fund" worth approximately KRW 50 billion as a project to support the fund liquidity of SMEs. This provides a low-interest fund to SMEs by forming a loan fund via one-on-one matching with the Industrial Bank of Korea based on KOGAS' non-interest-earning deposits. We secured a fund worth approximately KRW 100 billion from bank deposits of KRW 5 billion in 2015, KRW 20 billion in 2016, and KRW 25 billion in 2017, and we executed loans of KRW 77.3 billion to 282 SMEs. Furthermore, we were able to contribute to job creation using this Shared Growth Fund. We established a loan fund worth KRW 15 billion linked to job-creating enterprises with an increase of more than one unemployment insurance holder as compared with the end of the previous year, and we provided loans of KRW 4.9 billion to 14 SMEs in the Daegu area, resulting in creating 108 new jobs.

KOGAS implemented the project 'Small and Medium Business Corporation Plan' together with SMEs, aiming to help them lay the foundation for generating long-term retention of core personnel and for the recruitment of superior talent. The project is intended to provide performance pay – the joint fund accumulated by an employer and an employee - to mid-term core personnel after five continuous years of service. KOGAS supported 38 core personnel selected from a total of 11 companies from October, 2016 to December, 2017.



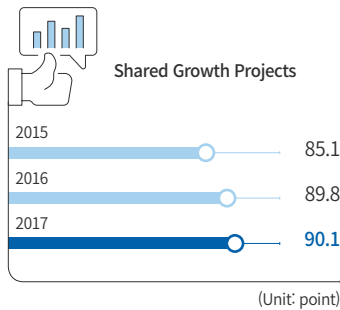
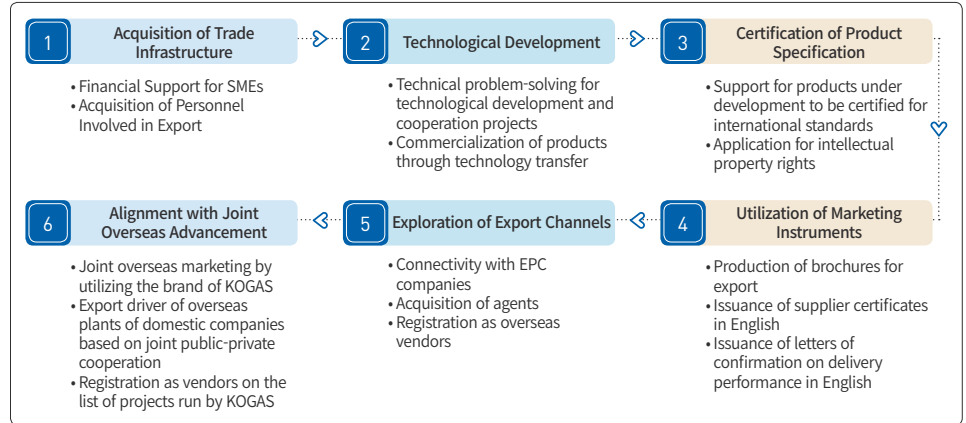
## Intensified Efforts to Open up New Markets

### Establishing 'KOGAS Export Platform' for SMEs to Open Up New Markets

KOGAS is building the Gas Industry ExPOrt Platform (GASPO), a platform for systematic export support, which, in light of the nature of KOGAS and governmental policies, intends to assist small- and medium-sized suppliers develop their competencies in each export stage and secure independent capability to improve performance in areas lacking in export. GASPO is a platform that integrates and improves upon the existing sporadic schemes for export support into a single system. We ensure diagnosis and resolution of points of possible export blockage by establishing and implementing GASPO, and we activate and operate the function of each core stage. In 2017, we improved the technical efficiency of SME products through on-site training in the front-end process in which products were used, and we provided solutions for technical problems through the network and an industry-academy collaboration in which six universities participated. We also expanded opportunities for small and medium-sized suppliers by helping them solve problems in acquiring certification of target countries and providing order information of overseas projects in real time. In addition, we assisted in registering SMEs as vendors for major foreign companies with high entry barriers to secure sales channels.

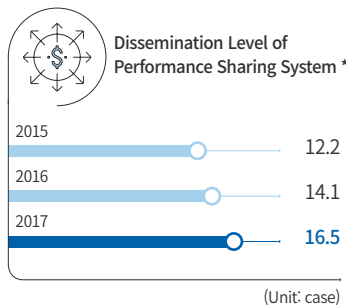


GASPO System



Joint Overseas Expansion

In the light of the fact that it is extremely difficult for local SMEs to register as vendors of overseas major gas companies due to complicated procedures and lack of contact routes, we focused on vendor registration of foreign KOGAS partners by taking advantage of KOGAS' global recognition. As a first step, we recommended three local valve manufacturers to ENI – an Italian partner for KOGAS project in Iraq, and we succeeded in registering all of them as vendors. This is the first successful case in which local SME suppliers were accepted as registered vendors of a foreign major player due to direct support from a public corporation. As a result, the SMEs gained the opportunity to present proposals when ENI places an order.



Dissemination of a Culture of Shared Growth

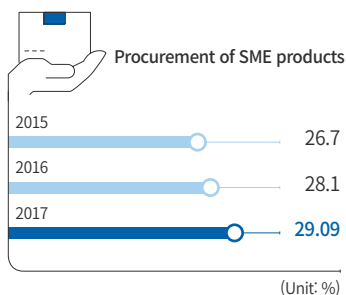
Dissemination of a Performance Sharing System

KOGAS implements a performance sharing system to select tasks catering to the joint needs of small- and medium-sized suppliers and KOGAS, extend economic and technical support, and share performance. Both entities gain win-win benefits and achieve the goal of shared growth as the system spreads a culture of fair performance distribution and provides opportunities ranging from product development to securing sales channels. We raise efficiency within the system by periodically measuring and evaluating the process of implementing projects for technological development cooperation and competency buildup of SMEs.

\*Dissemination Level of Performance Sharing System: the number of registered tasks in the year of evaluation X 0.3 + the number of identified tasks up to the year of evaluation X 0.7

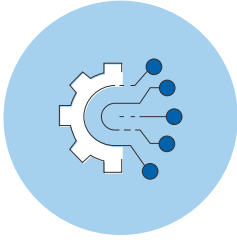
Consideration of Bottleneck Issues of SMEs and Improvements to Relevant Systems

KOGAS holds on-site meetings to listen in-depth to the honest voices and opinions of SMEs. In particular, we provide immediate feedback in consultation with working-level departments on small and medium-sized suppliers' requests for improvement. We have set up a system to gather external opinions to listen and give feedback to SMEs on KOGAS' website in order to gather suggestions for business, safety, contracts, and shared growth, and we report on the results on improvements made on the bulletin board and provide individual notification to those who requested the feedback. Moreover, we operate online channels, including 'Shared Growth Band' and 'Shared Growth Center of KOGAS,' and offline channels, including 'Demand Analysis Research' and 'Open Council/Meeting,' to collect diverse opinions.



Expansion of Procurement of SMEs' Products

KOGAS offers training for personnel in charge in the public procurement system to expand the scope of procurement of SMEs' products, and implements activities to facilitate opening up new markets, such as holding sales meetings, supporting exhibitions, and providing sales support for medium-sized shipbuilding component manufacturers. We use the SMEs' product purchase index as a performance indicator and link tasks to the performance indicator after measuring contributions to the direct sales improvement of small and medium-sized suppliers.



## Customer Service Innovation

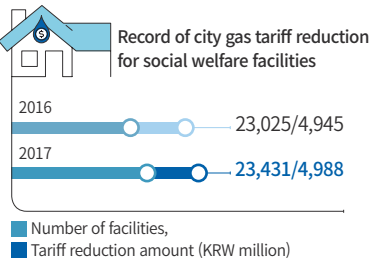
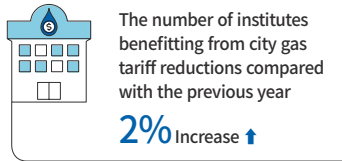
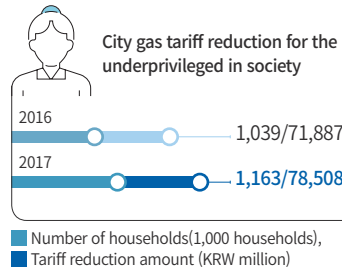
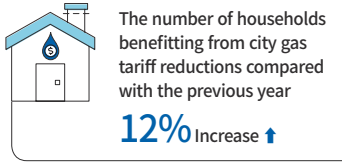
### Innovation in Public Services

#### Public Service Innovation Strategy

The customers of KOGAS includes all users, from city gas companies to the public who are directly/indirectly provided with services of KOGAS. As a public corporation established for the purpose of enhancing public benefits and welfare by supplying natural gas in a safe and stable manner, KOGAS implements various programs to promote customer satisfaction by accurately identifying the needs of customers who receive services and incorporating them in our management activities.

#### Service Innovation System for the Public

Innovation Vision	Nonstop Innovation, Changes for the People		
Direction of Progress	Strengthen Public-Oriented Service	Revitalization of the Economy	Alleviation of Public Burden and Increase in Public Benefits
Implementation Process	<ul style="list-style-type: none"> <li>Expand welfare services for the underprivileged</li> <li>Improve the process of tariff reduction application</li> </ul>	<ul style="list-style-type: none"> <li>Construct cryogenic logistics complex utilizing cold energy</li> <li>Expand the scope of supply to non-service areas</li> <li>Support the revitalization of the shipbuilding and marine transport industries</li> </ul>	<ul style="list-style-type: none"> <li>Reduce gas import cost</li> <li>Improve energy welfare of residents on Jeju Islands</li> </ul>



### Strengthen Public-Oriented Services

#### Expand Energy Welfare Service for the Underprivileged

KOGAS is redoubling our energy welfare support for the underprivileged and we actively identify those who do not fully enjoy such benefits and provide relevant guidance to them. KOGAS and Ministry of Health and Welfare analyzed the status of persons with disabilities, individuals with national merit, lower income families, and multi-child households in the social security information system to identify those who are not receiving welfare services and inform local governments of their existence. Local governments provided information to those households on how to benefit from welfare services using the residential communication network. As a result of these efforts, the number of households benefitting from gas tariff reductions increased to 1.16 million households in 2017, 12% rise compared to the previous year.

KOGAS also endeavors to expand the scope of groups who can receive tariff reduction benefits. In 2017, the number of facilities eligible for this benefit, such as welfare institutions for children and persons with disabilities, were increased to 13 facilities by adding youth welfare institutions. A total of 23,431 institutions benefited from tariff reductions and the amount was KRW 4.99 billion in 2017.

We have extended the scope of target groups exempted from the suspension of gas supply in the winter season by adding three groups – housing benefit recipients, education benefit recipients, and low-income families – to the existing 6 groups which includes recipients of living and medical benefits. A total of 54,000 households were exempt from gas supply suspension in 2017, which was up 7% from the previous year.

#### Upgraded Gas Tariff Management System (GRMS)

The gas Tariff Reduction Management System (GRMS) operated by KOGAS ensures easy application for gas tariff reduction benefit candidates and convenient user management for regional city gas managers. We have improved and simplified the process of how underprivileged people may apply for city gas tariff reductions and how applicants may renew their eligibility by linking them to the government’s administrative network and we upgraded the accuracy and efficiency of the management work by digitizing the beneficiaries. In 2017, a database of social welfare institutions was built and this management system was added and linked to the Happiness E-Eum System run by the government. Therefore, the status of social welfare facilities, such as temporary or permanent closure of individual facilities may be identified more promptly, allowing city gas suppliers to manage tariff reduction beneficiaries in a more effective and accurate manner.

Northeast Asian Cold Chain



## Public-Oriented Operation for Economic Promotion

### Laying the Groundwork for Northeast Asian Cold Chain\*

KOGAS is implementing the idea of supplying cryogenic LNG cold energy generated from its production bases to regional cold and refrigeration logistics complexes. In March 2018, we signed an agreement with Incheon Port Authority on a project to supply LNG cold energy to the cold chain clusters in the hinterland of New Incheon Port. Utilization of LNG cold energy in the cold chain clusters will contribute to reducing operational costs and carbon emissions and will facilitate revitalization of local economy, generating about KRW 4.3 trillion of added value and 26 thousand new jobs over the next 10 years.

\* Cold Chain: a cold distribution system, i.e. a distribution method of fresh food at cold or freezing temperatures.

## Efforts to Ease Public Burden and Improve Public Benefits

### City Gas Tariff Reduction to Ease the Ppublic Burden

KOGAS contributes to easing the burden of the public and improving energy welfare through effective operation of its core businesses. We try to reduce the public burden by reflecting tariff reduction factors in a timely manner, and mitigate and assuage difficulty by applying tariff discounts to the public hit hard by natural disasters, including earthquakes and typhoons. In particular, we enhance public benefits by minimizing charge hikes through our continuous efforts to collect outstanding bills and reduce gas tariffs through lowering the purchase price using our purchase power.

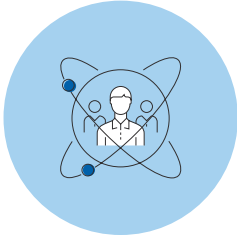
### Construction of the Jeju Receiving Terminal Reflecting Local Communities' Needs

KOGAS is constructing a receiving terminal in Aewol-eup, Jeju Island. In order to minimize residents' inconvenience and reflect their needs as much as possible, we are committed to completing the construction in time while listening to requests from local residents and cooperating with other public agencies. We were able to reduce the construction period by 6 months and construction costs by KRW 520 million by laying gas pipelines and water pipelines of the receiving terminal at the same time in cooperation with Jeju Office of Waterworks. In addition, we ensured the local fishing communities will not suffer damage by preventing the discharge of cooled water using eco-friendly ambient air vaporizers. In addition, in an effort to secure the safe navigation of ships, we designated pilotage areas and installed floating lights to prevent in advance the risk of collision.

## Customer Communication

KOGAS communicates with customers through various channels. We run off-line promotion centers in Daegu, Incheon, Pyeongtaek, Tongyeong, Samcheok, and Seoul and provide various content, via online channels including websites, blogs, and SNS. In addition, a separate website for children is run in an effort to expand the relationship network with citizens, and key achievements, like shared growth, improved public benefits, and expansion of energy welfare, are promoted through media. We run anthe enterprise-wide 'network to initiate customer satisfaction management' to actively identify customer needs. KOGAS' on-site service organizations led by dedicated departments by type of customer handle activities for customer satisfaction (CS) management. CS leaders are selected by customer type and contact point, thereby enhancing our capability to execute tasks for customer satisfaction. KOGAS conducts on-site seminars to address in advance those inevitable problems that occur at sites, thus listening to the voices of customers and finding solutions with customers. KOGAS is equipped with face-to-face communication channels for key customers including city gas producers, power generators, and direct suppliers, and operates various programs, including a joint workshop with customers, the Demand Development Council, a seminar on tariff schemes, a seminar for customers, technical information exchange meetings, Demand Development Workshops, and On-site Business Day. In addition, we select important VOCs from individual suppliers via a website service portal, regional ARS call centers, real time chatting with wholesalers and retailers, and regional on-site communication with a regular CS promotion committee in which customer committee members participate, and actively reflect reasonable and urgent demands in improvement tasks.





## Contribution to Communities

**Social Contribution Brand**  
 On(溫-warm) nuri → Have People Live in a Warm World

### Implementation System for Social Contribution Activities

KOGAS is committed to taking full responsibility as a corporate citizen by engaging in fundamental management activities which contribute to the livelihood of the public and returning corporate profits to society. As a part of our efforts to achieve social return, we strive to accomplish energy welfare and spread a culture of sharing through 'Onnuri' – our KOGAS-style social contribution brand.

Social Contribution Slogan	Green Energy and Happy World			
Social Contribution Goals	KLOGAS Leads Socially Responsible Management for Happy and Co-Prosperous Living			
Strategic Tasks in 2017	Energy Welfare (Onnuri Love)	Expand a Culture of Sharing (Onnuri One Heart)	Foster Future Generations (Onnuri Hope)	Local Community-Oriented Projects (Onnuri Harmony)
Implementation Tasks in 2017	<ul style="list-style-type: none"> <li>• KOGAS Business-Based Projects</li> <li>• Heating Efficiency Improvement Projects</li> <li>• Job Creation Projects</li> </ul>	<ul style="list-style-type: none"> <li>• Operation of Volunteer Groups</li> <li>• Onnuri Fund</li> <li>• Sharing Books</li> </ul>	<ul style="list-style-type: none"> <li>• Support for Education</li> <li>• Support for Medical Services</li> <li>• Free-Semester System</li> </ul>	<ul style="list-style-type: none"> <li>• Community Environment Improvement</li> <li>• Community Culture Activities</li> <li>• Support for Pyeongchang Winter Olympics</li> </ul>
Link to the UN's Sustainable Development Objectives	SDG 1, 3, 7, 8, 9, 11, 13, 15	SDG 6, 11, 15, 16, 17	SDG 1, 2, 3, 4, 5, 6, 10, 11, 15, 17	SDG 1, 2, 3, 4, 5, 6, 8, 10, 11, 12, 14, 16, 17

### Realization of Social Responsibility through Energy Welfare Activities

#### KOGAS Business-Based Activities

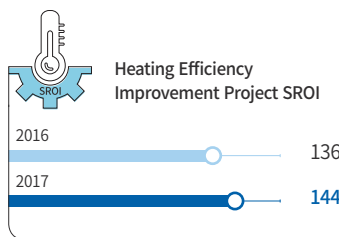
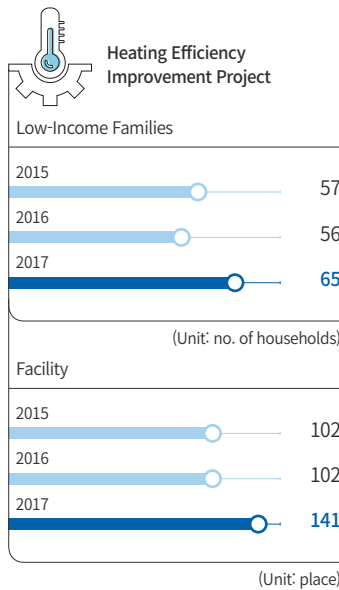
In connection with the nature of our business, our support for low-income households and social welfare institutions includes enhancing heating efficiency by repairing floor heating and wall insulation and replacing windows, wallpaper, and floor paper, installing products creating demand for city gas such as gas laundry dryers, and laying city gas inlet pipelines. We also engage in projects of fuel cell installation to widen the supply of new and renewable energy as well as contribute to the energy welfare of social welfare facilities. Beneficiaries were increased to 3 facilities from 2 in 2017 and the overall volume was expanded to KRW 333 million (KRW 33 million from KOGAS + KRW 300 million from KEMCO) in 2017 from KRW 282 million in 2016 in cooperation with Korea Energy Agency.

#### Gas Tariff Reduction Activities

KOGAS implements a program to subsidize heating costs for neighbors struggling to make payment in order to improve quality of life and provide energy welfare for the underprivileged. Widening the scope of those who are eligible for gas tariff reductions, in 2017 we provided gas tariff reduction benefits of KRW 78.5 billion to 1,163,000 underprivileged households and KRW 4.988 billion to 23,431 social welfare facilities. We strive to reach more neighbors by exempting the underprivileged from payment of outstanding city gas bills in the winter, and providing payment discounts for residents in Pohang, which was designated a special disaster area after the 2017 earthquake.

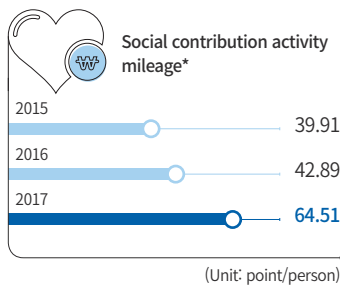
#### Job Creation

Since 2010, KOGAS has conducted activities under the 'Onnuri Love Project' to improve heating efficiency by replacing and repairing floor heating units, flooring, wall insulation, windows, and wallpaper of low-income underprivileged households and social welfare facilities. In 2017, we implemented the heating efficiency improvement project for 152 households and 30 companies including social enterprises and self-support enterprises. KOGAS established a system to offer opportunities to trainees of the 'Architectural Academy for Homeless Persons,' which we operate is run by us for vocational training and job creation for homeless persons. Trainees enter the construction industry, thereby securing a synergic effect of fostering self-reliance capability of homeless persons and simultaneously creating jobs in social enterprises. A total of 14 trainees became employed through the Architectural Academy for Homeless Persons, which is more than twice that of the previous year (6 people).



**Code of Conduct for Onnuri Volunteers**

- Practice with humility.
- Be together with a sincere heart.
- Act with a positive mind.
- Be together with a joyful heart.
- Act voluntarily.
- Practice responsibly.
- Be together with a serving attitude.



\* A system that manages the performance of employees' social contribution activities such as volunteering and donations by quantifying them.

**Beneficiaries from Onnuri Hope Activities** (Unit: people)

Classification	2015	2016	2017
Local Scholarship Project	200	180	284
Overseas Scholarship Project	8	8	5
Support for Operations of Child Cardiac Disease Patients	2	2	2
Support for Kyungpuk National University Children's Hospital	19	23	63
Support for Rehabilitation of Underprivileged Children with Severe Disabilities	235	166	202

**Monetary Value of Contribution in 2017** (Unit: KRW)

Type of Contribution	Total amount
Cash contribution	13,278,042,151
Time: employee volunteering during paid working hours	848,379,702
Management overhead	15,240,010

## Spreading KOGAS's Culture of Voluntary Sharing

The 'KOGAS Onnuri Volunteers' team consists of a total of 26 divisions – 9 divisions in headquarters and 17 sub-divisions in regional branches. Onnuri aims to spread consensus in our culture of sharing culture through voluntary service activities in conjunction with local welfare institutions, labor-management joint activities for sharing briquettes, weekend family volunteer activities, and community service activities. The number of one-on-one sisterhood relationships with social welfare facilities was increased to 9 facilities in 2017 from 7 facilities in 2016. In addition, we operate the 'Onnuri Fund' raised by our employees to support the underprivileged and were able to collect KRW 190 million in 2017, an increase of 11.8% from the previous year. Another social contribution activity was our book sharing campaign. A total of 1,193 books contributed by KOGAS employees were donated to welfare facilities. Furthermore, we have established a system to monitor the voluntary service activities of individual employees in real-time and conduct a 'Volunteer 5 Up Campaign' every year to raise the social contribution mileage by over 5% compared with the previous year.

## Fostering Future Generations for a Better Future

KOGAS conducts social contribution activities with the purpose of fostering future generations through educational support, medical support, and support for a free-semester system. As a part of our scholarship program, we offer scholarships for high school and college students from underprivileged households and endeavor to improve the educational environment by building toy libraries and study rooms for young students. In particular, as of 2017, we opened a total of 8 toy libraries since 2014 and continuously replace old or broken toys for stable operation of the libraries. In addition, we endeavor to fulfill our social responsibilities as a global energy company by continuously discovering projects that contribute to fostering the self-reliance of local residents, as demonstrated by the technical training class in Mozambique, rather than simply giving benefits. Our social contribution also includes the continuous supports in medical areas, including donations for operations on young patients with rare and intractable diseases and young cardiac disease patients in developing countries and sponsoring instruments to assist people with physical disabilities. In 2017, approximately 4,500 people participated in programs designed for youth to discover careers such as visiting natural gas production divisions and promotion centers.

## Community-Oriented Social Contribution Activities

### Community Environment Improvement and Cultural Activities

KOGAS donated KRW 50 million for the 'Motherly Road Project' aimed at improving the living environment, which included the installation of CCTVs and streetlights for crime prevention in neighborhoods vulnerable to crimes, drawing paintings on aging walls, planting flowerbeds, and replacing ageing steel fences in areas around Daegu Innovation City. We also donated KRW 120 million for 6 households for a city regeneration project that provides low-income families with a new houses by renovating old houses through 2017. KOGAS organized a park concert twice every year after holding the inauguration ceremony of Daegu Mecenat Council, with our commitment to champion Daegu as a premium city of culture and art in 2016. We are endeavoring to develop Daegu as a globally-renowned city of culture by promoting the concert as cultural content that represents not only Daegu but also Korea. We also sponsored the Colorful Daegu Festival and donated KRW 50 million to Daegu International Marathon in which 93 KOGAS employees also participated. In these ways, KOGAS practices sharing activities and builds consensus through various social contribution programs for local communities.

### Sponsoring Pyeongchang 2018 Winter Olympic Games

KOGAS provided infrastructure, human and physical support for the Pyeongchang Winter Olympic Games, contributing to the success of the event. We initiated supply of natural gas in the Gohan, Sabuk, and Pyeongchang-gun areas at the end of 2016 and reinforced safe management of gas facilities in areas near venues of the Olympic Games, such as Gangneung, Pyeongchang, and Jeongseon in January, 2018. While the event was in progress, we dispatched 25 personnel for voluntary services such as guiding visitors in the athletes' village and maintaining relevant facilities, and we offered financial support as well by purchasing tickets (valued at KRW 100 million) and sponsored KRW 200 million for those events that are less popular in Korea such as the biathlon.

## Motivation for KOGAS' Social Contribution Activities - 'KOGAS Onnuri Volunteers'

### 'KOGAS Onnuri Volunteers'?

The driving force of KOGAS' social contribution activities comes from 'KOGAS Onnuri Volunteers' composed of our employees. Launched in April, 1994, the volunteer group celebrated its 18th anniversary in 2017. KOGAS Onnuri Volunteers participate in the lives of marginalized people to practice true sharing through continuous volunteer activities as well as providing physical support



### The Sharing Activity Calendar of 'KOGAS Onnuri Volunteers' in 2017

January



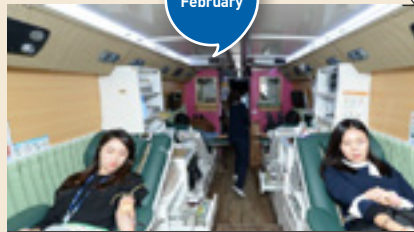
On January 24

#### Shared sliced rice cake soup to celebrate the Korean New Year

The president and employees of KOGAS carried out an activity to share sliced rice cake soups with senior citizens in Seongseo Senior Welfare Center in Daseo-gu, Daegu, to celebrate the Korean New Year. They also donated the installation of air purifiers for the health of the elderly in the welfare center.



February



On February 15

#### First blood donation event

We held an event to donate blood for neighbors in cooperation with Gyeongbuk Red Cross Blood Center and donated blood donor cards in the spirit of our employee participants' love and warmth. The donated blood donor cards will be used to treat child patients suffering from leukemia.



March



On March 28

#### Activity to clean nearby hiking trails

We organized an activity to clean the hiking trails of Mt. Chorye located near the Head Office in Daegu. The participants collected garbage and participated in repairing and maintaining the trails to keep the pathways safe and clean. The members of Onnuri Volunteers took the lead in promoting a clean environment in the local community.

April



On April 20

#### Volunteer activities for in-patients of a welfare institute for the disabled

We provided support for the event of National Disabled Persons Day and for meal service in Daegu Ansik Foundation Facility. KOGAS' Onnuri Volunteers continuously conducts voluntary activities based on a system of one-on-one relationships between our divisions and local welfare facilities.



May



On May 12

#### Silver Party of the National Family Month

We hosted a feast for local senior citizens and participated in voluntary activities in Ansik No. 1 Comprehensive Social Welfare Center in Daegu.

June



On June 13

#### Joint Social Contribution Activities with Public Organizations

We provided 500 sets of summer blankets to underprivileged families in local communities as a part of first-half-of-the-year joint social contribution activities with employees of other public organizations located in the innovation city, such as Korea Appraisal Board and Korea Credit Guarantee Fund.



and performing voluntainment\* to create a sharing culture where everyone lives in happiness.

\* Voluntainment: a newly coined word formed by combining volunteerism and entertainment to indicate the internal and external enjoyment from uniting the service of sharing and the fun of amazement, challenge, learning, and immersion.



July

On June 4

**Voluntary Activities in Songjeong Senior Citizens Center**

Onnuri Volunteers visited Songjeong Senior Citizens Center in Dong-gu, Daegu and shared a time of warmth with the senior citizens. We conducted various voluntary activities including providing nutritious meals, massages, moxa cautery for treatment, and recreation. Onnuri Volunteers took the initiative and sets an example to join together with local communities.



August

On August 30

**Served Free Meals in Dongdae-gu Counselling Center of the Salvation Army**

We participated in the free meals servicing activity in the Dongdae-gu Counselling Center of the Salvation Army. KOGAS' Onnuri Volunteers continuously performs volunteer activities for the underprivileged to aid marginalized neighbors in the community.

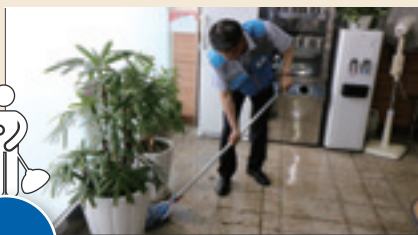


September

On September 13

**Gardening Activity at a Senior Citizen Center**

We participated in a gardening activity at a local senior citizen center of Ansim No. 1 Comprehensive Social Welfare Center in Daegu.



October

On October 31

**Cleaning Activity at a Child Welfare Center**

We participated in voluntary activity to clean the floor of the special activity room for small children at Daegu Child Welfare Center.



November

On November 15

**Cleaning the Area around Sinji Lake**

We cleaned the area around Sinji Lake. KOGAS has a huge interest and is continuously engaged in preserving local environment.



December

On December 21

**Shared Winter Items with Underprivileged Youths**

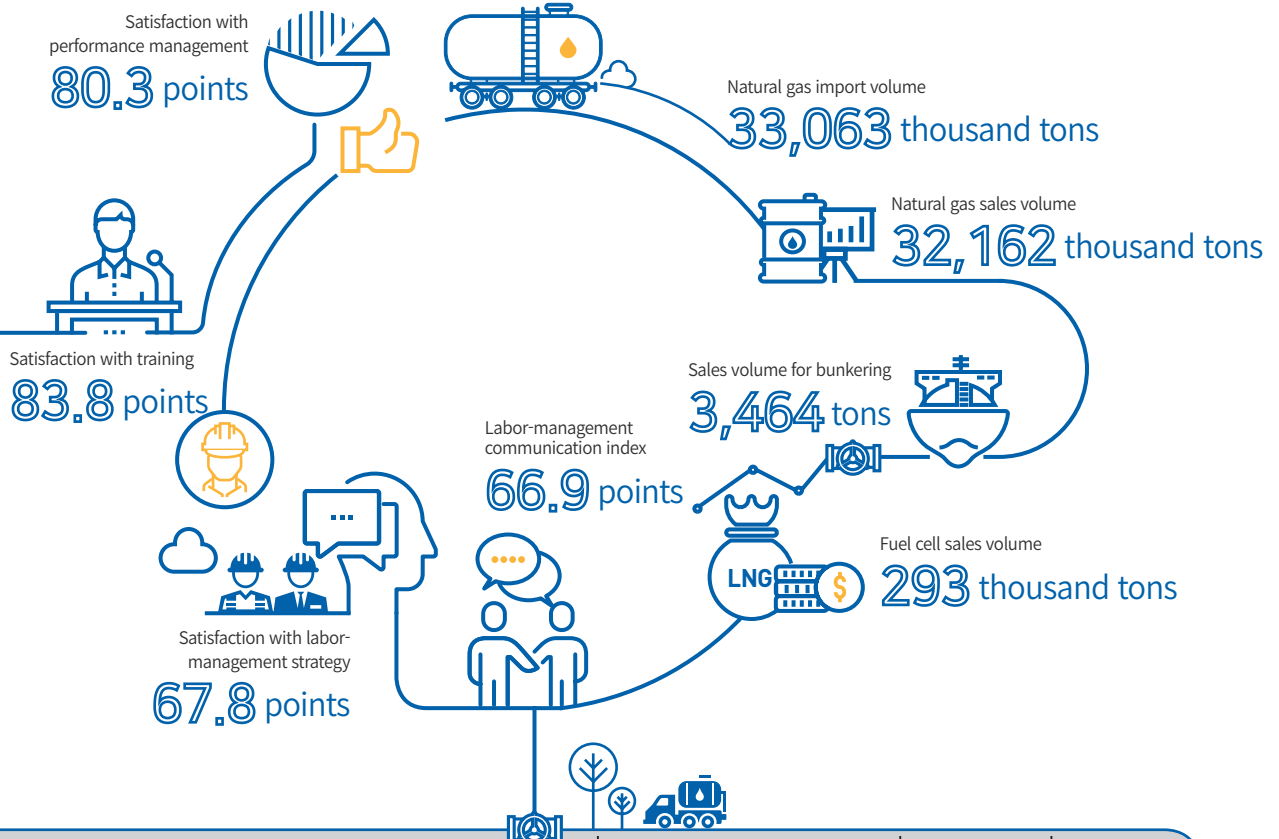
We participated in a hearty event to share winter items with marginalized youths at Ansim No. 1 Comprehensive Social Welfare Center.



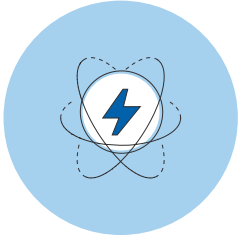
# Creating Economic Value



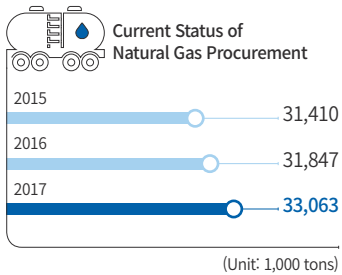




Key Issues	Background and Policies from the Perspective of Sustainability	Management Direction	Relevant Stakeholders	Department in Charge
Operation of a Sustainable Energy Business	As a public corporation involved in the entire process of the import, production, supply, and sale of natural gas, we place a huge importance on maintaining stable supply of and improving accessibility to natural gas as this has a significant and direct impact on public benefits. To this end, we strengthen the response to stable demand and supply and the operation of a sustainable energy business through accurate demand forecasting, production management, and innovation activities.	<ul style="list-style-type: none"> <li>Stable operation of the business based on balanced demand and supply from importing to selling</li> <li>Safe and stable production and supply</li> <li>Expansion of the scope of involvement in upstream businesses such as exploration and development to secure long-term price competitiveness</li> </ul>	Employees Shareholders The Government The Public	Contract Operation Dept. Production Operation Dept. Supply Operation Dept. Sales Planning Dept. Overseas Business Strategy Dept. R&D Dept.
Identify future growth engines	It is very important to identify risks and opportunities for management activities and to establish countermeasures based on predictions of future changes and mega trends for securing organizational sustainability. KOGAS coordinates and improves the existing businesses based on analysis of the changes in business environment, and establishes future direction by discovering new growth engines.	<ul style="list-style-type: none"> <li>Lay the groundwork for new businesses of natural gas for creating future added value</li> <li>Create demand for natural gas utilizing energy conversion policy</li> </ul>	Employees Shareholders The Government	New Business Dept. New Technology Dept. LNG Direct Supply Dept. Sales Planning Dept.
Communication-Based Management	We consider it desirable to accomplish the vision and objectives of the corporation through cooperation between labor and management based on various communication channels and active dialogue. In order to build an independent KOGAS' labor-management culture, we strive to building consensus and communication in the labor-management relationship, and we are creating an upgraded labor-management culture based on compliance with principles through a rational collective agreement system.	<ul style="list-style-type: none"> <li>Implementation of strategy for advanced labor-management relations</li> <li>Expansion of social responsibility through labor-management cooperation</li> <li>Increase in capacity building and labor-management consensus</li> <li>Operation of the labor-management council for labor-management coexistence</li> </ul>	Employees The Government	Labor-Management Cooperation Dept. Planning & Coordination Dept. Future Strategy Dept.
Human Resource-Based Management	We aim to create an organization where employee satisfaction with jobs and the workplace is high and where job commitment is improved by allowing individual employees' to freely display their abilities in order to achieve self-fulfillment and simultaneously create public values. We regard our employees as valued partners who pursue common goals and recognize respect for diversity and protection of rights as key factors in human resource management.	<ul style="list-style-type: none"> <li>Operation of a competency-based human resource system without discrimination due to gender, age, academic background, major, or region</li> <li>Establishment of annual training plans that meet company-wide goals and employees' needs</li> <li>Support for balance between works and life</li> </ul>	Employees	Human Resource Operation Dept. Personnel Innovation Dept. Human Resource Development Dept. Innovation Culture Dept.



## Operation of Sustainable Energy Business



### 1. Supply of Natural Gas

#### Import and transport

Exploration Development Production Liquefaction **Transportation** Unloading Storage Gasification Piping Consumption

#### Zero Demand and Supply Crises through a Stable System

We analyze the records of daily demand and supply, and we perform monthly demand and supply forecasts based on every possible scenario in order to identify rapidly changing demand and supply situations using a comprehensive system to ensure stable demand and supply management. In 2017, we were also able to supply natural gas without cease by securing sufficient LNG volume to meet the demand forecasted through scenarios and by checking the demand and supply status of base power generation including temperature changes, coal, and nuclear energy.

#### Enhancement of Supply and Demand Management System

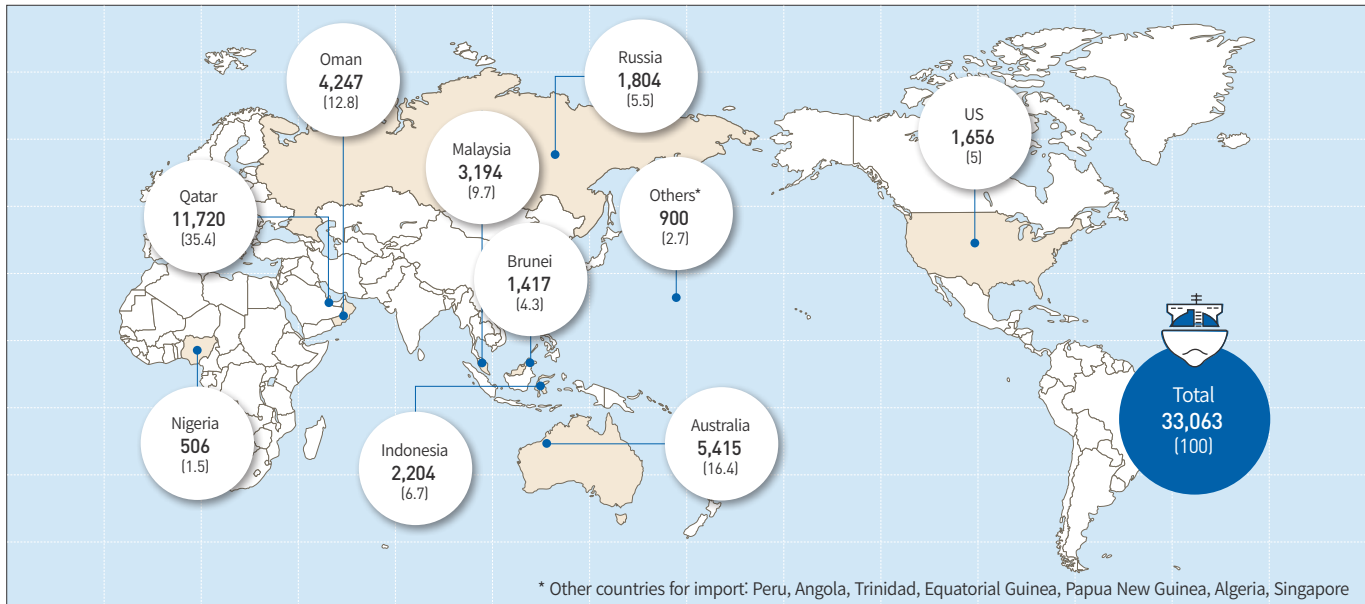
In light of growing uncertainties in future gas demand and supply due to the increase of natural disasters, such as abnormal cold waves and earthquake, and escalating LNG demand for power generation due to eco-friendly policies, we have improved our ability to respond to future uncertainties through on scenario-based demand forecast and supply plans. We have established a 'real time demand and supply monitoring system' together with the government and public energy organizations for joint response to demand and supply crises and improved the forecast rate of 9.1%, which is up 3% compared with the previous year. In the situation of natural gas for city gas supply, the supply of city gas reached the saturation point in 2013 and is now showing changes in demand due to short-term factors. For this reason, we improved the demand forecast models for the private sector with the main variable of temperature and for the industrial sector with the main variable of relative price, reducing the error rate to 2.7% (from 10.9% of the previous model) in 2017.

#### Stable LNG Transport

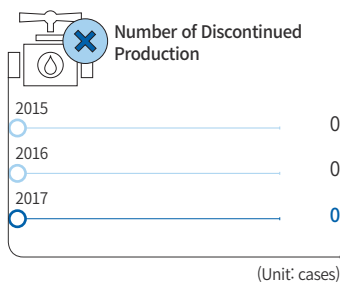
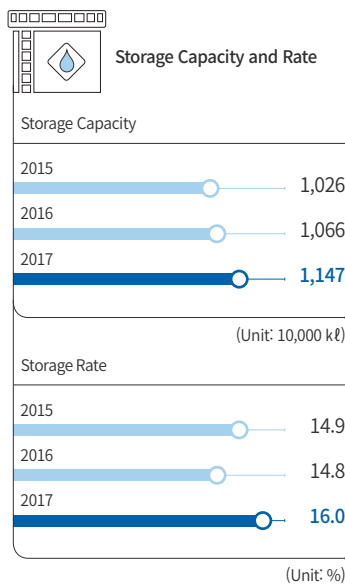
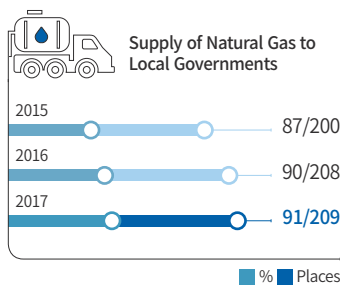
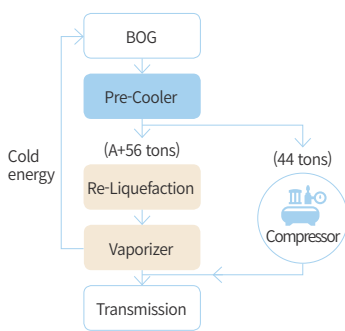
KOGAS systematically manages national flag vessels to ensure transport stability. If a settlement difference occurs between the fare paid and the fare settled when operating national flag vessels, a dispute over fare may occur with ship owners. KOGAS addresses such possible disputes by minimizing the error rate through timely and appropriate freight payment. In addition, as the possibility of safety accidents increases due to the operation of aging national flag ships, we conduct dock repair to ensure safe ship performance. Furthermore, we secure stable operations by timely resolving any issues that occur during LNG loading, unloading, and transport. In 2017, the error rate of freight fare was reduced to 0.15%, which was down 0.15% from the previous year, and achieved 'zero fare dispute' and 'zero transport accident' status in 2017.

LNG Import Volume in 2017

(Amount of import (1,000 tons), data in the bracket: portion (%))



Pre-Cooler Concept Map



## Production and Supply

Exploration Development Production Liquefaction Transportation Unloading Storage Gasification Piping Consumption

### Efficiency Improvement by Enhancing Terminal Equipment

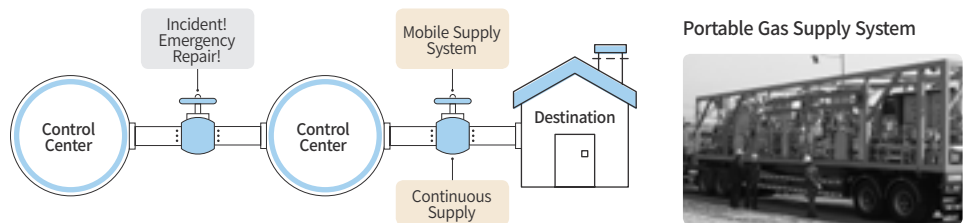
The cost of processing natural boil off gas (BOG) is continuously increasing due to constant expansion in terminal equipment. BOG is recovered through the process of mixing with delivered LNG for liquefying (re-liquefaction). However, when the delivered LNG is reduced during certain periods such the summer, the entire amount of BOG is not re-liquefied and the compressor is activated to inject the unprocessed BOG into a high-pressure pipe, thereby resulting in costs of KRW 2.2 billion annually from operation of the compressor. For this reason, KOGAS introduced a pre-cooler system, which increases the efficiency of the BOG process through the pre-cooling of BOG using the cold energy of LNG, reducing operational time of the compressor by 56% and power generation costs. In particular, the pre-cooler was installed in a manner to prevent any interruption to the supply of natural gas and public inconvenience.

### Enhancing Diagnosis and Management of Equipment Using ICT

As the era of the Fourth Industrial Revolution comes into force, KOGAS has upgraded and improved operation of our facilities to ensure equipment stability. We expect to reduce the occurrence rate of faults by implementing an 'Intelligent Diagnosis System' which monitors and analyzes in real-time the main power facilities, such as cable and transformer, to prevent operational malfunction. We will build up the foundation for the system by 2018 and complete development of its automatic prediction and diagnosis algorithm by 2021 by upgrading the system to expand the scope of its application. In addition, we use drones to inspect pipelines, have conducted a pilot operation in the Nakdong River, and run the drone system 2 times per day in areas where manual inspection is difficult. We have improved the location data accuracy of underground pipelines using surface-penetrating 3D radar in areas where laid pipelines are not detectable due to other facilities. In addition, we developed the positioning system of the emergency shutdown facility (ESD navigation system) to shorten the response time when an emergency incident occurs during gas supply by linking emergency stop valves and other facilities with GPS.

### Introduction of Portable Gas Supply System

In order to prevent the interruption of gas supply when an emergency incident occurs or when the natural gas supply pipes need to be repaired, we replaced the pipelines in question with a 'portable gas supply system' instead of bypassing. The portable gas supply system consists of an LNG pump as a production terminal, vaporization unit, deodorization unit, weighing facility as a feeding control center, and static pressure unit. KOGAS, in September of 2017, used the portable system at the construction site of national highway No. 37 between Eumsoeng and Goisan, reducing the budget by KRW 5.7 billion and the construction period by 212 days compared to the installation of bypass piping.

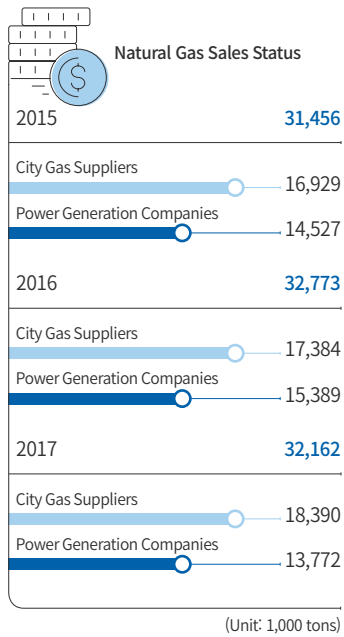


Portable Gas Supply System



### Securing Infrastructure in a Timely Manner

It is crucial to secure required facilities in a timely manner to ensure stable natural gas supply. KOGAS has established a mid- to long-term facility construction plan for proactive response. Construction of the Samcheok Terminal completed its third stage in 2017 as planned, opening the area of four terminals including three terminals in Pyeongtaek, Incheon, and Tongyeong. We have started commercial operation of the super-large 27kℓ-volume LNG storage tank constructed in Samcheok Terminal. We are also planning to increase the storage rate to 20% by 2029 and actively conduct the construction of an LNG terminal in Jeju Island.



## Sales Business



### Expansion of the scope of supply to alienated areas and non-supply regions

The demand for gas supply to areas which are excluded from using natural gas and where expensive kerosene is being used continuously increases. We have agreed to additional supply to areas including Beolgyo in Jeollanam-do requesting supply through in-depth discussions with local governments, resulting in the annual supply of 3,700 tons to approximately 2,200 households. In the situation where city gas suppliers are expected to suffer a loss due to the lack of mass-scale requests, we have also been able to identify large-scale customers such as apartments for servicepersons in Goseong and welfare and care facilities in Jumunjin in cooperation with city gas suppliers, and we started to supply 5,300 tons annually to approximately 7,800 households.

### Expansion of the Supply of Gas Cooling

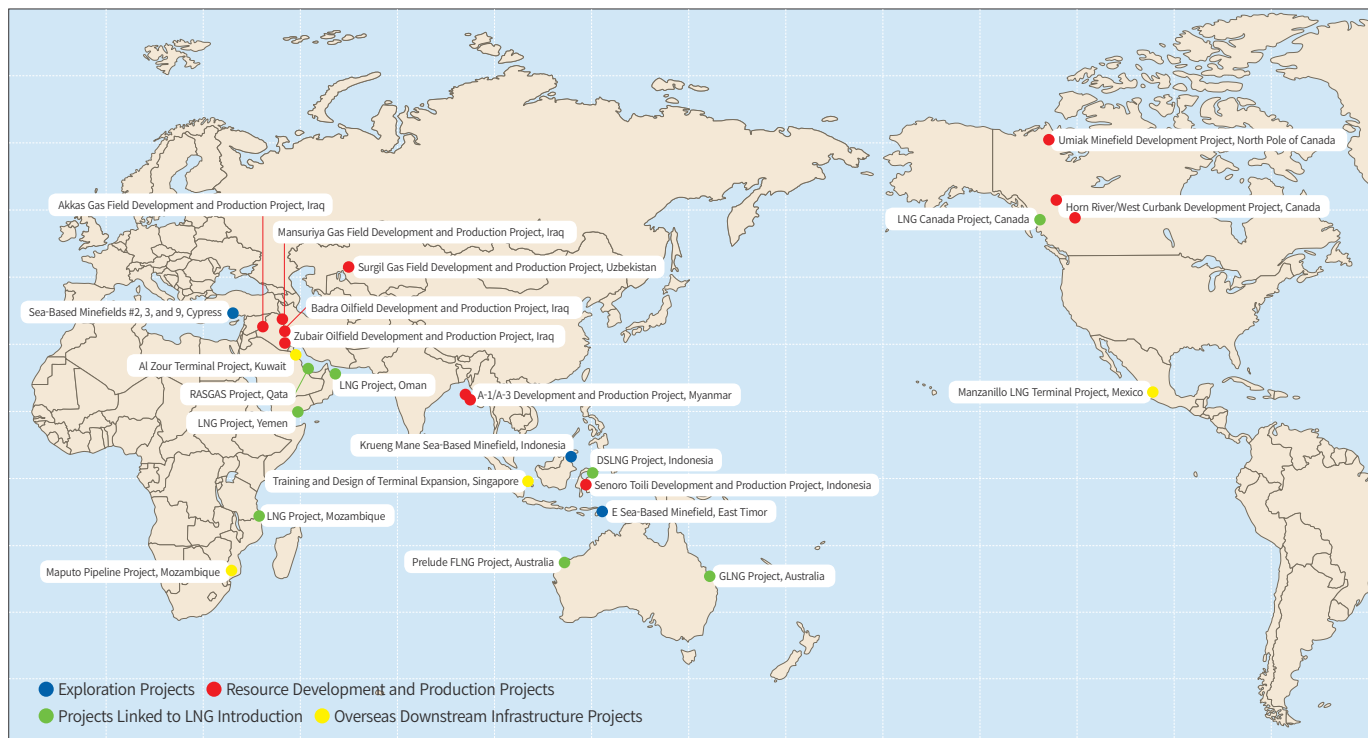
We are expanding the scope of gas cooling supply in order to alleviate electric power peaks and reduce the difference in natural gas demand between winter and summer time. To this end, we provide subsidies of KRW 10 thousand to KRW 350 thousand per RT depending on the performance of high-efficiency gas cooling equipment and an additional 5% support for SMEs. In addition, we contribute to building the foundation for supply expansion through joint marketing with related industries and technology exchange support, and we will make continuous efforts to supply gas cooling equipment to more diverse customers.

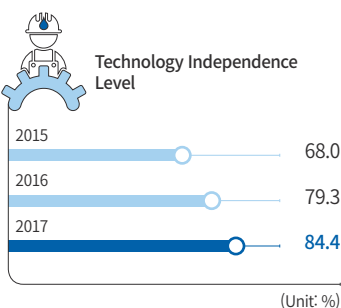
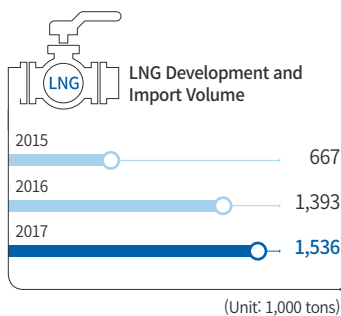
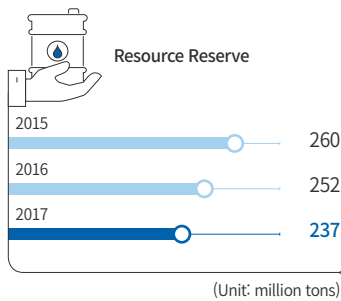
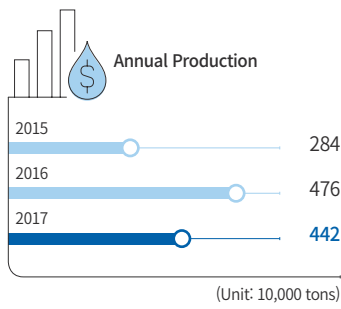
## Overseas Business



Korea's dependency rate for energy from overseas resources reaches as high as 96%. For this reason, KOGAS is actively engaged in overseas resource development projects to secure stable demand and supply of natural gas. We are continuously involved in not only upstream businesses, such as the exploration and development of natural gas and crude oil, but also the LNG liquefaction business, overseas LNG terminal operation, and construction and operation of overseas city gas pipelines and medium and infra businesses, expanding our activities to the entire breadth of the natural gas industry.

Status of Overseas Business (as of the end of December 2017)





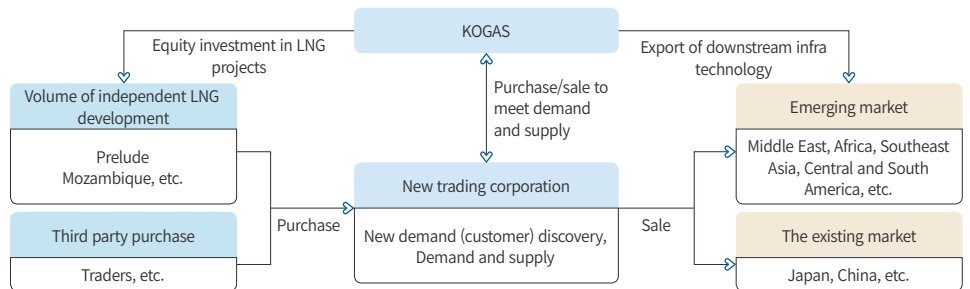
### Resource Development Projects

KOGAS continuously pursues overseas resource development to stabilize the supply and demand of domestic natural gas and to bolster energy security. We are raising the efficiency of overseas resource development by improving profitability through efficient project management and systematically responding to deterioration in the business environment caused by uncertainty. In the case of the Jubair project in Iraq, we fully recovered investment costs as the production volume has already exceeded its original objective by upgrading the operational efficiency of ground facilities. In addition, in the case of the GLNG project in Australia, recovery of investment costs has already begun only one year after completion of construction through thorough production management. As a result, the total recovered amount has increased by 29% compared with the previous year and the operating profit of the LNG business turned a profit in 2017.

### Establishment of the Foundation for LNG Trading

KOGAS established a trading company in December after obtaining the government's approval in August 2017, to prepare for a shortage in supply due to the expiration of existing overseas project contracts and due to the rise of emerging markets such as the United States and Iran, thereby laying the groundwork for growing into a global provider. We have been able to sell LNG volume that we secured and that exceed domestic demand to third parties and to quickly supply natural gas in case of shortages by responding flexibly to demand. In addition, we expect to decrease import costs by reducing the transport distance through location swaps. KOGAS expects to stabilize supply and demand and pricing by providing sufficient volume, as well as to secure profits through sales in the global market.

LNG Trading Structure

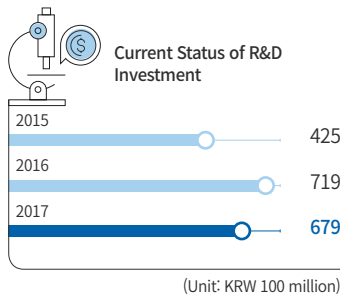


### Downstream Infrastructure Projects

Overseas downstream infra project collectively refers to the development, investment, construction, operation, and technological service projects related to entire facilities including LNG terminals and pipelines to supply natural gas. KOGAS is expanding its market domination power through joint entry into overseas markets with private companies and horizontal integration based on our gas infra business capability accumulated over the past 30 years. In 2017, we strived to increase sales by discovering new demand sources through active marketing activities in the city gas project of Mozambique, and we achieved 'Penalty Zero' in the Mexico terminal project for 6 consecutive years by lowering hazard factors through regular inspections, emergency training, and facility calibration. We have also been able to raise profitability of the cylinder/charging station project in Uzbekistan by reducing costs through effective human resource adjustment.

### Maintenance of Business Capacity

KOGAS approaches overseas projects from the perspective of system improvement, technological expansion, and order-taking capabilities, in order to secure the capability to independently conduct and operate overseas projects. With respect to the promotion system of overseas projects, we are establishing advanced project management system by drawing improvement issues at each promotion. We conducted independent technical analysis on the gas field in Iran, the coal seam gas field in Australia, the gas field in Myanmar, and the shale gas field in Canada with our own technology to secure core technologies, thereby establishing a foothold for independent operation by upgrading technological capability. There has been continuous demand to enhance the order-taking rate in the area of downstream infrastructure. To this end, we established a roadmap to strengthen our order-taking and development ability and set 2017 as the first year of securing the foundation of implementation. Furthermore, we are in the pursuit of securing dominating global competence by 2021.



Current Status of IPRs and Technology Transfers (Unit: number of cases)

Category	2015	2016	2017	
Industrial property rights				
Patents	Patent applications	57	56	69
	Registrations	20	48	42
Programs	6	0	0	
Technology transfers	16	18	19	

## 2. Innovation Activities

### Technological Innovation Based on Professional Research

KOGAS makes continuous efforts through R&D to enhance technological competitiveness and to apply developed technologies to industrial sites around the world. The KOGAS Gas Research Center, which plays a pivotal role in R&D, conducts comprehensive research on future energy resources such as new and renewable energy and alternative energy to secure new growth engines as well as basic yet essential technologies required for the entire process of the gas industry from exploration and development of natural gas to transportation and storage of LNG and natural gas supply.

#### Main Business Areas

Exploration and Development of Natural Gases	Liquefaction and Transport of Natural Gases	Supply of Natural Gases	Clean Energies
<ul style="list-style-type: none"> <li>E&amp;P of Oil &amp; Gas Fields</li> <li>CBM</li> <li>Shale/Tight Gas</li> <li>GM/Polar Resources</li> </ul>	<ul style="list-style-type: none"> <li>Design of storage tanks</li> <li>Containment system (KC-1)</li> <li>Liquefaction plant and liquefaction process</li> </ul>	<ul style="list-style-type: none"> <li>Intelligent Pigs</li> <li>Gas quality and metering</li> <li>Risk and safety diagnosis</li> <li>Methodology and pipeline soundness</li> </ul>	<ul style="list-style-type: none"> <li>Hydrogen fuel cell</li> <li>Natural gas-powered vehicles</li> <li>LNG bunkering</li> <li>Synthetic natural gas</li> <li>DME</li> <li>GTL</li> </ul>

#### 2025 Future Solution Portfolio

Current Key Technologies	Key Next-Generation Technologies	Promising Technologies for the Future
<ul style="list-style-type: none"> <li>Design of LNG storage tanks and terminals</li> <li>Design of liquefaction plants</li> <li>Safety analysis and risks assessment of gas facilities</li> </ul>	<ul style="list-style-type: none"> <li>Shale gas production technologies</li> <li>Pipeline gas importation technologies</li> <li>Technologies to create demand for new natural gases</li> <li>Establishment of the manufacturing/supply-based hydrogen infrastructure</li> <li>Alternative natural gas technologies</li> </ul>	<ul style="list-style-type: none"> <li>Design of gas field production systems</li> <li>Technologies for evaluation of oil/gas fields and production promotion</li> <li>Smart Gas Grid</li> </ul>

### Korean-Style LNG Cargo Containment System (KC-1)

The Korean-style LNG Cargo Containment System (KC-1) started as a national research project to ease dependency on overseas technologies and royalty burden in 2004, and we successfully and independently developed the system using domestic technology after a decade of joint research with Korea's three shipbuilding companies (Daewoo Shipbuilding & Marine Engineering, Samsung Heavy Industries, and Hyundai Heavy Industries). So far, the KC-1 cargo containment system has been installed in two out of six flag-registered LNG carriers acquired by Sabine Pass of the U.S. and the last no. 27 ship (SK Spica) was recently delivered and started commercial operation in 2018.

### LNG Storage Tank with the World's Largest Capacity

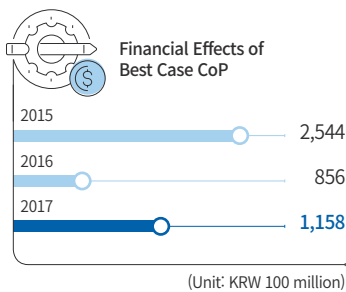
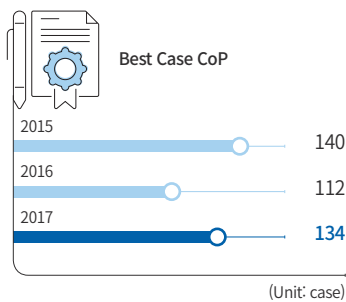
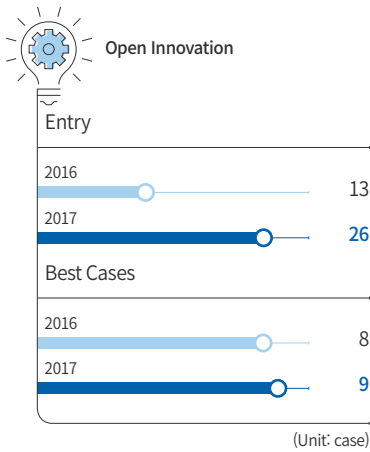
KOGAS has developed a next-generation ultra-large LNK storage tank touting a size of 270,000kℓ based on our localized technology and installation expertise of LNG storage tanks. A comprehensive review took place on the tank in terms of thickness of the steel sheet that can be constructed, occurrence rate of evaporation gas inside the storage tank, and seismic load-driven design possibilities. In particular, the seismic scale in the design was upgraded from 6.5 to 7.0 to secure safe and economic performance.

### Smart Pipeline Management, Intelligent Pigs

Intelligent Pigs are cutting-edge pipeline management technology that accurately diagnoses the status of pipelines by passing through the pipeline where gas flows. The pigs are applied with the latest technologies, including data storage system, monitoring system, wireless reception/transmission system, and inertial measurement unit. The pigs do not merely remove impurities within the pipeline but also detects abnormalities by identifying pipeline thickness based on measurements of magnetic flux changes. As of June 2017, Intelligent Pigs are testing a total of 2,674km long pipelines for 50 sections, contributing to a stable and safe supply of pipelines of natural gas, and we continue to develop it as a part of our future business for entering into overseas markets.

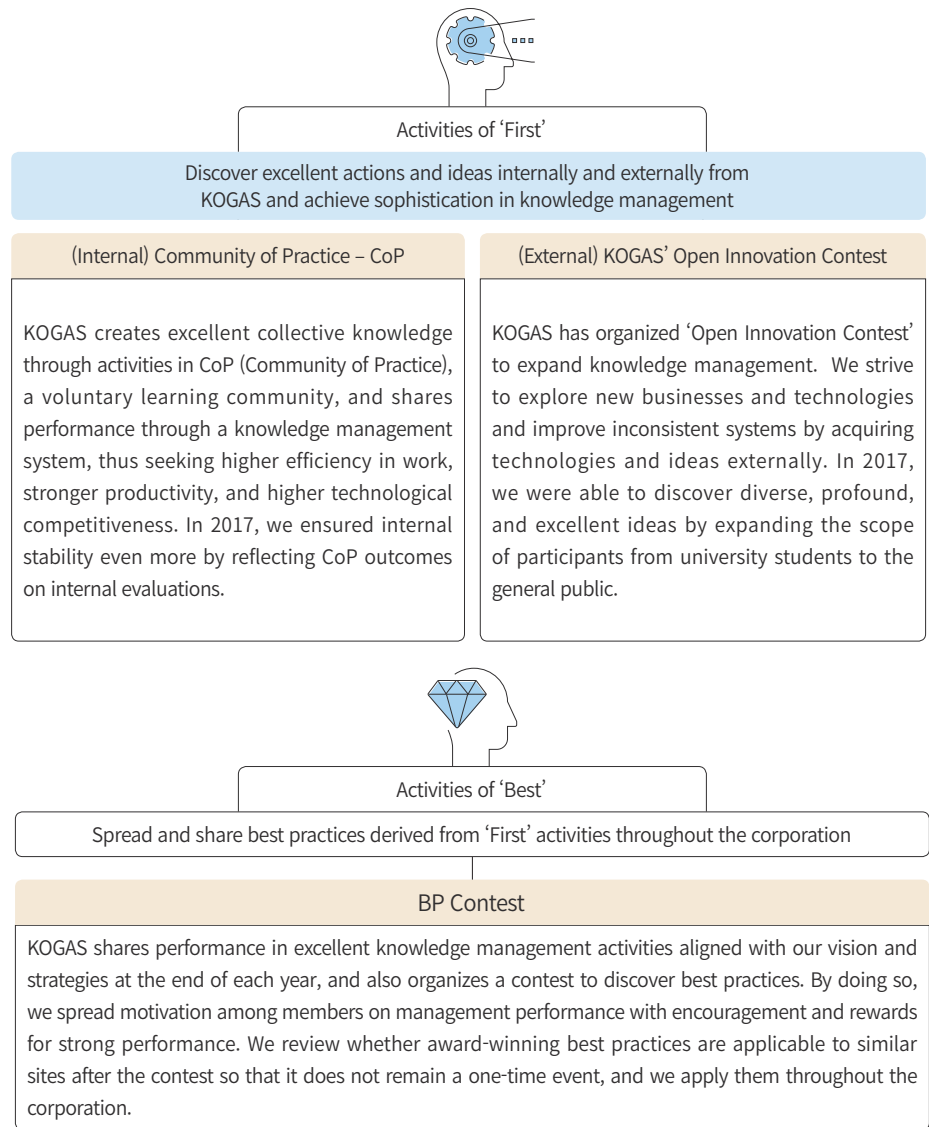
### Management Innovation – Driver of Sustainable Growth

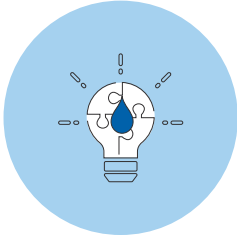
KOGAS organizes an annual BP Contest to select best practices and share them among business sites, contributing to higher management efficiency. In addition, we continue to foster corporate competencies through on-site innovation activities that engage working-level employees, and we attract the interest of employees by using the brand of ‘Best & First (BnF)’. In 2017, we expanded the value of incentives for business ideas, increasing rewards for outstanding knowledge results. We also created a reward for open innovation initiatives and offered KRW 1.1 million as incentive to a total of five best cases.



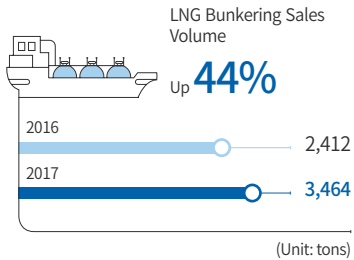
## Best & First(BnF)

Achieve innovation earlier than others to be top-notch





## Discover Future Growth Engines

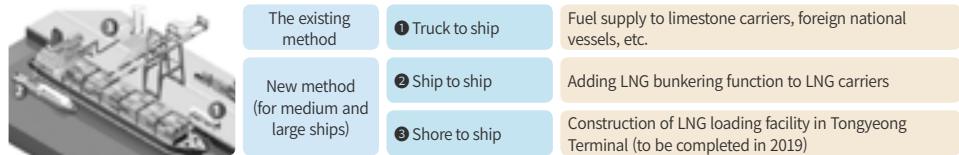


## Groundwork for New Business

### Lay the Groundwork for LNG Bunkering Business

The International Maritime Organizations (IMO) has tightened regulations on the ratio of sulfur oxides in the fuel of ships navigating the high seas to 0.5% from the current 3.5%, highlighting attention to LNG as a new replacement fuel for ships. Accordingly, global demand for LNG to be used as fuel for ships is expected to increase up to 3 million tons per year by 2030. We pave the way to establish related systems and infrastructure so that we may create new demand for natural gases through the development of an LNG bunkering business. KOGAS has helped to secure a legal foundation for using LNG as fuel for ships by advocating for the improvement of related laws and regulations including the Port Act and the enforcement rules of the City Gas Business Act. In order to promote an increase in LNG-fueled vessels, we are securing ship-to-ship LNG bunkering capability by the end of 2019, and we also seek information exchange and joint projects with advanced overseas companies. As of the end of December 2017, LNG bunker sales volume increased by 1,053 tons year on year to 3,464 tons. In the future, we will continue to build infrastructure to preemptively respond to the LNG bunkering business and make efforts to revitalize projects.

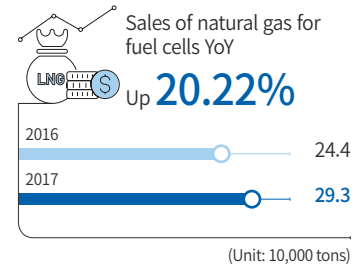
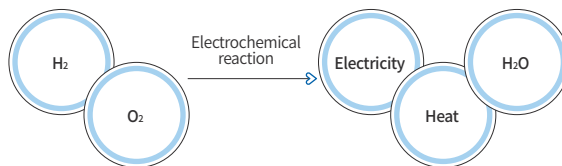
### Diversification of LNG bunkering system to prepare for supplying to medium and large ships



### Pioneering the Way of Fuel Cell Business

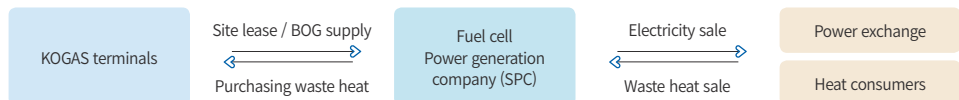
A fuel cell is a high efficiency power generation system that produces electricity and heat through the chemical reaction between oxygen and hydrogen generated mainly by reforming natural gas. KOGAS aims to expand new demand for natural gas and fostering our future growth engines by facilitating the dissemination of fuel cells.

#### Operation Principle of Fuel Cells



Since 2000, KOGAS has developed fuel cell technologies and performed monitoring and tests of fuel cells for household use. We now strive to secure technological competitiveness in fuel cells for buildings and hydrogen production equipment. In addition, we are preparing to propose an eco-friendly residential model by constructing a fuel cell-based new and renewable energy convergent housing complex, and we are also engaged in a pilot project to attract large-scale fuel cell-based power generation projects in our terminal site and supply BOG generated in the terminal site as fuel. In addition to these pilot projects, we make various efforts to facilitate the wide use of fuel cells such as by collecting the opinions of relevant industries and proposing various policies for fuel cell promotion.

#### Concept of Pilot Project Linking KOGAS Terminals



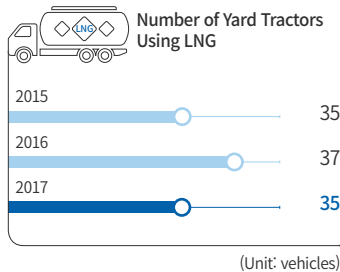


## Creation of Natural Gas Demand

### Expansion of CNG Buses

Applying natural gas to an automobile engine significantly reduces emissions and improves fuel efficiency through lean burning as the range of combustion limit is wide. In addition, since the octane number is as high as 130, this can increase the compression ratio of the engine improving fuel consumption rate with better efficiency than other alternatives. Compressed natural gas (CNG) is a low-carbon fuel that is made by compressing and storing natural gas at 19.7MPa (200atm) or higher, featuring less greenhouse gas emissions than diesel or gasoline cars and creating almost zero fine dust.

KOGAS started the development of CNG buses in 1992, and succeeded in commission in 1996. For the first time in May 1998, two buses started running in Incheon and Ansan, respectively. CNG buses have been introduced in earnest from Seoul since June 2000. KOGAS has promoted the supply of CNG buses by proposing to the government a CNG subsidy system, such as subsidies for purchasing CNC buses, fuel, and CNC charging station construction; and we are also involved in implementing the subsidy system. With these efforts, in 2017, we sold 947,000 tons of CNG bus fuel and the number of CNG route buses increased by 313 units compared to the previous year, forming a basis for consistent sales of natural gas for transportation.

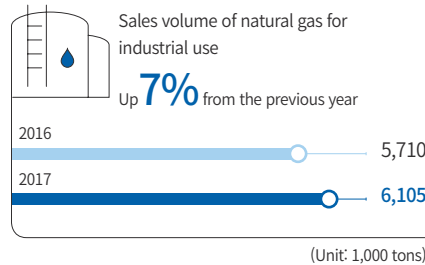


### Converting Yard Tractors' Fuel into LNG

KOGAS has identified a new business opportunity in changing the type of fuel used for yard tractors that transport containers in a port from diesel to LNG. Converting the fuel into LNG for yard tractors will reduce greenhouse gas emissions by 42% compared with diesel, contributing to the environmental improvement of the ports. If gas storage facilities and other infrastructure are built in a port, it would become possible to create a new market of container tractors between ports and compact LNG ships. Our efforts to convert the fuel of yard tractors into LNG continued through agreements with Ministry of Oceans and Fisheries and Busan Port Authority, and we were able to convert 35 units in 2017. In addition, as a part of our program to expand the business, we promote the installation of portable charging stations in a port where fixed charging stations cannot be constructed due to low economic benefits.

### Efforts to Increase Demand for Industrial Natural Gas

KOGAS intends to achieve low-carbon management such as reducing industrial manufacturing costs and greenhouse gas emissions through actions to increase the industrial demand for industrial natural gas, a low-carbon industrial fuel. In 2017, we lowered gas tariffs for industrial use by 10.2% compared to the previous year, supplying gas fuel at a lower price than other types of fuel, and subsidized KRW 1.23 billion for the operation of facilities using industrial natural gas. In addition, as a result of diverse efforts such as field marketing conducted jointly with city gas suppliers focusing on large-scale customers, the volume of industrial sales in 2017 reached 6.10 million tons, up 7% from the previous year.

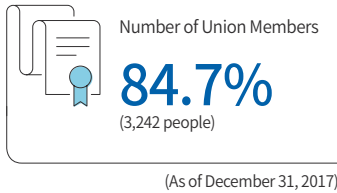


#### Industrial Subsidies

<b>Support targets</b>	Enterprises that constructed or expanded new facilities using industrial natural gas
<b>Support amount</b>	Supported KRW 0.6881/MJ for volume increase (from the previous year) of usage in June * Yearly limit of KRW 100 million for each entity



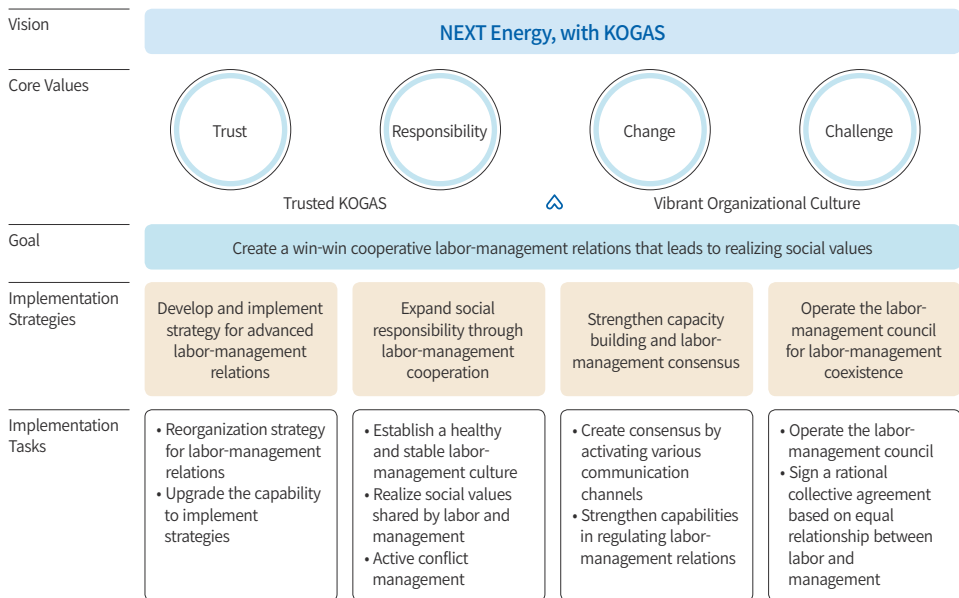
## Communication-Based Management



## Strategy for Advanced Labor-Management Relations

Forming advanced labor-management relations of win-win cooperation is critical to continuously generate favorable management performance. Aiming at maintaining a beneficial labor-management relationship, KOGAS has re-established strategies for enhanced labor-management relations by analyzing pending issues between the two sides and performing internal diagnoses based on the unique features of its labor-management culture. Based on the goal of “achieving win-win and cooperative labor-management relations that lead to realizing social values,” we have developed strategic direction to advance labor-management relations, attain social values, and achieve a stable labor-management relationship and win-win and cooperative labor-management partnership. Pursuing future values shared by labor and management based on these strategies, we will create a favorable labor-management culture and build a vibrant organizational culture.

### Strategy for Advanced Labor-Management Relations



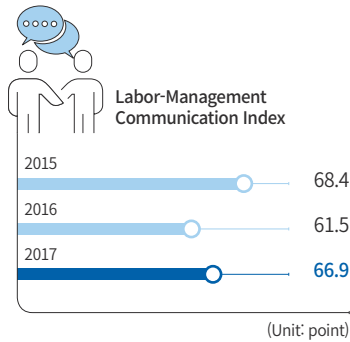
### Highlight Issue

#### Realize Social Values Shared by Labor and Management – The First Public Corporation Contributing to the ‘Public Workers Solidarity Foundation’.



KOGAS had been initially opposed to the introduction of a performance-based annual salary system, but both labor and management have made concessions and the annual salary system was implemented early, receiving incentives from the government. However, our employees returned the entire amount of incentives received (KRW 2 billion from union members and 0.4 billion from executives) to contribute to the Public Workers Solidarity Foundation, the first time a public corporation had done so. The Public Workers Solidarity Foundation is a public foundation established by representatives of unions of the public sector in August 2017 and is committed to practicing ‘win-win cooperation’ based on funds contributed by employees of public organizations, for the purpose of eliminating social disparities by improving the labor conditions of temporary and low-wage workers and performing activities to strengthen social awareness

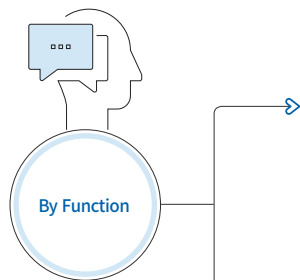
using the contributed funds. Based on the consensus to participate in realizing social values through continuous communication between labor and management, KOGAS entered into a final labor-management agreement in August 2017. The agreement includes a statement that the government’s incentives received due to early implementation of a performance-based annual salary system will be contributed to a social win-win fund under the joint name of labor and management and that the ‘Joint Labor-Management Committee’ will be established. Both labor and management within KOGAS has made contributions to the Public Workers Solidarity Foundation based on this agreement. The KOGAS union also announced its message that ‘it hopes this contribution will pave the way for more public organizations and unions of public corporations to participate in fund contributions so that foundation can operate smoothly and expand social awareness.’



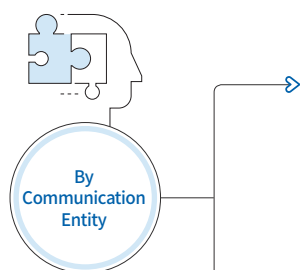
## Strengthen Labor-Management Communication

With a high rate of union participation, 84.7% of all KOGAS employees are union members. KOGAS consists of employees from various job groups, positions, regions, and age brackets, and there are differences in working times, locations, and wages between regular and shift workers. Due to these characteristics, communication between labor and management can be more challenging than communication among union members. In addition, workers working in outlying gas facilities scattered throughout the country face difficulty in participating in communication and group interests vary depending on shift patterns in duties between headquarters and regional offices and among job groups. For these reasons, smooth and diverse communication channels are required. Based on our understanding of the circumstances and characteristics of such labor-management communication, KOGAS has established and is effectively using a '4-way communication channel' based on role divisions among communication entities (organization-oriented / organization manager-oriented) and functions (bottom-up / field-oriented) to facilitate labor-management communication. In 2017, KOGAS established four channels - Joint Labor-Management Committee, Consensus Communication Training, Youth Committee, and day events to run multiple channels - to meet the requirements of various communication targets, thereby creating consensus through multi-faceted communication with the union and raising the labor-management communication index compared with the previous year. KOGAS has established deep consensus between labor and management regarding various conflicts in the organization, including management issues, promotion imbalances, wage disparities, labor-management confrontations, etc., and addresses the issues in a reasonable manner and shares the improvement process.

### 4-Way Communication Channels



Organization-Oriented	
Communication Channel	Main Content
Labor-Management Council	Increased number of meetings (6 times→16 times) and agenda items to be discussed
Joint Labor-Management Committee	Established the Committee to resolve conflicts and improve the system
Consensus communication training	Promoting understanding between groups and revitalizing organizational culture
Meetings with employees of each group	
Communication Channel	Main Content
Time for communication with CEO	CEO-Employee conference on management issues
Executives' visit to fields	Meeting to listen to complaints and communication with employees
Division Director meetings	Meetings with employees of each group



Bottom-Up	
Communication Channel	Main Content
Laplaza	Improve unreasonable practices based on members' consensus and facilitate communication - Increase the number of posts / comments by conference, campaigns, etc.
Youth Committee	Collect opinions of youth workers on system improvement, promote organizational culture, and deduce corrective measures
Field-Oriented	
Communication Channel	Main Content
Regional office manager's presentation on management issues	Once per quarter on key management issues and future direction→From time to time when an issue occurs
Various meetings	Address the issues of specific groups such as women, youths, shift workers, and irregular workers
Training in core values	Improve teamwork through sharing the core values of KOGAS
Day events	Various events that suit the features of each office such as smile day, lunch meeting day, and where is my dad going day

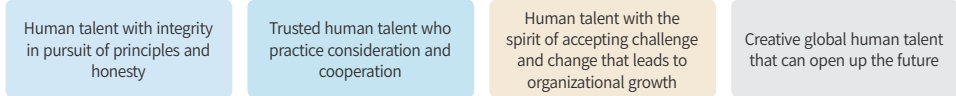


## Talent Management

### Talent Management

KOGAS has defined the following as human talent desirable to achieve our vision together: ‘human talent with integrity in pursuit of principles and honesty,’ ‘trusted human talent who practice consideration and cooperation,’ ‘human talent with the spirit of accepting challenge and change that leads to organizational growth,’ and ‘creative global human talent that can open up the future.’ These have become the criteria for recruitment, personnel management, evaluation, and talent development at KOGAS.

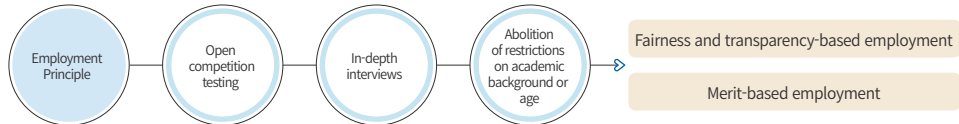
#### Ideal Human Talent



### Talent Recruitment

We employ excellent human resources fairly without barriers due to academic background, age, major, or region. Transparent recruitment is conducted without disclosing the interviewee credentials including name, hometown, and academic background. We evaluate candidates’ job performance capabilities instead of their educational/career background and select customized human talent who are suited for the work of KOGAS by adopting National Competency Standards (NCS).

#### Employment Principle



### Work-Life Balance

#### Flexible Working Hours

We run a flexible work hour system to make the forms of working more flexible to create an environment with work-life balance. We gather employee opinions through a survey on satisfaction level and a survey on the demand for a convertible part-time system, and we improve the operation system in order to facilitate usage of employees’ flexible work hour system.

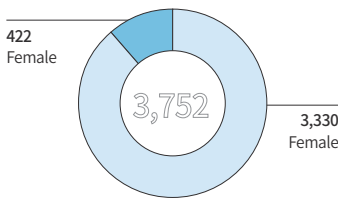
KOGAS has broadened the options through various schemes including alternative work scheduling, intensive work system, and smart work system, as well as a different time commuting system, and we intend to operate a flexible work hour system that moves away the stereotypical work time and space.

#### Family-Friendly Program

We create an environment for maternity protection for female employees during pregnancy based on their needs. Their working hours are shortened, their job can be changed, and in-house married couples are appointed to workplaces in the same area. Moreover, the duration of maternity leave has been extended to three years to prevent career interruption in women due to childbirth or childcare.

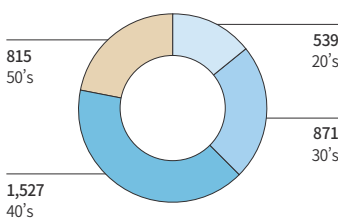
Maternity leave after childbirth is 120 days for women with multifetal pregnancy. The number of working hours on weekdays was reduced to 15 to 30 hours a week during pregnancy and childcare to guarantee work-life balance as much as possible. Upon returning to work after using the childcare leave, their preference for job positions is fully embraced so they may continue their existing career. We boost female employees’ job satisfaction and immersion by managing nursing rooms and in-house childcare centers in five sites and by guaranteeing lactation hours during work. Meanwhile, we create a corporate culture that strongly recommends and is considerate of male employees when they are to take paternity leave by guaranteeing the advance replacement of alternative personnel, thereby easing the burden for them to use the leave. In 2017, a total of 10 employees used the shortened working hour program for those who are pregnant or caring for infants, and there were a total of 9 male employees who took paternity leave.

Employee status - by gender \*  
(Unit: Number of employees)



\* Regular employees, as of the end of 2017

Employee status - by age  
(Unit: Number of employees)



## Strengthen the Competencies of Employees

### Fostering Female Leaders and Specialists

KOGAS operates a training program for talented female employees and has expanded the number of female employees when selecting applicants for long-term commissioned training courses for master’s degrees to foster female leaders and specialists. We have paved the way for female employees to advance to high-ranking positions by promoting managerial positions for women and expanding positions in major departments. Female judges have been mandatorily allocated to strike a balance in making judgments for promotion review of positions in Grade 3 or higher to expand and foster female managers. In February 2018, we appointed female division heads (technology business division heads and executives) for the first time since the foundation of the corporation, and we expanded the appointment of female managers to key positions in essential businesses.

### Talent Development Programs

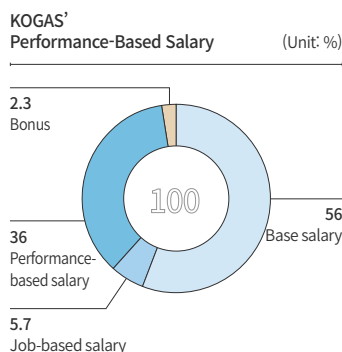
In order to foster competent human talent, KOGAS has established a balanced talent development roadmap addressing organizational competencies (core values and leadership) and personal competencies (job competencies and global competencies) in each stage from joining KOGAS until departing. Dual tracks for career development were established and are up and running – KOGAS-led and self-led tracks – including a specialist track and a manager track.

Basic Plan for Training

Classification		Courses available	Training focuses in 2017
Organizational capability	Identify strategy-linked planning process / Survey on education demand by department	10 courses including core value, ethics and integrity education	<ul style="list-style-type: none"> <li>Strengthen educational courses for social equity, and ethics and integrity education for securing a desirable and safe society</li> <li>Expand organizational synergies through structuring the education of workers under the wage-peak system</li> </ul>
	Leadership Competency	17 courses including job level education, executive education, and job conversion training	<ul style="list-style-type: none"> <li>Diversification of field-oriented training programs for practical job competency improvement</li> <li>Systematization and specialization of job education to improve job applicability and organizational performance</li> </ul>
Personal competency	Individual competency diagnosis and demand survey	Job competency	<ul style="list-style-type: none"> <li>Establish systematic and open goal setting and a horizontal organization system by expanding the participation of team members in decision-making</li> <li>Strengthen leaders’ capabilities by improving leadership and leadership candidacy training</li> </ul>
		Global competency	<ul style="list-style-type: none"> <li>Strengthen cross-disciplinary and cross-sectoral education to foster global professionals</li> </ul>

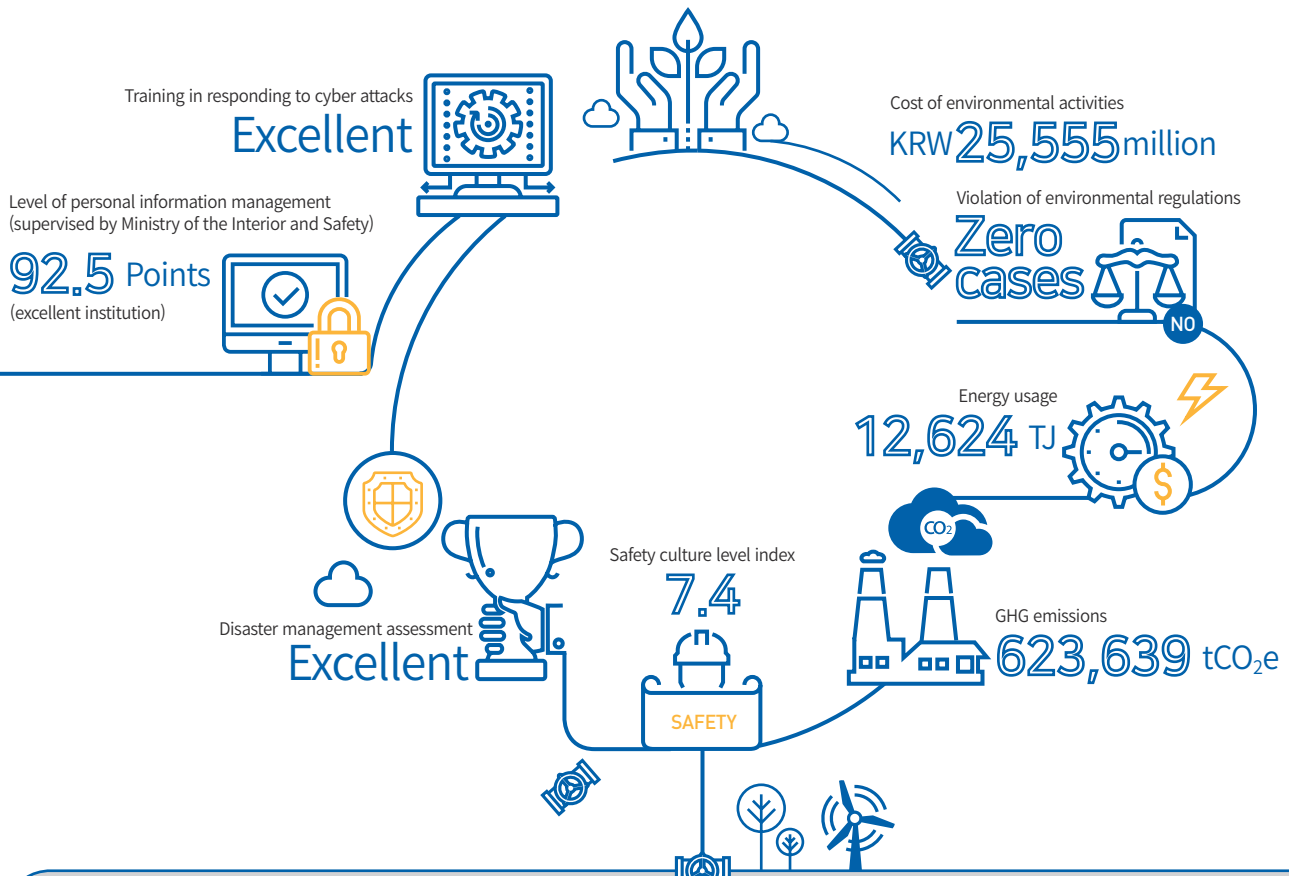
## Fair Evaluation and Remuneration

KOGAS conducts a fair and transparent efficiency rating based on employees’ performance and capabilities, and the results are reflected in personnel appointment and remuneration. All employees excluding executives are, in principle, subject to goal-based performance evaluation. All employees set goals for their achievement and competencies at the beginning of the year and have them approved by their manager. They are subject to year-end performance evaluations based on their individual yearly performance. For high achievers, incentives are provided to enhance their organizational immersion by differentially paying the bonus and base salary and by giving benefits in a review to select employees to be dispatched outside. Meanwhile, for low achievers, we seek higher performance by supporting competency development through training or job rotation. Furthermore, chief officers (excluding executives), intermediary managers, and candidates to be promoted to manager level among team members are subject to multi-dimensional evaluation. Results of the evaluations are ultimately assessed in ranking based on comparative analyses among employees in the same rank who are subject to evaluation. In addition, KOGAS encourages long-term performance and productivity by aligning evaluation results with remuneration. All wage items are broken down into basic, job, and performance-based under the pay-for-performance scheme, except for statutory benefits (paid leave). Accordingly, base salary comprising 56% of total salaries are divided into five grades depending on competency evaluations for differential increases. Differential payments are made so the maximum and the minimum amounts could vary by over two times by converting 36% of total salary into a performance-based one.



# Creating EHSQ Value





Key Issues	Background and Policies from the Perspective of Sustainability	Management Direction	Relevant Stakeholders	Department in Charge
Environmental Management	Natural gas is getting the spotlight as an eco-friendly fuel that does not generate pollutants when burned because sulfur, nitrogen, and dust are eliminated during the liquefaction process. KOGAS established an environmental management system (in accordance with ISO 14001), in order to further minimize the environmental impact that may arise in the supply of natural gas, and we maintain the environment-friendly management system by identifying environmental risks and opportunities.	<ul style="list-style-type: none"> <li>Efforts to minimize environmental load</li> <li>Management of activities of dealing with pollutants, if occurring</li> <li>Compliance with environmental regulations and stricter self-management standards</li> <li>Environmental responsibility activities that reflect local needs</li> </ul>	Communities NGO	Environmental Management Department
Response to Climate Change	The entire world is focusing on the issue of climate change and maintaining a demand for a clean environment. KOGAS is constantly introducing renewable energy facilities and is building a system to respond to preemptively climate change. In addition, we promote energy-efficiency activities on an enterprise-wide level, and we also actively respond to the carbon emissions trade system by identifying emission reduction projects, thereby fulfilling our responsibilities for future generations.	<ul style="list-style-type: none"> <li>Conducting company-wide greenhouse gas reduction activities</li> <li>Responding to the emissions trading system</li> <li>Continuous introduction of new and renewable energy facilities</li> </ul>	Communities NGO The Government	Environmental Management Department
Safety Management	Although natural gas is safer than other fuel sources, safety is by far the most important issue for KOGAS because any incident may lead to a huge accident. KOGAS minimizes risks on-site and improves productivity through the Safety Management System (OHSAS 18001). In addition, in order to improve the level of safety culture of our employees, we strive to achieve goals by sharing tasks throughout the company.	<ul style="list-style-type: none"> <li>Prevent industrial accidents through workplace safety management</li> <li>Enhance disaster management system and strengthen capacities</li> <li>Enhance employee safety and health management system and awareness</li> </ul>	Employees Suppliers Communities	Safety Management Department Disaster Management Department
Information Security	More sophisticated and elaborate cyberattacks, such as DDoS attack, hacking, and disabling servers, are occurring. KOGAS preemptively prevents cyber infringements by establishing and operating an information security management system to stop threats and protect personal and national information, including industrial information.	<ul style="list-style-type: none"> <li>Enhance implementation ability by upgrading information security management system</li> <li>Enhance information protection system including internal control system</li> <li>Strengthen personal information protection activities</li> </ul>	Communities The Government	Security Planning Department



## EHSQ Management System of KOGAS

### What is EHSQ Management System?

KOGAS has endeavored to establish a management system that integrates environment, safety, health, and quality, giving the utmost priority to ‘respecting human and nature.’ As part of these efforts, we independently developed the EHSQ (Environment, Health, Safety & Quality) system to minimize risks and improve productivity by managing issues in an integrated and efficient manner. We have acquired ISO 9001, ISO 14001, OHSAS 18001, and ISO 29001 certifications for the system. The system was designed and operates to be suited to domestic and international standards. In addition, we developed and applied an objective and quantitative global evaluation system (Management & Assessment Tool for Efficient Rating, MASTER) to ensure continuous improvement of the operation of the EHSQ management system and achieve the best performance, fortifying the foundation to secure global competitiveness. Adopting the EHSQ management system as the core tool for our management activities, we strive to live up to our social responsibilities as a clean energy provider through active cooperation with stakeholders in related fields.

### EHSQ Management Vision and Policy

#### EHSQ Management Vision

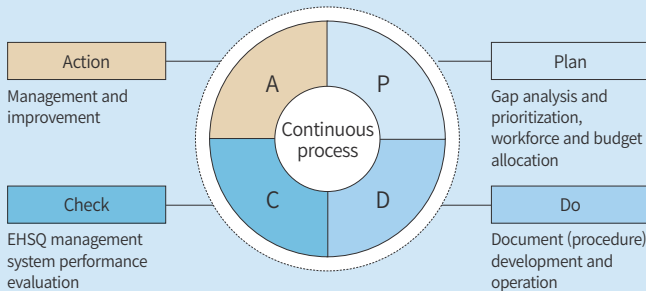
Considering safety, health, environment, and quality (EHSQ) as our top priority, KOGAS promotes continuous improvement and prevention activities based on mutual cooperation to create a safe and pleasant environment, and we seek to improve the health and quality of life of our employees and the public by providing high quality and services that meet our customers’ needs and expectations.

#### EHSQ Management Measures

- ① EHSQ Management Measures Comply with related laws and regulations and domestic and international standards
- ② Establish the EHSQ management system and effectively manage it
- ③ Secure top quality from production to supply of natural gases
- ④ Conduct training for all employees to enhance the level of EHSQ
- ⑤ Consider safety of suppliers equal to KOGAS’
- ⑥ Ensure that employees fulfill their roles safely, and establish a disaster response system by striving to prevent disaster causing casualties and environmental pollution
- ⑦ Internally and externally disclose measures, goals, and performance and gather feedback to maintain transparency of EHSQ management

### EHSQ Management Operation System

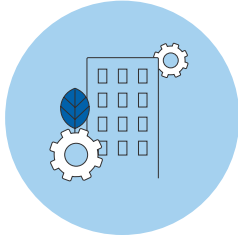
#### Operation system



#### Construction of Global EHSQ Assessment System

- |   |   |
|---|---|
| 1. General rules of management                | 8. Crisis management and accident investigation |
| 2. Management policy                          | 9. Environmental management                     |
| 3. EHSQ management team                       | 10. Health management                           |
| 4. Information technology                     | 11. Education and training                      |
| 5. Information technology                     | 12. Public relations and complaints management  |
| 6. Design, materials, construction management | 13. Legal management                            |
| 7. Facility operation and maintenance         | 14. Measurement and improvement management      |

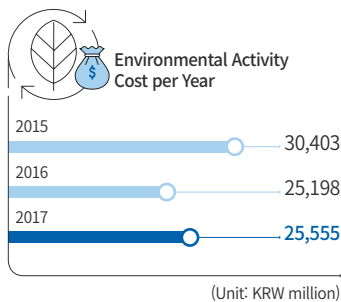




## Environmental Management

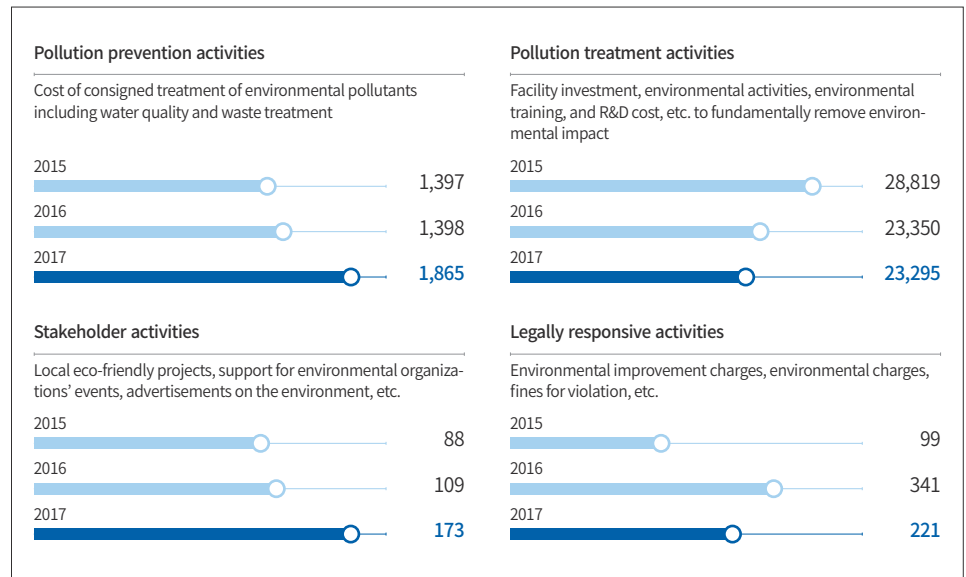
### Environmental Management System

KOGAS declared environmental management in 1997. Since then, we have acquired and maintained ISO 14001 certification and fulfill our social responsibilities as an eco-friendly company that contributes to the sustainable development of the nation and society. In an effort to identify the environmental impact of in-process activities from exploring to supply to power plants directly or to city gas suppliers, we strive to reduce environmental risks by providing environmental management guidelines related to the work of our partners including in-house partners. In addition, we manage the emission of pollutants by applying more stringent standards than the legal limits, and we collect environment-related data generated on-sites on a monthly basis and disclose them via ENV-INFO SYSTEM, the national environment information disclosure system. The Incheon Terminal Division is designated as a green enterprise and is managed accordingly. As such, we strive to establish voluntary environmental management system on sites.



### Environmental Activity Cost

(Unit: KRW million)



### Efforts to Minimize the Environmental Burden

#### Air Pollution Management

Major facilities emitting air pollutants among our production and supply facilities include the Submerged Combustion Vaporizer (SMV), the Sear Water Heater (SWH), and boilers, and key pollutants are NOx, Sox, and dust. KOGAS is also equipped with the low-concentration NOx emitting mechanism in production and supply facilities. The facilities are designed to emit less than one third of the statutory allowable level (<150ppm) as they are managed to not exceed the threshold. The amount of NOx emission is managed on a monthly basis, and when the amount of NOx is higher than that of the yearly target emission, we establish reduction plans, and take actions for improvement including checking the status of facilities and adjusting operation time. In particular, the Incheon Terminal Division and the Pyeongtaek Terminal Division as business sites in metropolitan areas are allocated with the amount of NOx on a yearly basis and classified as eligible sites for total load management to allow the emission of NOx. As such, we systematically manage the amount of NOx emission. Meanwhile, LNG produced and supplied by KOGAS emits over 90% of sulfur oxides less than fossil fuels. Sulfur oxides generated by each site can be checked on a monthly basis in the IT system for environmental management - KOGAS' intranet - as is the case with other air pollutants. We establish measures for improvement related to usage of the annual usage amount for relevant facilities upon exceeding the annual target in order to reduce the emission amount of sulfur oxides.

### Water Pollution Management

LNG terminal divisions are managed below the statutory level of concentration for water pollutants as they are equipped with oil treatment facilities. Moreover, seawater entering into an open rack vaporizer (ORV) in the LNG gasification process is discharged into the coast without any environmental impact after being used for heat exchange. The Pyeongtaek, Incheon, and Samcheok Terminal Divisions located on the coastal line discharge domestic sewage into a river or sea in a concentration level below the statutory level, after purifying it at sewage treatment facilities.

### Management of Chemicals

Major chemicals used on sites include sodium hydroxide (NaOH) and hydrogen chloride (HCl). They are used to adjust the level of pH within water tanks of the submerged combustion vaporizer (SMV) which serve as LNG gasification facilities. Such substances, in particular, are used in a lower level of concentration and are not classified as hazardous. KOGAS discloses related data through the chemical substance handling information disclosure system and ensures that hazardous chemicals used are managed according to legitimate procedures without leakage.

### Waste Management

We stringently apply treatment standards above the statutory levels prescribed in related laws regarding waste generated from sites in the middle of the production and supply process and construction work. Data on waste is recorded in the IT system for internal environmental management on a monthly basis and is reflected in the next year's plan to lower the amount of waste generated. We proactively participate in the government policy on control and recycling of waste, and we continuously reduce the amount of waste discharge by transparently managing the entire process from discharge to delivery and final treatment.

We ensure that waste treatment companies are periodically guided and inspected so waste generated from sites may be appropriately treated. Waste generated in all sites of KOGAS is registered in Allbaro system (<http://www.allbaro.or.kr>) in real-time whenever it is discharged, delivered and treated, and this is disclosed through the environmental information disclosure system once a year.

### Protection of Bio-Diversity

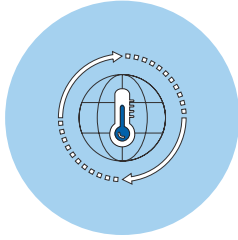
KOGAS conducts environmental impact assessments to seek eco-friendly and sustainable development by predicting and evaluating the impact of construction or operational projects on environmental changes in advance and by devising measures for environmental conservation. In addition, we conduct follow-up reviews on environmental impact for ex-post management and monitoring upon the completion and operation of construction works. Changes in the habitation of flora and fauna and observational review of the aquatic eco-system are discussed in the consultation council consisting of related specialists – project companies, representatives of local residents in the area of review, and organizations of environmental conservation. We also develop measures for improvement through consultation with them upon exploring points for improvement. The results of bio-diversity review are submitted to a related local government to be subject to verification of appropriateness and feasibility, and this is registered in the information support system for environmental impact assessment and disclosed accordingly.

### Prevention of Marine Pollution

KOGAS has established a system to promptly and efficiently respond to accident sites by creating a 'manual for on-site actions (marine pollution)' and an 'emergency plan for marine facility pollution' to respond to marine disasters. In addition, we are fully equipped with more disaster control supplies than statutorily required, and we also provide continued training on preventing potential accidents, thereby minimizing secondary environmental damage resulting from accidents.

### Marine Environment Protection

The Tongyoung Terminal Division has established a marine environment information disclosure system to disclose 11 items including water temperature, dissolved oxygen, and chlorophyll in the seas around the LNG base every single minute. The Samcheok Terminal Division plans to perform restoration work of the Wolcheon coast which eroded due to environmental changes caused by reclamation, in order to restore the natural environment and turn it into a local water-friendly facility.



## Response to Climate Changes

### Low-Carbon Management Strategies

KOGAS set a vision of becoming ‘a sustainable future energy company’ that continuously strives to achieve the goal of cost-effective GHG reduction and of becoming a leading company in responding to climate change. KOGAS’ low-carbon management strategies are determined and executed through a two-step deliberation process. The Climate Change/Energy Working-Level Committee consisting of heads of working-level departments in charge deliberate on pending issues on low-carbon management. Then the Climate Change Energy Committee as the decision-making body comprised of executives devises final strategies and decides on critical matters on climate change response. We have acquired and maintained integrated ISO 50001 certifications for each of four terminal divisions and nine trunk line divisions, and we have established and operate an IT-based integrated management system (ECO<sub>2</sub> View) for effective management of the total greenhouse gases and energy that all business sites discharge and use during the production and supply of natural gas.

#### Low-Carbon Management Strategies

Vision	Sustainable Future Energy Company	
Major Goals	Cost-effective GHG reduction	A leading company in climate change response
Core Tasks (six tasks in two areas)	<p>Response to the Emissions Trading</p> <ul style="list-style-type: none"> <li>Establish a system to respond to the emissions trading scheme</li> <li>Develop personnel for the emissions trading scheme</li> <li>Initiate projects to reduce GHGs</li> </ul>	<p>Climate Change Response</p> <ul style="list-style-type: none"> <li>Respond through new and renewable energies</li> <li>Manage energy efficiently</li> <li>Raise awareness about and promoting climate change response</li> </ul>

### Efforts for Climate Change Response

#### Emissions Trading Scheme

KOGAS was designated an eligible target company falling under the emission trading scheme in 2015, and makes various efforts to reduce greenhouse gas emissions based on our experience accumulated during the first phase of the scheme’s implementation period (2015~2017). In particular, we strive to work in line with the nation’s greenhouse gas reduction policy, including preparing for implementation of cost-allocation auction system and the government’s forecasted plan to continuously reduce the allocated amount during the second phase (2018~2020).

#### Incentives for Management of GHG Emissions

We conduct semi-annual monitoring on achievement of goals by setting internal targets for GHG emissions by business site. Excellent business sites that have strived to and achieved strong results to achieve GHG reduction goals and raise awareness about energy usage are selected to receive rewards and compensation. Key items for evaluation include performance records compared to targets, basic unit management of energy, and records of exploring GHG reduction projects. Additional points are granted to business sites that have maintained the energy management system (ISO 50001) and set up the real-time energy monitoring system. In 2017, rewards were offered to five business sites (two prizes each for highest excellence and excellence, as well as one encouragement prize) out of 13 in total. The activities of KOGAS to reduce GHG emissions include the identification of in-house projects and ideas to reduce GHG emissions and holding presentations to share best practices.

#### New and Renewable Energy Projects

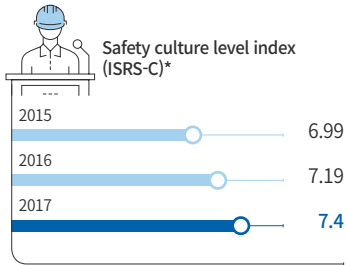
We foster low-carbon energy projects in line with the government’s low-carbon growth policy. We are reducing GHG emissions and energy usage by leveraging five types of new and renewable energy facilities: photovoltaic, solar energy, geothermal energy, wind power and fuel cells. We internally produce and use a certain portion of in-house electricity by introducing various new and renewable energy facilities to the headquarters building, 13 business sites, and gas supply facilities. We can produce electricity of 3,062,367kWh and cold and heat energy of 160,440,140kcal, using the new and renewable energies facilities constructed by KOGAS in 2017, and thereby reducing GHG emissions of 1,428tCO<sub>2</sub>e.

Current Status of Installing New and Renewable Energies (As of March 31, 2018)

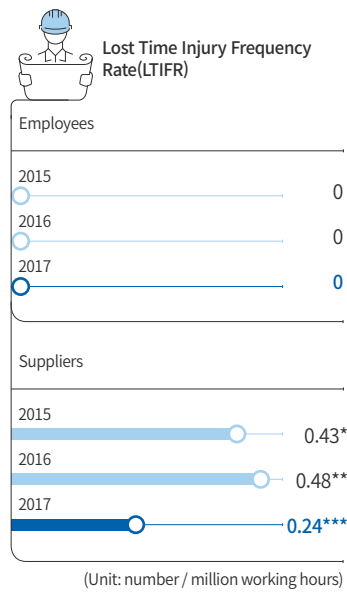
	Capacity	Sites (number of sites)
Photovoltaic	1,728 kW	66
Solar energy	607 m <sup>2</sup>	5
Geothermal energy (cooling)	1,425 kW	2
Geothermal energy (heating)	1,459 kW	3
Wind power	16 kW	5
Fuel cells	301 kW	2



# Safety Management



\* ISRS-C (International Safety Rating System-Culture): A safety culture investigation method developed by DNV and applied globally

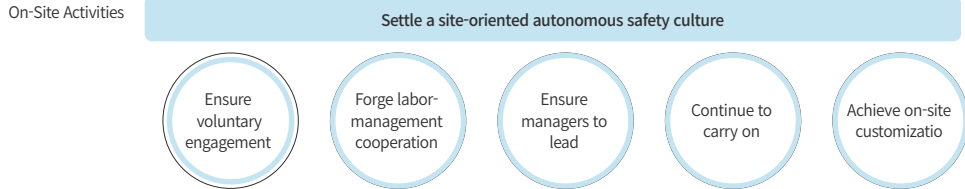
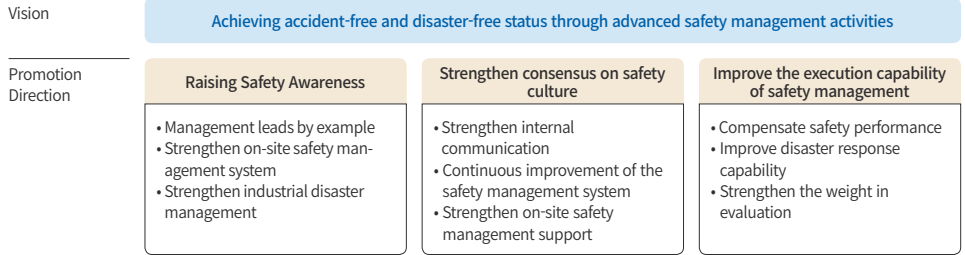


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 \*\* 5 X 1,000,000 / 5,000 X 40 X 52  
 \*\*\* 2 X 1,000,000 / 4,000 X 40 X 52

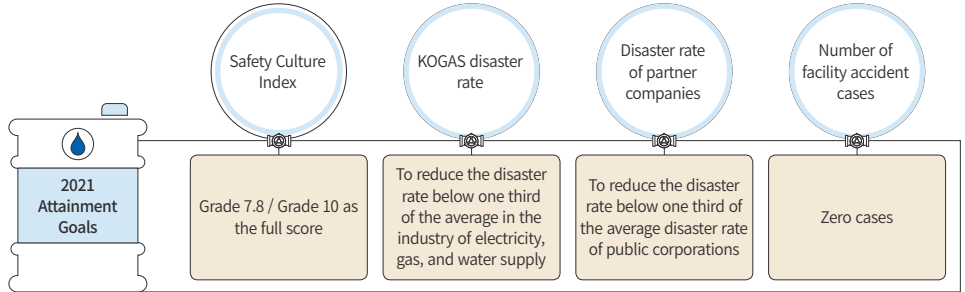
## Safety Management Strategies

Safety is the foremost issue as natural gas can lead to a major disaster in the event of an accident. KOGAS promotes safety management with the vision of creating an advanced safety culture based on voluntary safety activities by raising employee awareness of safety culture and enhancing their practical capabilities.

### Safety Management Promotion Strategies



### Mid-to-Long Term Goals of Safety Management



## Workplace Safety Management

### Industrial Accident Prevention Activities

KOGAS conducts site-oriented safety management activities to prevent industrial accidents at workplaces. In order to boost workers' safety awareness, we provided special education on safety culture at construction sites and built safety communication channels such as the operation of a safety management Q&A system and mutual advice on safety violation behavior. In addition, for the purpose of upgrading preventive activities, we conducted safety diagnosis of tower cranes at construction sites, and we also implemented safety assessment of two construction companies in the Jeju terminal construction site through an industrial safety agency to improve the work risk assessment method. We have identified improvement factors, including the change of alarm values, after safety and process experts performed safety diagnoses of the safety areas of four terminal divisions. The number of industrial accidents at KOGAS worksites was consistently reduced over the years, from 13 cases in 2014 to a record-low 2 cases in 2017, and we also achieved the goal of zero accidental deaths in 2017.

### Risk Element Management

KOGAS conducts safety inspection activities through the year. We identify hazards that may occur in a new, expanded, or changed facilities or that are related to job activities, causal analysis, and evaluation of results, and we take measures by suggesting recommendations to alleviate or remove risks and to establish relevant implementation plans. Through this process, we collect and analyze risk data, and we focus on managing key elements to enhance safety inspection efficiency, thereby fully committing ourselves to disaster management.

## Strengthening the Disaster Management System

### Strengthening the Disaster Management System

KOGAS performs activities to manage prevention of natural disasters including typhoons, earthquakes, and tsunamis and emergencies including terrorism and fires outbreaks. We have raised awareness among all employees by operating an exclusive unit for disaster-related operations, and we have reinforced implementation of preventive inspections. We established alarm and disaster prevention systems for gas facilities and operate a surveillance system 24 hours a day, 7 days a week. We conduct training for quick response to disasters in accordance with systematic and sophisticated manuals customized to disaster types.

#### Disaster Management Evaluation\*

2015	2016	2017
Exempted from evaluation	Excellent	Maintain excellent level

Evaluation of Disaster Management of National Infrastructure System supervised by Ministry of Public Administration and Security

#### Disaster Safety Management Strategies

Disaster Management Goals	Building disaster management system for a society safe from disasters		
Strategy and Implementation Tasks	Strengthen infrastructure for disaster response	Systematic preparation for disasters	Speedy response to disasters
	<ul style="list-style-type: none"> <li>Manual segmentation by type</li> <li>Strengthen disaster management system</li> </ul>	<ul style="list-style-type: none"> <li>Joint disaster training through collaboration</li> <li>Systematic improvement of gas facilities to prepare for disasters</li> </ul>	<ul style="list-style-type: none"> <li>Manual-based disaster response</li> <li>Fast operation and inspection of the control center</li> </ul>
Performance Goals	Government approval of manuals	Selection as an excellent disaster response agency	Zero damage from disasters

### Establish Separate Manuals by Disaster Type

In 2017, KOGAS revised the previous comprehensive disaster manual into separate manuals tailored to disaster types. As a result, the disaster manual is separated into the manual for earthquake response, which defines the crisis alert level according to the earthquake's intensity and specifies criteria for stopping operation of the supply system, and the manual for gas leakage management, which defines the crisis alert level according to leakage intensity and provides for fast evacuation and notification to residents. Both manuals were approved by the Ministry of the Interior and Safety.

### Activities for Systematic Disaster Preparedness

KOGAS secures stability in safety against disasters by improving preemptive disaster facilities and response training. Because the public's anxiety has risen and improvement of the seismic performance of gas facilities and supplementation of measurement facilities have been required since earthquakes occurred in Gyeongju and Pohang, respectively, in 2016 and 2017, we have engaged in activities to create gas facilities that are safer from earthquake disasters. We also improved the error sensors (28 units) through performance tests of the entire seismic acceleration meters (141 units), and we significantly expanded the scope of facilities subject to seismic performance evaluation from the previous 12 locations to 576 locations. Furthermore, we selected structures that need reinforcement by performing detailed evaluation of each structure and upgraded their seismic and structural performance.

Meanwhile, the Ministry of Trade, Industry, and Energy, Korea Power Exchange, KOGAS, and five power plants jointly conducted an anti-disaster drill to prepare for the occurrence of earthquakes as a collaborative effort among public energy agencies, laying the groundwork for immediate response in the event of emergencies by building a system to share gas and power supply and demand in real-time.

### Disaster Situation and Quick Response

In November 2017, an earthquake measuring 5.4 on the Richter scale occurred in Pohang. After receiving information about the earthquake, KOGAS immediately issued an alert of "Serious" level in accordance with the "Action Manual for On-site Measures to Respond to Earthquake," and implemented countermeasures such as operating a disaster situation room and emergency safety inspections of gas facilities. As a result, no damage to KOGAS' gas supply facilities took place due to the earthquake, and we were able to continue gas supply without interruption.



## Raising Employees' Awareness of Health and Safety

### Employee Health Management

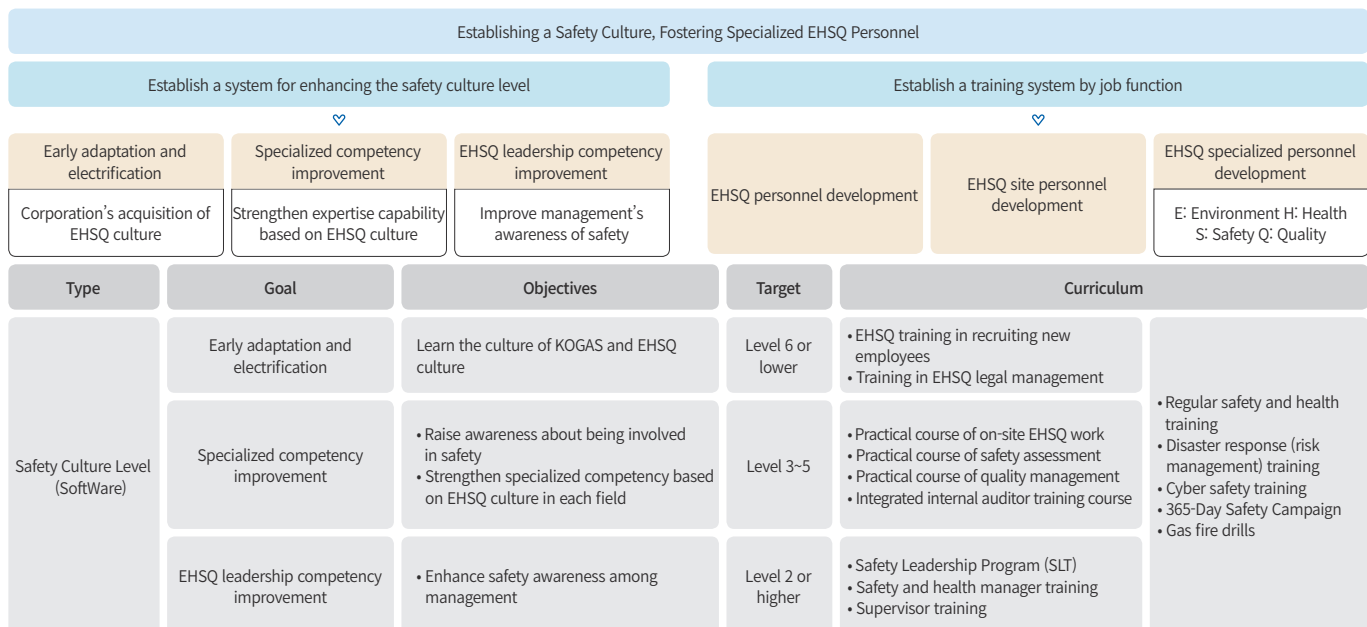
KOGAS has established and operates a health management system for industrial health management and prevention of occupational diseases by preventing health risks in the middle of work on sites and in offices, creating a pleasant working environment and systematically managing employee health. Furthermore, we establish and operate the Industrial Safety Health Committee to review and decide upon important matters related to industrial safety and health such as securing a safe workplace and safety and health hazards for employees.

We manage the safety and health of each employee systematically and make every effort to create a pleasant and healthy workplace culture through health management, GHS MSDS, health exposure assessment, and PPE. We operate an in-house health management office to regularly manage employees' work-related illnesses, and we conduct health check-ups every year. We ensure that intensive management of health conditions, if existing, is implemented by health managers and health management agencies. In order to resolve work-related stress and psychological concerns and provide relevant supports in addition to physical health management, we operate a committee to promote employees' mental health through regular psychological tests. We conduct athletic events and hiking events to facilitate employees' physical fitness and cooperative spirit, and we also operate employee welfare facilities such as a physical training room, table tennis courts, and a health club to support activities that promote health in individuals. Furthermore, we ensure that our sites are free from smoking through continued efforts to wage an anti-smoking campaign throughout the corporation.

### Safety Training for Employees

KOGAS boosts employees' knowledge and expertise and encourages voluntary activities in the fields through ongoing training starting with a variety of on-site activities to share management's commitment to safety. We perform training to improve employee awareness of safety for all our employees in order to strengthen the safety culture level throughout the corporation, and we provide job function-specific training to foster safety specialists. We offer special training courses and in-house safety training courses in addition to providing education required by law. For executives, we operate a safety leadership enhancement program, while for team directors and above, we incorporate the weight associated with disasters. We are committed to our social responsibilities for safety from disasters through diverse training sessions: 'Safe Korea Anti-Disaster Drill' led by the Ministry of Public Safety and Security, joint anti-disaster drills among related institutions, a Disaster Control Room, and video conferencing via the communication network for national mapping.

EHSQ Training System



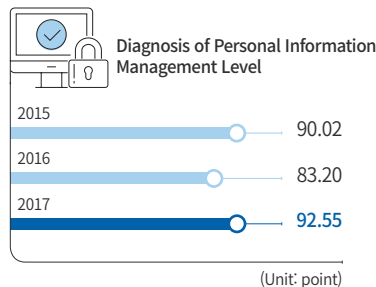
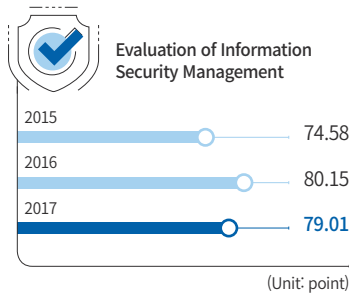
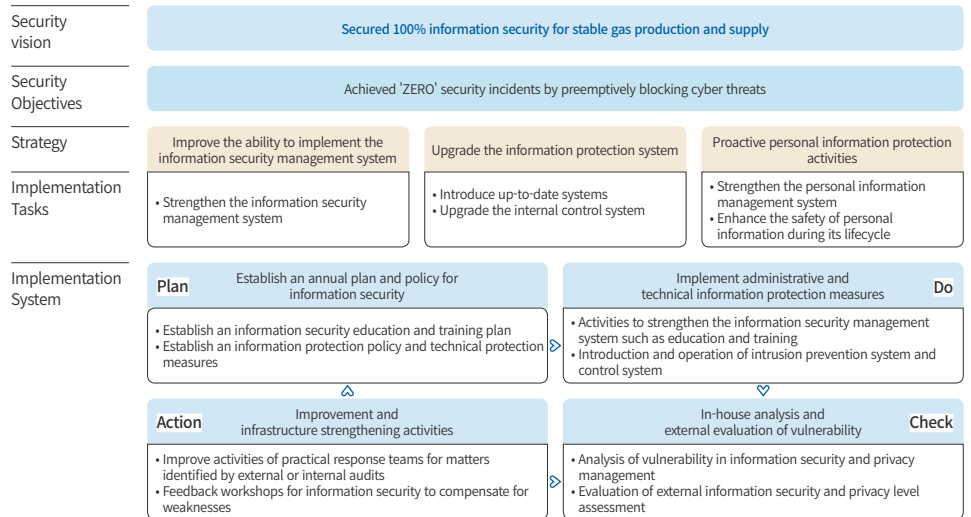


## Information Security

### Strategic System for Information Security

There is a trend toward strengthening the laws and regulations regarding information management activities, along with restricting the collection of unnecessary personal information. KOGAS has strengthened our policy and our technical and managerial safeguards for the security environment and established a strategic system for information security based on national policy trends to secure our crisis response capabilities.

#### Strategic System for Information Security



#### Strengthen the Information Security Management System

KOGAS conducts activities including training and inspection to upgrade the implementation capability of the information security management system. We performed training to achieve internalization of information protection for each target and were able to completely cut off cyber simulation attacks through tabletop exercises and simulated hacking drills. We completed six company-wide drills, which were conducted without prior notice, to deal with malicious emails with an average of 98.8 points. We also corrected 614 cases of vulnerability by inspecting information security status using the Information Protection Management system (ISO 27001), and we built an independent cyber control center which operates 24 hours a day and 7 days a week to comprehensively monitor the security observation network from basic facilities such as entry, video, firefighting, and power control to block cyber intrusions through emergency measures and fast and early responses.

#### Installation of Up-to-Date Protection Systems

KOGAS adopts the latest information protection system to prevent internal system threats. The wireless intrusion prevention system aims to prohibit the unauthorized use of wireless Internet inside the premises and blocked 1,584 cases of intrusion attempts last year. We also built a data leakage prevention system to prevent external downloading and screen capture of work-related data by virtual private network users, and we introduced 33 units of a network control and access blocking system across the company, shutting down 637 PCs that violated our security policy.

#### Personal Information Protection Activities

KOGAS enhances the security of personal information through various stages of protection activities ranging from collecting, storing, using, and destroying personal information. The collection and storage of personal information contains only the minimum amount of personal information as within the legal basis. Collection and storage of personal information is performed at the minimum level within the legal basis, and the process of using the data is controlled through systems such as access rights, disclosure check, and automatic detection of personal information when sending documents. In addition, we strictly prohibit abuse of personal information by establishing management standards for access to systems containing personal information. We operate a system that searches and deletes personal information that is no longer in use using an on-demand easy search tool. As a result of these efforts to protect personal information, we recorded zero cases of personal information leakage in 2017.

# KOGAS Sustainability Management



**Corporate Governance**





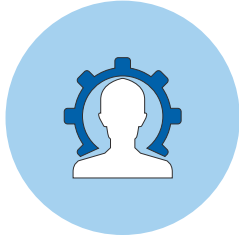
## **Risk Management**



## **Human Rights Management**

## **Ethical and Integrity Management**





## Corporate Governance

### Composition and Operation of the Board of Directors

#### Composition of the Board of Directors (BOD)

KOGAS' BOD is the top decision-making body in charge of overseeing decisions made regarding major strategies and policies and the management agenda, and of supporting management. It operates pursuant to the Act on the Management of Public Institutions and the Articles of Incorporation and consists of 9 members – 3 executive directors including the CEO and 9 non-executive directors, thereby ensuring establishment of a desirable corporate governance structure for keeping top management in check with a high portion of non-executive directors compared to executive directors. A non-executive director is appointed as the chairman of the BOD to ensure independence in the corporate governance structure and strives to advance stakeholders' rights in all decision making.

#### Operation of BOD

In order to fairly manage the BOD, the agenda is decided with the approval of a majority of registered directors. It is stipulated that directors with a special interest regarding decision-making at the BOD are restricted from exercising their decision-making right on the agenda item so that decisions can be made transparently. The BOD meets once a month in principle and can be organized to gather with the sole authority of the chairperson or the demand of over one third of registered directors. Non-executive directors are prohibited from holding more than one position for the purposes of reinforcing the BOD's function to check management and improving operational efficiency. The results of BOD meetings are disclosed on the KOGAS website and the management information disclosure system for public institutions ([www.alio.go.kr](http://www.alio.go.kr), Alio), except for special matters including confidentiality in management.

#### Independence of the BOD

KOGAS appoints members of the BOD who meet the qualification requirements in accordance with the Act on the Operation of Public Institutions, the Articles of Incorporation, and the management regulations of the Executive Recommendation Commission. We established screening criteria through the Executive Recommendation Commission consisting of 3 non-standing directors and 2 outside directors, and we systematically and fairly select candidates through confirmation procedures. We have secured independence in the screening process by restricting the candidacy of those who were an employee of the corporation or a company that engages in an important business relationship or in competition with the corporation within a 2 year period, and we appoint experts who have professional knowledge and experience in economics, management, law, or related technologies and, in particular, a broad range of knowledge and experience related to our business such as energy areas including gas to make reasonable decisions based on their expertise.

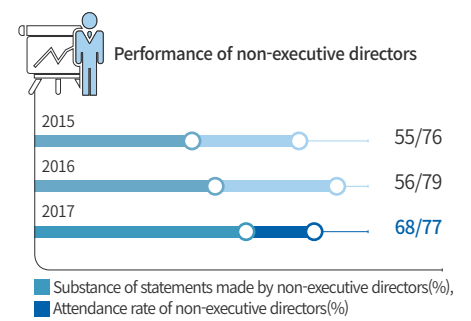
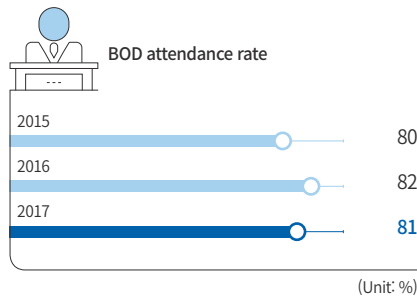
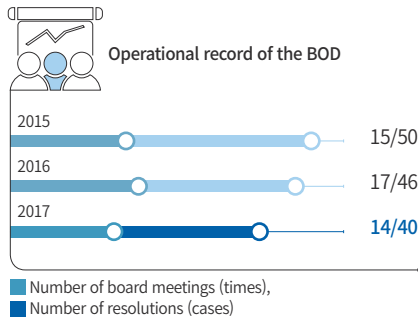
#### Diversity in the BOD

KOGAS respects the diversity of the members of the BOD. We impose no particular restriction in recruitment to secure diversity of members in the BOD. The BOD door is always open to candidates regardless of gender, religion, race, or nationality as long as they are qualified and capable. We make every effort to appoint female directors for the sake of BOB's diversity. Upon recruiting them through public opening and recommendation, we have continuously requested for recommendation of female candidates by request to the Ministry of Personnel Management (database on national human talent), and yet, there has been no female applicant so far. Currently, all members of KOGAS' BOD are male.

Composition of the BOD

(As of June-end, 2018)

Type	Name	Position	Type	Name	Position
Executive Director	Seung-Il Cheong	Executive Director, CEO	Non-Executive Director	Sun Woo Lee	Lead Non-Executive Director (Chairman of the BOD), Professor of Public Administration, Korea National Open University
	Sang Hoon Lee	Chief Auditor Executive		Kwang Sik Choi	Director, Chairman of SL Innovations Co., Ltd.
	Young Du Kim	Executive Director, Vice President of Technology / Vice President of Management		Man Kyo Chang	Director, Auditor at the Korean Construction Guarantee Cooperative
		Won Tak Lee		Director, President of Daewon University	
		Jong Rae Kim		Director, Visiting Professor of Business Administration and Management, Chungnam National University	
		Jun Hyung Lee		Director, Chairman of GoodNET Corp	



### Operation of Subcommittees

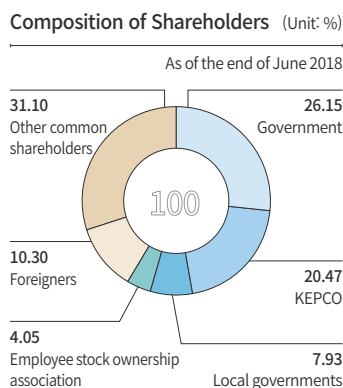
Three subcommittees were launched and are in operation under the BOD to intensively deliberate on agenda items and strengthen checking and supervisory functions for corporate management through in-depth debate and discussion, leveraging the expertise of non-executive directors: Audit Committee, Sustainability Management Committee, and Overseas Project Committee.

#### Subcommittees

Type	Composition	Key Roles
Audit Committee	One executive director, two non-executive directors	<ul style="list-style-type: none"> <li>Reporting to the BOD on directors' acts that violate laws and the Articles of Incorporation</li> <li>Matters entrusted by the BOD, and those determined to fall under the responsibilities of the Audit Committee according to laws and the Articles of Incorporation, etc.</li> </ul>
Sustainability Management Committee	Two or more directors	<ul style="list-style-type: none"> <li>Mid- to long-term management plans, major investment projects</li> <li>Budgetary and operational plans, management evaluation, promotional projects, etc.</li> <li>Safety and environmental projects and operational plans</li> <li>Ethical management and social contribution activities, etc.</li> </ul>
Overseas Project Committee	Overseas Project Committee	<ul style="list-style-type: none"> <li>Overseas resource exploration and development/production</li> <li>Review or counseling on overseas plant projects and other overseas projects</li> </ul>

### Evaluation of the BOD

KOGAS has established a BOD management system that manages the activities and performance of directors including BOD attendance rate, suggestions for corporate management, and substance of statements. In addition, KOGAS seeks to develop the BOD through objective evaluations following BOD management evaluation and individual director evaluation. Remuneration for executives is composed of basic salary, incentives, and severance pay. The yearly basic salary is decided in BOD meetings within the range of salary limits which is approved in a shareholders' meeting. The president receives incentives depending on the results of assessments of management performance after signing a management contract to achieve the corporate philosophy and vision with the head of the governing agency (Ministry of Trade, Industry, and Energy). The assessment is based on performance indicators of financial performance of management activities and external perception, as well as environmental and social indicators. Executive directors receive incentives after making contracts for performance with the president.



### Composition of Shareholders

KOGAS was listed on the Korea Exchange on December 15, 1999. The amount of KOGAS' legal capital stands at KRW 1 trillion. Shareholders of KOGAS are comprised of public shareholders and ordinary shareholders. Public shareholders, namely the government, KEPCO, and local governments, hold approximately 54.55% of total shares. The majority shareholder is the Korean government which holds 26.15% of total shares. There has been no change regarding the majority shareholder for the past three years.



# Risk Management

## Risk Management System

### Risk Management Strategy

KOGAS defines risks as uncertainties and opportunity losses which hamper the achievement of strategies and business goals, encompassing both risks and crises. KOGAS takes the following actions in order to respond to such risks: identifying potential risks which block our efforts to achieve our goals in the integrated perspective of KOGAS, deciding the level of risk tolerance, searching for rational responsive measures, and establishing and managing a system for risks to be managed by specific parties in charge.

### Risk Management Organization

KOGAS separates the functions of establishing and managing a risk management system from day-to-day risk management operations. A supervisor of risk management, its decision-making body, and related regulations were established to ensure independence within the business area. Critical deliberation and decision-making on corporation-wide risk management are performed by the Risk Management Committee and the Chief Risk Officer (CRO) oversees corporate-wide risk management operations. The Risk Management Committee meetings are, in principle, organized more than once a year, during which the Committee reviews the current status of corporation-wide risk management and decides on the agenda. KOGAS' risk management is based on the '3-lines of defense' model: the first-line supervising departments that are primarily responsible for risks as they conduct daily risk management operations; the second-line Risk Control Management Department that manages the risk management system and supports risk management operations on the working level; and the third-line Office of the Auditors that audits the procedural adequacy of risk management activities. Each organization is organically configured in correlations.

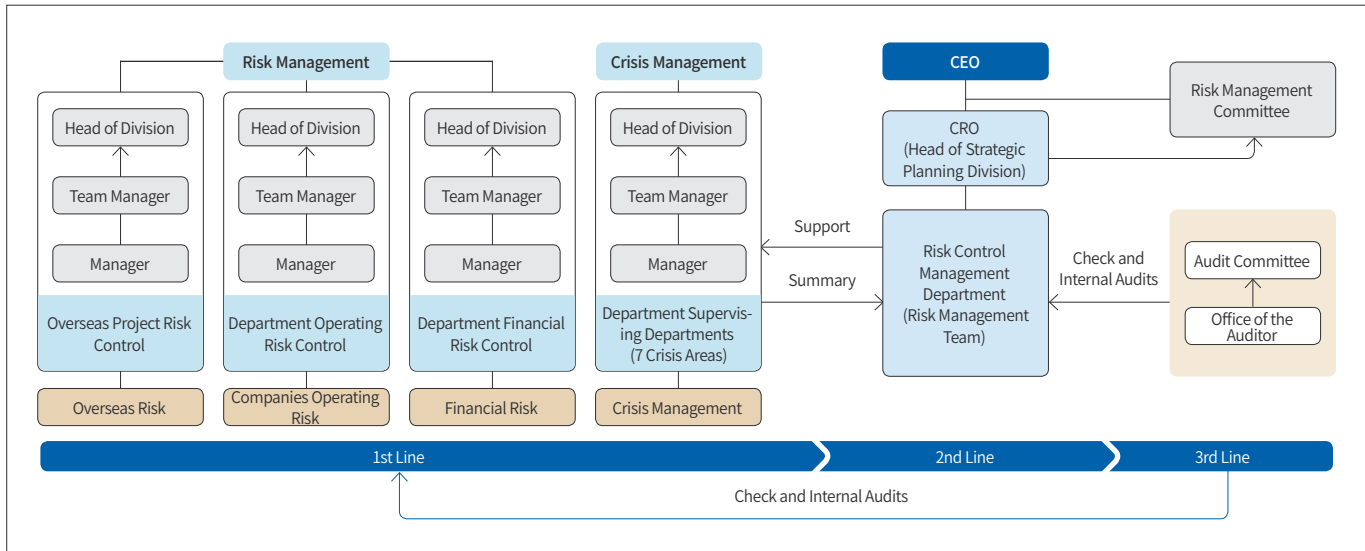
### Risk Monitoring and Reporting System

KOGAS monitors the current status of risk management on a quarterly basis, providing feedback to departments in charge so that they can make timely and effective responses by monitoring response performance upon the issuance of risk alerts. For the reporting system, the departments in charge report on the results of each of their risk management activities to the supervising departments, which collect them and report to the CRO on the current status of enterprise-wide risk management. Lastly, the CRO reports to the Risk Management Committee.

#### Principles of Risk Management

1. Principles of Risk Management Perform independent functions in the enterprise level
2. Accurately identify, measure, and evaluate risk, and appropriately managing risk
3. Strike a balance between risk management and profitmaking, considering cost benefits
4. Sett and manage risk tolerance level or management targets
5. Document the results of risk management operations, and designate personnel in charge
6. Make timely reporting and establish a reporting system thereof

#### Risk Management Organization



Checklist on Risks

Area	Risk Event
Target Country	Forfeiture of resources and nationalization, natural disasters, socio-political anxiety, inconsistency in policies and regulations, default of a target country, shortage of labor, shortage of infrastructure, civilian petitions, occurrence of disputes on national borders environmental regulations
Laws/Regulations	Regulations on money exchange and transmittance, regulations on export control, regulations on local materials and corporate usage, high regulatory levels, lack of laws/institutions, occurrence of local labor issues, environmental regulations
Market	Failure to secure raw material gases, failure to secure clients, drop in product prices, stagnant demand in sales areas
Finance	FX risks/Money exchange risks, PF and management capabilities, issues in accounting/taxation, issues in insurance
Contract	Unfavorable business contracts with a government (or a company) of a target country, unfavorable contract conditions among enterprises, unfair EPC contracts, unfair SPA contracts
Partner Companies	Non-fulfilment of contractual obligations of operators (participating companies), poor management of business by operators, problematic communication among business participants, payment default of customers
Technology	Excess of capex than planned, low performance of facilities, process delay, insufficient technical analysis

## Risk Management Activities

### Spread a Culture of Risk Management

#### Training

KOGAS devised measures for training in order to intensify competencies to perform risk management operations and raise awareness about their importance, and we implement these measures by establishing yearly training plans. For personnel exclusively in charge of risk conduct, a workshop is organized, focusing on practical sessions, while team directors of related departments and overseas subsidiaries are invited to periodic training to form consensus on risk management. For heads of departments/divisions and executives, training measures are established in the form of meetings to enable intensified communication for cooperation among departments.

For overseas subsidiaries, global strategy meetings are organized for heads and country managers of overseas subsidiaries on a yearly basis to overcome the crisis of low oil prices and achieve qualitative growth in overseas projects. In global strategy meetings, strong performance by subsidiaries is evaluated on the risk management operations of overseas subsidiaries which are dispersed on each continent, and best practices are selected to remind attendees of the importance of risk management and provide an environment for mutual training.

#### Evaluation and Remuneration

Overseas subsidiaries are evaluated once a year to improve the performance of risk management and management operations in overseas business. Risk profiles of each project and performance level of the self-checklists are evaluated on a quarterly basis. The adequacy of establishing and implementing plans to manage core risks are qualitatively evaluated. Evaluation of subsidiaries is conducted for entire members including the president of each overseas subsidiary. The risk management performance of subsidiaries is measured, and the performance pay of their members is differentially paid based on the evaluation results.

### Risk Management of Overseas Projects

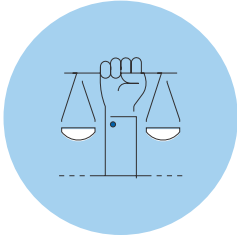
Performance of long-term overseas projects is not generated over the short term, and they are significantly impacted by external conditions. KOGAS manages such factors as ‘emerging risks.’ We establish response strategies by scenario and make due responses based on the outlook of external institutions regarding risks of target countries. In addition, we have developed and utilize the ‘risk checklist’ for business departments to identify risks in target countries. Regulations on the obligations of local investigations upon conducting business evaluation are prescribed, thereby intensifying country risk management in the procedure to manage overseas risks.

#### Investment Risk Committee

The purpose of the Investment Risk Committee is to identify in advance risks that may occur in new or modified projects and establish a system to devise protocols. The committee is an independent organization from business units and reviews risks in 5 areas – nation, economic feasibility, technology, and operation, and the results of deliberation are important reference data for business evaluations.

#### Investment Management System

We run an investment management system to increase the efficiency of risk management and manage risks related to strategies. The investment management system enables perusing and analyzing the current status and risks of all overseas projects underway. The current status of overseas investment projects and business-specific risks can be shared company-wide through the system. We are also equipped with a system to establish strategies in consideration of related risks upon setting long-term strategies.



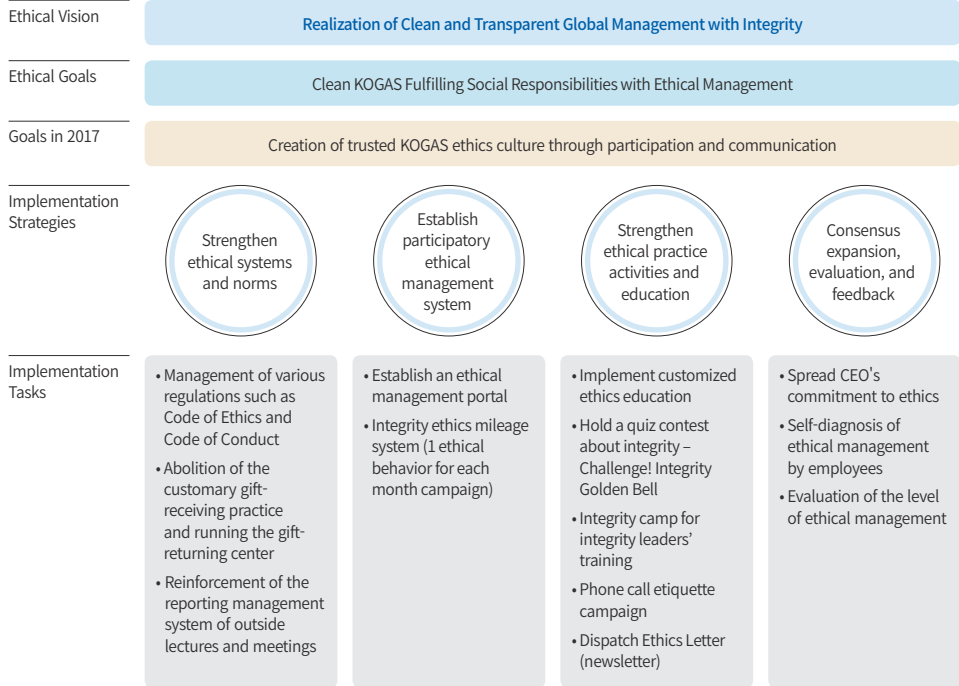
# Ethical and Integrity Management

## System for Ethical and Integrity Management

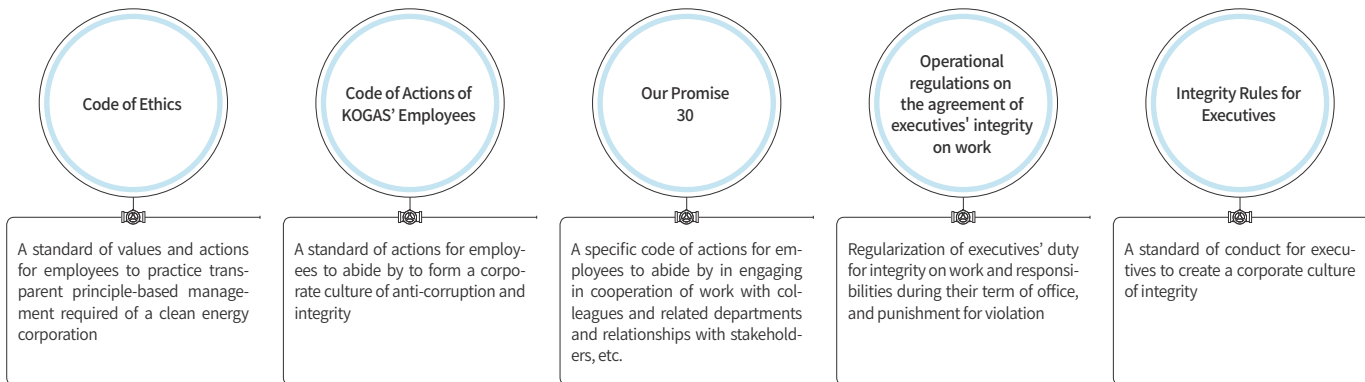
### System for Ethical and Integrity Management Strategies

KOGAS suggests four strategic directions and relevant tasks for action to realize ‘Clean KOGAS’ under the vision of ‘realizing clean and transparent global principle-based management.’ We ensure such commitment to ethics and integrity to be internalized by all employees, and we reflect them throughout corporate management.

#### System for Ethical and Integrity Management Strategies



### Ethical Management Code



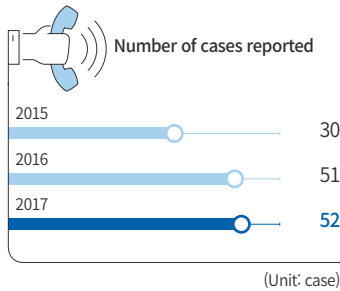
### Organization in Charge

KOGAS has established a responsible organization in order to secure momentum for ethical management. The organization in charge of ethical management oversees formulates and revises the code of ethics and establishes and operates a program for actions, and it periodically evaluates and monitors ethical management to measure the implementation and improvement level. Moreover, we also develop training sessions and materials on ethics, and we provide ethics counseling for ethical decision-making and conflict resolution.

## Formation of a Culture of Ethics and Integrity

### Facilitate the Whistleblowing System

KOGAS operates an internal and external system for reporting through various channels to fundamentally block illegal acts by facilitating the whistleblowing system. We adopted 'KOGAS-Whistle,' a system for counseling with a lawyer and whistleblowing at the same time, thereby facilitating the system by guaranteeing whistleblowers' anonymity and position and enabling better access to whistleblowing through counseling.



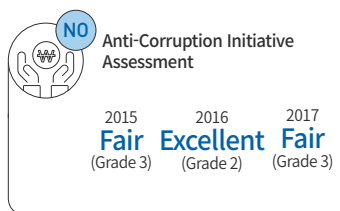
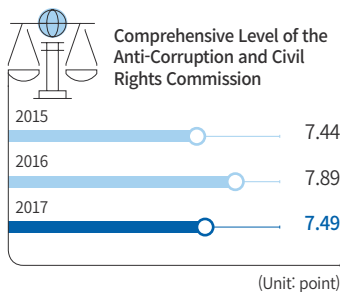
#### KOGAS' Reporting System

Internal reporting channel	Improper solicitation reporting center	Intranet reporting channel for employees who have received improper solicitation
	Internal reporting center	Intranet reporting channel for reporting corruption and public interest
External reporting channel	Reporting by name	Integrated operation with National Ombudsman
	Anonymous reporting	Integrated operation with the external reporting system

### Ethics and Integrity Internalization Program

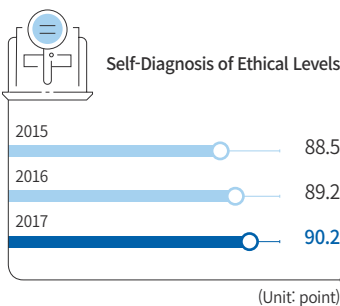
KOGAS operates ethics and integrity education programs utilizing on-line and off-line methods to promote a sense of ethics in employees. We held 'Challenge! Integrity Golden Bell' - a quiz contest about ethical norms for all employees to participate and share consensus about ethics. In addition, we publish various ethics-related news items such as monthly major activities related to ethics and integrity, amendments to ethics rules, business office activities, and CEO messages, and send them to employees every month by email.

Furthermore, we built 'Cheongahan' - an ethics management portal. The portal includes the CEO's commitment, introduction of ethics management activities, a campaign for 1 ethical behavior for each month, an ethics discussion room, visits to memorial integrity sites, and activities by department/division/business office, and is used as a platform of ethics and integrity activities allowing all employees to communicate and participate.



#### Ethics and Integrity Education Program

Targets	Methods	Content
Executive staff	Collective	• Education about improper solicitation prohibition law, reporting corruption and public interest reporters (82%, 196 people completed)
Employees of overseas subsidiaries	Collective	• Prevention of integrity blind spots and integrity training in content tailored to overseas subsidiaries (three subsidiaries)
All employees	Collective, online	• Case-centered cyber education (2 times, 99% completed), visiting education about integrity for business offices (15) • Challenge! Integrity Golden Bell: Company-wide quiz contest based on the Code of Conduct (reported by Yonhap News and other 24 news media)



### Integrity Ethics Mileage System

We encourage voluntary participation of all employees by linking various ethics activities with the mileage system. The records of 1 ethical behavior for each month campaign, visits to memorial sites, education program attendance, participation in contests, etc. are converted into ethical mileage, and the best employees and departments are rewarded at the end of the month or at the end of the year. The average mileage earned per employee in 2017 is 54 points.

### Semi-Auditor System

For each department and division, KOGAS has selected one semi-auditor who is responsible for monitoring the overall implementation process of projects and assisting in regular audits. In 2017, a total of 53 semi-auditors were selected and assigned practical roles to perform regular audits and self-audits of business offices.



## Human Rights Management

### Principle of Human Rights Management

KOGAS formulated and declared the ‘Charter on Human Rights Management’ in April 2017 to establish a system for human rights management that fulfills international standards and to raise reliability in domestic and international markets, thereby contributing to sustainability management. We implemented internal and external promotions proactively on the ‘Charter on Human Rights Management’ to spread consensus among all employees and create a culture for human rights. These efforts were shared on KOGAS’ official website and the in-house portal, via email for all employees, SNS (Facebook), and in the newspaper. In addition, all employees signed the ‘Pledge to Comply with the Charter on Human Rights Management.’ We established diverse communication channels, endeavored to prevent violations of human rights, diversified the grievance handling system, and continuously conducted due diligence in order to put the Charter into action throughout the corporation. In 2018, KOGAS designated “Human Rights Management Regulations” to institutionalize our human rights management, and we reviewed KOGAS’ Charter on Human Rights Management in consultation with human rights experts and by collecting internal and external stakeholder opinions. As a result of these activities, we revised the ‘Charter on Human Rights Management’ in a way to further strengthen our commitment to protecting and respecting the human rights of employees by incorporating the international human rights standards that our employees should comply with and providing provisions for remedies for human rights violations. Furthermore, KOGAS joined the UN Global Compact in 2007, an international agreement prescribing global corporate social responsibilities. We announced that we will sincerely implement the ten principles in four areas as human, rights, labor standards, environment, and anti-corruption. We express our endorsement for the Universal Declaration of Human Rights through the Sustainability Report on a yearly basis.

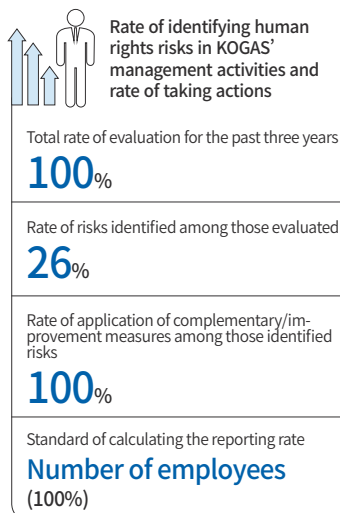
### Identification of Risks for Human Rights

KOGAS evaluated 38 items in 10 areas according to the checklist of human rights management: establishment of the human rights management system; non-discrimination in employment; guarantee of freedom of association and collective bargaining; prohibition of forced labor; prohibition of child labor; guarantee of industrial safety; responsible management of the supply chain; human rights protection of local residents; guarantee of environmental rights; and human rights protection of consumers. The results were overall favorable and satisfying. The results of identification are disclosed through corporate-wide notices and posting to the e-bulletin board, etc. and include information on classes neglected by KOGAS, areas to be improved, and potential risks, etc. In addition, we preemptively introduced, in 2018, the standard manual for human rights management published by National Human Rights Commission of Korea as a part of our efforts to maintain human rights management and established our own checklists for evaluating the impact of organizational operation and major projects on human rights. The checklist, which originally evaluated 38 agencies in 10 categories, was upgraded by adding three more categories of protecting information rights, protecting women’s rights and maternity rights, and protecting employees’ human rights for 190 agencies. In addition, we established an additional checklist of 58 major projects in 4 categories based on our ‘terminal division operation’ project. We will conduct human rights impact evaluation with the enhanced checklist in the second half of 2018.

### Plans and Measures to Mitigate Human Rights Risks

#### Strengthen Management of the ‘Responsible Supply Chain Management’ Area

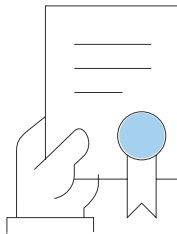
Potential risks in the area of ‘responsible supply chain management’ (suppliers) have been identified based on the evaluation results from the risk checklist. Accordingly, the ‘Special Instructions to Bidders on Integrity Agreements’ and ‘Pledge to Perform Integrity Agreement’ to be signed with suppliers were amended in December 2015. The amendments included the following provisions. We need to strive for supply of goods that comply with related laws on human rights protection and protection of human rights for personnel that execute and perform upon contracts. Furthermore, we are to follow corrective actions for human rights violations in the event that they occur, and we additionally included a provision in the documents to enable reporting to an investigative agency, if necessary. A client (the head of a department in charge of a construction work) must take actions upon regulatory violation through due diligence of the compensation and the safety and health status of laborers as well as of the labor environment through biannual subcontracting reviews in accordance with KOGAS’ ‘Guideline on Subcontracting Management.’ If actions are not continuously taken, penalties will be imposed to suppliers, which might act as a disadvantage when they are to enter to bid upon another construction project.





## Complement the ‘Establishing a Human Rights Management System’ Area

Seeking to improve the area of ‘establishing a human rights management system,, we took these actions for improvement and complementation: establishing KOGAS’ Charter on Human Rights Management and human rights management regulations, periodically disclosing results, and launching a department in charge of human rights management (Innovative Culture Team).



### KOGAS’ Charter on Human Rights Management

#### KOGAS’ Charter of Human Rights Management

We strive to achieve our mission to enhance benefits for people’s lives and realize welfare in energy by supplying natural gases securely and stably to the public in pursuit of ‘Better Energy, Better Tomorrow.’ We pursue ‘implementation of a non-discriminating fair society’ and ‘human rights management that places people as the top priority.’

To this end, we declare the ‘KOGAS’ Charter on Human Rights Management’ as a standard for taking proper actions and making proper value-based decisions for employees in order to enhance respect for humans and raise values in all our management activities, reflecting international human rights standards including the ‘Guiding Principles on Business and Human Rights (UNGP)’ and the 10 principles of United Nations Global Compact (UNSG), and we pledge to take necessary actions as follows:

We respect and support international and domestic standards which support values such as human rights, labor, environment, and anti-corruption.

We do not discriminate against any stakeholder including employees for reasons of race, religion, disability, gender, place of birth, or political opinion, etc.

We guarantee freedom of association and collective bargaining to protect the rights of employees.

We prohibit all forms of forced labor and child labor.

We enhance industrial safety and health by creating a safe and hygienic working environment.

We strive for win-win development with suppliers, and we support and cooperate with them for them to practice human rights management.

We respect and protect the human rights of local residents in the areas where we do business.

We comply with local and overseas environmental laws and strive to prevent the occurrence of environmental damage.

We strive to ensure that our business operations do not harm public safety, and we protect personal information collected for business purposes and ensure customer’s rights to access information.

We provide prompt and appropriate remedies for human rights violations that occur in business activities.

We pledge that we will strive to protect the human rights of all stakeholders including employees, and we do our best to establish and spread human rights management.

Employees of KOGAS

# Appendix

**Performance Summary**

**Prizes and Awards/Memberships**

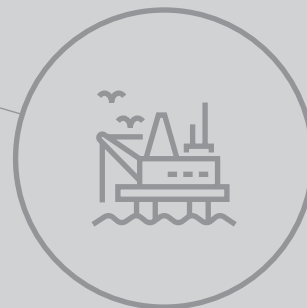
**Supply Chain Management**

**Third Party's Assurance Statement**

**GRI Content Index**

**Sustainability Initiative**

**Subsidiaries and Invested Companies**



## Performance Summary

### Major Economic Performance\*

(Consolidated Financial Sheets)

Type	Unit	2015	2016	2017
Revenues	KRW 100 million	260,527	211,081	221,723
Operating income	KRW 100 million	9,719	9,982	10,339
Net income (loss)	KRW 100 million	2,920	△6,125	△11,917

\*Certain discrepancies from data released in the Sustainability Report 2017 were due to the resettlement of accounts

### Major Financial Indicators\*

(Consolidated Financial Sheets)

Type	Unit	2015	2016	2017	
Growth potential	Increase rate in revenues	%	△30.13	△18.98	5.04
	Increase rate in net income	%	△34.71	△309.75	94.58
Profitability	Return on Assets (ROA)	%	0.65	△1.49	△3.09
	Return on Equity (ROE)	%	2.95	△6.31	△14.03
Stability	Current ratio	%	175.40	155.82	115.05
	Debt ratio	%	320.72	322.70	356.24
	Capital ratio	%	23.77	23.66	21.92
Productivity	Productivity of capital	%	6.47	5.64	5.15

\*Certain discrepancies from data released in the Sustainability Report 2017 were due to the resettlement of accounts

### Summary of Consolidated Financial Statement\*

(Consolidated Financial Sheets)

Type	Unit	2015	2016	2017	
Assets	Current assets	KRW 100 million	100,482	86,580	75,822
	Non-current assets	KRW 100 million	323,707	313,840	295,572
	Total assets	KRW 100 million	424,189	400,420	371,394
Liabilities	Current liabilities	KRW 100 million	57,287	55,562	65,904
	Non-current liabilities	KRW 100 million	266,078	250,127	224,086
	Total liabilities	KRW 100 million	323,365	305,689	289,990
Shareholders' equity	Paid-in capital	KRW 100 million	17,651	17,651	17,651
	Others	KRW 100 million	83,173	75,953	60,482
	Equity attributable to shareholders of the corporation (subtotal)	KRW 100 million	100,824	93,604	78,133
	Non-controlling interests	KRW 100 million	-	1,127	3,271
	Total shareholders' equity	KRW 100 million	100,824	94,731	81,404

\*Certain discrepancies from data released in the Sustainability Report 2017 were due to the resettlement of accounts

### R&D

Type	Unit	2015	2016	2017
R&D investment expenses	KRW 100 million	425	719	679
Technological patents (accumulated)	Number of cases	307	347	378

### Generation and Distribution of Economic Value

Stakeholders	Calculation Criteria	Unit	2015	2016	2017
Suppliers	Expenses for purchasing goods from SMEs	KRW 100 million	3,569	2,983	2,705
Employees	Employee wages and welfare benefits	KRW 100 million	3,164	3,480	3,848
Government	Corporate tax	KRW 100 million	298	3,542	3,032
Community	Donations and social contribution activity expenses	KRW 100 million	207	183	171
Customers	Revenues	KRW 100 million	260,527	211,081	221,723
Creditors	Interest	KRW 100 million	7,764	8,408	8,295

## Greenhouse Gas Emissions

Type	Unit	2015	2016	2017
Total GHG emissions	tCO <sub>2</sub> e	502,988	525,573	623,639
Direct emissions	tCO <sub>2</sub> e	150,711	166,283	263,068
Indirect emissions	tCO <sub>2</sub> e	352,277	359,290	360,571

## Amount of Energy Usage

Type	Unit	2015	2016	2017
Total amount of energy usage*	TJ	10,189	10,651	12,624
Direct energy	TJ	2,965	3,248	5,187
Indirect energy	TJ	7,224	7,414	7,442

\* There is a difference between the sum of direct and indirect amount of usage and the actual sum based on the standard to calculate GHG emissions by site (on decimal point handling) in the National Greenhouse Gas Management System.

## Total Energy Consumption

Type	Unit	2015	2016	2017
Non-renewable energy fuel purchased and consumed for energy use	MWh	818,055	902,222	1,440,833
Purchased non-renewable electricity	MWh	750,701	765,337	769,532
Purchase of steam/heating/cooling and other energy	MWh	16,944	18,333	13,611
Purchase or production of renewable energy	MWh	2,152	2,059	3,249
Total non-renewable energy consumption	MWh	1,585,545	1,686,666	2,223,976
Total energy consumption cost	KRW	88,413,882,367	92,406,114,233	110,585,545,150

## Amount of Water Usage\*

Type	Unit	2015	2016	2017
Total amount of water usage	m <sup>3</sup>	1,581,999,173	1,572,304,237	1,241,908,454
Seawater	m <sup>3</sup>	1,581,500,930	1,571,859,597	1,241,441,822
Water supply	m <sup>3</sup>	491,108	436,182	459,130
Underground water	m <sup>3</sup>	7,135	8,458	7,502

\* Differences from figures presented in the previous report were due to errors in water supply and other water usage units.

## Emission of Environmental Pollutants

Type	Unit	2015	2016	2017		
Sales volume of natural gases	1,000 tons	31,456	32,773	32,162		
Air pollution	NOx	Amount of emissions	kg	256,230	278,257	212,995
		Basic unit	kg/1,000 tons	8.15	8.49	6.62
	SOx	Amount of emissions	kg	689	749	1,175
		Basic unit	kg/1,000 tons	0.02	0.02	0.04
	Dust	Amount of emissions	kg	2,191	2,363	3,548
		Basic unit	kg/1,000 tons	0.07	0.07	0.11
Water pollution	BOD	Amount of emissions	kg	125.3	124.2	55.9
		Basic unit	kg/1,000 tons	0.004	0.004	0.002
	COD	Amount of emissions	kg	71.8	48.6	61.3
		Basic unit	kg/1,000 tons	0.0023	0.002	0.002
	SS	Amount of emissions	kg	236.3	139.5	124.5
		Basic unit	kg/1,000 tons	0.0075	0.0043	0.0039
Waste	General		tons	967	3,300	547
	Designated		tons	429	198	53
	Construction		tons	411,583	290,394	83,679
	Total	Amount of emissions	tons	412,979	293,892	84,279
		Basic unit	tons/1,000 tons	13.13	8.97	2.62

Amount of Chemicals Used

Type	Unit	2015	2016	2017
Sales volume of natural gases	1,000 tons	31,456	32,773	32,162
Amount of use	kg	333,427	142,358	91,620
Basic unit	kg/1,000 tons	10.60	4.34	2.85

Risks and Opportunities of Climate Change

There has been a greater interest in measures to address climate change because of the continuous increase in carbon emissions – the cause for global warming – and due to the Paris Agreement. In Korea, directions to convert fuels for power generation (including coal) are positively reviewed, and the role of natural gas (LNG) – a low-carbon emitting fuel – is expected to play an intensified role as an intermediary fuel, which may be an opportunity for KOGAS.

Furthermore, KOGAS' initiation to diversify our business into new and renewable energy sectors including hydrogen energy and LNG bunkering business is expected to significantly contribute to higher revenues and KOGAS' financial structure. Meanwhile, KOGAS is aware of the necessity of the CDM business, while exploring businesses for reducing emissions. Some of the businesses cover a need to procure emission credits as the amount of allocation by the government is reduced by phase (including the amount of paid allocation), and also the need to improve facilities to control procurement costs. Currently, we have established measures to respond to climate change by selecting and analyzing a list of risks for each climate impact factor (including heat waves, cold waves, heavy rain, heavy snow, strong winds, rise in sea levels, etc.) affecting gas facilities, and we prevent and prepare for risks through continuous performance evaluation.

Seeking to proactively respond to climate change risks, KOGAS runs the Climate Change/Energy Committee and the Working-Level Committee for devising plans for climate change response and energy management, etc. We also respond to climate change throughout the corporation by devising indicators to evaluate the compliance of the allocated amount of GHG emission in each terminal division and regional division and their efforts to save energy.

Violation of Environmental Laws and Regulations

Type	Unit	2015	2016	2017
Violation of statutory obligations/regulations	Number of times	0	0	0
Amount of penalty	KRW	0	0	0

Performance in the BOD Operation

Type	Unit	2015	2016	2017
Number of times BOD meetings have been held	Number of times	15	17	14
Agenda items agreed upon	Number of agenda items	50	46	40
Pre-deliberation rate	%	81	95	86
Revised agreed-upon agenda items	Number of agenda items (%)	2(4)	1(2)	0(0)
Reported agenda items	Number of agenda items	28	29	21
BOD attendance rate	%	80	82	81
Attendance rate of non-executive	%	76*	79	77
Substance of statements /motions delivered by non-executive directors	%	55	56	68

\*79% stated in the Sustainability Report 2017 is a typo and has been corrected to 76%.

### Status of Labor Union Membership

We provide prior written notifications on changes in corporate management: changes in the Articles of Incorporation and the organization, amendment or abolition of regulations on labor conditions, shareholders' meeting and the board of directors associated with rights of union members, and agenda items proposed to the Management Committee and their results. All these matters are stipulated in the collective agreements.

Type	Unit	2015	2016	2017
Number of labor union members	Number of employees	3,017	3,186	3,242
Labor union membership rate	%	86	86.1	84.7

### Occupational Health and Safety

The portion of workers represented by the Joint Labor-Management Health and Safety Committee (total number as of the end of 2017: 3,742, number of employees on sites: 2,759). Topics for consultation include establishing preventive plans against industrial accidents and matters regarding safety/healthcare measures following the adoption of hazardous/risky machinery and equipment in accordance with Article 19 of Occupational Safety and Health Act and Article 25.2 of Enforcement Decree of the same law. We perform a health check-up once a year for employees to prevent occupational diseases, along with a once-a-year special health check-ups for shift workers and private police guards.

Type	Unit	2016		2017	
		Number	Note	Number	Note
Injury rate*	%	0.029	1 case of fracture due to a fall	0	
Rate of taking number of time-off leave**	%	0.1	Sick leave of 901 days	0.13	Sick leave of 1,330 days
Rate of absenteeism	%	0	-	0	
Number of occupational deaths	Number of employees	0	-	0	

\*Rate of the injured out of 100

\*\*Average working hours of 40 per individual/week X 52 weeks

### Status of Suppliers

Type	Unit	2015	2016	2017
Number of major partner companies	Number of companies	82	85	93

### Procurement Contracts with Suppliers

Type	Unit	2015	2016	2017
Purchases of SME products	KRW 100 million	3,569	2,983	2,705
Ratio of purchases of SME products	%	26.7	28.1	29.1

### Support for SMEs' Competitiveness

Type	Unit	2015	2016	2017	
Joint R&D	Number of cases	Cases	20	18	22
	Participating companies	Number of companies	20	18	21
	R&D budget	KRW 100 million	22.2	10.0	17
Training for employees in small- and medium-sized suppliers	Training for technical/research personnel	Number of people	70	-	180
	On-the-job training	Number of people	8	-	16
	On-line training	Number of people	28	37	40
	Subtotal	Number of people	106	37	236

### Customer Satisfaction

Type	Unit	2015	2016	2017
Public-Service Customer Satisfaction Index (PCSI)	Grade (points)	A(93.7)	S(94.9)	A(94.4)

### Product and Service Information and Labeling

KOGAS supplies natural gases as products, and we disclose to customers and on our website the Material Safety Data Sheet (MSDS), which explains hazardousness, risks, emergency tips, and handling procedures for the materials supplied. These are supplied pursuant to Article 41 of the Industrial Safety and Health Act, Article 37.2 of its Enforcement Decree, and Article 92.2~10 of its Enforcement Rule. KOGAS did violate related rules and regulations in 2017.

## Status of Employees

Type		Unit	2015	2016	2017
Total Employees		Number of employees	3,497	3,626	3,752
Employment type	Regular (Including the executive director)	Number of employees	3,460	3,605	3,742
	Non-regular	Number of employees	37	21	10
Distribution of employees by age bracket	Under 30s	Number of employees	1,205	1,347	1,410
	In 40s	Number of employees	1,603	1,578	1,527
	Above 50s	Number of employees	652	701	815
Female employees	Female employees	Number of employees (%)	350(10.1)	390(10.8)	412(11.0)
	Female managers	Number of employees (%)	5(0.14)	37(1.03)	4(0.11)
Distribution of personnel based on social equity	Persons with disabilities	Number of employees	108	131	122
	High school graduates	Number of employees	547.5	497	521
	People of national merit	Number of employees	331	356	367
	Local human talent	Number of employees	1,640	1,749	1,756
New recruits based on social equity	Persons with disabilities	Number of employees	15	8	3
	Female employees	Number of employees	13	52	32
	High school graduates	Number of employees	29	69	28
	People of national merit	Number of employees	18	26	11
	Local human talent	Number of employees	65	27.5	72

※ Data produced based on the All Public Information In-One

## Status of Training for Employees

Type	Unit	2015	2016	2017
Investment expenses for education and training	KRW million	9,371	8,364	8,660
Education hours per person	Number of hours	135	102	114
Education training expenses per person	KRW 1,000	2,654	2,382	2,530

## Employees' Rate of Return to Work After Parental Leave

Type	Unit	2015	2016	2017
Childcare applicants	Number of employees	23	46	26
Male employees applying for paternity leave	Number of employees	2	2	8
Post-parental leave return rate	%	100	92	100

## Employees' Performance Evaluation

All employees are subject to periodic self-review and review by supervisor on job performance and career development, which is managed in the system, except for dispatched workers or long-term trainees.

Type	Unit	2015	2016	2017
Rate of application of performance evaluation	%	96.2	96.5	96.0

## Employees' Retirement Management

We support employees and their families to prepare for stable post-retirement life by operating a retirement pensions program. By offering both defined benefit (DB) plans and defined contribution (DC) plans, we give opportunities to employees to select a plan based on their preference. We run a program to offer educational subsidies to support post-retirement life for eligible applicants for wage peak system (KRW 2 million per individual). The program operates in the form of commissioned training where trainees design a course themselves and take it.

Type	Unit	2015	2016	2017	
Retirement pension	Amount of assets under management	KRW 100 million	1,664	2,566	2,494
	Number of participants	Number of employees	3,518	3,640	3,666
Retired employees	Retirement age	Number of employees	21	0	0
	Voluntary retirement	Number of employees	8	10	18

## Cases of Anti-Corruption and Violations

We periodically monitor all sites and all business activities by establishing an internal compliance system. In addition, we operate an internal whistleblowing (reporting) system, and we prevent corruption and management risks through advisory and supervisory activities including the Integrity Ombudsman and integrity auditors. The routine inspection system operates as follows to prevent and strengthen control over cases of key corruption and management risks.



Type	Unit	2015	2016	2017
Cases of anti-corruption law violations	Number of cases (Number of employees)	1(1)	1(22)	3(3)*

\* 1 case of malpractice (discharge), 2 cases of receiving entertainment (discharge, dismissal)

## Employee Training on Human Rights Policies and Procedures

Type	Unit	2015	2016	2017
Completion of ethics training	Number of employees	1,624	3,144	3,422
Completion of on-line training on the code of conduct	Number of employees	3,237	5,980	6,877

## Social Contribution Activities

Type	Unit	2015	2016	2017
Total volunteering hours	Number of hours	74,593	34,711	45,093
Volunteering hours per person	Number of hours	21.2	9.4	14.4
Discounts for gas fees	KRW 100 million	735	768	835

## Creating Jobs through Social Contribution Projects (2017)

Type	Business cost (KRW 100 million)	Number of jobs (persons)	Note
Onnuri heating efficiency improvement project (energy assistance)	19.6	30	Number of construction workers participating in the project
Self-Sufficiency Program for the Homeless (architecture academy)	1.5	14	Actual number of people employed
Operation of social contribution buses	0.9	1	1 bus driver
New operation of the toy library (2 places)	1.4	2	1 social worker/toy library
Rehabilitation assistance equipment (R-BANK) operating personnel	0.7	1	Actual number of people employed
Mozambique technical school	0.7	2	Actual number of people employed
Personnel in charge of Onnuri projects	0.8	3	Actual number of people employed
Subtotal	25.6	53	

## Amount of Contribution

Type	Unit	2015	2016	2017
Total contribution amount (lobby group, interest representations, or similar organizations)	KRW	5,107,753,500	4,452,000,260	3,909,700,000

## Top Five Sources of Contributions

Type	Unit	2016	2017
Corporate Partnership Foundation	KRW	408,545,000	404,700,000
Foundation for Overseas Resources Development	KRW	610,000,000	610,000,000
Korea Energy Agency	KRW	900,000,000	700,000,000
Korea Energy Economics Institute	KRW	900,000,000	700,000,000
Korea Gas Union Corp.	KRW	950,000,000	700,000,000
Total	KRW	3,768,545,000	3,114,700,000

\* KOGAS provides contributions for the development of related associations but does not offer any direct or indirect political donations.



## Prizes and Awards/Memberships

### Awards and Certifications

Titles of awards	Organized by	Year
Prime Minister's Award for Early Supply of Natural Gas in Saemangeum District - Jeonbuk Regional Headquarters	Office for Government Policy Coordination	2017
Prime Minister's Award in Korea Energy Efficiency Award – Pyeongtaek Terminal Division	Korea Energy Agency	2017
Grand Prize in Social Contribution Sector	Daegu Metropolitan City	2017
Korea CSR Film Festival – Minister's Prize	Ministry of Trade, Industry, and Energy	2016
Selection as the best contractor for construction disaster prevention	Korea Occupational Safety and Health Agency	2016
Ranked top in national infrastructure disaster management evaluation	Ministry of Public Safety and Security	2016
1st Place in Best Companies to Work	GWP KOREA	2016
Certification as an excellent company in Standard Service Quality	Ministry of Trade, Industry, and Energy	2016
Ministerial Award of Trade, Industry, and Energy in the Energy Voucher Business	Ministry of Trade, Industry, and Energy	2016
Prime Ministerial Commendation commemorating 2016 World Standards Day	-	2016
Prime Ministerial Award in Korea Safety Award	Ministry of Government Administration and Home Affairs	2016
Integrated ISO certifications (ISO 8001, ISO 14001, ISO 29001, OHSAS 18001)	KOGAS, British Standards Institution (BSI)	2016
Acquisition of the highest level (excellence) in Evaluation of Customer Satisfaction Level of Public Corporations (for nine consecutive years)	Ministry of Strategy and Finance	2015
Designation as an excellent institution in security equipment for major national facilities – Tongyeong Terminal Division	National Intelligence Service	2015
Korea Energy Environment Award – Chungcheong District Division	Ministry of Environment	2015
Collective Ministerial Commendation of Trade, Industry, and Energy in energy saving and efficiency improvement – Gyeonggi District Division	Ministry of Trade, Industry, and Energy	2015
Award for Person of Merit for Sharing in 2015 by Gyeonggi Province – Gyeonggi District Division	Gyeonggi Provincial Government	2015
Korean National Sharing Award (Minister of Health and Welfare) – Jeonbuk District Division	Ministry of Health and Welfare	2015
2015 Korea Energy Environment Award – Chungcheong District Division	Ministry of Environment	2015
Designation as an excellent institution in integrated defense for major national facilities (prime ministerial award) – Incheon Terminal Division	Ministry of National Defense	2015
Designation as an excellent institution in joint evaluation of disaster management in the national infrastructure system	Ministry of Public Safety and Security	2015

### List of Memberships

(As of June 2018)

Title of organization	Year of enrollment
The Korea Gas Union	1985
WEC Korean Member Committee	1985
GIIGNL (International Group of Liquefied Natural Gas Importers)	1985
SIGTTO (the Society of International Gas Tanker and Terminal Operators)	1990
Environment Preservation Association (KOGAS Pyeongtaek Terminal Division)	1997
UN Global Compact	2007
Energy and Mineral Resources Development Association of Korea	2008
Korea-Japan Economic Association	2013
Green Company Council (KOGAS Incheon Terminal Division) 2013	2013
Korean-American Association	2014
Korea Indonesia Partnership Council	2014
IGU (International Gas Union)	2014

# Supply Chain Management

## Code of Conduct for Suppliers

KOGAS formulated a code of conduct for suppliers to strengthen compliance management and create the backbone of shared growth. The code of conduct suggests standards for suppliers to abide by on the environment, human rights, safety and health, and ethics. These are for secondary and lower-tier suppliers to abide by that are in transaction with employees and agents of suppliers and the suppliers themselves. KOGAS recommends that they comply with legal requirements, through provisions in the code of conduct and requirements in transaction agreements. We expect that compliance to the code of conduct by suppliers will help both KOGAS and suppliers gain global competitiveness.



Target of self-evaluation rate for companies registered for major equipment and materials

**100%**  
(2018)

## Suppliers of KOGAS

KOGAS' suppliers are classified into two types: construction work and major equipment and materials\*. The category of construction work is comprised of 129 companies engaged in the construction of production and supply facilities and maintenance work, and the category of major equipment and materials contains 101 companies that are registered to supply components that are essential to produce and supply natural gases.

\*Major equipment and materials (8 types): valves, insulated joints, metering equipment, gas leakage alarms, control equipment, static pressure equipment, uninterruptible power units, and equipment such as explosion proofs

### Status of KOGAS' Suppliers in 2017

Primary suppliers	Key primary suppliers*	Total procurement cost of primary suppliers	Procurement ratio of core primary suppliers out of total procurement cost
193 companies	53 companies	KRW 760,629,894,262	54.47%

\* Number of large-scale construction companies with more than KRW 5 billion (construction service area) + Number of companies that won contracts in 2017 among registered suppliers of major equipment (major equipment)

## Strategies for Supply Chain Management

KOGAS establishes strategies and direction for managing the supply chain for suppliers, and we devise environmental, social, and governance (ESG) targets aligned with them. In addition, we reflect such ESG elements in the decision-making process of selecting and retaining suppliers.

For construction work, we impose penalties depending on KOSHA 18001 certification, accident rate, and history of disciplinary records based on statutory decrees on the environment during pre-qualification (PQ) inspection. Candidates' personal positions take up 1.2 points (3%) out of the total score of 40 in the performance ability evaluation in evaluating bidding. Such an evaluation is conducted as a complete survey on construction work of over KRW 5 billion. For major equipment and materials, acquisition of ISO 9001 certification is required of companies that are registered for major equipment and materials and those wishing to be newly registered. Companies that do not have the certification are eliminated from the complete survey and periodic evaluation (3 years) and routine evaluation (1 year).

### Strategies for Supply Chain Management

Quality	Technological capability	Continuity	Delivery	Transparency in selection
Mandatory clarification of acquisition of ISO 9001, KOSHA 18001 certification	Confirmation of technological capability including designing and manufacturing by confirming the records of goods supply	Confirmation of management crises (merger, integration, etc.)	Confirmation of actual manufacturing capability, etc. through due diligence	Acquisition of sufficient quality by implementing competitive bidding
<b>Key ESG Targets</b>				
<p style="text-align: center;"><b>ISO 9001 Certification</b></p> <p>Acquisition of manufacturing capability for major equipment and materials for suppliers, and adequate quality by establishing a quality control system</p>		<p style="text-align: center;"><b>KOSHA 18001 Certification</b></p> <p>Imposition of credits on KOSHA 18001 certified companies to bolster safety and health activities of suppliers so that industrial accidents on construction sites may be reduced</p>		

## Management of Risks in the Supply Chain

KOGAS is equipped with a process to distinguish potential sustainability risks within the supply chain, and suppliers with high risks, based on evaluation results, are subject to suspension of qualification and requests to make improvements.

	Construction Work	Major Equipment and Materials
Identification of Risks	<p><b>1. An official process to identify potential risks when bidders participate in bidding for construction work</b></p> <ul style="list-style-type: none"> <li>- Applicable standards: Specific Standard [Guideline] for Qualification Inspection for Construction Work</li> <li>- Content: Identifying risks in areas of personal position (accident rate, legal violations in safety and environment, and certification on safety, etc.) while conducting qualification/pre-qualification inspection for construction projects above a predetermined threshold</li> </ul> <p><b>2. Method of identification</b></p> <p>Direct evaluation at KOGAS based on applicable materials in each area predetermined by government agencies and subordinate institutions (accident rate, etc.)</p> <p><b>3. Alignment with strategies for managing the supply chain</b></p> <p>The probability of industrial accidents is very high, given the nature of sites for construction work. Therefore, companies with high potential risk are eliminated by identifying suppliers' safety and health management status.</p>	<p><b>1. An official process to identify potential risks of companies registered for major equipment and materials</b></p> <ul style="list-style-type: none"> <li>- Applicable standards: [EHSQI-06401 Guideline on Registration and Management of Manufacturers of Major Equipment and Materials] 8. Monitoring and Measurement</li> <li>- Content: Companies registered for major equipment and materials may be requested to undergo inspection and submit related documents. When issues which are critical to management occur or reasons to restrict qualifications for participating in bidding take place, a special inspection might be conducted, or bidders may be required to submit documents.</li> </ul> <p><b>2. Method of identification</b></p> <p>For document evaluation and due diligence on sites, sanctions are implemented, e.g. bidders' qualification for registration are terminated upon identification of falsification of submitted documents, suspension of production, and severe defects in materials. Such findings are reported to top management internally, e.g. decisions made at the Working Level Committee and the Plenary Committee, and are notified to relevant companies.</p> <p><b>3. Alignment with strategies for managing the supply chain</b></p> <ul style="list-style-type: none"> <li>- (Evaluation of applicant companies for new registration) Site reviews for companies are conducted to decide on their registration, including technological ability, management status, and pilot product test. Potential sustainability risks are periodically evaluated and managed to prevent safety risks in advance, and then suppliers are added accordingly. As such, supply chain risks are managed and implemented for effective management.</li> <li>- (Evaluation of pre-registered companies) The valid period for registration is renewed and managed through re-evaluation of technological ability, management status, and constraints, etc.</li> </ul>
Scope and Objectives of Evaluation	<p>Evaluation of personal position on the intensity of sustainability risks in construction work is subject to items for review, and for the bidders with such high risk, the risks are defined as high sustainability risks.</p> <ol style="list-style-type: none"> <li>1. Integrity as construction companies' penalties</li> <li>2. Construction accidents and administrative sanctions</li> </ol> <ul style="list-style-type: none"> <li>- Accident rate, track records of violating the purpose of using the industrial safety and health management cost, track records of violating the duty to report on occurrence of industrial accidents, track records on punishment pursuant to environmental laws and regulations, acquisition of KOSHA 18001 certification</li> </ul>	<p>The intensity of sustainability risks on major equipment and materials is an essential factor. Acquisition of ISO 9001 certification is identified and soundness and technical ability (designing/manufacturing ability, and remedy of defects, etc.) of the quality management system is referred to for evaluation.</p>
Methods of Risk Management	<p>We evaluate sustainability risks of suppliers by biannually measuring penalties for large construction work of KRW 5 billion or higher. The penalties are measured through evaluation of industrial accidents of suppliers, safety and health management methods, and track records, and the results are reflected in follow-up construction contracts.</p>	<p>For companies registered for major equipment and materials, we organize the Working Level and Plenary Committees for evaluating major equipment and materials to impose corporate sanctions. Once sanctions are determined, they are notified to companies, by requesting them to making improvement and reflecting the integrity in maintenance for follow-up evaluations in the evaluation of personal position. Quality inspections are performed for initial order volume after sanctions were imposed, if necessary.</p>

## Third Party's Assurance Statement

### Preface

KFQ was engaged by Korea Gas Corporation (further 'KOGAS') to provide limited assurance on the 'KOGAS Sustainability Report 2018' (further 'the Report'). Our responsibility is to perform a limited assurance engagement and to express a conclusion based on the work performed. We conducted its assurance based on completeness of the data and information provided by KOGAS. KOGAS is responsible for all contents within the Report including the reporting principles and standards.

### Independence

KFQ is not involved in the preparation of any part of the Report, other than providing an assurance opinion, and there has been no interest between KOGAS and us. We have no biased opinion on stakeholders of KOGAS.

### Assurance Standards

KFQ has designed and implemented assurance according to the following standards.

- AA1000 Assurance Standard (2008)
- AA1000 Accountability Principles Standard (2008)
- GRI Standards
- UN SDGs(Sustainable Development Goals)
- UN GC(Global Compact)

### Assurance Scope

KFQ identified the followings as its scope:

- KOGAS's sustainable management activities and performances of the headquarter and all domestic business establishment described in the Report
- Compliance with the guidelines according to GRI Standards Core Option
- GRI Standards compliance assessment regarding contents of the Report and assurance principles of reporting quality
- Application of Type 1 assurance approach according to AA1000 APS (2008) and AA1000 AS (2008) to assess compliance with inclusiveness, materiality and responsiveness principles and reliability of sustainability performance information. The term 'Moderate Assurance' used in AA 1000 AS is designed to be consistent with 'Limited Assurance' as articulated in ISAE 3000.
- The link between the core subjects and the UN SDGs
- The link between KOGAS's sustainable activities and the UNGC

### Assurance Procedures

KFQ designed procedures to have reasonable assurance of the Report's critical errors or inaccurate information. We verified the reliability of the contents, processes and systems of data generation and report preparation.

#### • Document Review

We reviewed the reliability of non-financial data in respect of the 'Sustainability' by cross-checking the Report with GRI Standards, quantitative data of KOGAS, and internet & media research information. We also confirmed that the financial information has been appropriately extracted from the internal documents and the financial statements of the business report of the following system (<http://dart.fss.or.kr>).

#### • On-site Verification

We visited KOGAS headquarter and conducted on-site verification to confirm reliability of the sustainability activities and performance data contained in the Report and to evaluate the effectiveness of the reporting process. We performed verification in the accuracy topic of the aggregated data from KOGAS. These procedures included the following:

- Materiality assessment process, stakeholders inclusiveness, key issues, internal response procedures, and etc.
- Assessment of data analysis and descriptions and sustainable management performance in the Report
- Consistency between the financial data contained in the Report and the audited financial statements 2017
- Interviews with relevant staff responsible for providing information in the Report



• **Resolution of Findings**

We confirmed that some errors, inaccurate information, and ambiguous expressions found during on-site visit were properly reflected in the final Report.

• **Limitations**

The Report has been prepared solely for KOGAS in accordance with the terms of our engagement. We do not accept or assume responsibility to anyone other than KOGAS for our conclusions we have reached in the statement. Completeness and responsiveness of sustainability performance information presented in the Report have inherent limitation due to their nature and the methodology used for determining, calculating and estimating such data.

**Opinion**

Based on the verification activity stated herein, KFQ confirmed that the Report meets the GRI Standards ‘Core Option’. According to the principles of AA1000 APS (2008) and AA1000 AS (2008), inclusiveness, materiality and responsiveness, sustainability performance information were assessed and we could secure reasonable grounds to provide Type 1 level of assurance with the following confirmation:

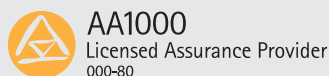
- **(Stakeholders Inclusiveness)** KOGAS subdivided four types and eleven stakeholders related to the major issues of sustainable management. To hear any concerns and opinions from them, KOGAS had a customized communication strategy for each stakeholder group and reflected their responses and opinions to its sustainable management activities.
- **(Sustainability Context)** In terms of sustainability, KOGAS has established four strategic areas in accordance with KOGAS 2025 vision and has been making continuous efforts to establish a sustainable management system while considering environmental impacts. KOGAS has established a system for human rights risk assessment recently, and the evaluation results are reflected in sustainability management activities. This is an active commitment to human rights in the UNGC and ISO 26000 principles.
- **(Materiality)** KOGAS established issue pools and reviewed by internal guidelines and external assessment criteria (GRI Standards guideline, DJSI, ISO 26000, UNGC, UN SDGs, media coverage, benchmark, and issue analysis) in compliance with the materiality assessment process. As a result, KOGAS appropriately reflected that ten key topics derived from the process along with key performance in 2017.
- **(Completeness)** KOGAS applied reporting scope, boundary and temporal criteria. We confirm that the Report is suitable for stakeholders to assess sustainability performance.

**Recommendation for Improvement**

It is necessary to systematically report on continuous management and response to key issues raised by stakeholders for more sustainable management of KOGAS. In addition, we expect that human rights impact assessment through the newly established human rights risk checklist will be reflected in your sustainability management activities. It is recommended that future report will be systematically reported on the sustainable activities of various environmental topics related to climate change and environmental management.

June 2018  
Seoul, Korea

CEO Nam Dae Hyun



Korean Foundation for Quality (KFQ)

## GRI Content Index

### GRI STANDARDS UNIVERSAL STANDARDS (GRI 100)

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Strategy	102-14	Statement from senior decision-maker	4-5
Ethics and integrity	102-16	Values, principles, standards, and norms of behavior	70-71
Governance	102-18	Governance structure	66-67
Stakeholder Engagement	102-40	List of stakeholder groups	22-23
	102-41	Collective bargaining agreements	78
	102-42	Identifying and selecting stakeholders	22-23
	102-43	Approach to stakeholder engagement	22-23
	102-44	Key topics and concerns raised	22-23
Reporting practice	102-45	Entities included in the consolidated financial statements	91
	102-46	Defining report content and topic Boundaries	24-25
	102-47	List of material topics	24-25
	102-48	Restatements of information	2
	102-49	Changes in reporting	2
	102-50	Reporting period	2
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	102-55	GRI content index	86-87
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### GRI STANDARDS ECONOMIC PERFORMANCE (GRI 200)

Topic	Disclosure		Page/Comments
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	201-1	Direct economic value generated and distributed	16-17, 75
	201-2	Financial implications and other risks and opportunities due to climate change	48, 59, 77
	201-3	Defined benefit plan obligations and other retirement plans	79
Indirect Economic Impacts	203-1	Infrastructure investments and services supported	34-35, 49
	203-2	Significant indirect economic impacts	34-35, 49
Anti-corruption	103	Management Approach(103-1, 103-2, 103-3)	70-71
	205-1	Operations assessed for risks related to corruption	80
	205-2	Communication and training about anti-corruption policies and procedures	71
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## GRI STANDARDS ENVIRONMENTAL PERFORMANCE (GRI 300)

Topic	Disclosure		Page/Comments
Energy	302-1	Energy consumption within the organization	18, 76
	302-4	Reduction of energy consumption	59, 77
Water	303-1	Water withdrawal by source	18, 76
Biodiversity	304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	58
	304-3	Habitats protected or restored	58
Emissions	305-1	Direct (Scope 1) GHG emissions	19, 76
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	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	19, 76
Effluents and Waste	306-2	Waste by type and disposal method	19, 76
Environmental Compliance	307-1	Non-compliance with environmental laws and regulations	77

## GRI STANDARDS SOCIAL PERFORMANCE (GRI 400)

Topic	Disclosure		Page/Comments
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Occupational Health and Safety	103	Management Approach(103-1, 103-2, 103-3)	55
	403-1	Workers representation in formal joint management-worker health and safety committees	78
	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	78
	403-3	Workers with high incidence or high risk of diseases related to their occupation	78
	403-4	Health and safety topics covered in formal agreements with trade unions	78
Training and Education	103	Management Approach(103-1, 103-2, 103-3)	41
	404-1	Average hours of training per year per employee	79
	404-2	Programs for upgrading employee skills and transition assistance programs	53
	404-3	Percentage of employees receiving regular performance and career development reviews	79
Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	66, 79
Human Rights Assessment	412-2	Employee training on human rights policies or procedures	80
Local Communities	103	Management Approach(103-1, 103-2, 103-3)	27
	413-1	Operations with local community engagement, impact assessments, and development programs	36-39
Supplier Social Assessment	414-1	New suppliers that were screened using social criteria	82-83
	414-2	Negative social impacts in the supply chain and actions taken	82-83
Marketing and Labeling	417-1	Requirements for product and service information and labeling	78
	417-2	Incidents of non-compliance concerning product and service information and labeling	78
Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	63

## Sustainability Initiative

### ISO 26000

ISO 26000 is the international guidance that standardizes the social responsibilities formulated and announced by the International Organization for Standardization (ISO) in November 2011. It encompasses many existing guidelines on management integration as well as seven core subjects which span from 'organizational governance,' 'human rights,' 'labor practices,' 'environment,' 'fair management practices,' and 'consumer issues,' to 'local community engagement and development.' We comply with ISO 26000 and continuously manage our implementation records.

Core Subjects	Issues	Matching Provision in ISO 26000	Page
Organizational Governance	Decision-making process and structure	6.2.3	66-67
Human Rights	Due diligence	6.3.3	72-73
	Human rights risk situations	6.3.4	
	Avoidance of complicity	6.3.5	
	Grievance resolution	6.3.6	
	Discrimination and vulnerable groups	6.3.7	
	Civil and political rights	6.3.8	
	Economic, social, and cultural rights	6.3.9	
	Fundamental principles and rights at work	6.3.10	
Labor Practices	Employment and employment relationships	6.4.3	50-53, 60-62, 78
	Conditions of work and social protections	6.4.4	
	Social dialogue	6.4.5	
	Health and safety at work	6.4.6	
	Human development and training in the workplace	6.4.7	
Environment	Prevention of pollution	6.5.3	56-59
	Sustainable resource use	6.5.4	
	Climate change mitigation and adaptation	6.5.5	
	Protection of the environment, biodiversity, and restoration of natural habitats	6.5.6	
Fair Management Practice	Anti-corruption	6.6.3	70-71, 80, 82-83
	Responsible political involvement	6.6.4	
	Fair competition	6.6.5	
	Promoting social responsibility in the value chain	6.6.6	
	Respect for property rights	6.6.7	
Consumer Issue	Fair marketing, factual and unbiased information, and fair contractual practices	6.7.3	34-35, 63
	Protection of consumers' health and safety	6.7.4	
	Sustainable consumption	6.7.5	
	Consumer service, support, and complaint and dispute resolution	6.7.6	
	Consumer data protection and privacy	6.7.7	
	Access to essential services	6.7.8	
	Education and awareness	6.7.9	
Local Community Engagement and Development	Active community involvement	6.8.3	36-39
	Education and culture	6.8.4	
	Employment creation and skills development	6.8.5	
	Technology development and access	6.8.6	
	Wealth and income creation	6.8.7	
	Health	6.8.8	
	Social investment	6.8.9	







## UN SDGs (Sustainable Development Goals, SDGs)

The UN Sustainability Development Goals (SDGs) address universal issues of humanity, environmental issues, and socio-economic issues as the largest common goals of the UN and the international community from 2016 to 2030. KOGAS maintains our corporate social responsibilities and ease of doing business by implementing strategic social contribution activities and by reviewing alignment with the UN SDGs and KOGAS' social contribution strategies.

UN SDGs	KOGAS' Strategies for Social Contribution				Alignment
	Love	Hope	Harmony	One Heart	
1 Eradicate all forms of poverty everywhere	○	○	○		Contribute to easing economic impoverishment and poverty through various forms of social contribution activities, including providing city gas tariffs for the underprivileged at home and abroad, providing for medical fees, operating welfare facilities, providing economic support for families in crisis, and supporting the underprivileged with stable housing
2 Eradicate poverty, and promoting food security and sustainable agriculture		○	○		Strive to eradicate poverty at home and abroad through continued support for Food for the Hungry International, Friend Asia, and the Korean Red Cross
3 Guarantee a healthy life and promoting welfare for people of all ages	○	○	○		Implement comprehensive and systematic health and welfare projects for various groups of people by age – children, adolescents, and the elderly – and by factors other than age – the homeless and residents of slums, etc. (guarantee healthy lives for the underprivileged and contribute to welfare improvement by providing for medical costs for severely ill pediatric patients in underprivileged households, giving assistance for rehabilitation equipment for disabled adolescents, supporting the elderly by installing gas timer clocks, and running job placement programs for self-sufficiency and rehabilitation of the homeless and residents in slums)
4 Provide comprehensive high-quality education and life-long learning opportunities	○	○	○		Continuously provide opportunities for high-quality comprehensive education and life-long learning through support for a high-quality educational environment by providing scholarships to children and adolescents in low-income households at home and abroad, improving the educational environment, and constructing the Toy Library and children's playground; and also through the operation of training programs on construction skills for fundamental self-sufficiency and rehabilitation of the homeless and residents in slums so they may be self-sufficient without financial support
5 Achieve gender equality and empower the rights of all women and girls	○	○	○		Implement activities as a part of KOGAS' interest in gender equality by sponsoring facilities and households with single mothers (supporting their living environment through wall covering and replacement of flooring, providing emergency living expenses for families in crisis to empower women's rights, donating sanitary products to underprivileged women, and providing for medical costs for severely ill women)
6 Ensure the availability of water and sanitation and manage it sustainably		○	○	○	Continuously perform environmental preservation activities including cleaning up rivers by running Onnuri Volunteer Groups, and support the project to improve a residential environment by improving the hygiene state of the underprivileged
7 Provide modern types of energy which are cost-effective, reliable, and sustainable for all	○				Conduct business to stably and continuously provide cost-effective, clean, and natural gases by supporting energy cost reduction for the underprivileged, e.g. installation of fuel cells and gas-powered HVAC units in welfare facilities to save cooling and heating costs, and implementing gas tariff reduction policies for the underprivileged
8 Guarantee sustainable economic growth and high-quality jobs and employment	○		○		Perform business to generate demand to increase the usage of natural gases as clean, economical, and safe energy sources, and contribute to job creation and promotion of employment through the Architecture Academy (programs on construction skills and job placement) for the homeless and residents in slums
9 Establish social infrastructure and promote sustainable industrialization	○				Contribute to sustainable industrial development through social investment to spread distributed electricity by supporting the installation of inlet pipelines for city gas and fuel cells
10 Resolve inequality within and across countries	○	○	○		Continuously perform activities to resolve cross-national inequality through medical support and improvement of the educational environment for developing countries, and continue to strive for resolving inequality in Korea through various projects: academic sponsorship of the underprivileged, invitations to cultural and art shows, and support for housing stability and heating costs
11 Create safe and resilient sustainable cities and settlements	○	○	○	○	Contribute to the creation of safe and resilient cities by continuous and diverse engagement in projects: expansion of fuel cells as a distributed electricity form for clean, safe, and sustainable cities, formation of settlements by ensuring an equal society through support for the destitute and impoverished, operation of the Blue Sky Project to improve the atmospheric environment, operation of the Cultural Property Jikimi (protection) Project, and volunteering of employees for environmental clean-up
12 Guarantee sustainable consumption and production patterns	○		○		Contribute to the stable supply and demand of natural gases and the positive structure for domestic demand by enabling the stable operation of facilities for storing natural gases through support for the installation of inlet pipelines for city gas, reducing gas tariffs, and managing conflicts within a region
13 Prevent impact to climate change and undertake immediate actions	○				Social contribution projects for generating demand for natural gases as clean fossil fuels are categorized as efforts to prevent the impact of climate change and undertake immediate actions
14 Have the capability to preserve and use marine, sea, and oceanic resources sustainably	○		○	○	Engage in environmental clean-up activities by employees working in terminal divisions adjacent to the sea by contributing to the preservation of oceanic resources through projects to generate demand for natural gases, a clean form of fossil fuels, minimizing damage to the oceanic environment near natural gas bases, and providing support for damage recovery when accidents happen based on internal regulations
15 Preserve the inland eco-system and forests, prevent desertification, and maintain bio-diversity	○	○	○	○	Minimize environmental damage in areas near natural gas bases and provide support for damage recovery when accidents happen. Engage in environmental clean-up activities including the Blue Sky Project and the Cultural Property Jikimi (protection) Project, and improve the environment through projects to increase demand for natural gases – a clean form of fossil fuels
16 Promote a peaceful and inclusive society and establish effective and accountable systems accessible to all		○	○	○	Contribute to promoting a peaceful and inclusive society by raising awareness of social responsibilities by facilitating an inclusive society through support to open the Rights Experience Center to empower the human rights of adolescents and social contribution projects in multiple areas for the underprivileged, running the mileage point system on social contribution for employees, and facilitating the employee donation program
17 Strengthen instruments to achieve the above objectives and facilitate global partnerships among companies, the National Assembly, and countries		○	○	○	Enhance responsibilities by reflecting the mileage point system for social contribution for employees in internal job assessments, supporting areas near terminal divisions of natural gases by cooperating with local governments, and continuously striving to strengthen partnerships with domestic and international institutions and the government by improving the educational environment and supporting medical costs in developing countries aligned with overseas businesses

## Signatory to and Commitment to Support the UNGC

Since 2007, KOGAS has joined the UN Global Compact (UNGC), which is an international agreement that stipulates the social responsibilities of global enterprises. We declared that we will sincerely implement the ten principles in four areas as human, rights, labor standards, environment, and anti-corruption.

Principle			Page
 Human Rights	Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights; and	72-73
	Principle 2	Ensure that they are not complicit in human right abuses.	
 Labor	Principle 3	Businesses should uphold freedom of association and effective recognition of the right to collective bargaining;	50-53, 72-73, 78
	Principle 4	The elimination of all forms of forced and compulsory labor;	
	Principle 5	The effective abolition of child labor; and	
	Principle 6	The elimination of discrimination regarding employment and occupation	
 Environment	Principle 7	Businesses should support a precautionary approach to environmental challenges;	56-59
	Principle 8	Undertake initiatives to promote greater environmental responsibility;	
	Principle 9	Encourage the development and dissemination of environmentally friendly technologies.	
 Anti-Corruption	Principle 10	Businesses should work against corruption in all its forms, including extortion and bribery.	70-71, 80

## Subsidiaries and Invested Companies

### 1. Subsidiaries

Type	Company Name
1	Korea Gas Technology Corporation Co., Ltd.
2	KOGAMEX Investment Manzanillo B.V.
3	KOMEX-GAS, S. de R.L. de C.V.
4	KOGAS Iraq B.V.
5	KOGAS Badra B.V.
6	KOGAS Akkas B.V.
7	KOGAS Mansuriya B.V.
8	KOGAS Canada Ltd.
9	KOGAS Canada LNG Ltd.
10	KOGAS Australia Pty. Ltd.
11	KOGAS Prelude Pty. Ltd.
12	KG Timor Leste Ltd.
13	KG Krueng Mane Ltd.
14	KG Mozambique Ltd.
15	KOGAS Mozambique Lda.
16	KOGAS Cyprus Ltd.
17	KGLNG E&P Pty Ltd.
18	KGLNG E&P II Pty Ltd.
19	KGLNG Liquefaction Pty Ltd.
20	KCLNG Tech Ltd.
21	KG-SEAGP Company Limited
22	KG-Myanmar Corporation
23	KOGAS International Pte. Ltd.

### 2. Affiliates and Joint Ventures

Type	Company Name
1	Korea Ras Laffan LNG Ltd.
2	Korea LNG Ltd.
3	Hyundai Yemen LNG Company
4	Korea LNG Trading Co., Ltd.
5	Kor-Uz Gas Chemical Investment Ltd.
6	South-East Asia Gas Pipeline Company Limited
7	Sulawesi LNG Development Limited
8	TOMORI E&P Limited
9	AMEC Partners Korea LTD
10	Coral South FLNG S.A
11	Coral South FLNG DMCC
12	Kor-Uz Cylinder Investment Co., Ltd.
13	Korea-Uz CNG Investment Co., Ltd.
14	TERMINAL KMS de GNL, S. De R.L. De C.V.
15	GLNG Operations Pty. Ltd.
16	GLNG Property Pty. Ltd.
17	ENH - KOGAS, SA.
18	LNG Canada Development Inc.
19	Manzanillo Gas Tech, S. de R.L. de C.V.



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