



BETTER ENERGY,
BETTER WORLD

KOGAS Sustainability Report 2020

ABOUT THIS REPORT

We at the Korea Gas Corporation (“KOGAS”) are striving to fulfill our social responsibilities as a public enterprise that aims to convert to environmentally-friendly energy. We will accomplish this by playing a leading role in the natural gas industry and creating social value based on our corporate motto, namely, “Better Energy for a Better World!” We aim to strike a sound balance between economic, environmental, and social values while carrying out our business, and disclose the results transparently in our annual sustainable management report. The present 2019 Sustainable Management Report is our fourteenth, following on from the thirteenth report published in June 2019.

Report period and scope

This report has been drawn up based on the data related to the results of our sustainable management for 2019 (January 1 to December 31). In terms of the quantitative results, this report contains the data for the three years since 2017 in order to show the corporation’s changes, as well as contents related to the qualitative results obtained during the first half of 2020. This report covers our corporate headquarters, terminal/district divisions, and the KOGAS Research Institute, plus overseas business where necessary. There have been no important changes in the size and organizational/ownership structure of our corporation during this report period. Where there have been changes in the data disclosed in the preceding report, we provide the reasons for such in the relevant pages.

Criteria for drawing up this report and verifications

This report has been drawn up based on the core methods of the GRI Standards, which are the international standards for the production of sustainability reports. The contents of this report have been duly verified by an independent verification institution in an effort to enhance its reliability and quality. The results of the verification are shown in the Appendix.

Additional information

You may obtain more detailed information about KOGAS on our homepage. If you have any queries about our sustainable management activities or wish to express an opinion on this report, please contact us through the following contact details:

Homepage : <http://www.kogas.or.kr>
Postal address : 120, Cheomdan-ro, Dong-gu, Daegu City, South Korea (41062)
Department : CSR Planning Team, CSR Department
Email : ksy26@kogas.or.kr
Tel : +82-53-670-0603
Fax : +82-53-670-0601

CONTENTS

02	About This Report
04	CEO's Message
06	KOGAS Profile
10	KOGAS Business
12	Vision & Strategy
14	KOGAS Social Value Highlight

Shared Value with KOGAS

20	KOGAS Social Value Creation
22	#1 Contributing to Environment Improvement by Converting into Eco-friendly Energy
24	#2 Stable Supply of Natural Gas by Technological Innovation
26	#3 Supporting Community Development and Mutual Growth

Better Energy, with KOGAS

30	Materiality Assessment
32	Future Energy Leaping Toward the World
40	Eco-friendly Energy for Future Generations
52	Win-Win Energy Growing Together
62	Happy Energy Enjoying Together

Sustainability Fact Book

72	Governance
74	Integrity & Ethical Management
77	Human Rights Management
82	Risk Management
84	Stakeholder Engagement

Appendix

87	Sustainability Performances
93	GRI Standards Index
96	Global Initiatives
98	Third-party Assurance Statement
100	Prizes and Awards/Memberships

CEO'S MESSAGE

We will create better energy and a better world through clean and safe energy conversion, and thereby create social value.



Dear stakeholders,

Dear stakeholders,

KOGAS has strived to secure a safe and stable supply of clean natural gas for the public during the past thirty-seven years. Based on our world best LNG storage tank construction technology and excellent operational experience, we are currently operating seventy-four 11.56 million kℓ storage tanks in five LNG terminals nationwide, with a total pipe length of 4,908 km, and are actively involved in twenty-five projects in thirteen countries around the world.

Under our corporate philosophy of "Better Energy, Better World," we aim to create social value by incorporating the government's policy goals of innovative growth and inclusive growth into the sustainable management of our organization. In 2019, our sustainability initiatives were acknowledged with the receipt of the Excellence Award at the 1st Public Institution Social Value Creation Contest in recognition of our efforts to expand the market for social economy enterprises. We were also honored with a Presidential Award as the "best public institution" in disaster management evaluation in the energy sector and a Presidential Citation at a national volunteering competition. Furthermore, we are fulfilling our social responsibility as a public energy company by increasing the city gas supply rate (based on local government data) to 92.1% in an effort to achieve equitable energy welfare, expanding the scope of vulnerable groups who are eligible for discounted rates, and reducing the energy burden for people affected by natural disasters. KOGAS will continue to make the following social value creation efforts to become a leader in sustainable management.

First, we will drive our future growth engines by leading the transition to green energy.

We are making multi-faceted efforts to address environmental problems such as air pollution and climate change and to implement green strategies that are aligned with the government's energy conversion policy. In an effort to secure future growth engines, we will actively promote eco-friendly fuel conversion projects such as LNG bunkering, which is projected to become an alternative to the International Maritime Organization's (IMO) regulation of GHG emissions from ships, and LNG tank cars that will help to solve the problem of fine dust in exhaust emissions. Moreover, we will take the lead in the hydrogen energy industry, which is attracting attention as a future source of sustainable energy.

Second, we will create social value by communicating with our stakeholders.

We are creating social value by identifying and supporting the practical needs of all our stakeholders, including local communities, business partners, and customers. In particular, we support the sustainable growth of SMEs by helping them to achieve technical independence and by exploring sales channels on their behalf. We have also introduced the KOGAS fair trade model with the aim of promoting fair trade. In addition, we will promote a variety of local win-win programs related to the characteristics of our business, such as improving energy welfare, nurturing future generations, and creating jobs while increasing public satisfaction through service innovation activities that reflect the diverse needs of the public.

Third, we will strengthen our competitiveness by enhancing our sustainability management practices.

We are not only practicing human rights management that respects our stakeholders, but are also strengthening our culture of ethics and integrity to establish a sound corporate culture. We are committed to improving the working environment of both our employees and those of our partners, and to ensuring that all KOGAS-related employees achieve a healthy work-life balance through maternity protection, childcare support, and health and working environment improvements. We will create a corporate culture that improves working conditions by taking all of these factors into consideration.

KOGAS will continue doing our very best to meet the expectations of our stakeholders and become a trusted public enterprise through steadfast efforts to innovate and create social value. We will also achieve our vision of promoting the public interest and realizing energy welfare, and will continuously provide "better energy" that is clean and safe to create a "better world."

Thank you!

채희봉

President & CEO Hee-bong Chae, Korea Gas Corporation

KOGAS PROFILE










Overview

KOGAS is a representative energy-based public enterprise established in 1983 to supply natural gas safely and steadily to the Korean people, guided by its corporate philosophy of “Better Energy, Better World.” Since supplying natural gas to Pyeongtaek Thermal Power Plant in 1986, KOGAS has continued to expand the provision of natural gas nationwide and recorded a 92.1% natural gas penetration rate as a result.

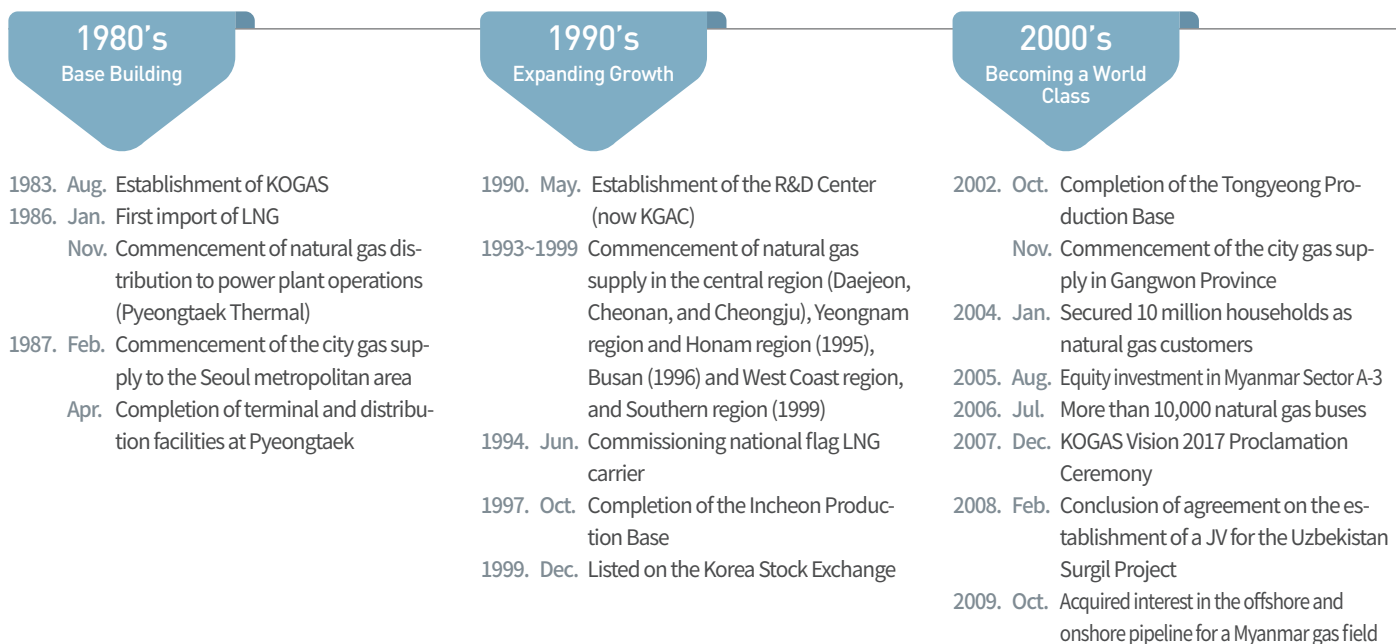
(As of Dec. 31, 2019, Consolidated Financial Statements)

Company Name	Korea Gas Corporation (KOGAS)	Type of Corporate Body	Stock company
Representative	Hee-Bong Chae	Sales	KRW 249,826 Hundred Million
Establishment Date	August 18, 1983	Operating Profit	KRW 13,345 Hundred Million
Grounds for Establishment	Korea Gas Corporation Act (Act No. 3639, Enacted in Dec. 1982)	Earnings Per Share (EPS)	KRW 395 (basic EPS), KRW 395 (diluted EPS)
Location	120, Cheomdan-ro, Dong-gu, Daegu, Republic of Korea	Employees	4,107 persons (as of Mar. 31, 2020)

Key Business Areas

	Production and Supply of City Gas and Purification and Sales of By-products		Construction and Operation of LNG Terminals and Natural Gas Distribution Network
	Exploration, Transport, and Import/Export of Natural Gas		Exploration and Import/Export of Liquefied Petroleum Gas (LPG)
	Production and Distribution of Hydrogen Energy		Development and Import/Export of Hydrogen Energy
	Research and Technical Development (R&D) for Related Business Areas		Projects Commissioned by the Central or Local Government
	Overseas Projects Related to the Businesses Above		Businesses Related to the Exploration and Development of Petroleum Resources

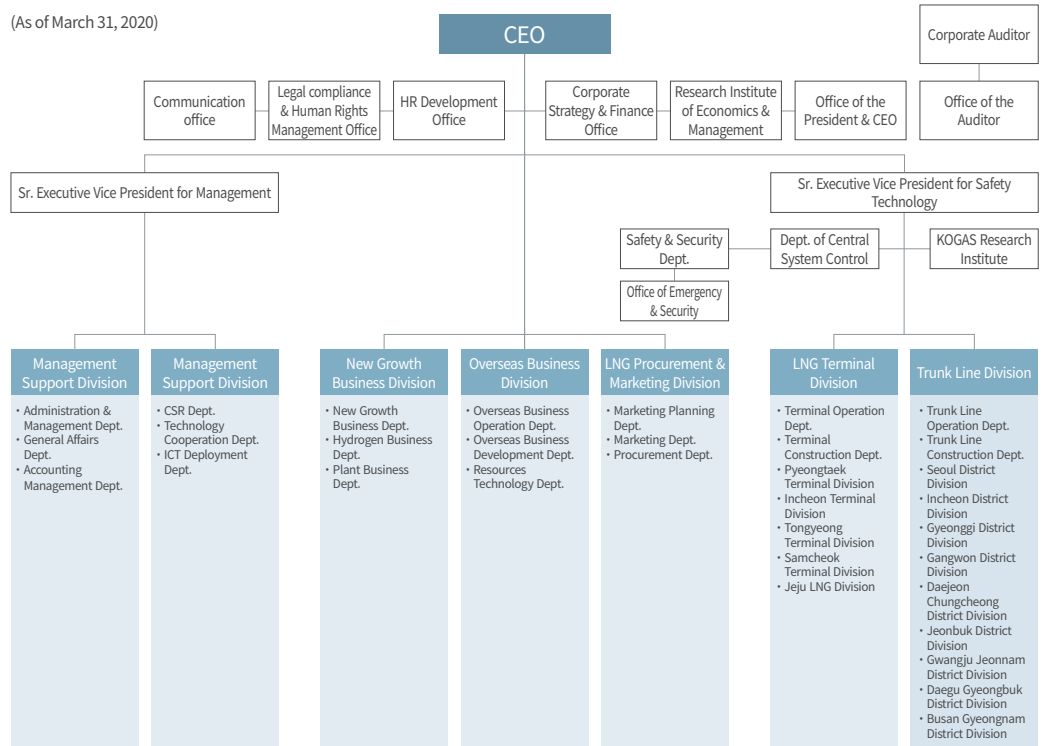
KOGAS Key Milestones



Organization

KOGAS has restructured its organization in order to internalize the national policy of the Korean government with regard to innovation and inclusive growth and respond actively to changes in the external environment. The Corporate Social Responsibility (CSR) Division has been newly established for the realization of fair transactions and social value, and the Hydrogen Business Department, for the promotion of the new hydrogen business in earnest. In addition, the New Growth Business Division has been reorganized for the early establishment of the energy conversion system and rebirth as a customer-centered energy business operator. As of the end of March 2020, KOGAS consists of 28 Departments (including Offices and Institutes) and 14 Divisions (including Terminal Divisions and District Divisions) under 7 Headquarters.

(As of March 31, 2020)



2010's Better Energy, Better World

- 2010. Jan. Incheon LNG Terminal surpassed the 100 million-ton mark in accumulated production of natural gas
- 2011. Mar. Named as the World's 4th Most Admired Energy Company by Fortune
- 2012. Oct. Received the President's award at the Korea Sharing Awards
- 2013. Jan. Received the Top Award at the Korea Ethical Management Awards in the Public Corporation Category
 - Aug. 30th anniversary of the founding of KOGAS
 - Sep. Included in DJSI Asia Pacific Level, No. 1 in the Gas sector
- 2014. Mar. Hosted "Gastech 2014" at Kintex successfully
 - Oct. Attracted the 2021 World Gas Conference to Daegu
 - Oct. Headquarters moved to Daegu Innovation City
- 2015. Oct. Commencement of commercial operations at GLNG, Australia
- 2016. Jan. Declared Vision 『KOGAS 2025』 ("NEXT Energy, with KOGAS")
 - Oct. Received the Prime Minister citation on World Standards Day
- 2017. Jun. Commencement of Stage 3 commercial operation of the Samcheok Production Base with a 270,000kℓ storage tank (the largest capacity in the world)
- 2018. Sep. Ranked in the Dow Jones Sustainability Indices Asia Pacific Level (DJSI Asia Level) for the 6th consecutive year
 - Dec. Won the General Grand Prize in the Korea Management Awards
- 2019. Apr. Established a hydrogen business execution roadmap
 - May. Selected as "the best institution" in the evaluation of disaster management by MOIS
 - Jun. Won the grand prize in the "Korea Innovation Awards" for 2 consecutive years
 - Oct. The Jeju LNG Base commenced supplying natural gas

“With KOGAS”

We will work with the people for a better tomorrow and a brighter future.

- Possessing 74 storage tanks in 5 LNG terminals nationwide with 11.56 million kℓ total capacity
- Operating 4,908km of an annular piping network and 411 supply management facilities nationwide

Since supplying natural gas to the Pyeongtaek Thermal Power Plant in 1986 for the first time in Korea, KOGAS has secured storage tanks at the best locations around the country for the stable supply of gas. Today, it is supplying natural gas to 47 power plants and 32 city gas companies through a nationwide piping network. KOGAS will contribute to easing the petroleum dependency of the Korean economy and stabilizing the supply of national energy by not only making efforts to maintain a stable natural gas supply system but also expanding the supply of natural gas, an environment-friendly energy source.

**NEXT ENERGY,
WITH KOGAS**

(MEANING : NEO EXCELLENT
TRUST ENERGY,
WITH KOGAS)

KOGAS PROMOTES CONVERSION INTO ENVIRONMENT-FRIENDLY ENERGY BY LEADING THE NATURAL GAS INDUSTRY, SHARES THE PROCESS AND PERFORMANCE OF BUSINESS WITH THE PUBLIC, AND LEADS INNOVATION TOWARD THE FUTURE.

“Excellent KOGAS”: We explore the future of sustainable energy.

- Production quantity of 4,049,000 tons through overseas resources development projects in 2019 (LNG sales quantity of 33,596,000 tons in 2019)

KOGAS is making comprehensive efforts to secure resources and supply natural gas stably to all people at a time when the degree of dependence on energy resource imports is very high in Korea. In particular, we have continued overseas resources exploration through careful investments and with confidence in order to explore energy as the foundation of national development. As a result, we have achieved national energy security through continuous overseas resources development and production. KOGAS will not rest on its laurels but will continue exploration for the next generation and push ahead with overseas resources development and production projects with a passion for ensuring a stable supply of energy.



“Neo KOGAS”: KOGAS will be a global energy company based on advanced technical know-how.

- Success in the LNG terminal in Manzanillo, Mexico, CNG project in Uzbekistan.
- Technical support for LNG terminals in China, Kuwait, Singapore, etc.

The capability of KOGAS is being recognized by the world through successful participation in and execution of overseas plant projects using its know-how of the construction and operation of LNG terminals accumulated for over 30 years. In particular, the LNG business, which began in 1996 in the form of equity investment, grew into a stage of independent development, leading the entire operation in 2016. KOGAS will secure energy independence for Korea with a keen eye for business feasibility and strong execution power for business success based on its experience and know-how of the construction and operation of LNG terminals.



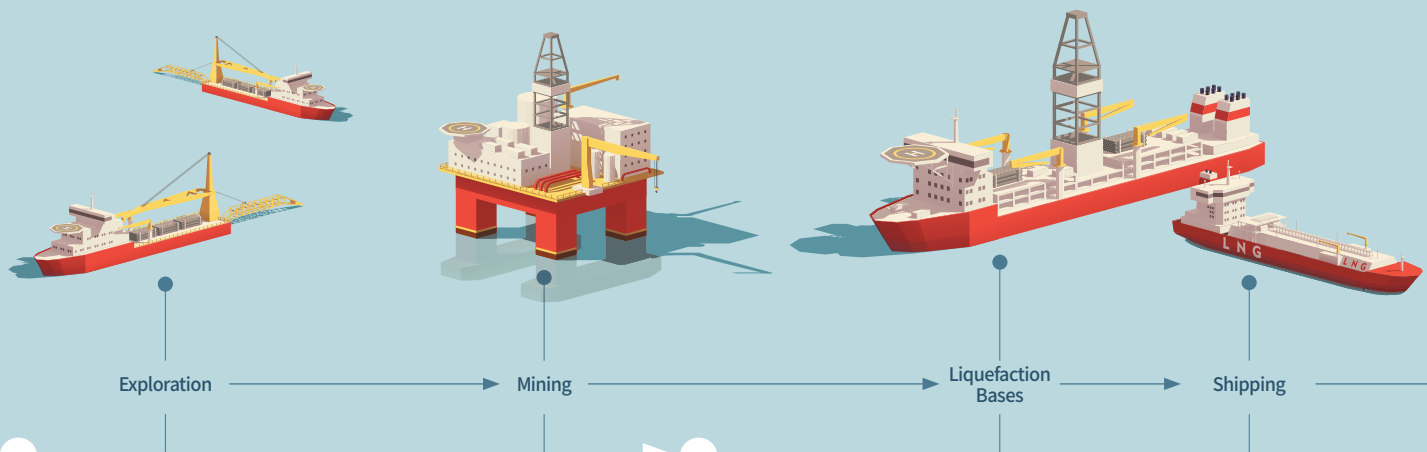
“Trust KOGAS”: We will practice trustworthy, transparent global management.

- Result of an internal evaluation of satisfaction with social contribution: 94.8 points
- Promoting human rights management as a pilot organization for the application of the manual of the National Human Rights Commission

We can go faster if we walk alone, but we can go farther if we walk together. With KOGAS, not only executives and staff members and partner companies but also small & medium enterprises, local citizens, and vulnerable social groups share bigger hopes and dreams together. We fulfill our social responsibility and listen to the voice of the field through various channels via transparent and ethical righteous management. In addition, KOGAS pursues win-win growth by providing economic and technical support for the formation of a healthy corporate ecosystem and sharing the results and offering opportunities in various ways from product production to securing sales channels. We focus on the specific realization of the meaning of ‘win-win growth’ and are making efforts to make a virtuous cycle of social contribution in which support of vulnerable social groups can lead to revitalization of the regional economy. KOGAS proceeds fairly in order to make not only the results but also the process trustworthy.

KOGAS BUSINESS

KOGAS introduced LNG to Korea, which was a wasteland for the natural gas industry, and it has positioned itself as the best energy company in Korea with 11.56 million kℓ in LNG storage capacity and a 4,908km piping network. In particular, we have established a business area encompassing all processes from the exploration and development of overseas resources, transport of natural gas to Korea, and production and supply to sale of natural gas. Moreover, we are leading the global energy industry as a global enterprise implementing 25 projects in 13 countries. Meanwhile, the natural gas industry can be classified into upstream, mid-stream, and downstream, based on the scope of activities. The upstream sector involves the exploration and mining of natural gas before liquefaction, the mid-stream sector, liquefaction and transporting, and the downstream sector, re- evaporation and supply of the gas through pipelines for customers.



Upstream

Overseas Resources Exploration/Development/Production

To secure a stable supply chain of natural gas, KOGAS has explored and developed overseas oil and gas fields by improving its resource development capabilities.

Outcome

- Achieving a 41.2% cumulative rate of return on investment by increasing investment collection and saving costs
- Securing future resources stably by increasing production quantity and discovering new operating rights projects
- Establishing a precise project management system by setting up a comprehensive project & subsidiary management system

2019 production quantity

4,049,000 tons

Social Value Performance

- **National Contribution** : Securing energy resources for the public stably through oil and gas fields development projects when competition among nations for securing resources is intensifying
- **Community** : Supporting developing countries (Mozambique, etc.) that seek to improve their national economy using natural resources
- **Mutual Growth** : KOGAS partnering gets results in receiving overseas orders for SMEs by expanding export channels
- **Job Creation** : Direct job creation through projects in Mozambique, Australia's Prelude, Iraq's Zubair and Badra, etc. (4,271 jobs)

Midstream

LNG Projects

KOGAS participates in large-scale LNG projects ranging from the production, shipping, and transportation of LNG. As for floating LNG (FLNG), a collaboration with a domestic shipbuilding company is in progress in terms of a large-scale offshore liquefaction plant capable of transporting and unloading the gas.

Outcome

- First advancement of the KOGAS Consortium into an overseas LNG bunkering project

2019 order receipt in an overseas LNG bunkering project

USD **59** million in profit creation

Social Value Performance

- **National Contribution** : Securing KRW 77.2 billion worth of funds for reducing gas rates through stable project operation → Reducing the burden of gas rates for the public
- **Mutual Growth** : Gaining a foothold in the Team Korea project by receiving an order for the LNG bunkering infrastructure project
- **Job Creation** : Construction of a special LNG carrier worth KRW 73 billion by a Korean shipbuilding company, creating 148 direct jobs for 8 years

Procurement and Transportation of Natural Gas

KOGAS has diversified its procurement sources from the Middle East and Southeast Asia to Australia and the United States in order to import foreign LNG to Korea stably. KOGAS is also contributing to the growth of the domestic shipbuilding industry by utilizing national vessels as LNG carriers and investing in the development of LNG transportation technology.

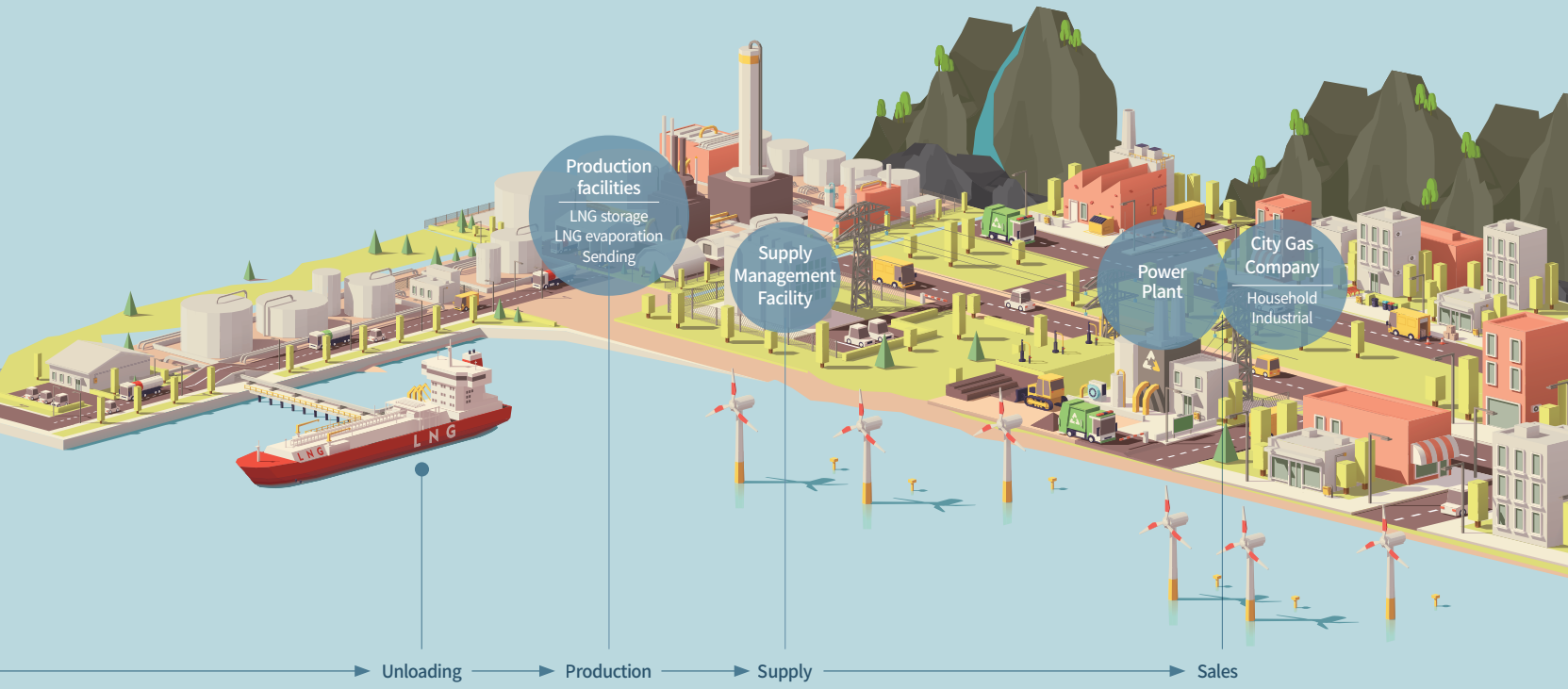
Outcome

2019 LNG procurement

33,734,000 tons

Social Value Performance

- **Environment** : Contributing to the reduction of fine dust by securing more LNG for power generation according to the replacement of coal-fired power plants
- **Mutual Growth** : Leading the localization of core equipment and creating jobs in new construction or operation of a national flag carrier



Downstream

Production and Supply

The LNG imported into Korea is unloaded to KOGAS's domestic LNG terminals and stored in large storage tanks during the summer when gas demand is low. In the winter season when the demand increases, the gas is re-evaporated and sent to city gas companies and power plants through the national pipelines.

Outcome

LNG Storage Capacity

11.56 million kℓ

Total length of the national main pipelines (as of the end of 2019):

4,908 km

2019 Output

(Unit: 1000 tons)

	Pyeongtaek LNG Terminal	Incheon LNG Terminal	Tongyeong LNG Terminal	Samcheok LNG Terminal	Jeju LNG Terminal	Total
Production Capacity*	41,291	54,400	26,542	11,563	265	134,061
Output	10,978	12,368	6,954	3,897	23	34,220

* Production capacity (ton/hour) * 24 hours/day * Operation days

- The applied production capacity of Pyeongtaek LNG Terminal is 4,816 ton/h for the first quarter of 2019 and 4,680 ton/h for the second and third quarters; that of the Incheon, Tongyeong, and Samcheok LNG Terminals was 6,210 ton/h, 3,030 ton/h, and 1,320 ton/h respectively. The Jeju LNG Terminal began operation in the fourth quarter of 2019, and the applied production capacity of the fourth quarter was 120 ton/h.

Social Value Performance

- **National Contribution** : Increasing supply and demand stability by efforts to raise the accuracy of demand forecasts and minimize supply crises
- **Safety** : Establishing a business continuity management system meeting the global standard to maintain business continuity in times of crisis (acquired ISO 22301 international certification)

Downstream Infrastructure and Natural Gas Sales

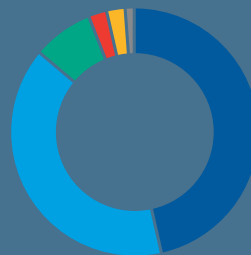
As public awareness of clean energy has grown, the sales volume of natural gas increased by 24 times in over 30 years. The gas is sold for a variety of purposes including household use, industrial use, and power generation. The price of natural gas is affected by winter cold waves, rate of operation of nuclear power plants, oil prices, etc.

Outcome

LNG sales in 2019

33,596,000 tons

(Power plant: 14,774,000 tons, City gas: 18,822,000 tons)



- Housing · Heating 44%
- Industrial 39%
- General 9%
- Cogeneration 4%
- Heating & Cooling 3%
- Other 1%

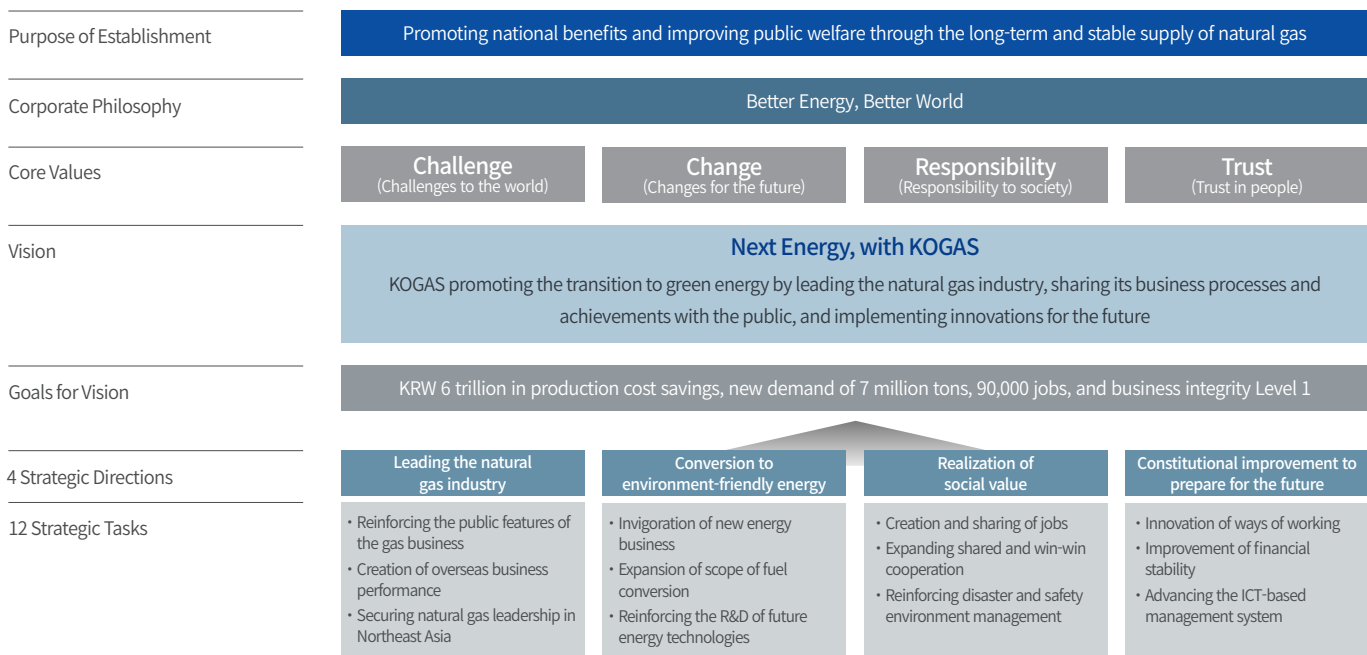
Social Value Performance

- **Environment** : Saving about 2,000 tons of gas use by the new implementation of energy efficiency enhancement project such as replacement by high-efficiency boilers
- **National Contribution** : Easing the burden of gas charges for vulnerable social groups through the national expansion of the ONE-STOP gas charge reduction service
- **Job Creation** : Expanding the horizon of job creation by receiving orders for the LNG bunkering new business

VISION & STRATEGY

KOGAS 2025

KOGAS is actively implementing the “KOGAS 2025” mid- and long-term management strategy in order to accelerate transition into environment-friendly energy by leading the natural gas industry and become a clean energy public enterprise that pursues innovation toward the future based on public trust. In particular, we are practicing 12 strategic tasks according to 4 strategic directions to accomplish the management goal of “saving KRW 6 trillion in production cost, creating new demand of 7 million tons, and achieving business integrity Level 1” by 2025. KOGAS will continue to grow by promoting national benefits and improving public welfare based on the corporate philosophy of KOGAS to create “Better Energy, Better World.”



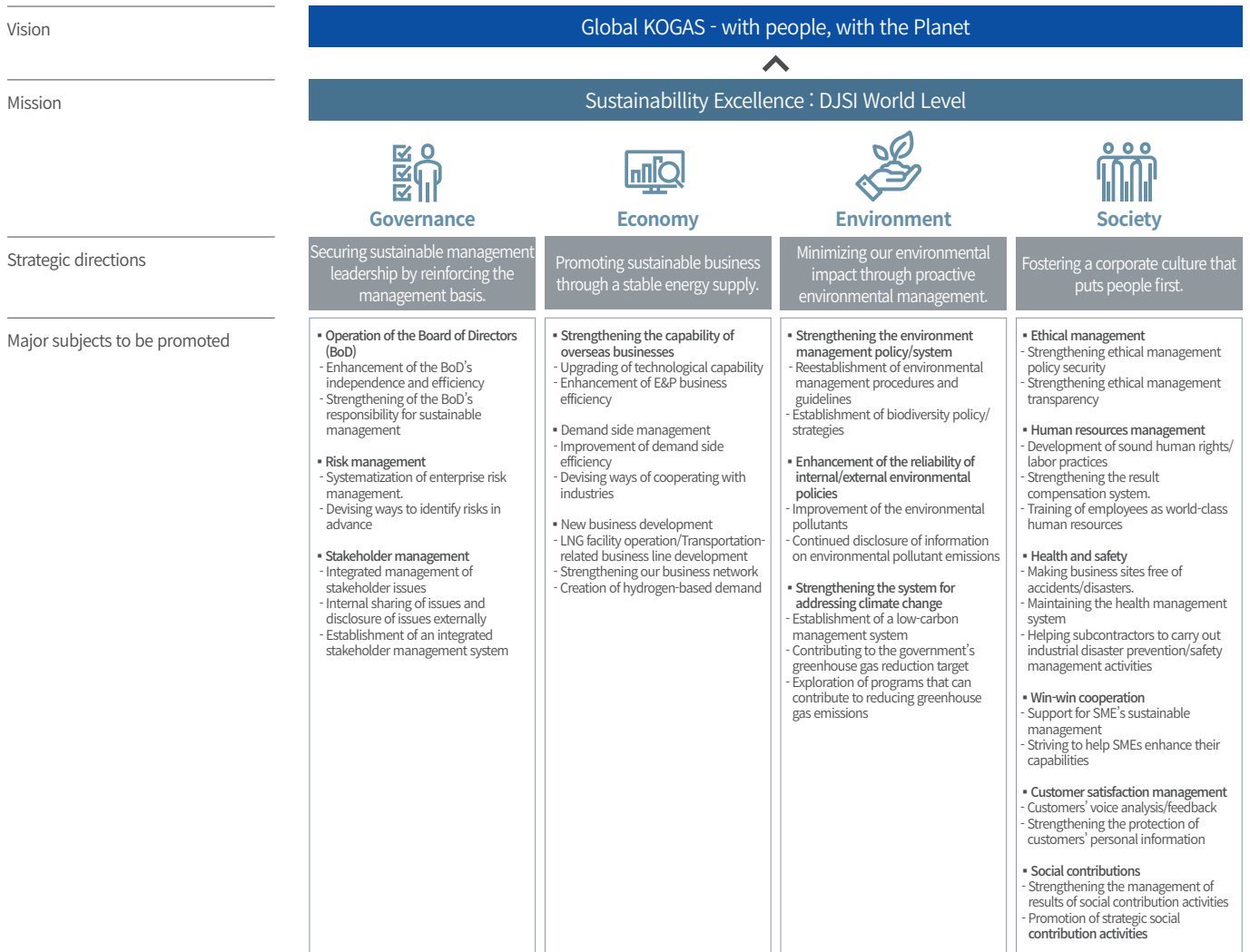
KOGAS's Major Performances and 2024 Goals

4 Strategic Directions	12 Strategic Tasks	Key Performance Indicators	Outcome in 2019	Achievement ratio compared to goals	Goals by 2024
Leading the natural gas industry	1. Reinforcing the public features of the gas business	Reduced procurement cost (KRW 100 million)	3,804	134.7%	3,833
		Supply Stability Index (score)	100	100%	100
	2. Securing natural gas leadership in Northeast Asia	ROI of overseas business (%)	41.2	89.4%	65.1
Conversion to environment-friendly energy	3. Creation of overseas business performance	PNG business progress	Joint research of Korea and Russia	100%	Pipeline construction
	4. Invigoration of new energy business	Hydrogen filling stations (No. of stations)	Create infrastructure for the hydrogen business	100%	30
	5. Expansion of scope of fuel conversion	Supply for fuel cells (1,000 tons) (Fuel conversion) Sales volume for industrial use (1,000 tons)	577 6,459	125.4% 98.6%	850 8,726
Realization of social value	6. Reinforcing the R&D of future energy technologies	General new growth technology level	Fulfilling improvements in the organization, personnel management system and research process according to the recommendations of the R&D Innovation TF	100%	Improving strategic technology levels
	7. Creation and sharing of jobs	Job creation (persons)	14,688	91.1%	13,320
	8. Expanding shared and win-win cooperation	Urban gas penetration rate (%)	83.1	98.3%	92.7
		Index of win-win cooperation (points)	77.44	112.6%	87.4
		Settlement of human rights	Introduction and implementation of global human rights management (100%)		100%
9. Reinforcing disaster, safety, and environment management	Accident rate construction orders (%) Greenhouse gas reduction rate (tCO ₂ e/kilo ton LNG)	0.09 18.7	Incomplete 102.2%	0.0 18	
Constitutional improvement to prepare for the future	10. Innovation of ways of working	Composite index of organizational culture (points)	84.34	96.9%	94.6
	11. Improvement of financial stability	Debt ratio (%)	382.6	117.4%	273
	12. Advancing the ICT-based management system	Establishing ICT-based new systems (cumulative) (cases)	6	100%	20

Sustainable management strategy

KOGAS has adopted a sustainable management strategy along with our vision, Global KOGAS - With People, With the Planet, managing it from the governance, economic, environmental, and social perspectives. All business pertaining to sustainable management - such as social value creation, mutual growth, social contributions, win-win cooperation, fair transactions, and contracts - are managed by the CSR Division. Important decisions on matters concerning the establishment and promotion of strategies and the results thereof are made by reporting them to the Committee of Innovative Growth (formerly the Committee of Sustainable Management) on a periodic basis. We will listen to our stakeholders' valuable opinions, fulfill our social responsibilities, and continue to create social values.

Sustainable management strategy system



Vision Slogan



KOGAS Social Value Highlights

01.

Winning the presidential award as an “excellent organization” in the evaluation of disaster management by public agencies

KOGAS received the presidential award as an excellent organization in the “evaluation of disaster management by public agencies in the energy sector” from the Ministry of Public Administration and Security. It received a positive evaluation in the establishment of a situation management system for advanced prevention of major disasters such as typhoons, strengthening on-site safety management, creation of safe villages in connection with local governments, reinforcement of capability to cope with fire disasters, etc. in 2019. In particular, KOGAS increased the stability of equipment by performing assessments of safety against forest fires for gas facilities near forests and installing and operating disaster prevention facilities and 24-hour surveillance CCTV cameras. We will continue to make efforts and improvements to establish the best safety management system against disasters.



02.

Concluding a joint labor-management agreement to realize win-win cooperation and social values

In July 2019, KOGAS concluded a joint labor-management agreement for the “realization of win-win cooperation and social values.” The joint labor-management agreement includes not only contents related to labor conditions but also comprehensive matters such as efforts for the successful implementation of the national energy policy and cooperation for the realization of social values. In addition, labor and management agreed to make joint efforts for securing governance autonomy and realizing responsible management, creating a safe working environment, protecting vulnerable social groups, etc. We will continue to make constructive labor-management relations by leading labor relations with dialogue and communication.

03.

Winning the grand prize in the “Korea Innovation Awards” in the social innovation sector for 2 consecutive years

KOGAS won the grand prize in the “2019 Korea Innovation Awards” in the social innovation sector for 2 consecutive years. The members of the Deliberation Committee, who are specialists in each area, examined more than 500 candidate companies, selected superior companies that have created new values, and discovered new growth engines through innovation in the areas of technology, product, and service. KOGAS was recognized for its contribution to innovating environment-friendly future energy by taking the lead in the “development of the hydrogen industry” and encouraging “energy conversion.” We will continue to contribute actively to the development of the national industry through ceaseless innovation activities and lead the era of environment-friendly future energy.



04.

Starting to supply natural gas to the Jeju combined cycle power plant

KOGAS began to supply natural gas to the Jeju combined cycle power plant in October 2019 for the first time in the Jeju region after the first LNG carrier docked in Jeju the month before. It spent KRW 427.5 billion on the Jeju LNG Terminal and piping network construction project and built 2 sets of a 45,000kℓ storage tank, 60 ton/h evaporation transmission facility, one pier, main supply pipe (20” × 80.09km), and 7 supply management facilities for 34 months from January 2017. We will improve the universal energy welfare of the citizens of Jeju Province and actively contribute to the “Carbon-free Island 2030” policy of Jeju by supplying safe natural gas in a stable manner.

05.

Raising Mutual Growth Fund

KOGAS is operating the Mutual Growth Fund it has raised to support the liquidity of small and medium businesses. In 2019, we raised KRW 120 billion jointly with IBK Bank and gave loans at low interest rates. In 2020, we have raised an additional KRW 40 billion for loans to alleviate the economic burden of small businesses and SMEs in the Daegu and Gyeongbuk regions, which are suffering from serious financial difficulties due to the COVID-19 pandemic. KOGAS expects the additional Mutual Growth Fund to help small businesses and SMEs overcome the damage caused by COVID-19 and contribute to the recovery and revitalization of the local economy.



06.

Being selected as an exemplary disclosure corporation for the first time among public enterprises

KOGAS was selected as an exemplary disclosure corporation for the first time among public enterprises in November 2019 at the awards ceremony of “Exemplary Corporations in the Disclosure of Corporate Governance” held at the Korea Exchange. Exemplary corporate governance disclosure corporations are selected based on the faithful disclosure of rights of shareholders and status of institutional devices of companies for transparent management such as the responsibility of the BOD, independence of the auditing body, etc. Among the 170 listed public enterprises subject to submission of the disclosure report, KOGAS was selected as one of the 5 exemplary corporations recognized for the stable establishment of corporate governance disclosures.

07.

Receiving a government citation for innovation city policy and social value creation

KOGAS received an excellence award in the “First Awards to public agencies for the creation of social value and social economy-friendly city,” which were launched in 2019. It was recognized for its efforts to expand the sales channels of social economy enterprises using its infrastructure. In addition, KOGAS was awarded a Minister of Land, Infrastructure, and Transport citation in the “Specialized regional development” sector of “The first innovation city performance report contest” for its superior performance in supporting mutual growth with local SMEs. We will continue to support the sustainable growth of SMEs and social enterprises and create social values by creating jobs and revitalizing the local economy for mutual prosperity with SMEs as well as the community.



08.

* The human rights impact assessment was conducted via an on-site survey among approximately 380 persons using 117 items in the checklist.

Taking the lead in improving human rights in the construction field

Being designated as the pilot organization for the application of the human rights management manual of the National Human Rights Commission of Korea in 2018, KOGAS established the mid- and long-term roadmap of human rights management. KOGAS has further taken the initiative in establishing a human rights management system. In 2019, KOGAS discovered 23 items that need to be corrected for human rights improvement in the field of the construction business based on the issues drawn in the results of human rights impact assessment* and discussion with partner companies. In addition, we have resolved a case of violation of human rights of employees of a partner company by the effort of a professional lawyer of the human rights counseling center of KOGAS for the first time among public enterprises to take the lead in human rights management. Moreover, KOGAS contributed to spreading the culture of respecting human rights by giving a representative presentation at a forum of public agencies hosted by the National Human Rights Commission of Korea as an exemplary organization representing public agencies and diffusing exemplary cases of human rights management (to 40 public agencies).

“KOGAS Win-Win Cooperation Package” to Overcome the COVID-19 Pandemic

KOGAS has not spared support for the citizens of Daegu who are suffering much more difficulties than other regions because COVID-19 hit the Daegu region in the early stage of its outbreak. In particular, we created the KRW 210 billion “KOGAS Win-Win Cooperation Package” to support SMEs and small business owners in crisis due to COVID-19 in various ways using 24 execution plans. Such execution plans include supporting medical supplies for the prevention of spread of COVID-19 in the early stage of the outbreak, giving loans for urgent liquidity support to SMEs and small business owners through the mutual growth and win-win fund, providing articles for vulnerable social groups, and revitalizing the regional economy by creating jobs. In addition, KOGAS prepared the first social financing (micro credit) platform in Daegu through voluntary donations from executives and managing the staff of KOGAS to give interest-free loans to the small business owners in the Daegu region. We plan to continue to make additional contributions to the win-win fund, support SMEs by placing orders for construction, service, and products early, support small business owners in liquidity and sales, prepare various programs for the revitalization of the traditional market and local commercial areas, provide vulnerable social groups with daily necessities so that they could overcome the disaster, and create jobs. KOGAS will fulfill the role of a public enterprise leading the national industry based on its management principle and vision for mutual growth and win-win management.

1. Reason for implementation

2020.2

Proactive response prior to government instruction or policy

- Establishing a 24-hour emergency response system
- Early implementation of remote working
- Supporting the urgent disinfection of the local community
- Prompt and accurate judgement and response of the CEO

2020.3

Quick and proactive action of the Emergency Planning Committee

- Company-wide quick decision making and response to disaster
- Strict social distancing
- Establishing measures for the stable supply of natural gas

2020.3

Setting up plans to overcome the COVID-19 disaster

- Donation by all employees (190 million won)
- Quick support of medical supplies in Daegu
- Urgent planning and execution of the Win-Win Cooperation Package



2. Contents

KOGAS Win-Win Cooperation Package

Urgent loans for SMEs in Daegu

SMEs (11 execution plans)

- Expand the mutual growth fund (120 billion won → 160 billion won)
- Early order placement for SME products (140.6 billion won → 176.2 billion won)
- Increasing the minimum winning rate (80.5% → 87.75%)
- Exemption from compensation for arrears due to COVID-19 (2.7 billion won), etc.

Social financing (Micro Credit)

Small business owners (8 execution plans)

- Expanding the win-win fund (20 billion won → 40 billion won)
- Supporting the urgent operating fund through social financing (about 350 million won collected through the return of pay of executives and managing staff)
- “Traditional market day,” “Alley cafeteria day,” and “Warm heart relay” campaigns

Early implementation of heat efficiency improvement program and support of compact rooms

Vulnerable social groups (5 execution plans)

- Supporting vulnerable social groups in connection with energy welfare
- Early purchase of articles to be sent to compact rooms for wintering (250 million won)
- Creating jobs by hiring people living in compact rooms for disinfection work
- Expanding social contribution designed for the revitalization of the local economy, etc.

Supporting effect | About KRW 210 billion in support!

Liquidity support (63.8 billion) | Sales support (149.9 billion) | Disinfection support (1.7 billion) | Livelihood support (3.4 billion)

3. Future Plan

Expanding financial support for SMEs in the Daegu & Gyeongbuk regions to improve their financial stability and profitability

- Planning to increase the amount of win-win fund with Daegu Bank, which is located in the Daegu & Gyeongbuk regions

Thorough performance management with a smooth feedback system

- Hold regular meetings to check the performance of win-win cooperation (twice a year)
- Checking the execution performance of each task regions

To develop additional win-win cooperation programs customized for SMEs in the Daegu & Gyeongbuk regions

- Discover customer-centered business opportunities
- Focus on providing support in connection with commercialization, etc. regions

Continuous execution of projects in connection with the yearly win-win cooperation plan

- Check and manage the performance of the “2020 Win-Win Cooperation Basic Plan” (established in May 2020) commercialization, etc. regions



4. Major Execution Plans

■ Create a mutual growth/win-win fund to support the liquidity of SMEs and small business owners

- Expand mutual growth/win-win fund for the revitalization of the regional economy of the Daegu & Gyeongbuk regions!
- Offer urgently-needed liquidity for SMEs and small business owners hit by COVID-19
- Add KRW 60 billion more to the already raised KRW 140 billion to create a KRW 200 billion liquidity fund.
- 720 enterprises can benefit as of 2020 (3% of Daegu's total SMEs)

Object of support: SMEs



KOGAS:
₩60bil.+₩20bil.
IBK
₩60bil.+₩20bil.

₩160 bil.

Object of support: SMEs + Small business owners

Win-win fund



KOGAS:
₩10bil.+₩10bil.
DGB
₩10bil.+₩10bil.

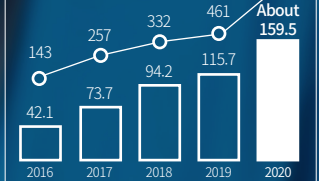
₩40 bil.

Support target: SMEs + Small business owners

Support effect

Max. of **2.7%** Reduce interest!

Max. of **₩500mil.** Available



● Sales amount of companies in Daegu & Gyeongbuk (companies)
■ Sales amount of large companies Number of companies(bil)

Supporting the liquidity of SMEs and small business owners and reducing interest

■ Supporting the liquidity and sales of small business owners

(Social Financing: Micro Credit)

- Providing interest-free loans for small business owners in Daegu as urgent operating funds through the voluntary donations of executives and managing staff of KOGAS (Social financing/Micro Credit)

*Social Financing (Micro Credit): Finance that pursues realizations of social value and financial profit.

Purpose and Source of Revenue

- Resolving the financial pinch of small business owners and supporting the urgent operating fund (Policy funds take at least 5 weeks to arrive.)
- Supporting small business owners in the blind spot of policy funds with low credit ratings by giving loans through social financing
- Using the fund raised by the voluntary donation of executives and managing staff of KOGAS (KRW 350 million)

Main Terms

- Object of loan ▶ Small business owners in Daegu region
- Limit of loan ▶ KRW 5 million
- Interest rate ▶ No interest
- Term of loan ▶ 2 years (24 months)
- Method of repayment ▶ Redemption of principal by installment with a six-month grace period

Implementation System (Platform)

- (KOGAS) Supporting fund to overcome the crisis and evaluating the program
- (Community & Economy) Planning and PR as the representative organization in Daegu in the area of small business and social economy
- (Foundation Band) Execution of loans and management as a professional agency in social financing with sufficient experience in supporting social enterprises

Offering priming water for the expansion of social financing by implementing the first social financing in the Daegu region

■ Supporting the sales of traditional markets and local cafeterias

Expanding the existing supporting activities

- Expanding "Traditional market day": Once a month → Twice a month
→ Each department/division visits a traditional market in a certain week and buys goods.
- Implementing "Alley cafeteria day"
→ Each department/division uses a cafeteria near the office during lunch time
→ Use safe (disinfected) cafeteria designated by the Dong-gu District Office

Revitalizing the regional economy

- Supporting online market sales channels for small business owners (KRW 100 million)
→ Use "Dongbanmall" platform and support entry into the mall
- "Warm heart relay" for the promotion of voluntary awareness of all employees
→ Lunchbox purchase movement for supporting sales of local small business owners
- Purchase community gift cards with the bonus points of company cards and donate them to social welfare facilities. (KRW 100 million)

Direct support for sales of small business owners (KRW 210 million)

■ Supporting medical supplies and jobs for vulnerable social groups

- Creating jobs by using the people living in compact rooms for disinfection work
- Supporting medical supplies for COVID-19
 - Donating the money collected by the executives and staff members of KOGAS to the Daegu branch of the Community Chest of Korea
 - Supporting medical supplies for the medical staff and vulnerable social groups in Daegu
- Distributing the Onnuri Sharing Box
 - Groceries, functional clothing, masks, hand sanitizer, etc.
- Deferring the payment of city gas charges In April: 2,257 persons (KRW 529 million)



SHARED VALUE WITH KOGAS

AS A LEADER IN ENVIRONMENT-FRIENDLY ENERGY, KOGAS IS MARCHING TOWARDS THE FUTURE BY CREATING SOCIAL VALUES. WE WILL FAITHFULLY FULFILL OUR SOCIAL RESPONSIBILITY FOR WIN-WIN GROWTH WITH THE LOCAL COMMUNITY, CUSTOMERS AND PARTNER COMPANIES BY DEVELOPING FUTURE GROWTH ENGINES THROUGH THE ACTIVE IMPLEMENTATION OF TECHNICAL INNOVATION, ENVIRONMENT-FRIENDLY BUSINESSES, AND OVERSEAS PROJECTS.



• KOGAS Social Value Creation	20
• #1 Contributing to Environment Improvement by Converting into Eco-friendly Energy	22
• #2 Stable Supply of Natural Gas by Technological Innovation	24
• #3 Supporting Community Development and Mutual Growth	26

KOGAS CREATING SOCIAL VALUE

As a public enterprise established for the promotion of benefit and improvement of welfare of the nation in the energy field, KOGAS has a mission of contributing to the interest of society and development of the local community and the nation. It is facilitating sustainable development by creating the common value of society through the creation of good-quality jobs guaranteeing labor rights and human rights, mutual growth with small- and medium-sized partner companies for the creation of a healthy industrial ecosystem, social contribution for win-win growth with the local community, and energy welfare for vulnerable social groups.

Efforts of KOGAS to create social values

KOGAS has newly established the "Corporate Social Responsibility Headquarters" to take charge of the realization of social values such as mutual growth with small- and medium-sized enterprises, establishment of fair trade practices, etc. Moreover, we have placed the CSR Department and Technology Cooperation Department in the headquarters. As a result of such organizational restructuring, KOGAS can now internalize the Korean government's policy of innovative and inclusive growth and actively respond to the change in the external environment. The case of KOGAS was selected as a good example of fair trade by the government, drawing the highest level of satisfaction from partner companies. In

2019, KOGAS developed the standard textbook of social values for public organizations and spread it not only to the executives and staff members of KOGAS but also to local governments and other public organizations (3,812 persons). Moreover, it developed and operated educational programs reflecting the characteristics of the local residents and stakeholders. In 2020, we will establish the company-wide social value implementation system and strategic tasks by adding new tasks unique to social values such as the government's "implementation strategies in the public sector for realization of social values" based on the mid- and long-term strategic tasks and innovation tasks of KOGAS.

Strengthening the management of publicness indicators for the creation of social value performance

Safety

Achieving the "Best" level in the evaluation of disaster management by the Ministry of Trade, Industry, and Energy

- Strengthening the management of safety indicators including the "establishment of the safety management system"
- (Head Office) Expanding the weight of measurable items in technical departments: 15 points → 17 points
- (Business Departments) All departments, measurable items (19 points → 29 points), immeasurable items (8 points → 10 points)
- ※ To be given the lowest grade if an accident occurs due to safety law violations

Integrity

Acquiring "Level 2" in the evaluation of measures for the prevention of corruption by the Anti-Corruption & Civil Rights Commission

- New establishment of indicators of the external integrity level
- Internalization of integrity awareness
- Internal integrity level → Internal integrity + External integrity level (newly established)
- Violation of social responsibility is added, with the lowest grade to be given if there is a violation
- Sexual harassment, assault (abusive language), workplace bullying, abuse of power
- Indicator of "Efforts to institutionalize the internal accounting management system" (✓ newly established)

Innovation

Winning in the "Korea Innovation Awards" in the social innovation sector

- Strengthening the indicator of "efforts to participate in innovation activities" (3 points → 4.5 points)
- Additional points will be given to a department that implements innovative projects related to "national participation," "national suggestion," and "sharing information and data"
- Holding the Innovation EP Contest by national participation (evaluation by the national evaluation group: 70%)

Social value

Winning the "grand prize" in the establishment of a comprehensive social economy platform

- Strengthening the indicator of "efforts to realize social values" (6 points → 8 points)
- Indicator of "contribution to social values" (2 points) and indicator of "efforts to implement job creation" for common additional points (0.5 points) (✓ newly established)
- Additional points will be given for conversion into direct jobs and execution of a new project.

KOGAS's measurement of social values

KOGAS aims to secure sustainable competitiveness by preparing the standard for measurement of corporate social value. In 2018, it developed the tool for measuring Social Value Performance in collaboration with the Korea Institute of Public Finance (KIPF) and SK and completed the simulation of performance measurement using the developed tool in 2019. As a result, we were able to measure the social values in 7 areas including job

creation, energy welfare, and safety maintenance and converted the quantitative performances from 2016 to 2018 into costs. We will be a public institution that can fulfill social responsibility with the ability to measure performance and set goals by internalizing the basic capability in pursuing social values and upgrading the tool for the measurement of social values.

Current business scope

Measured company	KOGAS
Measurement method	Monetization of outcomes
Base year	2018
Measurement schedule	Sep.- Oct. 2019
Measurement target	All aspects of management

Additional business scope

Social value indicator	Complementing measuring indicator
1. Government's management evaluation indicator	1. TOP 100 social value tasks
2. Strategic tasks indicator	2. Items omitted in major works
3. Collaboration with KIPF and SK	3. Complement accident and disaster measurement

- Completed development of tool for measuring social value performance through collaboration (2018)
- Completion of social value performance simulation using tools (2019)
- Measuring performance in the first half of 2019 and deriving objective level in 2020

Yearly performance (KRW 100 million)

Social value measuring indicator	Components	2016	2017	2018
1. Job creation (new employment)	Job creation (new employment)	187	247	240
2. Support for vulnerable social groups (energy welfare)	Reducing city gas charges for people who need social consideration and social welfare facilities	768	834	873
3. Safety maintenance	Safety cost (Input)	3,354	3,486	3,568
4. Environment preservation	Pollution treatment/prevention activities, substitution of natural gas for combined power plant and industrial use	1,176	1,000	3,415
5. Win-win cooperation	Amount of support for SMEs, cost of purchasing SME products, and amount of purchase of social enterprises' products	638	630	830
6. Respect for labor (quality of life)	Quality of life of workers (support for health checkup, etc.)	9	9	11
7. Social contribution	Donation and volunteer service activities	182	171	188
Total		6,314	6,377	9,125

Continuous efforts to increase social values

The social value of KOGAS is being created in the direction of contributing to the improvement of national benefit and improvement of public welfare by reinforcing the publicness of the mission of KOGAS, which is supplying natural gas in an economical, stable manner. For this, KOGAS set “realization of social value” as one of the 4 main strategic tasks in “Vision 2025” as the mid- and long-term management plan, and it has made efforts to generate company-wide results. In addition, the president emphasized in his July 2019 inaugural speech that KOGAS must be the best and exemplary enterprise by realizing social values as an important task for sustainable growth.

As a result, we have created substantial results in 2019

- ① 197% increase of direct job creation in the private sector in 2019 (6,080 workers yearly) compared to the previous year;
- ② 44% increase in the purchase of social enterprises' products (KRW 12.5 billion yearly) compared to the previous year and creation of a sustainable business environment by upgrading the platform for social enterprises;

- ③ receiving an Excellence award in the evaluation of disaster management by the Ministry of Public Administration and Security for a perfect response to disastrous situations in 2019 (forest fires in Gangwon-do Province, Typhoon Danas, etc.);
- ④ taking the lead in forming an ecosystem for win-win cooperation and mutual growth and introducing human rights management in the public sector;
- ⑤ contributing to the prevention of the spread of COVID-19 by actively responding to the pandemic based on the manual for coping with infectious diseases, etc.

KOGAS will continue to keep pace with the increasing demand of the government for the leading role of the public sector in relation to social values as stated in the “Implementation strategy of the public sector for the realization of social values (Innovative Growth Strategy Meeting in January 2020),” etc. to establish the status of a leading public enterprise as an exemplary social value creation company in the short-term and secure the engine for the creation of sustainable jobs by implementing new businesses such as the hydrogen business in the long-term.



Establishing a comprehensive platform for the realization of social values

KOGAS is actively supporting the social economy enterprises in the local community with PR and marketing for the exploration of sales channels. For the first time among public institutions, KOGAS opened an offline social economy support center to help small social enterprises in the exploration of sales channels and entry into the market. We also changed a welfare mall – which used to be operated by a large company – into a social enterprise, providing support for the preferential purchase of products produced by companies run by women or handicapped persons. In addition, we opened an online mall exclusively for social enterprises and combined it with innovative technologies such as artificial intelligence and blockchain to expand sales channels. Purchasing from social

enterprises is done by integrated company-wide order placements. We purchased products made by social economy enterprises worth KRW 12.5 billion in 2019. This is a ten fold increase compared to 5 years ago. Public agencies nationwide and local governments are benchmarking the exclusive online mall for the social economy, which is being used by increasingly more companies as a result of applying innovative technologies and continuously upgrading. We will continue to support social economy enterprises actively using the characteristics of our business and our own facilities and infrastructure.

Establishment and operation of the sustainable and universal social economy platform through omnidirectional collaboration

Expanding purchases from social economy enterprises (KRW 8.7 billion in 2018 → KRW 12.5 billion in 2019)

Social enterprise	Computer, mineral water
Social cooperative	In-house café
Community enterprise	Video production, etc.
Self-sufficient enterprise	Cleaning supplies, etc.
Severely handicapped persons	Food supplies for cafeteria, etc.

KSP, a social economy platform brand (KOGAS Social economy Platform)

Core support	<ul style="list-style-type: none"> • Social economy online mall • Social enterprise welfare mall • Social economy support center
Leading Institutional support	<ul style="list-style-type: none"> • AI/blockchain/mobile app • Integrated information system • Company-wide combined contracting • Guidelines for preferential purchases

Platform diffusion and continuous growth

Year	2017	2018	2019
Number of organizations using the platform	-	1	50
		company	company
Muhan Direct employment	2workers	4workers	8workers
Coop Sales	KRW 300 million	KRW 1.3 billion	KRW 6.3 billion

- Nationwide delivery and sales network
- Additional entry of social enterprises nationwide
- Wave of benchmarking by local governments and organizations nationwide

#1. CONTRIBUTING TO ENVIRONMENT IMPROVEMENT BY CONVERTING INTO ECO-FRIENDLY ENERGY

KOGAS is preparing to operate the LNG bunkering business by supplying liquefied natural gas (LNG) for vessel fuel, in order to contribute to the solution of fine dust which has become a serious environmental problem. Further, this will expand the conversion of transport fuel into environment-friendly energy. We are also leading the LNG truck business to improve the quality of the land atmosphere by substituting LNG for the diesel fuel for trucks. We expect to gain a foothold for new growth by pushing ahead with new businesses in earnest according to the increasing role of natural gas, going further from the existing investment in natural gas infrastructure.

Operation of the first LNG bunkering vessel in Asia

Business Performance

- Pioneering a blue ocean for shipping companies in crisis and strengthening the competitiveness of the export industry (joint business of KOGAS and private companies)
- Advancing into the market for supplying LNG to vessels in Europe for the first time as an Asian company

Social Value Performance

- Improving air quality and reducing greenhouse gases by converting vessel fuel
- Creating jobs through the bunkering vessel infrastructure supply business



The International Maritime Organization (IMO) makes it obligatory from 2020 to reduce the sulfur content in all vessel fuels in the world to less than 0.5% from the previous standard of 3.5%. Countries in Europe and North America are limiting the sulfur content in fuel oil to less than 0.1%, designating their coasts as emission control areas (ECA). Korea, too, revised the regulations on the air transport business in 2018 to add natural gas to vessel fuels. In February 2020, the LNG bunkering business was included in the Urban Gas Business Act, and the amended act will take effect in August 2020. Thus, KOGAS is preparing to operate the LNG bunkering business in earnest, supplying vessel fuels at sea. In 2017, KOGAS signed a contract with Korea Line Corporation for LNG transportation, and it is now operating "SM Jeju LNG 1 (since September 2019)" and "SM Jeju LNG 2 (since January 2020)," both of which can be used as carrying vessels and LNG bunkering. KOGAS will lead the environment-friendly low-carbon energy era for Korea by establishing environment-friendly LNG ports, expanding the clean fuel business without fine dust or air pollution.

What is the LNG bunkering business?

The business supplying LNG for vessel fuel in response to the regulations implemented for the reduction of fine dust and greenhouse gases

Sulfur oxide content of vessel fuel

3.5% → 0.5%

*IMO (International Maritime Organization) 2020

Limit of sulfur oxide content in 5 major ECAs

0.1%

5 Emission Control Areas:
Busan port, Incheon port, Yeosu
Gwangyang port, Ulsan port,
Pyeongtaek-Dangjin port

*Ministry of Oceans and Fisheries

Sulfur oxides emissions of the existing vessel fuels

1 container vessel = 50 million diesel cars

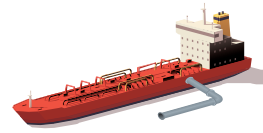
What is LNG bunkering vessel?

A vessel filling LNG for vessel fuel; there are only 6 bunkering vessels being operated in the world.

LNG bunkering methods



*Ship to Ship



*Pipeline to Ship

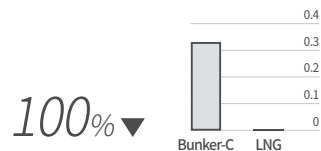


*Truck to Ship

Effect of conversion of fuel into natural gas [air quality improvement]

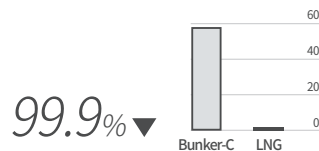
PM emission

Unit: Kg/yr



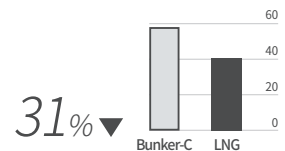
SOx emission

Unit: Kg/yr



CO₂ emission

Unit: ton/yr



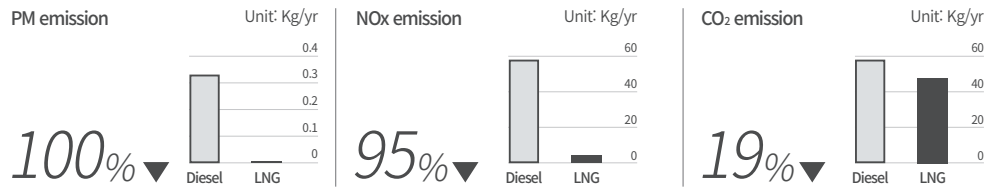
Improving the air environment with eco-friendly LNG cars

- Business Performance**
 - Strengthening logistics competitiveness by increasing fuel economy (saving about KRW 4.3 trillion in logistics costs)
 - Strengthening the export competitiveness of environment-friendly commercial vehicles
- Social Value Performance**
 - Reducing fine dust by supplying large LNG cars (generating about KRW 2.1 trillion in environmental benefit)
 - Can create about 12,000 jobs if more than 17,000 commercial LNG cars are sold



Looking at the emission source of fine dust downtown, the fine dust generated in the transportation sector is said to account for 41% of the total and about 70% is emitted by trucks. The need for the propagation of LNG cars is increasing with the issue of reducing fine dust in the transportation sector and the increasing interest in LNG fuel. Accordingly, KOGAS is introducing environment-friendly large LNG cars to improve the quality of land atmosphere and installing LNG stations. In 2019, KOGAS expanded the types of LNG trucks and decided on 37 kinds of trucks to be fueled with LNG by agreements. KOGAS plans to supply about 60,000 LNG cars by 2030 to generate approximately KRW 2.1 trillion in environmental benefit and save about KRW 4.3 trillion in logistical costs. We will continue to supply large LNG cars and expand the installation of infrastructure such as LNG stations in order to reduce fine dust and greenhouse gas.

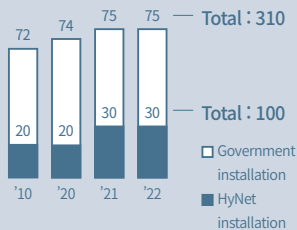
Results of testing the environmental effects of LNG trucks



- Reducing pollutants of PM by 100%, NOx by 95%, and CO₂ by 19% compared to diesel
- Reducing the pollutants of PM by 0.3kg and CO₂ by 11 tons per year per truck compared to diesel

KOGAS building a bridge to hydrogen, the future energy

Roadmap for installation of hydrogen stations



Construction and operation of hydrogen stations

- Business Performance**
 - Offering priming water for the self-sustainable growth of the hydrogen economy with a sense of mission as a representative public enterprise leading the energy business as well as know-how on supplying natural gas
 - Discovering a Korean model of the SPC business
- Social Value Performance**
 - Creating good-quality innovative jobs through the establishment of HyNet and installation of charging stations
 - Leading mutual growth together with Korean SMEs related to the hydrogen business through the installation and operation of hydrogen stations through the SPC

In April 2019, KOGAS unveiled the “strategy to execute the hydrogen business.” The company announced the vision of taking the lead in promoting the hydrogen economy through active participation in all processes including production, supply, distribution, and technological development of hydrogen by investing a total of KRW 4.7 trillion by 2030. With over 30 years’ know-how regarding the safe and stable operation of the gas business, KOGAS will not only take the lead in the facility operation and safety management of hydrogen – whose property is similar to that of natural gas -- but also take a significant leap forward as a general energy company by exploring new markets and through innovative growth in the future.

KOGAS will construct 25 hydrogen production facilities in Korea by 2030 and make efforts to reduce the production costs by expanding production facilities. In January 2020, it held a groundbreaking ceremony for the “Gimhae direct production hydrogen station,” which is scheduled to produce and ship out hydrogen in 2021. Moreover, for the transportation of hydrogen, KOGAS will procure 500 tube trailers and install a 700km hydrogen piping network by 2030 for the transportation of hydrogen and expand the infrastructure for efficient hydrogen transportation mainly in the 5 core cities of Seoul, Busan, Daegu, Gwangju, and Daejeon. In addition, a special-purpose company (SPC) for the installation and operation of hydrogen station was launched in 2019 with the participation of more than 10 companies and institutions to install 100 hydrogen stations by 2022 to prepare the infrastructure for hydrogen charging. Further, KOGAS will realize the technology independence of the hydrogen industry in all value chains by investing KRW 300 billion by 2030. We will fulfill the roadmap of the hydrogen business, which is essential in the future age of low-carbon, eco-friendly hydrogen energy.

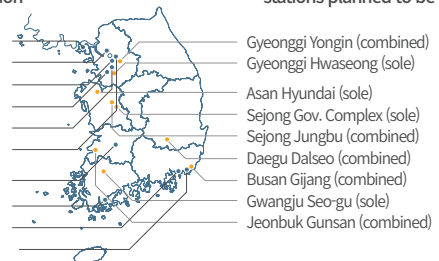
Current Status of Hydrogen Stations

10 stations under construction
9 stations planned to be installed

10 stations under construction

- Incheon Airport (sole)
- Gyeonggi Goyang (combined)
- Gyeonggi Gwacheon (combined)
- Gyeonggi Hwaseong (sole)
- Gyeonggi Suwon (combined)
- Seoul Gangnam (sole)
- Jeonju Jeonju (sole)
- Jeonnam Yeosu (sole)
- Busan Dong-gu (combined)
- Busan Gijang (combined)

stations planned to be installed



#2. STABLE SUPPLY OF NATURAL GAS BY TECHNOLOGICAL INNOVATION

KOGAS has introduced various kinds of the latest facilities to increase the stability of the 5,000km piping network stretched nationwide. In particular, we are using the innovative key technologies of the 4th industrial revolution, such as drones and virtual reality, to maintain a zero-accident record. In addition, we have computerized the optimum storage level and calorie management of LNG terminals and reduced human errors continuously by introducing a smart equipment management system. We will supply natural gas more stably by grafting the technologies of the 4th industrial revolution onto the technologies used for the safety and competitiveness of natural gas.

Development of Advanced Metering Infrastructure (AMI) technology to accurately read gas usage

Business Performance

- Rationalizing gas use as a public enterprise
- Strengthening technical competitiveness by improving the procedures to perform joint consigned research

Social Value Performance

- Solving the privacy problem by telemetering
- Reducing people's burdens by saving on gas charges
- Contributing to energy saving through the efficient operation of power generation facilities



Smart gas meter development



Low-friction magnetic flux leak pig

Most households using city gas in Korea use a low-price mechanical gas meter, which measures the quantity of gas consumed by unit of volume. Thus, it does not fit the current calculation method, which imposes charges by unit of calorie, and there may be an error in summing up the consumption due to the temperature difference between the summer and winter seasons and the calculation of rates. Moreover, as the mechanical gas meter needs human power for reading and inspecting the use of gas, there is risk of privacy invasion and crime. In fact, civil complaints are filed frequently due to the use of mechanical gas meters. To solve the problem, KOGAS held an idea contest for the development of smart gas meters and conducted research with the participation of the general public and external organizations. Finally, we signed an agreement for research and development after 6 rounds of negotiations and legal review of the agreement. We also improved the process for the introduction of an open, collaborative-type R&D system and prepared the foundation for the implementation of collaborative research with professional external institutes. In December 2019, 100 sets of pilot smart gas meters were installed in Nohyeong-dong, Jeju City. We will install 36,500 sets in 2020 and examine the efficiency of the overall AMI system in 2021. The smart telemetering system will get rid of the privacy problem associated with visiting the gas-meter reader and worries of gas leaks while there is no one in the house as the supply of gas is automatically stopped when gas leaks occur. KOGAS will increase social value by enhancing the reliability of the gas meter used at home through technological development and realizing results in each stage of technological development by communicating and collaborating with the public.

Progress



Reinventing the buried pipe inspection technology for people's safety

Business Performance

- Improving the reliability of safety management of buried pipes with high technological power
- Securing intellectual property rights for innovative technologies
- Import substitution effect in the inspection of low-pressure pipes in the capital area

Social Value Performance

- Improving the safety and quality of people's lives by reinventing the technology for buried pipe inspection

The method of buried piping can increase the efficiency of the national backbone network easily with the high energy density of fluid flowing in the pipe buried nationwide. At the same time, enormous damage can be caused by the high energy density if the piping explodes. For such reason, the safety management of the buried piping is emphasized at the national level throughout the world. KOGAS is vigorously pushing ahead with the development of robot technology for the next-generation piping inspection according to a mid- and long-term technical development roadmap. The next-generation piping inspection robot is an advanced propulsion system equipped with the innovative Magnetic Flux Leak (MFL: a kind of nondestructive inspection technique) incomparable with the existing system. In 2019, KOGAS developed the 24-inch, low-friction intelligent pig system by improving the existing system innovatively and performed In-Line Inspection (ILI) of the Mokgam-Gunja line successfully. We have succeeded in securing and demonstrating the original technology of the next-generation MFL platform, which is essential for the next-generation piping robot.

From the sky to underground! Calming public anxiety with smart piping management

Business Performance

- Using drones for patrolling the piping section beyond the reach of humans to shorten the required time and strengthen safety in vulnerable sections
- Reinforcing the technical competitiveness of the 4th industry
- Can apply the technology to an organization that operates and manages underground facilities




Social Value Performance

- Promoting the drone industry through mutual growth with SMEs
- Detecting underground sinkholes near the gas piping in advance and preventing a secondary accident like a traffic accident



The public's concern is increasing due to infrastructure accidents such as rupture of the hot water pipe near Baekseok Station, occurrence of sinkholes near gas piping, etc. It is necessary to prevent an accident near the gas piping in advance as it can cause secondary damage and increase the worries of nearby residents. Therefore, KOGAS is trying to relieve this anxiety by establishing a complete piping safety management system from the sky to underground. We are making efforts for the intensive safety management of the gas piping from the sky, underground, and on the ground using drones, a smart pipeline system, GPR, etc. We fly drones in the sky to leave no blind spots in areas that are not easily accessible by the piping patrol car (mountain, river, sea, etc.), and monitor the sites on the ground using the smart pipeline system equipped with state-of-the-art technology by referring to the latest electronic drawings. In addition, underground, we check for the existence of a sinkhole near the gas piping in advance using the principle of GPR for the detection of sinkholes under the ground.

Implementation methods

	Sky	On the ground	Underground
Existing	<ul style="list-style-type: none"> • Unauthorized excavation works • Blind spots in patrol 	<ul style="list-style-type: none"> • Identifying the location of piping with unrevised paper drawings • Manual recording in checking form 	<ul style="list-style-type: none"> • Recovery after finding a sink hole • Inaccurate laying information
Buried piping management system	 Drone Piping patrol system	+  Smart pipeline system Nonstop safety management	+  GPR application Detecting underground sinkhole, location information
Improved	<ul style="list-style-type: none"> • Drone patrol to leave no blind spot 	<ul style="list-style-type: none"> • On-site nonstop safety management 	<ul style="list-style-type: none"> • Removing sinkhole in advance and improving accuracy of location

#3. SUPPORTING COMMUNITY DEVELOPMENT AND MUTUAL GROWTH

KOGAS believes that it is the responsibility of a public institution to create a sound corporate environment of the natural gas industry for the nation and people. Thus, it has improved unfair business practices for mutual growth together with small and medium partner companies, supporting their growth by sharing technology and know-how and contributing to increasing the productivity of the natural gas industry.

9% nickel steel welding material localization technology bears fruit after 20 years

Business Performance

- Import substitution effect (about KRW 2.6 billion) and royalty income (KRW 110 million)
- Bridgehead for overseas advancement (receiving the order for “Kuwait LNG Terminal construction work” with the performance of delivery to the Incheon Production Base)

Social Value Performance

- Complying with the government’s policy of localizing core materials
- Contributing to the technology independence and competitiveness improvement of SMEs

The 9% nickel steel welding material is a core material for the LNG storage tank, but it was 100% dependent on foreign-made materials mainly produced in Japan, which practically has monopoly status. In order to respond to the export regulation measures of Japan, the Korean government is implementing the policy to localize core materials, and KOGAS is exerting multilateral efforts to ease the dependency on foreign-made products. The Gas Research Institute of KOGAS developed a welding material in 1996 and transferred the technology to Hyundai Welding Co., Ltd. Note, however, that the technology has not been used in the field for about 20 years, and the original Korean welding rod production technology is in danger of being buried. KOGAS organized a consultative group in May 2017, and it has held 11 meetings so far. In order to secure the perfect construction quality of LNG storage tanks, KOGAS inspected the quality of the welding material by conducting the model test two times and the preliminary performance test 9 times. In addition, we applied the welding material to the field and improved its performance twice by monitoring the tests. As a result, we successfully applied a total of 51.8 tons of domestically produced welding material – which is equivalent to the quantity for 2 LNG storage tanks – to the “#21-23 storage tank construction work” of the Incheon Production Base. It is the first case of commercial application of a domestically produced welding material, and we increased the ratio of the domestic product, which used to be zero, to 4%. This way, KOGAS is contributing to the development of related industries and overseas advancement of manufacturers that had difficulty in global marketing due to lack of business performance by actively supporting the technological development of Korean-made welding rods as the leader of the LNG industry in Korea.



Realizing social value by establishing a win-win construction culture with construction participants

Business Performance

- Fostering a win-win construction culture according to the government’s core national task of “establishment of a fair market order”
- Securing construction quality by paying due compensation

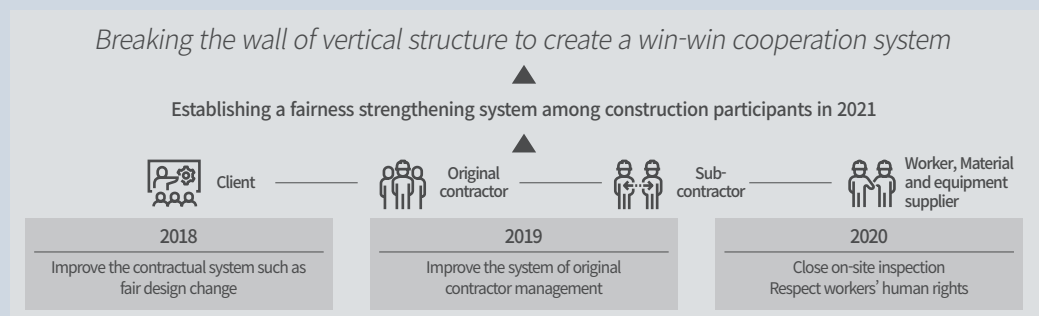
Social Value Performance

- Securing the safety and human rights of construction workers and establishing a horizontal construction culture without abusing power
- Realizing social value by establishing a win-win cooperation system with partner companies



Workshop for the improvement of unreasonable business practices and system and win-win management (Sep. 2019)

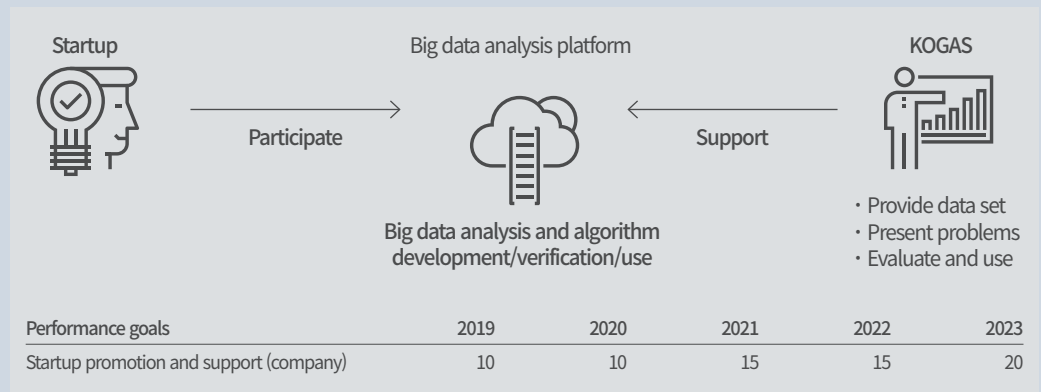
The various unfair practices in the construction industry caused by vertical and multilevel structure results in costs leak, poor construction, and a greater burden on the socially weak, such as subcontractors and workers at the lower stage. To remedy such problems, KOGAS conducted a general examination of the existing unfair practices and undue special agreements, and it has improved the system through collaboration among the government, public agencies, and private sector to foster a righteous construction culture upholding principles and common sense, and such efforts led to the establishment of the “Win-win Cooperative Business Model” unique to KOGAS. We are fully committed to the formation of a win-win cooperative business environment. First of all, we inspected the overall contractual relations with subcontractors that are at the lowest position in the construction business and improved them to maintain fair contractual relations and secure the quality of construction work. In 2019, KOGAS collected various opinions from subcontractors and other participants in construction works in order to improve the unreasonable practices between the original contractor and the subcontractor and came up with 41 system improvement plans in the TF meeting of the hands-on staff of KOGAS. The plans include ideas for the general improvement of the system including prevention of illegal subcontracting, guaranteeing of appropriate additional costs, etc. Such system improvement leads to the improvement of the quality of construction work and better safety so that the safety of workers can be guaranteed and the energy welfare of the people can be promoted based on the safe and stable supply of natural gas.



Increasing support for startups with big data, the basis of the 4th industry

- Business Performance**
 - Contributing to innovative digital growth by sharing and opening public data
 - Enhancing efficiency and safety in the operation of facilities by applying the technologies of the 4th industrial industry
- Social Value Performance**
 - Offering SMEs and startups opportunities for win-win growth (Promote and support ten startups and create one direct job)
 - Promoting win-win growth by matching with the companies in the community for commercialization

KOGAS needs to enhance the efficiency and safety of facility operation using big data, the core technology of the 4th industrial revolution. Thus, KOGAS is holding startup contests to discover superior startup companies and provide support for good startups in need of money and/or data so that they can continue growing. In 2019, KOGAS held a contest themed “Development of the best algorithm for facility operation using big data of facility operation” wherein 40 teams (139 persons) of startups and prep entrepreneurs applied. The 30 teams (115 persons) that passed the first document screening were instructed to develop algorithms using the big data of KOGAS, and 10 successful participants were given KRW 35 million worth of prize money for developing good algorithms that can be applied to KOGAS. The secured technologies of the startup companies are matched with the companies in the community for commercialization to give opportunities for the win-win prosperity of SMEs and startups. KOGAS will continue to create a good environment for the promotion of startups using the big data of KOGAS and enhance efficiency and safety in the operation of facilities by applying technologies of the 4th industrial industry.



Practicing win-win co-operation with the “free opening of motor general diagnosis system!”

- Business Performance**
 - Increasing the use rate by reducing the idle time of the general diagnosis system
 - Improving our corporate image by opening the motor general diagnosis system for the first time among public enterprises
- Social Value Performance**
 - Improving corporate reliability through the free opening of equipment to the local community
 - Improving our corporate image through KOGAS's win-win cooperation model

The motor general diagnosis system is used to analyze the condition of motors including vibration and overheating by conducting test operations after the maintenance of large motors. Many motor maintenance enterprises cannot afford to have all of the expensive 6.6kV high-pressure power-receiving equipment, breakdown analysis device, motor fixing equipment, etc. Thus, they ask large companies to conduct the tests on their behalf or simply substitute the on-site test for the test operation. For this, KOGAS is opening the motor general diagnosis system in the headquarters of the Incheon Base to the community to raise the use rate of the diagnosis system and contributing to real win-win cooperation through free support of construction equipment. In addition, KOGAS distributed information materials on the introduction and opening of the motor general diagnosis system and distributed them to the SMEs in the community and held an explanatory session for the participating SMEs to hear their difficulties and suggestions. We are further improving trust with the local community by transparently sharing all processes of system reservation, entry into KOGAS, use of facilities, etc. in relation to the motor general diagnosis system, which is opened to the local society.





BETTER ENERGY WITH KOGAS

KOGAS IS FULFILLING ITS ROLE AND CORPORATE RESPONSIBILITY AS A PUBLIC ENTERPRISE BY CREATING SOCIAL VALUES CONTINUOUSLY WITH THE CORPORATE PHILOSOPHY OF “BETTER ENERGY, BETTER WORLD.” WE WILL STRENGTHEN SUSTAINABLE COMPETITIVENESS THROUGH THE ACCUMULATION OF FUTURE ENERGY TECHNOLOGY AND CONVERSION INTO ENVIRONMENT-FRIENDLY ENERGY. WE ALSO SEEK TO BUILD A SOCIETY THAT CAN MAKE EVERYONE HAPPY BY GROWING TOGETHER WITH STAKEHOLDERS INCLUDING PARTNER COMPANIES AND THE LOCAL COMMUNITY.

- Materiality Assessment 30
- Future Energy Leaping Toward the World 32
- Eco-friendly Energy for Future Generations 40
- Win-Win Energy Growing Together 52
- Happy Energy Enjoying Together 62



MATERIALITY ASSESSMENT

Process of selecting and reporting important issues

We manage our stakeholders' needs and opinions from a sustainable management perspective by examining them periodically. We acquire a deeper understanding of the potential issues related to our business based on an international standards analysis, benchmarking of more advanced businesses, media research, and questionnaire-based surveys among other methods. We also strive to identify which issues we should cope with first in our sustainable management activities.



STEP 1 Identify and understand the sustainable management issues

We have used a series of issue analysis mechanisms to come up with a pool of 32 sustainable management issues, based on an overall consideration of the relevant factors such as changes in the KOGAS-related environment, industrial characteristics, and internal pending issues, in order to acquire a deeper understanding of the impact of sustainable management on all KOGAS-related activities and services.

Media research
Analysis of media articles on KOGAS's management and other relevant activities. (Jan. 2019 – Apr. 2020)

Questionnaire-based surveys on stakeholders
A survey of our stakeholders was conducted from 12-19 May 2020 to judge important issues. (538 stakeholders responded to the survey.)

Review of sustainable management-related international standards
Identification of major issues of international standards related to the sustainable management.

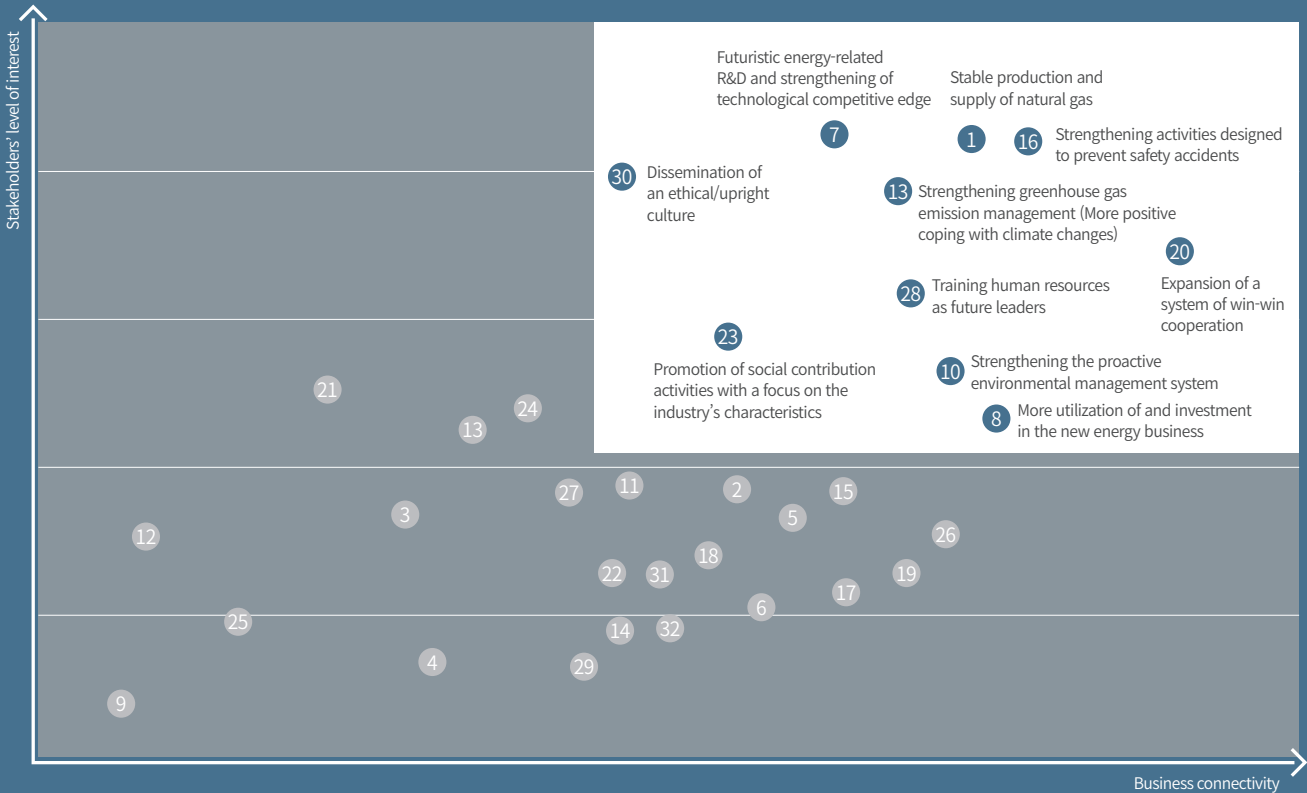
Benchmarking analysis
Analysis of exemplary cases of reports made by those in the same industry and relevant institutions both in and out of the country and of relevant trends.

Review of internal materials
We gained a better understanding of the status of important issues through an analysis of our mid- to long-term management strategies, sustainable management strategies, management public disclosure, and other internal report-related materials.

Results of the survey	(1) Level of communication with stakeholders for sustainable management; extent to which stakeholders' expectations are reflected in corporate management		(2) Level of sustainable management execution		(3) Necessities for sustainable management		(4) Areas where major social values are created	
	구분	percent	구분	percent	구분	percent	구분	percent
Diagnosis of our sustainable management	Very positive	32.1%	Reactive	12.2%	To reduce the business's expenses and risks	12.4%	Safety	27.3%
	Positive	31.0%	Perfunctory	22.0%	To maximize the business's corporate value by optimizing its competitive advantage	23.2%	Responsibility/ethics	20.6%
	So-so	20.4%	Defensive	23.2%	To enhance opportunities for the creation of future value	40.2%	Environment	18.5%
	Negative	11.9%	Positive	28.4%	To create shared values with diverse stakeholders	22.6%	Win-win cooperation	21.6%
	Very negative	4.6%	Proactive	14.3%	Other	1.7%	Jobs	8.5%
	Total	100%	Total	100%	Total	100%	Labor	3.4%
				Total	100%	Total	100%	

STEP 2 Prioritize the sustainable management issues

We narrowed the pool down to ten main issues in consideration of their relevance to our overall business and the stakeholders' level of interest based on the results of the materiality assessment.



STEP 3 Finalize the selection of the issues and review their effectivity

We examined the areas in which the ten issues have an impact on our operations (e.g. finance, operation, strategies and reputation) and reflected our findings in the contents of this report.

Nos.	Concerned stakeholders	Main Issues	GRI - Topic	Area of impact*	Contents of report
16	Directors/employees, government institutions, subcontractors, local communities	Strengthening of activities designed to prevent safety accidents	GRI 403	Reputation	Sophistication of safety management at business sites
20	Subcontractors	Expansion of the system for promoting win-win cooperation	GRI 204	Reputation	Dissemination of a culture of mutual growth
1	Customers, government institutions, shareholders/investors, subcontractors, local communities, people	Stable production and supply of natural gas	-	Finance	Sustainable energy-related business operations
7	Government institutions, shareholders/investors	Futuristic energy-related R&D and securing of technological competitive edge	-	Strategy	Expansion of new energy business
28	Directors/employees	Training human resources as future leaders	GRI 404	Operation	Strengthening of human sources-based management
30	Directors/employees, government institutions, subcontractors	Dissemination of a culture of ethics/integrity	GRI 205	Reputation	Upright/ethical management
10	Local communities, government institutions	Proactive environmental management system	-	Strategy	Realization of environmentally-friendly business sites(Reduction of the environmental impact on our places of business)
8	Government institutions, shareholders/investors	More utilization of and investment in the new energy business	-	Reputation	Expansion of the new energy business
13	Government institutions, shareholders/investors	Strengthening of greenhouse gas emission management (Coping with climate change in more positive ways)	GRI 305-1, GRI 305-2	Strategy	Realization of environmentally-friendly business sites(Efforts to deal with climate changes)
23	Local communities	Promotion of social contribution activities with a focus on the industry's characteristics	GRI 413	Reputation	Provision of win-win support for the local community

* 이해관계자 설문조사 진행 시, 재무, 운영, 전략, 평판 등 4가지 영역에 대한 질의로 이해관계자들이 생각하는 영향도를 파악하였음

FUTURE ENERGY LEAPING TOWARD THE WORLD



BUSINESS RELEVANCE

The natural gas business, which accounts for an important part of a country's energy industry, is a public good business that requires massive initial investment and should be promoted from a long-term perspective and at the national level. Natural gas is one of the main fuels we use in our everyday lives, including in various industries, transportation, and heating/air-conditioning. It is also linked to front/backline industries like LNG carriers or plants, thereby serving as the driving force in the creation of high added value. Recently, it has been linked to the use of hydrogen, which is attracting attention as a future energy source, and it will consequently be used in virtually all energy-related sectors such as vehicles, planes, and fuel batteries. This means that its value of use will become even higher. There will be challenges facing mankind such as energy conversion and the development of environment-friendly technologies. Under such circumstances, the role of public energy businesses will become more important in connection with the need for the enhancement of people's convenience and benefit and realization of energy welfare through the stable supply of natural gas.

OUR APPROACH

We at KOGAS strive for the stable operation of the entire process ranging from the import of natural gas to its sale to end users. In addition, we do our best to ease people's burden in terms of energy use by enhancing our price competitiveness while trying to realize energy welfare by improving the urban gas penetration rate. We also do our best to create new growth engines by making steady forays into not only upstream processes like the exploration/development of gas fields but also downstream processes like hydrogen, LNG, operation of overseas LNG terminals, etc. In addition, we are endeavoring to cement our reputation as a public energy corporation both at home and abroad based on our new energy technology -- LNG technology -- and base business technologies. We are subject to the government's annual management evaluation of major businesses. We manage our strategic tasks through the formulation of performance indicators and objectives.

2019 KEY PERFORMANCES

Natural gas sales

33.6

Unit: million tons

Turnover rate from overseas investments

41.2

Unit: %

R&D incubating support for hidden champions

2

Unit: enterprises

Usage rate of the patents for technical development

25.3

Unit: %

OUR TARGET

- Strengthening the "public good" factor of the gas business
- Creation of results in overseas operations
- Invigoration of the new energy business

INNOVATION OBJECTIVE IN 2024

Reduction of import expenses by

3,833

Unit: KRW 100 million

Turnover rate from overseas investments

89.4

Unit: %

R&D incubating support for hidden champions

16

Unit: enterprises

Usage rate of the patents for technical development

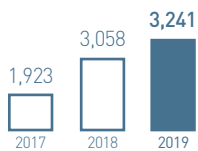
27.58

Unit: %

OPERATING A SUSTAINABLE ENERGY BUSINESS

Procurement and sale of stable, economic LNG

Saving procurement costs through spot purchase



Unit : \$ / mmbtu

Number of days of crisis in demand and supply



Securing price competitiveness by introducing the individual rate system

KOGAS adopted the “average rate system,” and it has applied the same LNG price to all power plants by calculating the average of different LNG prices. Due to the rapid increase in the portion of direct natural gas imports, however, it has become necessary to introduce the “individual rate system” for a stable supply, demand management, and establishment of a fair competition structure among power generation companies. Therefore, KOGAS plans to implement the individual rate system from 2022 for a new generator (100MW and over) and the generators for which the existing sales contract expires to charge different prices for each power plant. While it is difficult for the government to manage supply and demand of the quantity of direct imports, it is possible for KOGAS to manage the supply and demand of the quantity of the individual rate system in an integrated manner. As a result, KOGAS will be able to respond efficiently to a national emergency including rapid increases in power demand. Besides, KOGAS is securing price competitiveness through the strategic conclusion of contracts such as the improvement of prices in long-term contracts, conclusion of new short-term contracts, and conclusion of combined contracts for the summer and winter seasons.

Saving procurement costs by demand and supply management

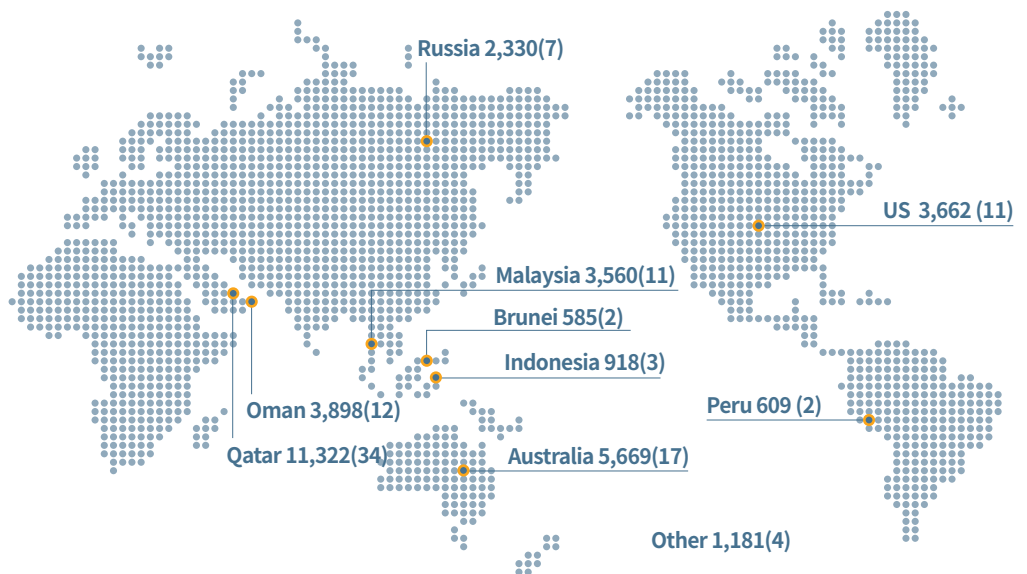
KOGAS is operating a constant demand and supply management system in order to respond actively to the rapidly changing demand and supply situation promptly. During the winter season of 2019, we were able to secure 5.4 million tons of LNG proactively by conducting weekly monitoring and save KRW 324.1 billion in procurement costs by exercising the right to reduce quantity for high-price, long-term procurement contracts and opting for low-price spot purchase. In addition, we could stabilize the supply system and minimize shock by grasping uncertain factors such as the energy conversion policy and fluctuation of other sources of power generation in advance and forecasting a sharp increase in demand in a timely manner. In 2019, we stabilized demand and supply by reflecting 90% of the expected increase in demand of 5.88 million tons.

Operation of LNG carriers and conversion of fuel for carriers

KOGAS imports natural gas from the countries of origin in the form of liquefied natural gas (LNG) and supplies it to power plants and city gas companies after vaporizing it. In the process, it is necessary to secure LNG carriers based on long-term contracts with shipping companies for the safe, stable transportation of natural gas. As of the end of 2019, we are using 29 national flag carriers for the transportation of LNG to Korea from major procurement countries such as Qatar, Australia, Oman, and the US. From 2020, it is necessary for LNG carriers to use environment-friendly fuels for their operation according to the enforcement of environmental regulations of the International Maritime Organization (IMO). The shipping companies can comply with the environmental regulations and at the same time save on transportation costs by using FBOG, which can be generated during the process of transportation of LNG, and low-sulfur oil fuel.

Major procurement countries for LNG (2019)

TOTAL 33,734 kilo tons(100%)



*Other procurement countries: Angola, Trinidad and Tobago, Equatorial Guinea, Papua New Guinea, Algeria, Singapore

Stable production and supply of natural gas

Penetration rate as of March 2020

92.1% (211 local governments)

83.8% (18,874,000 households)

Supply of natural gas nationwide through the new establishment of the Jeju Production Base

KOGAS is now supplying natural gas nationwide with the supply of LNG to the Jeju region from November 2019. A total of KRW 542.8 billion has been spent on the construction of the Jeju Production Base, the 5th base following Pyeongtaek, Incheon, Tongyeong, and Samcheok. The Jeju Production Base is composed of two 45,000kℓ natural gas storage tanks and a 80.1km main pipe network. With the supply of natural gas to Jeju, the national city gas penetration rate was expanded to 92.1% as of March 2020. The role of the Jeju Production Base is very important at a time when the source of energy needs to be shifted from fossil fuels to environment-friendly energy. We will realize universal energy welfare without any blind spots by expanding the supply of natural gas even to remote regions such as mountainous areas and islands using the minimum-quantity collective supply system.

Installation of stable facilities for a consistent supply of LNG

The production bases and pipe networks of KOGAS are located in optimal locations nationwide for the stable supply of natural gas. KOGAS boasts of the largest volume of LNG storage facilities in the world with 74 storage tanks (11.56 million kℓ) in 5 LNG terminals located nationwide, and it is planning to secure additional storage tanks by constructing new LNG terminals by 2029. The natural gas evaporated at LNG terminals is being supplied to power plants and city gas companies via the national ring pipeline after appropriate depressurizing. In addition, the supply network is usually in the form of a ring network to be able to supply gas in the reverse direction in times of crisis, such as supply stoppages. As of 2019, the length of the main pipe stood at 4,908km and additional piping will be done with a goal of installing 5,305km of pipeline in total by 2023.

Ring pipeline nationwide

Total length of **4,908km**



Goal of constructing an additional main pipeline

5,305km in all by 2023

Status of the LNG Terminal nationwide (as of January 2020)

Incheon LNG Terminal

- The world's largest delivery capacity in a single base
- Storage tanks: 100,000kℓ x 10 sets, 140,000kℓ x 2, 200,000kℓ x 8 sets
- Dock and unloading facilities : 75,000 tons 1 dock, 120,000 tons 1 dock
- Evaporation transmission capacity: 6,210 tons/hr

Samcheok LNG Terminal

- The largest-capacity storage tanks in the world
- Storage tanks: 200,000kℓ x 9 sets, 270,000kℓ x 3 sets
- Dock and unloading facilities : 127,000 tons 1 dock
- Evaporation transmission capacity: 1,320 tons/hr

Pyeongtaek LNG Terminal

- The world's largest storage capacity in a single base
- Storage tanks: 100,000kℓ x 10 sets, 140,000kℓ x 4 sets, 200,000kℓ x 9 sets
- Dock and unloading facilities : 75,000 tons 1 dock, 127,000 tons 1 dock
- Evaporation transmission capacity: 4,950 tons/hr

Dangjin LNG Terminal (under construction)

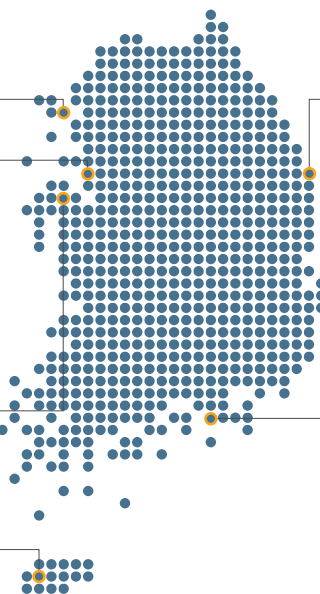
- Construction period: Dec. 2019 ~ Dec. 2025

Tongyeong LNG Terminal

- Storage tanks: 140,000kℓ x 13 sets, 200,000kℓ x 4 sets
- Dock and unloading facilities : 77,000 tons 1 dock, 127,000 tons 1 dock
- Evaporation transmission capacity: 3,030 tons/hr

Jeju LNG Terminal

- Storage tanks: 45,000kℓ x 2 sets
- Dock and unloading facilities: 65,000 tons 1 dock
- Evaporation transmission capacity: 120 tons/hr



LNG Tank, Jeju Production Base

EXPANDING NEW ENERGY BUSINESSES

Strengthening technology development competitiveness

R&D expenses in 2019

KRW **56.8** billion

(Unit: 100 million won)

	2017	2018	2019
	678	518	568

Intellectual property rights and technology transfer

(Unit: case)

Industrial property rights	2017	2018	2019
Patent Application	69	62	46
Registration	46	30	52
Program	0	1	1
Technology transfer (contract maintenance)	19	19	28

KOGAS continues to secure technological competitiveness in the overall energy industry by accumulating future energy technology and constant investment for the promotion of the Korean gas industry and technological development. We are securing not only technologies related to our main business of stably supplying natural gas but also those in new growth areas such as the hydrogen business, fuel cell, and climate and environment through choice and concentration. We are also conducting comprehensive research related to future new businesses including new & renewable energy, hydrogen production, and development of the hydrogen liquefaction process. KOGAS will do its best to secure future gas industry technologies and lead the global market through ceaseless technical innovation.

Performing open and innovative technological development

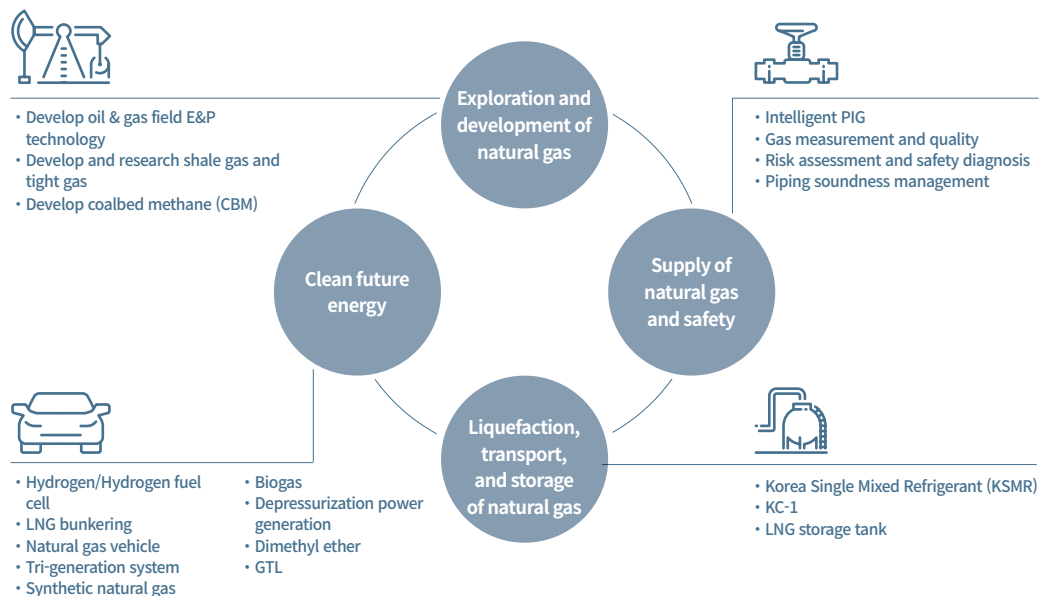
Consisting of over 100 researchers, the KOGAS Gas Research Institute is focusing on the development of new technologies in order to achieve the research objectives of “maintaining dominant competitiveness in the existing main business,” “providing basic technology for new growth businesses,” and “securing seed technology for future new businesses” with the vision of “Mission-centered Technology Solution Provider.” In addition, the research institute is operating a win-win cooperation platform among the industry, academia, research institutes, and government based on the infrastructure of natural gas including the production bases, pipeline, and supply management facilities of KOGAS by converting the R&D process into an open, collaborative system. In 2019, the research institute came up with 3 tasks for open and collaborative work by expanding cooperation with the private sector for technology development and led technical development by holding the Startup Contest and executing the pilot R&D booster project.

Strengthening technical competitiveness through global collaboration

KOGAS is strengthening technical competitiveness in key areas by establishing a solid network for technical cooperation with leading global energy companies around the world. With ExxonMobil, the largest energy company in the world, we have maintained -- since 2015 -- and expanded technical exchanges by signing an additional agreement on “research on energy and development of technologies” in June 2019. In addition, we have maintained technical exchanges steadily with Australia’s Woodside Company since the signing of an agreement on comprehensive technical cooperation in 2016. In September 2019, the two companies held a workshop of hands-on staff for the reinforcement of technical cooperation and agreed to conduct joint research.





Strengthening technical innovation through professional research

KOGAS is developing technologies for all areas of the natural gas industry from exploration and development of natural gas to the transportation and storage of LNG and supply of natural gas. Furthermore, we have proactively secured the technologies in new energy businesses, which are used for the production, storage, and use of hydrogen and related to fuel cells and reduction of carbon, and we are utilizing LNG utilization technologies that can be used in new growth businesses such as power generation through depressurization, cargo tanks, and bunkering. We will continue to do our best to the lead the development of technologies related to future energy such as the technology of environment-friendly cars and technologies for industrial use and transform KOGAS into the world’s best public enterprise in the energy field.



Implementation of new businesses of low-carbon, eco-friendly energy

In the era of global conversion from fossil energy into environment-friendly energy, energy companies are scrambling to find new growth engines. KOGAS, too, is making efforts to secure future growth engines and take the initiative in the era of conversion into low-carbon, environment-friendly energy by actively expanding various environment-friendly fuel conversion businesses such as hydrogen energy, fuel cell, LNG cold heat, and LNG bunkering as well as LNG truck and gas cooling.

 <p>Future energy (hydrogen, etc.) Establish infrastructure for the production, supply, and charging of hydrogen → Lead the promotion of the hydrogen economy</p> <p>Goal (2030) Invest KRW 4.7 trillion in all</p> <table border="1"> <tr> <td>Production plant</td> <td>25 sites</td> <td>1.73 mil. ton/yr (89% of nationwide demand)</td> </tr> <tr> <td>Supply pipe charging station</td> <td>740km</td> <td>110 sites</td> </tr> </table> <p>Performance</p> <ul style="list-style-type: none"> Establishing SPC for hydrogen stations (Mar. 2019; began construction of 19 stations nationwide) Groundbreaking of the Gimhae direct production hydrogen station (Jan. 2020) 	Production plant	25 sites	1.73 mil. ton/yr (89% of nationwide demand)	Supply pipe charging station	740km	110 sites	 <p>Smart factory LNG base+(Big data, AI) → Increase of productivity + Nurturing startups</p> <p>Goal (2023) Establish a smart production base (Smart facility operation + Condition-based maintenance)</p> <p>Performance</p> <ul style="list-style-type: none"> Began construction of an optimal facility operation system (Oct. 2019) and predictive maintenance system (Jul. 2019) (Saving KRW 1.2 billion/year in operation expense for each production base)
Production plant	25 sites	1.73 mil. ton/yr (89% of nationwide demand)					
Supply pipe charging station	740km	110 sites					
 <p>LNG-based new businesses Explore LNG-based new businesses → Promote air quality improvement + related businesses</p> <p>Goal (Bunkering) Secure 3 exclusive vessels and 1.57 million tons/yr of loading appliances by 2026, (large LNG vehicle) Supply to 60,000 vehicles by 2030</p> <p>Performance</p> <ul style="list-style-type: none"> (Bunkering) Complete loading appliances (Aug. 2019) and build 1 bunkering vessel (Dec. 2019) (Large LNG vehicle) Supplying to 100 new tractors and developing 2 kinds 	 <p>Drones, robot, etc. Gas piping+(Drone+AI+Robot) → Improvement of piping safety</p> <p>Goal (2023) Establish an integrated management system for piping risk factors</p> <table border="1"> <thead> <tr> <th>Overground</th> <th>Underground</th> <th>In-pipe</th> </tr> </thead> <tbody> <tr> <td>Drone+object recognition</td> <td>Ground penetrating radar</td> <td>Pipe inspection robot</td> </tr> </tbody> </table> <p>Performance</p> <ul style="list-style-type: none"> Expanding patrols using drones (2 sectors → 7 sectors) Development and application of low-pressure pipe inspection robots (48km) 	Overground	Underground	In-pipe	Drone+object recognition	Ground penetrating radar	Pipe inspection robot
Overground	Underground	In-pipe					
Drone+object recognition	Ground penetrating radar	Pipe inspection robot					

Contributing to low-carbon policy through gas stations

592 Yearly 592 tCO₂e / station

Fine dust reduction effect

80.7 kg / station

Strengthening future energy technology development

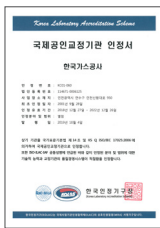
KOGAS released the “strategy to execute the hydrogen business” in April 2019 in order to lead the hydrogen business. KOGAS will take the lead in the promotion of the hydrogen economy as a public institute by actively participating in all processes of the hydrogen industry including production, supply, distribution, and technological development of hydrogen by investing a total of KRW 4.7 trillion by 2030. In addition, KOGAS established a roadmap for technology development in each stage of all areas of production, storage, transport, and use of hydrogen including localization of natural gas development technology for technology independence in the hydrogen industry, development of carbon capture and resource recovery technology, and research on water electrolysis, and it is implementing the roadmap in phases. KOGAS will also establish an advanced country-level safety management system for the hydrogen industry and take the initiative in leading the international standards related to safety. We launched demonstration projects by beginning to construct a hydrogen station within the estate of the Gimhae Management Office in January 2020. We will continue to build an ecosystem for the hydrogen industry according to the roadmap for the hydrogen business.

Vision	“Leading the promotion of the hydrogen economy by establishing a hydrogen production and distribution network”		
Goal (national demand)	To supply more than 60% of the total national demand		
	Preparatory period (~2022)	Diffusion period (~2030)	Leading period (~2040)
	470,000 tons (470,000 tons) 100%	1.73 million tons (1.94 million tons) 89%	3.45 million tons (5.26 million tons) 65.75%
Execution strategy	Create an ecosystem for the hydrogen industry by focusing on the establishment of hydrogen production bases, hydrogen stations, and distribution centers.	Expand the ecosystem of the hydrogen industry by expanding hydrogen production bases and hydrogen stations and securing the price competitiveness of the distribution center.	Complete the ecosystem of the hydrogen industry by diversifying the methods of production and distribution of hydrogen and upgrading the distribution structure.

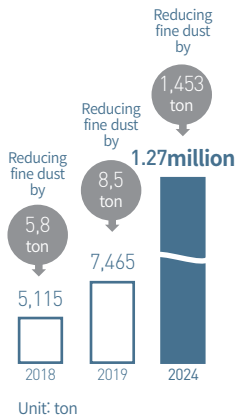
Optimal facility operation system

Saving KRW **1.2** billion/yr
(Amount saved in each base by productivity improvement)

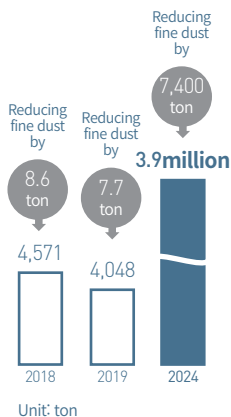
KOLAS international certification



Sales of LNG for trucks



Sales of LNG for vessels



Operation of smart production bases

KOGAS has established smart production bases using Big data and AI for the stable operation and high efficiency of natural gas production facilities. The smart production base consists of an optimal facility operation system, predictive maintenance system, and VR-based education system. The optimal facility operation system conducts an integrated analysis of the dispersed data related to facility operation and prepares equipment in real time considering the efficiency and safety of each facility. In addition, the system analyzes past big data such as the history of breakdowns and vibrations and learns the types of breakdowns with an AI algorithm. It can also grasp unusual movements in advance with the predictive maintenance system by substituting the current vibration value in real time. Big data technology is used for the preparation of an integrated demand and supply management system that can establish an optimal management system for the voyage for each base, the dates available for transmission, and the calorie in stock. The VR-based education system is used for realistic training system, improvement of understanding of equipment, and reinforcement of ability to take measures on the ground.

Upgrading core equipment maintenance technologies

KOGAS is strengthening its future competitiveness by upgrading equipment maintenance using innovative technologies such as drones, AI, etc. The patrol of piping -- which used to be done by people -- has become more efficient with the input of drones, and accidents can be prevented by eliminating underground sinkholes through the inspection of ground conditions near gas pipes using GPR*. In addition, KOGAS succeeded in developing the low-friction Pipeline Inspection Gauge (PIG)** with its own technology for the first time in Korea to solve the problem of sections that were not available for In Line Inspection (ILI). We have also begun to operate a large-scale flux measurement center, which is ranked No. 3 in the world, with our own technology for the first time in Asia. With the official international certification from KOLAS, the flux measurement center has secured public confidence for its flow correction capacity, and it is expected to be the Asian hub for flow correction.

* GPR (Ground Penetrating Radar): Used for the detection of structures, cavities, rocks, etc. in the ground by penetrating underground

** PIG (Pipeline Inspection Gauge): A device that inspects the condition of piping running inside the pipe using the pressure within the pipe

Pioneering LNG-based new businesses

In the area of natural gas for transportation, KOGAS is focusing on the LNG bunkering business and LNG truck business for the use of LNG for vessels and trucks to accelerate fuel conversion into LNG. We have launched the "LNG truck project" to improve the land air quality by replacing the fuel of diesel trucks -- which account for about 68% of fine dust emissions in the area of traffic and transportation in Korea -- with LNG. In November 2019, KOGAS completed a charging station exclusively for LNG vehicles in Busan Harbor and finished fuel conversion for 343 yard tractors to improve the air quality environment of the pier and induce energy diversification of the fuel for transportation. In addition, we established an LNG fuel shipping facility in the Tongyeong Base in August 2019 and began the operation of SM JEJU LNG #2, the first bunkering vessel in Asia, in January 2020 to implement the new LNG bunkering business speedily. We will contribute to solving the problem of air pollution and secure future growth engines by taking the lead in the environment-friendly fuel conversion project.



The Green Iris doing bunkering (truck-to-ship)



LNG bunkering combined carrier

OVERSEAS PROJECTS

Promotion of overseas projects by choice and concentration

KOGAS is actively implementing 25 overseas projects in 13 countries to realize energy independence and secure resources economically and stably. It has achieved the best competitiveness in all value chains of the natural gas industry by operating in not only upstream businesses such as exploration and development of natural gas and crude oil but also in mid-stream and downstream infrastructure business areas. These include the LNG liquefaction business, operation of overseas LNG terminals, construction of overseas city gas pipelines, and operation business.

KOGAS Global Project

(unit: case)

Division	E&P business			LNG business		Infra business	Total
	Exploration	Development	Production	Development	Production		
No. of projects	4	3	6	2	6	4	25

Iraq

KOGAS was given bidding qualification by the Iraqi government in 2009. In the first successful bidding, KOGAS was selected as the business operator for the Zubair oil field together with Eni S.p.A., a state-run company of Italy. In the second successful bidding, KOGAS built a consortium with Gazprom, a state-run company of Russia, and became the business operator of the Badra oil field. We have been stably recouping the investment cost of the Zubair project since 2011 and the investment cost of the Badra project since 2015 in the form of crude oil.

- ROI of Iraq Zubair: **108%** (as of Dec. 2019)
- ROI of Iraq Badra: **48%** (as of Dec. 2019)

Mozambique

Area 4 Gas well in Mozambique was confirmed to have natural gas reserves in the 3 gas fields of Mamba, Coral, and Agulha. KOGAS decided to invest in the development of Floating LNG in the Coral gas field (PIIP: about 16 trillion Tcf) in June 2017, and it will begin the first LNG cargo production in late 2022. Meanwhile, KOGAS established a JV company with state-run ENH of Mozambique in April 2013 to supply city gas. KOGAS constructed an 82km pipeline and one management office in Maputo, the capital of Mozambique, for the stable supply of natural gas to industrial and commercial customers.

- ROI of the Maputo pipeline project: **75%** (as of Dec. 2019)

Australia

KOGAS has a 15% share in the Australian GLNG project, which is being implemented for the development of a coal-layer gas field in the interior of Australia and export of LNG through the liquefaction base located in Gladstone on the northeastern coast of Australia about 420km away from the production site. The first production of LNG was successfully realized in September 2015. Through the project, KOGAS plans to secure core competence in the development of unconventional gas fields in the future. Meanwhile, KOGAS is participating in a project of developing the floating LNG of the small-sized gas fields including the one in Prelude, which is at the sea of the northwestern part of Australia. In March 2012, KOGAS signed a contract to purchase a 10% share and obtained the status of an official participating company in June of the same year. It is the world's first FLNG project for which the final investment decision (FID) was made. KOGAS will increase the production quantity gradually after the first LNG cargo production in June 2019.



E&P Business : 13

- ① East Timor, offshore Gas Well
- ② Indonesia, Krueng Mane Gas Well
- ③ Indonesia, Senoro Toili
- ④ Myanmar, gas field and land pipeline (A-1/3)
- ⑤ Mozambique, Area 4
- ⑥ Cyprus, Block 2, 3 & 9 Gas Well
- ⑦ Iraq, Zubair
- ⑧ Iraq, Badra
- ⑨ Iraq, Akkas
- ⑩ Iraq, Mansuriyah
- ⑪ Uzbekistan, Surgil
- ⑫ Canada, North Pole Umiak
- ⑬ Canada, Horn River (CAD)

LNG Business : 8

- ① Canada, LNG Canada
- ② Qatar, RasGas
- ③ Oman, O LNG
- ④ Yemen, Y LNG
- ⑤ Mozambique Coral FLNG
- ⑥ Indonesia, DSLNG
- ⑦ Australia, Prelude FLNG
- ⑧ Australia, GLNG

Infra Business : 4

- ① Mexico, Manzanillo LNG Terminal
- ② Uzbekistan, CNG Cylinder
- ③ Uzbekistan, CNG Station
- ④ Mozambique, Maputo natural gas distribution



Canada

KOGAS is implementing natural gas exploration/production and liquefaction projects in Canada. KOGAS has had a permanent mining right for the Umiak Area, which is located northwest of Inuvik City, since 2011 when KOGAS began the project. It has been producing natural gas stably in the Horn River gas field since 2012. Meanwhile, the “LNG Canada Project,” the first project to export LNG from Canada, is performed by constructing a liquefaction plant on the west coast. The produced LNG is transported to Korea or exported to Asian countries, etc., and KOGAS has a 5% share in the business. KOGAS has obtained all the required approvals and licenses from the Canadian government including LNG export permits (for 40 years), and it plans to begin production in 2024. KOGAS is preparing to produce competitive LNG using the ample natural gas that can be found in Canada.

Mexico

The order for the Manzanillo LNG Terminal Project in Mexico was placed by CFE (Comisión Federal de Electricidad) of Mexico for the fuel conversion of a coal-fired thermal power plant in Western Mexico into natural gas and increase of power generation capacity. The project is drawing a lot of attention as the core of the national energy industry, since natural gas will account for 10% of the total amount of gas supply in Mexico. The project was made possible with the cooperation of private enterprises that cannot develop overseas markets by themselves. The project is the first case of investment in an overseas LNG acquisition base and technology export.

• ROI of Manzanillo project: **72%**
(as of Dec. 2019)

ECO-FRIENDLY ENERGY FOR FUTURE GENERATIONS

BUSINESS RELEVANCE

The energy policies adopted by countries worldwide are going through a period of conversion amid the trend of increasingly stricter environmental regulations. The need for low-pollution energy that can mitigate climate change and environmental pollution is gradually increasing. International organizations are adopting increasingly stricter regulations to cope with environmental issues. Starting in 2020, the Regulations on Sulfur Content will come into force and apply to the seas of the world. Natural gas is becoming the center of attention as an environment-friendly fuel that hardly emits pollutants other than water and carbon dioxide after combustion. With the emergence of LNG (liquefied natural gas) as a transportation fuel, the worldwide conversion into environment-friendly energy is being accelerated. Compared to other fuels, natural gas is relatively safe but its proactive safety management remains important as its use is accompanied by the potential danger of gas leaks or fire.

OUR APPROACH

We at KOGAS prioritize safety and the environment in the entire process ranging from natural gas production to supply. We are operating the unique Environmental, Health, Safety, and Quality (EHSQ) Management system we developed in order to more effectively manage those factors. We are positively promoting low-carbon, environment-friendly activities based on systematic environmental management/climate change strategies to minimize negative environmental impacts arising in our management activities-related process. We are also implementing strong safety management of our workplaces through accident-free campaigns and efforts to foster a safety culture, while also operating a system for prompt responses to disasters like earthquakes or fire. We are subject to the government's annual management evaluation of major businesses, and we manage our strategic tasks through the formulation of performance indicators and objectives.

2019 KEY PERFORMANCES

Attaining a world-class safety culture

7.63

Unit: point

Accident rates at outsourcing construction sites:

0.09

Unit: %

Greenhouse gas (GHG) emission basic unit (reduction rate compared to prior year)

18.7 (3.4%)

Unit: tCO₂e/kilo ton LNG

OUR TARGET

- EHSQ system sophistication
- A stride in safety management to meet global standards
- Total Air Pollution Load Management System for the reduction of dust particles

INNOVATION OBJECTIVE IN 2024

Aiming at a safety culture level of

8.1

Unit: point

Accident rates at outsourcing construction sites:

0

Unit: %

Greenhouse gas (GHG) emission basic unit (reduction rate compared to prior year)

18.0

Unit: tCO₂e/kilo ton LNG

UPGRADING WORKPLACE SAFETY MANAGEMENT

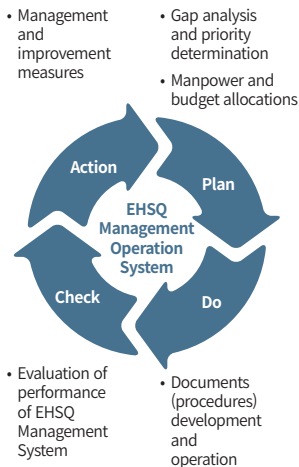
KOGAS-EHSQ Management System

KOGAS's safety management system international certifications

Certification	Area	First certification date
ISO 9001	Quality	Oct. 1997
ISO 14001	Environment	Nov. 1997
ISO 29001	Quality of petrochemicals and natural gas	Nov. 2013
ISO 45001*	Safety and health	May 2019

* OHSAS 18001 (acquired in June 2000) was changed to ISO 45001

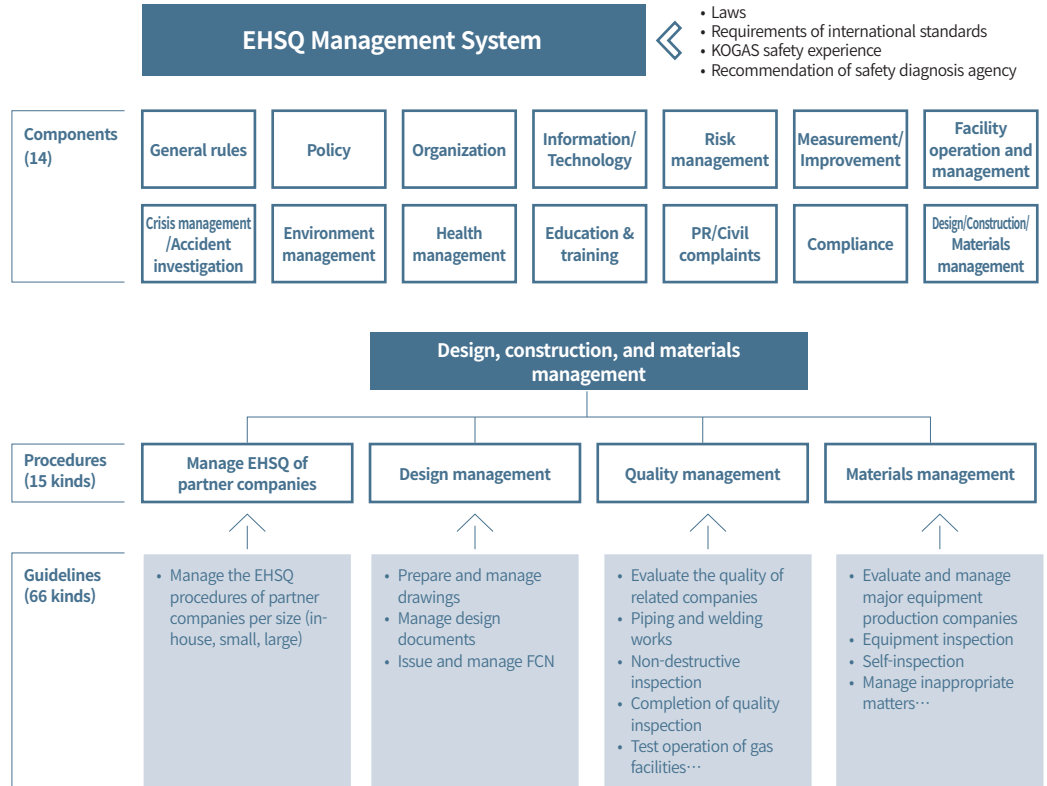
EHSQ Management Operation System (PDCA Cycle)



Achieving global-level safety culture

ISRS-C **7.63** points
(higher than the previous year's 7.51 points by 0.12 points)

KOGAS benchmarked advanced safety management techniques to develop and operate a unique EHSQ (environment, health, safety, and quality) Management System. It is an integrated safety management system designed for the systematic, efficient management of safety, health, environment, and quality affairs based on laws and regulations such as Occupational Safety and Health Act, Urban Gas Business Act, and Framework Act on Disaster and Safety Management and matters required by international standards*. We have prepared management regulations that identify site safety regulations, safe working methods, etc. for 14 components, procedures, and guidelines to be applied at the sites. We have continuously improved the safety level by performing all EHSQ affairs according to the PDCA process.



EHSQ global evaluation system

KOGAS has developed the MASTER (Management & Assessment Tool for Efficient Rating) system, an objective, quantitative global evaluation system, in order to improve the activities of the EHSQ management system and achieve the best results. In addition, we conducted ISRS-C (International Safety Rating System-Culture) together with DNV-GL, a professional international safety consulting agency, and garnered an evaluation score of 7.63 in 2019; this was higher than Korea's average of 5.78 points and the global average of 7.6 points. The result shows the high-level safety awareness of KOGAS. In addition, we are reflecting the improvement plans suggested after the diagnosis of safety culture level to EHSQ documents such as the Behavior-Based Safety (BBS) management and Standard Operation Procedure (SOP) for practical application.

* The average of 112 Korean companies including GS Caltex, Hanwha Chemical, Hanwha Total, and S-Oil was 5.78, and the average of global companies (137 companies engaged in Oil&Gas Extraction and 135 companies in the chemical products group) was 7.6 points.

Division	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	최종('23)
Safety awareness level (goal)	-	4.1	4.8	5.7	6.2	6.7	6.9	7.1	7.3	7.5	7.6	8.0
Performance	3.6	4.1	4.8	5.8	6.2	6.7	6.99	7.19	7.40	7.51	7.63	8.0

Strengthening the implementation of safety management

Investment in safety budget

KRW **494.6** billion
(7% increase from the previous year)

Division	Manual	Remarks
MOTIE	Practical manual for crisis response	Gas Industry Division (demand & supply and leak of gas), Office in charge of industrial disaster (disaster area)
KOGAS	Head Office (Action manual for on-site measures) Place of Business (Action manual for on-site measures)	Demand & supply, gas leak, disaster, earthquake, forest fire (5 areas) Gas leak, disaster, earthquake, forest fire (4 areas)

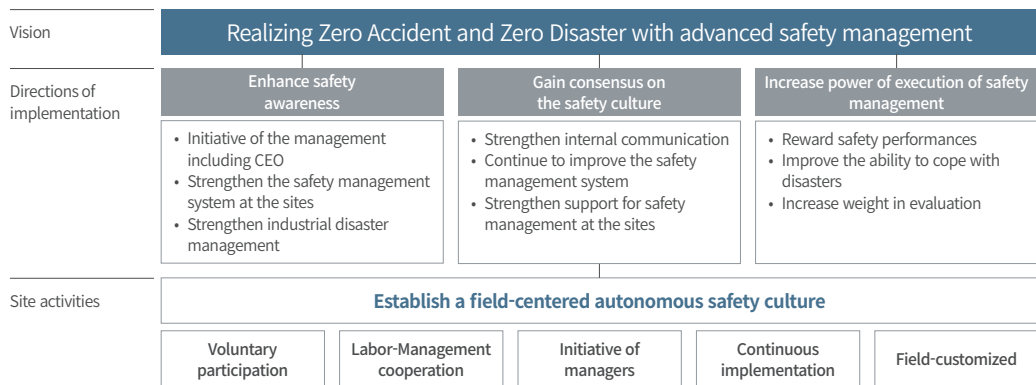
Evaluation of the level of safety management at construction works

Excellent

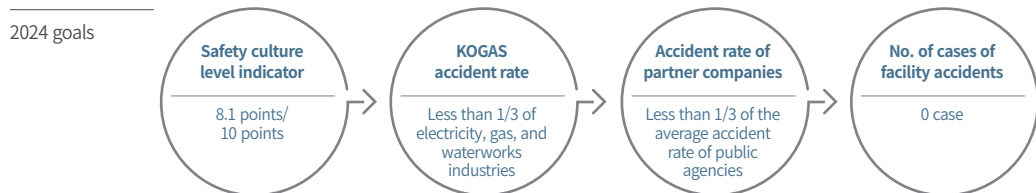
(The highest level for 2 consecutive years)

KOGAS is implementing advanced safety management strategies aiming at “Zero Accident and Zero Disaster” in order to prevent safety accidents and disasters that can occur in the process of production of natural gas and construction of the supply network. To accomplish such a goal, KOGAS has acquired and maintained OHSAS 18001 certification and implemented global-level safety and health management. In 2019, the management conducted safety accident prevention activities by holding the Accident STEP Safety Resolution Meeting, Industrial Disaster Prevention and Safety Forum, Safe KOGAS Explanatory Session, etc. In addition, KOGAS secured professional manpower in the safety area by hiring experienced staff in the area of construction safety management and reformed its organization considering the importance of safety by newly establishing an exclusive department in charge of industrial safety.

Safety Management Implementation Strategy



Mid- and long-term goals of safety management



Implementing the Safe Zero Accident Movement

After the expiration of the “Zero Accident Certification” system supervised by KOSHA since 1988, KOGAS has been implementing the “KOGAS-Style Safe Zero Accident Movement” since 2019. This movement strengthened the standard of achievement by including “facility accidents” according to the EHSQ guidelines compared to the previous system, which had focused only on “human accidents” and managed safety more thoroughly by directly reflecting the accidents at partner companies. With the movement, KOGAS actively inherited the concept of “compliment” -- which was the merit of the previous Zero Accident certification -- and it is implementing a solid safety system at the sites by raising the safety awareness of its executives and staff members.

Improving the industrial accident rate in construction work orders

In April 2019, KOGAS was ranked first (the lowest rate) for 2 consecutive years in the “evaluation of industrial accident rate in the construction works ordered by public agencies during 2018,” which was supervised by the Ministry of Employment and Labor. The industrial accident rate was evaluated by the number of victims among 100 workers in large-scale works ordered by 22 public institutes in Korea, and KOGAS was rated Excellent, having scored 0.09% (average of public institutes: 0.53%) following the lowest accident rate achieved in 2017. KOGAS has held the Safety Management Committee quarterly together with internal and external experts based on the practice of safety management and focused on strengthening the ability to maintain safety and cope with disasters. We will strive to achieve the lowest accident rate and devote all of our strength to fulfilling our mission of supplying natural gas stably and creating a safe Korea.

Satisfaction with consulting of subcontractors

97 points
(18% y-o-y rise)

Posting the lowest disaster rate among public institution

initiated works for **2** years in a row
(MOEL; Apr. 17, 2019)

Formation of safety culture-related consensus

Rated as the best among 55 institutions in an evaluation of public institutions' disaster management



(received the Presidential Commendation)

KOGAS selects 6 carefree villages

KOGAS selects **6** carefree villages
(cf. one in 2018)

Strengthening the examination of subcontractors' safety-related steps

We are strengthening our activities for safety checks concerning subcontractors in an effort to completely prevent industrial disasters. We have come up with a step that will put safety first in our work carried out with subcontractors including stipulating the strict observance of safety regulations in the contract conditions and routinely providing safety information/education to small-sized subcontractors. In particular, our punitive steps concerning violations of safety regulations on jobsites have been strengthened. We carried out random safety inspections on 44 jobsites engaging in dangerous work like excavation and had them improve the way they carried out work in 32 cases we pointed out. Our team of safety experts held a session of safety consulting/education for employees of seven subcontractors in a bid to foster a safety culture.

Securing facility safety proactively

We strive to prevent safety accidents through thorough safety diagnoses and improvements in national infrastructure facilities, multiple-use facilities, government buildings, etc. With regard to national infrastructure facilities including 72 storage tanks and 5 production bases, we standardize alarms that go off in case of a safety accident to prevent human error. We try to use as many locally produced facility parts as possible, and there has not been a single case of a gas facility accident over the past three years. We carry out a safety check of multiple-use facilities such as the Gas Science Museum periodically along with emergency evacuation training. The facilities proved to be "good" as a result of the safety diagnosis. We check embedded gas pipes using updated technology and programs for an accident consequence analysis and analysis of danger in a bid to secure gas facility safety.

We have designated every fourth of the month as Safety Check Day, carrying out activities designed to make safety a part of people's daily lives. Our monthly check covers natural gas production/supply facilities and construction jobsites. We hold safety education sessions to prevent disasters at our workplaces and remind employees of the importance of safety consciousness. We held onsite sessions of safety education (for a total of 11 times for 947 people), explanatory meetings (for a total of 16 times for 2,076 people), and safety assessment education (for a total of 568 people) at the subcontractors' places of business. We reformulate the contents of safety education as required. Other safety education we provide includes those for safety managers/supervisors (507 people in a total of 82 courses) and those held under the sponsorship of the Corporate Headquarters.

Expansion of safety activities that engage the public

We carry out gas-related safety campaigns together with local governments and public institutions. We also operate a "carefree village" program in an effort to prevent fires and safety accidents in local areas and vulnerable facilities with the cooperation of those from the private sector, local governments, and public institutions. We play a leading role in the formulation of carefree village councils to promote communication among the members of the local community. We strive to disseminate a safety culture, engaging in safety campaigns with the cooperation of the relevant institutions. We also provide fire extinguishers and gas detectors to less-privileged households, hold training sessions against fire, and make an effort to help people enhance their capability to cope with a safety accident. We provided CCTVs worth 100 million won to a vulnerable village in Dong-gu, Daegu in an effort to contribute to the formation of a safe local community.

Gas facilities-related activities in which the public participated

Standing Safety Check Corps	<ul style="list-style-type: none"> Carrying out joint checks of production bases/jobsites -> With the participation of those from the private sector, local governments, and public institutions
Terminal Division Safety Council	<ul style="list-style-type: none"> Sharing the results of safety activities with each other and offering feedback Discussing how to improve safety management
Excavation Work-related Local Watchers	<ul style="list-style-type: none"> Blocking the danger of unauthorized excavation work near gas pipes and reporting such instances

Positive reflection of locals' opinions

<ul style="list-style-type: none"> Forming a joint TFT to define the cause of stencches Promotion of change in a facility to put an end to locals' unease concerning the incineration of surplus gas -> Adoption of tightly sealed incineration facilities (showing no flames from incineration)
--

Safety training in which the public participated

<ul style="list-style-type: none"> Earthquake evacuation training carried out for vulnerable people during the gas-related safety training sessions Gained the participation of 231 young people including students paying visits to multiple-use facilities (number of visitors to the Gas Science Museum in Incheon: 70,000 a year)

Upgrading the disaster management system



Agreement ceremony for exchange and cooperation on safety from disasters among energy companies (May 2019)

With disasters increasingly becoming diversified in terms of types and occurring with more frequency, the risk of problems in the natural gas supply is increasing, including people’s anxiety as to the danger of safety accidents and natural disasters. In this regard, KOGAS has prepared proactive plans to respond to new composite disasters including the evaluation of the risk of damage by the volcanic ash of Mt. Baekdusan and the map of the risk of radiant heat of forest fires. We are reinforcing the external collaboration system by establishing piping safety management governance, holding safety forums, etc. In 2019, KOGAS signed exchange and cooperation agreements in the area of disaster safety with 5 local institutes related to energy in order to raise the level of safety management and strengthen the cooperation system for coping with disasters.

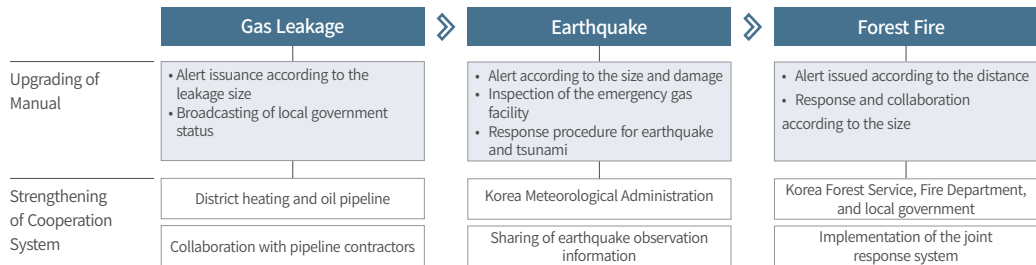
Strengthening the capability to cope with disasters

KOGAS has established a specific disaster response system for each type of natural disaster including damage from storm and flood, gas leak, earthquake, and forest fire. We are strengthening our capability for safety by expanding the object facilities of drills and implementing drills with the participation of the public. In 2019, the CEO of KOGAS personally directed the situation when 7 major disasters occurred including the forest fire in Gangwon Province, Typhoon Danas, etc. As a result of the active response by checking the damaged areas with all the manpower and resources of the company mobilized, no stoppage occurred in the supply of gas. In addition, KOGAS has established the disease prevention and control system based on the guidelines for responding to the outbreak of infectious diseases. If an infectious disease breaks out, KOGAS organizes an Emergency Planning Committee to be the control tower for an immediate, systematic response.

Maximizing the efficiency of restoration by establishing the Business Continuity Management System (BCMS)

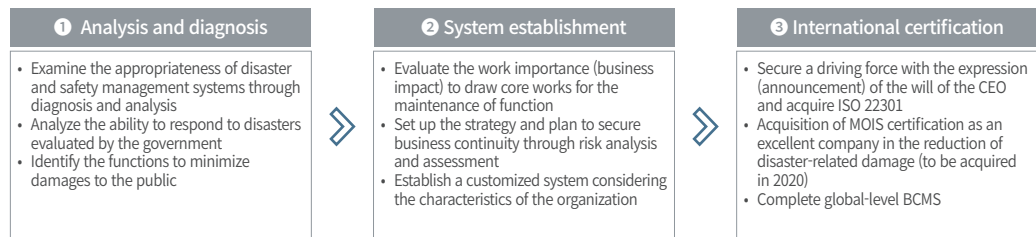
KOGAS established the Business Continuity Management System (BCMS) in order to restore core facilities and works in times of crisis due to the outbreak of a disaster. In 2019, we acquired ISO22301 certification, an international standard for BCMS that stipulates the activities that should be performed in each stage of PDCA.

Response System for Each Disaster Type



Business Continuity Management System (BCMS)

The system designed for business continuity through the quick restoration of facilities and works in times of crisis



[Anti-disaster drills]

KOGAS established the “action manual for on-site measures against forest fire disasters” for the first time among public institutions related to energy, and it is strengthening the ability to cope with natural disasters by conducting joint drills against forest fires with 7 related organizations including the Ministry of Trade, Industry, and Energy and the local government of Gangwon Province. As a result, KOGAS could respond quickly to the large-scale forest fire that broke out in April 2019 in Gangwon Province by giving the alarm by itself and operating the disaster situation room at the head office building in Daegu according to the manual prepared in advance. Thus, we were able to prevent damage to the gas facilities. In addition, we are strengthening the capacity to respond promptly to various disastrous situations such as typhoon, earthquake, and drone attack by participating in various drills including the Safe Korea Drill and through the efforts of the Fire Drill Center of KOGAS. We will establish the best disaster and safety management system by continuously reinforcing the capability to respond to disasters.



Safe Korea Drill to respond to disasters (Oct. 2019)

REALIZING AN ECO-FRIENDLY WORKPLACE

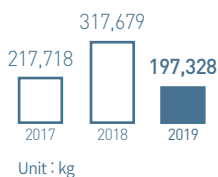
Reduction of the environmental impact on our places of business

We acquire or maintain certification of management systems [Environmental Management System (ISO 14001) and Energy Management System (ISO 50001)] to minimize negative environmental impacts occurring in the course of our management activities and operate environmental management systems that integrate the needs for managing environmental impacts and coping with climate change. We grasp the environmental impacts occurring in our work activities ranging from excavation to sale and disclose them through our environmental information disclosure system. We have those at our places of business and subcontractors to promote compliance with our environmental management guidelines in a bid to reduce environmental risks. We manage air/water quality and the emission of pollutants with standards stricter than what is required by law. There has not been a single case of violation of environmental laws and regulations over the past three years.

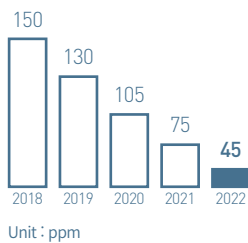
Strategies for the promotion of environmental management



Total amount of air pollutants



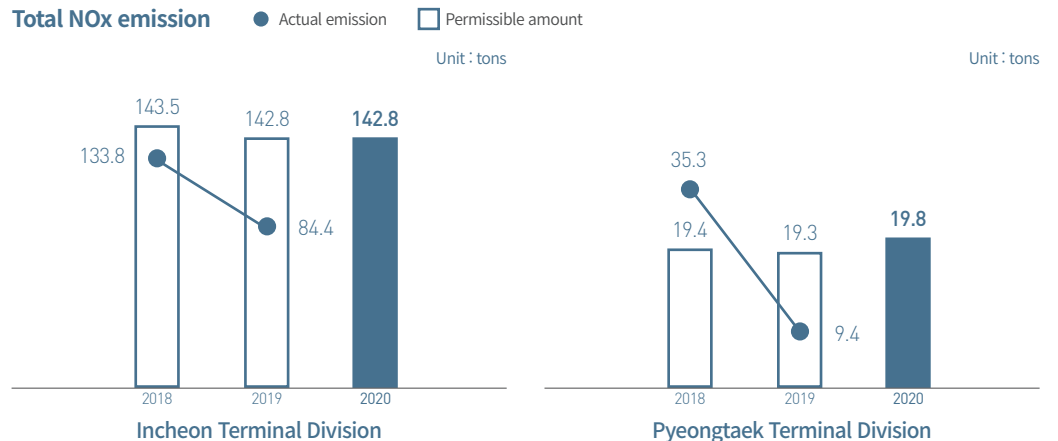
Permissible NOx discharge standards



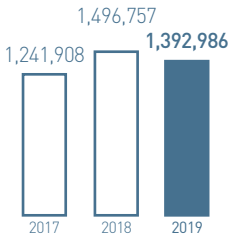
Management of air pollutants

It is inevitable that facilities like Submerged Combustion Vaporizers (SCVs), Seawater Heaters (SWHs), and boilers among our natural gas production/supply facilities emit air pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx), dust particles, etc. We manage the level of each pollutant using our in-house environmental management computer system on a monthly basis and take steps for improvement based on a reduction plan if the level is in excess of the pre-set annual target. Natural gas is a clean fuel that emits less air pollutants than other energy sources during combustion but emits NOx, which generates ultra-fine dust particles. We manage air pollutants by applying standards stricter than what is required by the Clean Air Conservation Act. Particularly, our Incheon/Pyeongtaek Terminal Divisions, which are located in the Greater Seoul area, are classified as those subject to total air pollution management under the Atmospheric Management Area Act. Thus, we ensure that each of them is operated within the total permissible emission volume of NOx set for it.

Total NOx emission

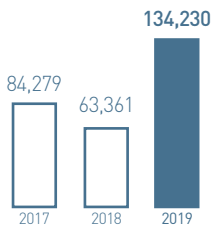


Water consumption



Unit : 1,000 m³

Total waste disposal



Unit : tons

* Reason for the increase: increase in waste due to the addition of places of business and construction work.

Water pollutant management

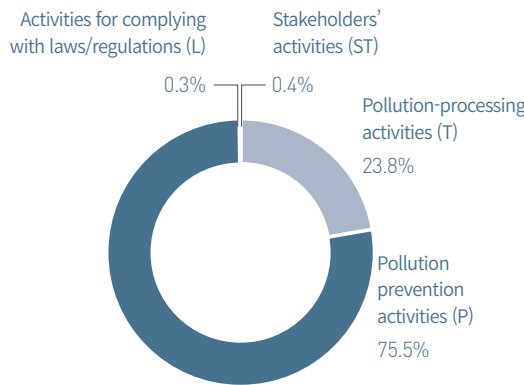
Most of the wastewater generated in our facilities is processed by businesses that we entrust with the task. With regard to the portion we process, we make it a rule to manage the water quality periodically using facilities for neutralization, non-point pollutants treatment, oil-water separation, etc. We also check marine facilities and anti-pollution devices/materials on a monthly basis to prevent marine pollution. We conduct training to prevent marine pollution every year in cooperation with the relevant institutions. We try to reduce the water used at our facilities by periodically checking the amount of consumption recorded in meters installed using an environmental management computer system. The amount of water/seawater consumption is also checked by the local waterworks office in charge of the areas where our facilities are located for more adequate management of water consumption.

Chemical substance management

We check toxicity/safety-related matters in the purchase/production/import of chemical substances required in the process of production/supply of natural gas. We use a small amount of non-toxic substances such as sodium hydroxide (NaOH), hydrochloric acid (HCl), potassium hydroxide (KOH), etc. The odorant put into our gas supplied to end users for the detection of gas leaks and the sodium hypochlorite put for the prevention of the attachment of marine life do not include toxic substances.

Waste management

We strive to minimize the waste generated in the process of natural gas production/supply and management activities like construction work and process them by separating according to their types and usage. In the works we initiated, we require the contractors to use recycled aggregates. Our company-wide resource-saving efforts include prohibiting the use of single-use items in offices and having those using single-use cups at the in-house café pay an extra environmental charge.



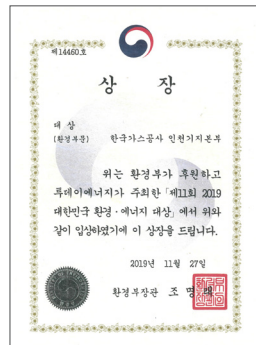
2019 Budget Performance on the Environmental Activities

Unit : KRW Million

Activities	Amount
1. Pollution-processing activities (T)	7,788
2. Pollution prevention activities (P)	24,698
3. Stakeholders' activities (ST)	116
4. Activities for coping with laws/regulations (L)	92
Total	32,964



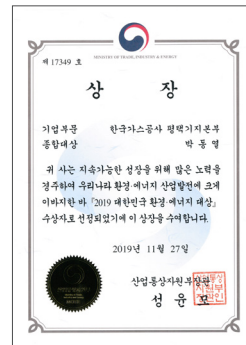
KOGAS campaign: Less GHG Emission and Energy Saving



Top Award at the 2019 Korea Environment and Energy Awards - Field of Environment (Nov. 2019)



Receiving a citation from Incheon 2019 Environment improvement Business Top Award at the 2019 Korea



Environment and Energy Awards - Field of Corporation (Nov. 2019)

Striving to cope with climate change

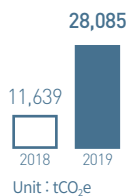


Status of new/renewable energy facilities

(As of the end of 2019)

Classification	Capacity	Places
Photovoltaic	1,966.4kW	74
Solar heat	606.8m ²	5
Geothermal heat (for air-conditioning)	1,424.6kW	2
Geothermal heat (for heating)	1,459.0kW	3
Wind power	15.7kW	5
Fuel cell	301.0kW	2

Reduced GHG amount



- Extra 141% decrease in GHG emission y-o-y
- Responding to new climate change system by improving and operating facilities

We have duly managed our GHG emissions and made reports on it since our designation by the government as a business subject to emissions allowances allocation with the adoption of the emissions trading system in 2015. We apply the evaporative fugitive emission factor we developed to reduce GHG emissions caused by leaks of natural gas occurring in the process of storing and supplying natural gas (relevant guidelines revised in 2020). Accordingly, we recorded an approximately 87% reduction of GHG emissions caused by the existing leaks of natural gas and reported to the government that GHG emissions were reduced by about 267,000 tons in 2019. This evaporative fugitive emission factor, which may be applied to the country's entire natural gas industry, is deemed to contribute to the country's attainment of the GHG reduction target. We have each of our business units fulfill their emission target and award the top five business units that have fulfilled the target each year.

Status of GHG emissions

(Unit : tCO₂e)

Classification		2015	2016	2017	2018	2019
Emissions	Direct greenhouse gas	456,413	469,305	551,497	663,206	287,680
	Indirect greenhouse gas	352,277	359,398	360,042	388,662	379,476
	Subtotal	808,690	828,703	911,539	1,051,868	667,156
Remarks		- 1 st planned period of the emission trading system ('15-'17) - Occurrence of about 270,000 tons of surplus (reduced) portion in emissions allowance		- 2 nd planned period of the emission trading system ('18-'20)		

Establishment of new/renewable energy facilities

We comply with the obligatory ratio of the installation of new/renewable energy facilities in the construction of a new building for the promotion of more rational/efficient use of energy under the Energy Use Rationalization Act. When purchasing devices/materials for a new facility, we prioritize those with high efficiency. As for GHS emissions from LNG bases and gas supply management offices across the country, the relevant records are systematically managed with ECO2 View. Since 2015, we have established our own GHG reduction roadmap and strived to reduce GHG through the exploration of ideas and improvement of the facilities.

Promotion of Strategies to Cope with Climate Change

KOGAS selected and analyzed a list of risks for each of the 6 climate impact factors (heat waves, cold waves, heavy rain and snow, strong wind and rises in sea level) that affect gas facilities to establish measures to adapt climate change. Moreover, we manage risks through continuous implementation evaluations. To reduce the impact of climate change, we established various detailed plans based on 3 strategies and systemically promoted them.

Vision	Supply of safe/clean energy through adaptation to climate change		
Objective	Supply of natural gas, which is stable and sustainable		
Top 3 strategies	Climate change impact assessment	Strengthening the capacity for coping with climate change	Establishment of a system for the prevention of negative results caused by climate change
Tasks to be done by the Team	<ul style="list-style-type: none"> • Spatial information-based evaluation of areas vulnerable to extreme climates • Detailed impact evaluation of rises in seawater levels • Review/Improvement of facility design criteria against temperature changes • Review/Improvement of facility design criteria concerning wind load • Survey of vulnerable areas with weak foundations and improvement of preventive measures 	<ul style="list-style-type: none"> • Composition of a management organization for adaptation to climate change • Training of experts on adaptation to climate change and education of employees • Establishment of a system for evaluating execution measures related to climate change • Improvement of the system for the classification of disasters by type/cause and management of the system for disseminating such • Improvement of the subdivision of the system for coping with disasters and manual improvement 	<ul style="list-style-type: none"> • Operation of measures for ensuring a stable supply in winter • Identifying countermeasures against boil-off gas in hot summers and for preparation for loads • Education on guidelines on what to do at the jobsite concerning a special weather forecast • Preventive preparations concerning areas subject to frequent dry weather forecasts

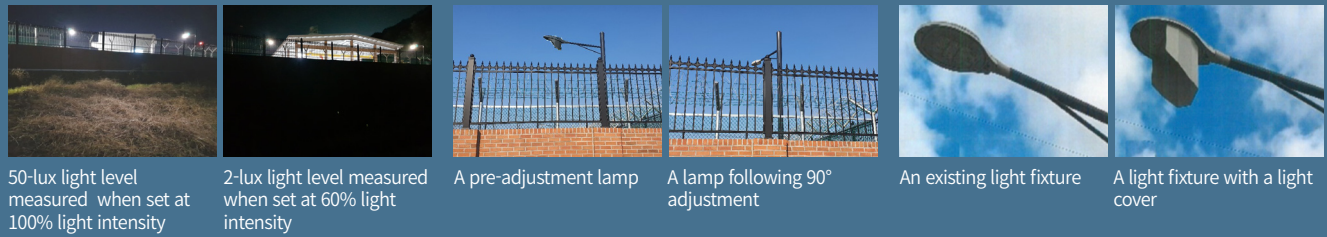
Protection of biodiversity

KOGAS has established environmental policies to protect biodiversity and ensure the health of ecosystems. We apply these policies to each of our business sites. First, we produce environmental conservation and ecosystem protection plans after conducting environmental impact assessments for any projects and operations that may affect the surrounding ecosystem. Most notably, we formulate a council composed of contractors, community representatives, and experts from environmental conservation groups, among others, discuss the environmental impact assessment processes and results, and design solutions to any potential problems together. When operating a business site, we regularly implement post-environmental impact assessments and continue to check for any changes in the surrounding ecosystem. As part of our marine and forest ecological preservation activities, we have promoted the conservation of otters and flying squirrels as well as rare plants and succeeded in restoring habitats for those endangered species.

Creating Clean Supply Control Centers without Light Pollution

01	Necessity	➤ Awareness of light pollution and its significance	Defining artificial lighting as pollution	Ministry of Environment [Fact-finding surveys to produce light pollution management plans (2009)]
02	Environmental Assessment	➤ Confirmation of problems caused by light pollution in communities near our control centers nationwide	① Environmental impact assessment of light pollution →② Designation of lighting management areas →③ Compliance with light emission standards	The Act on the Prevention of Light Pollution due to Artificial Lighting [‘12.21]
03	Legal Review	➤ Setting lighting management zones	Identification of control centers using artificial lighting Environmental impact assessment of the light emission rate and establishment of optimal improvement plans	Article 2 of the Enforcement Decree of the Act on the Prevention of Light Pollution due to Artificial Lighting
04	Preemptive Introduction	➤ Fulfillment of environmental protection obligations and social responsibilities	Building clean control centers focused on the protection of the environment and human rights -Protection of crops such as perilla, rice, and beans around the supply control centers	Fulfillment of the social responsibilities of KOGAS
05	Expanded Application	➤ Review of expanded application to control centers nationwide	Creating best practices for other companies through the expanded application Revision of KOGAS lighting fixture design criteria	New centers ⇒ universal application Existing centers ⇒ selective application

Introduction of system for controlling the intensity of light facilities (intensity adjustment)



Incheon Clean Corporation’s Environmental Improvement Agreement to Improve the Air Quality in Incheon Metropolitan City

Incheon Metropolitan City has launched 'the Incheon Clean Corporation Council' to reduce air pollutants and increase eco-friendly energy consumption in the city (until Dec. 31, 2024)

-Council Members: Incheon Metropolitan Government, Korea Gas Corporation, SUDOKWON Landfill Site Management Corporation, Incheon International Airport Corporation, Incheon Port Authority

Commitments made by KOGAS

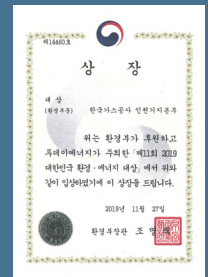
- Reduction of vehicle emissions (efforts to promote eco-friendly vehicles)
- NOx emission reduction (installation of or replacement with low-NOx burners)
- Actively operate NOx reduction facilities and promote local air quality improvement projects while operating submerged combustion vaporizers (SCVs) during the winter
- Stricter restriction on NOx emission of SCVs in District 4 (20% NOx reduction: 50ppm ⇒ 40ppm)
- Around-the-clock operation of odor control systems for odorization facilities
- Installation of a solar power generation facility (669kW)
- Manufacturing, installation, and commercial operation of a small hydro power plant (150kW)
- Facility modifications and fuel oil changes for vessels (Bunker C ⇒ LSMGO (low-sulfur marine gasoil))



Sites subject to Biodiversity Issue Assessments

Business sites		Unit	2019
Total business sites	No.	ea	14
	Area	hectare	842
Target sites for biodiversity issue assessments	No.	ea	3
	Area	hectare	262
Sites with biodiversity management plans	No.	ea	3
	Area	hectare	262

Efforts to Protect the Endangered 'Flying Squirrel' Species



While promoting the development of the Hosan General Industrial Complex, KOGAS carried out notable biodiversity conservation efforts.

- Species: The endangered flying squirrel (classified as Endangered Wildlife Class II, designated as Natural Monument No. 328).
- Actions: Monitoring of its habitats and implementation of post-environmental impact investigation reviews to reflect the results in the company's future business management plans.

Environmental clean-up efforts launched by various district divisions around Korea



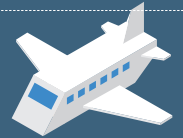


Environmental value

ISO 14001 -
Company-wide

ISO 50001 -
Company-wide

Environmental
Energy Grand Prize
2019 (ME)



INPUT

Amount of energy used



A total of

12,775 TJ

- Direct : 4,972 TJ
- Indirect : 7,803 TJ

Amount of water used



A total of

1,392,986,000 m³

- Seawater: 1,392,324,000 m³
- Piped water: 644,000 m³
- Underground water: 17,000 m³

Amount of chemical substances used



34,247,570 kg

- Basic unit : 1,019.36 kg/1,000 tons
- (Amount of natural gas used: 33,597,000 tons)

Expenses incurred from environmental activities



32,964 million won



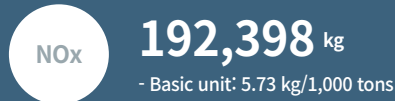


OUTPUT

GHG emissions



Air pollutant emissions



OUTPUT

Water pollutant emissions



WIN-WIN ENERGY GROWING TOGETHER

BUSINESS RELEVANCE

Publicness and social value have become very important in the evaluation of management of public institutions with the government's announcement of social value as its core philosophy. Today, public institutions have to consider social value comprehensively in the process of establishment and implementation of various policies and evaluate performance in the long term in the process of implementing policies reflecting social values. Social values include the win-win cooperation between large companies and SMEs, creation of good-quality jobs, revitalization of the local community, and provision of opportunities for the socially weak. Therefore, public enterprises are practicing it in the form of mutual growth, social contribution, and job creation. In addition, public institutions are deemed to have the responsibility of communicating actively with stakeholders, grasping related needs, and making efforts for win-win growth. It is regarded not as mere charity support but as a driving force for the realization of the social value of public enterprises and their sustainable management.

OUR APPROACH

KOGAS implements a win-win growth strategy according to the Team Plus win-win cooperation model. It is realizing mutual growth by grasping the actual needs of stakeholders and providing support through the Win-Win Cooperation Committee, Mutual Growth Association, etc. In addition, we strengthen the competitiveness of SMEs by supporting the localization of gas equipment, technological independence in all processes, exploration of sales channels, etc. and create a fair trade culture by establishing a partner company evaluation process using the environmental, social, and governance (ESG) criteria. Moreover, in order to fulfill our social responsibility as a leading energy company, we are implementing various social contribution programs based on the characteristics of our business and contributing to the revitalization of the local economy by creating various jobs including innovative and inclusive jobs. KOGAS is rated highly in the category of "job creation" in the annual management evaluation of the government, having established and intensively managed the goals and performance indicators of strategic tasks.

2019 KEY PERFORMANCES

Rate of supporting social contribution projects

74.28

Unit: %

Number of cases of technical development and demonstration for SMEs

25

Unit: cases

Creation of jobs in the private sector

6,080

Unit: persons

Number of cases of implementing heat efficiency improvement projects for vulnerable social groups

1,974

Unit: cases

OUR TARGET

- Implement social contribution activities to share the value of KOGAS
- Increase the effectiveness of mutual growth with partner companies
- Recover the hidden value through fair trading

INNOVATION OBJECTIVE IN 2024

Rate of supporting social contribution projects*

81.5

Unit: %

Number of cases of technical development and demonstration for SMEs

28

Unit: cases

Creation of jobs in the private sector

6,241

Unit: persons

Number of cases of implementing heat efficiency improvement projects for vulnerable social groups

2,461

Unit: cases

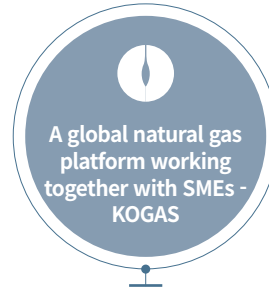
Rate of supporting social contribution projects = (Projects for social enterprises + Job creation projects)/(Total social contribution project expenses)

EXPANDING THE MUTUAL GROWTH CULTURE

Creating a win-win natural gas business environment

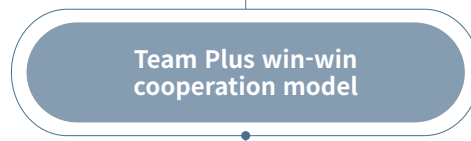
KOGAS decided on “Global natural gas platform working together with SMEs – KOGAS” as its vision for win-win growth. Accordingly, we are providing customized support for SMEs with strategies and tasks systematically established based on the Team Plus win-win cooperation model. We prepare practical support programs for SMEs so that they can solve realistic difficulties; as a result, we are realizing win-win- growth with SMEs by helping them in productivity improvement, exploration of sales channels, etc.

Vision



A natural gas platform evolving into a global provider based on the continuous growth and capability of partner SMEs - KOGAS

Growth Model



Creating Plus win-win value by teaming up with partner companies

Team 4 main strategies	T : Technology	E : Efficiency	A : Associating	M : Marketing
	Strengthen technical competitiveness	Strengthen technical productivity	Partnership/Cooperation	Support exploration of sales channel
Team tasks	Open doors for participation in R&D	Productivity innovation	Operate multilateral communication channels	Secure basic capability in market advancement
	Strengthen technical development linked to SMEs	Support liquidity	Share results openly	Offer bridge for exports
	Link with commercialization by qualification, etc.	Stabilize employment and strengthen capability	Create mutual growth culture	Support the settlement of stable exports
Plus Aiming Values	Making partner SMEs global hidden champions	Achieving the sustainable future growth of KOGAS	Creating a win-win business environment for the natural gas industry	



1st Win-Win Cooperation Committee meeting (Aug. 28, 2019)

Organization for win-win cooperation

For the professional implementation and management of affairs for mutual growth, KOGAS has established the Mutual Growth Team under the CSR Department; the necessary information is shared, and the methods to increase cooperation are discussed in related groups such as the Mutual Growth Consultative Group, Win-Win Cooperation Committee, and Hands-on Consultative Group for Fair Trade. In 2019, the “1st Win-Win Cooperation Committee” was held with the participation of experts, SME business operators, and executives of KOGAS who had in-depth discussions on how to promote fair trading and win-win cooperation. Besides, we are collecting various opinions through both offline channels such as field meetings, the Export Consultative Group, and online channels such as the “Mutual Growth Band” and “Mutual Growth Center.”

Issuance of partner company certificates

KOGAS distinguishes the partner companies supplying 5 items including the natural gas ball valve with 19 specifications as major suppliers. We issue partner company certificates for those companies so that they can complement their weak marketplace awareness and enhance their marketing. We issued partner company certificates to 98 companies in 2019, and we plan to increase the number of certified companies to 115 in 2020. In addition, we are making efforts to provide partner companies with convenience in customs clearance using the “Authorized Economic Operator (AEO)” system.

Supporting SMEs in strengthening competitiveness

Performance in development for localization

Classification	2018	2019
Development expense (1 million won)	101	296
Number of cases (case)*	5	12

* Localization is underway for 12 cases including components of the ultra-low temperature LNG pump, and 3 cases have been completed including the explosion-proof-type fire detector.

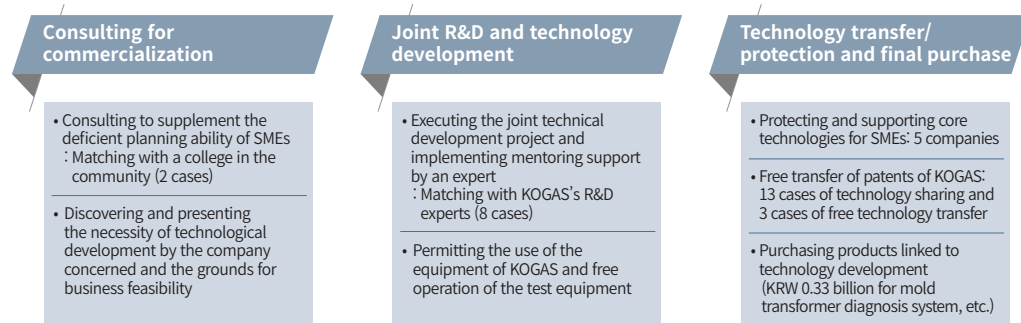
Expediting the localization of gas equipment

KOGAS established the “strategy to localize technologies and equipment” to lower the foreign dependence of natural gas equipment and strengthen the technical competitiveness of SMEs. We are also strategically implementing technological cooperation projects. In 2019, we designated 19 projects in 6 areas for urgent localization and implemented the localization of 12 field-centered materials and components including components of the ultra-low temperature LNG pump. In addition, we established the first test bed for the qualification of SMEs’ products through collaboration with the Korea Institute of Machinery & Materials (KIMM) to lay the foundation for win-win cooperation with SMEs by developing the criteria for reasonable evaluation.

Supporting the technical independence of SMEs in all processes

KOGAS is strengthening the global technical competitiveness of SMEs by implementing the “Born Global” project, which was designed to support and assume responsibility for all the processes necessary for the technical independence of SMEs. Through the project, KOGAS is providing an aid package for all processes of technology development from consulting for commercialization (Phase 1) and joint R&D and technology development (Phase 2) to transfer and protection of technology (Phase 3) and product development (Phase 4). In 2019, we have not only carried out active purchase of the products linked to technology development but also permitted the free use of KOGAS’s patents (including 13 cases of technology sharing and 3 cases of free technology transfer) to contribute to the spread of win-win growth with SMEs.

A model of support fostering SMEs to be specialized global enterprises (“Born Global” project)



Overseas sales of SMEs

USD **3** million (2019)
 * 9 registered vendors

Expanding purchases from social economy enterprises

KRW **1.2** billion (2015)
 KRW **12.5** billion (2019)

Specialized support to expand sales channels based on KOGAS’s business

KOGAS is supporting SMEs in the exploration of overseas markets through support for overseas patents and certifications, provision of information on overseas projects, etc. and in the diversification of sales channels in the domestic market by supporting purchase meetings and exhibitions and providing consulting. In 2019, we arranged the 1:1 matching of SMEs with overseas companies in the same industry and held 1:1 customized business meetings with global buyers of oil and gas equipment to achieve USD 3 million in exports. In addition, we gave 43 SMEs an opportunity to participate in the Mutual Growth Exhibition to publicize and promote their products and supported SMEs in domestic exhibitions including “KORMARINE 2019.”

Creating a purchasing environment for win-win cooperation

KOGAS is expanding the purchase of products from social economy enterprises by establishing a social economy platform that is used for the integrated management of the social economy online mall, social enterprises welfare mall, social economy support center, etc. We have also made efforts to establish a win-win cooperation environment by handling the bidding of companies run by women and the handicapped, providing the first system for purchasing small-sum goods for companies that have yet to establish a track record, operating a contract system reflecting social value, etc. As a result, the amount of purchases from social economy enterprises in 2019 reached KRW 12.5 billion; the number of cases of bidding for the purchase of small-sum goods was 61, which was 46 cases more than the previous year. A total of 145 new companies applied to join the business relationship.

Purchase from social economy enterprises		Social economy platform brand KSP	
Social enterprises	Computer, mineral water	Core resources	• Social economy online mall • Social enterprise welfare mall • Social economy support center
Social cooperative union	In-house café	Leading technologies	• AI/Blockchain/Mobile App
Community enterprise	Video production, etc.		
Self-supporting enterprise	Cleaning supplies, etc.	Institutional support	• Establishment of an integrated information system • Operation of company-wide integrated contracts • Establishment of guidelines for preferential purchases
Severely handicapped persons	Food supplies for the cafeteria, etc.		

Sustainable supply chain management

The status of our supply chain in 2019

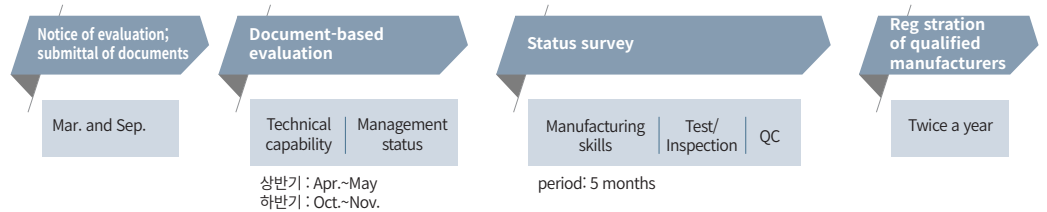
Classification	2018	2019
Number of subcontractors	131	131
Number of major subcontractors*	56	59

* "Major subcontractors" refer to those supplying the following 5 items under the 19 standards: valves, insulation joints, metering facilities, controlling facilities, and static pressure facilities.

We share our supplier code of conduct with those supplying goods to us to strengthen compliance management, which serves as the basis of mutual growth. The code of conduct stipulates the criteria for matters pertaining to the environment, human rights, safety/health, and ethics that our suppliers should observe. We not only expect our suppliers to observe this code but also their employees/agents and sub-suppliers. The code of conduct requires that the parties observe the relevant laws/regulations, the contents of the code of conduct, and the stipulations in the contract documents. We anticipate that together with our suppliers, we will move one step closer to our goal of securing global competitiveness through the code of conduct.

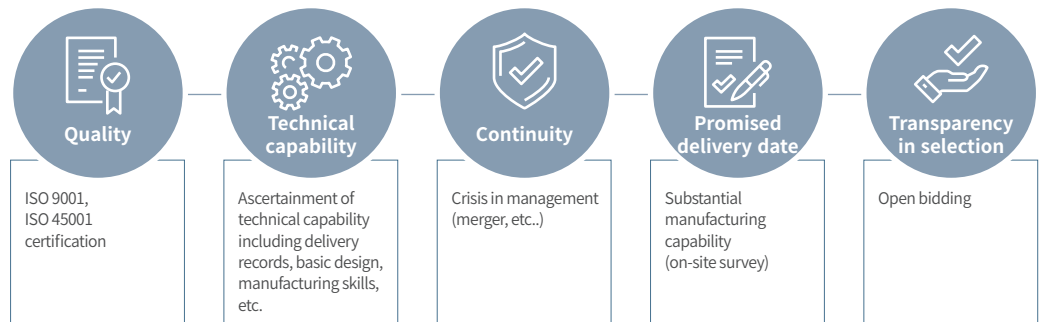
Process for identifying subcontractors' potential risks

We operate a system of having major equipment/device manufacturers registered with us to ensure safe gas suppliers, secure certified devices/materials, and enhance the efficiency of our bidding business. Under the system, we evaluate their manufacturing ability and status of management. As of January 2020, a total of 59 manufacturers are registered with us concerning 5 items of major equipment/devices and 19 standards. We carry out a periodic (twice a year) evaluation of manufacturers of major equipment/devices based on the applications submitted. The periodic evaluation includes five stages: submittal of application, document-based evaluation, notice of results, status survey, and registration of qualified candidates. The document-based evaluation includes an evaluation of technical capability and management status. The selection of qualified manufacturers involves an on-site survey designed to check whether the declarations in the documents submitted are true and status surveys such as sample tests.



Strengthening the supply chain: ESG risk management

With regard to supplier management, we operate based on strategies and promotional directions set systematically. We manage supply network risks with factors including environmental, social, and governance (ESG), which are considered when doing business with subcontractors and major raw material suppliers. We also consider the ESG factors even in the decision-making process concerning the selection and maintenance of suppliers. As for construction services, we carry out a status survey concerning subcontractors twice a year as per the Subcontract Management Guidelines, followed by an on-site survey on subcontractor management, work environment, compensation for workers, status of safety/workers' health, and environmental management as well as how complaints from people are handled, etc. With regard to construction projects valued at 5 billion won or more, said survey is carried out including all the items stated. We take punitive steps immediately concerning a business that is in violation of the regulations and give penalty points -- which will put the business in a disadvantageous position in biddings -- if the business fails to take a remedial step concerning its violation. With regard to suppliers of major equipment/devices, we first evaluate them based on the quality system, supply records, management status, manufacturing capability, and bidding methods, which are said to be the top five business capabilities. We then check their sustainable management activities and results as part of efforts for the integrated management of supply network risks. We disqualify suppliers that are decertified as ISO 9001, fail to meet the disaster rate requirements, or are subject to supply network risks. In 2019, not a single supplier of major equipment/devices was subject to our negative evaluation.



Major ESG objectives

- ISO 9001 certification: Securing adequate product quality through the establishment of a system for manufacturing capability of major equipment/materials and quality control.
- ISO 45001 certification: Strengthening subcontractors' safety/health activities by giving bonus points to those who have acquired ISO 45001 certification in a bid to reduce industrial disasters occurring on jobsites.

COMMUNITY SUPPORT

STRATEGIC SOCIAL CONTRIBUTION ACTIVITIES



Volunteer Corps' code of conduct

- Humble mindset
- Sincerity
- Positive mindset
- Pleasant companionship
- Voluntariness
- Sense of responsibility
- Service mindset

We carry out social contribution activities with the aim of working for the realization of social value and contributing to the development of communities in fulfillment of our social responsibilities as a public business. We seek to provide support for the less privileged using the Onnuri (meaning A Warm World) brand. We also promote win-win programs for local communities associated with the energy business including those for the promotion of energy welfare, training of social enterprises, and creation of jobs. We will continue to engage in activities designed to realize social values and contribute to the invigoration of the local economy.

Our slogan for social contribution



Our objective for social contribution

Contribution to the public good and development of communities through the realization of social values

2019	Playing a lead role in natural gas	Conversion into environment-friendly energy	Realization of social values	Improving the way we operate in preparation for the future
Strategic tasks for social contribution	Social enterprise/jobs (Onnuri harmony)	Energy welfare (Onnuri love)	Training future generations (Onnuri hope)	Public participation (Onnuri togetherness)
Projects for 2019	<ul style="list-style-type: none"> • Socio-economic Org. nurturing and support • Global Innovative Festa (GIF) • Construction Academy • Toy library operation • Public report session 	<ul style="list-style-type: none"> • Fuel cell installation program • Energy efficiency improvement program • Doss-house summer support program 	<ul style="list-style-type: none"> • Technical institutions in Mozambique • Toy library foundation • Scholarship program • Medical support for Uzbek kids • R-Bank • Support for kids with serious symptoms 	<ul style="list-style-type: none"> • Seniors' reemployment • Fire extinguishers for doss-house areas • Single parents support • Single moms support • Multicultural family support • Happy Nest Program
Linkage with UN's sustainable development objectives	SDGs 1, 3, 4, 7, 8, 9, 10, 11, 13, 15, 17	SDGs 1, 2, 3, 6, 7, 10, 11, 12, 15, 17	SDGs 1, 2, 3, 4, 5, 8, 10, 11, 17	SDGs 1, 2, 3, 6, 10, 11, 14, 15, 16, 17
Key Performance Indicators (KPIs)	<ul style="list-style-type: none"> • Sales of social economic organizations taking part in the work for the heat efficiency improvement project: KRW 2,342 million • Jobs created in association with social contribution programs: 17 (Architecture Academy) + 8 (Toy Library) = 25 	<ul style="list-style-type: none"> • Level of satisfaction with the heat efficiency improvement project: 96.5% • Expected effect on energy efficiency from the heat efficiency improvement project: KRW 72 million/year • Those benefitting from the heat efficiency improvement project: 92 households/184 institutions 	<ul style="list-style-type: none"> • Number of people benefitting from scholarship programs: 332 (all Koreans) • Level of internal satisfaction with social contribution programs: 77.9/100 • Level of satisfaction with the quality of service provided as part of the social contribution programs according to outsiders (concerning Toy Library: 85.1/100) 	<ul style="list-style-type: none"> • Number of Onnuri Volunteer Corps: All employees • Onnuri Fund donations: KRW 188 million



KOGAS's Onnuri Volunteer Corps receives the Presidential Commendation at a meeting of the Nationwide Volunteer Associations in 2019.

An organization engaging in social contribution activities

The main engine of our social contribution activities is Onnuri Volunteer Corps, which is composed of directors and employees. The year 2020 marks the 21st anniversary of the Corps, which was launched in 1999. As of January 2020, it is composed of 24 teams (9 from the corporate headquarters and 15 from places of business outside the headquarters). The Corps strives to put the genuine spirit of sharing into practice while carrying out voluntary activities in addition to providing material support for the less privileged. The Corps received the Presidential Commendation at a meeting of the Nationwide Volunteer Associations in 2019 in recognition of its efforts.

Dissemination of the voluntary fundraising campaign among employees

We operate the Onnuri Fund, which is made possible through our employees' participation. Programs supported by the Fund are selected through a survey of participants' opinions and an event asking for outsiders' ideas. In 2019, the Fund provided support to those living in doss-houses (supply of fire extinguishers), single parents, single mothers, and multicultural households. In 2020, the Fund is increasing the support amount for single mothers and providing zero-interest loans to small businesses suffering from the situation caused by COVID-19 using the amount donated by KOGAS officers. We will continue to engage in such win-win programs in ways that can create social values with the invaluable funds donated by our directors and employees.

Dissemination of Onnuri culture of sharing

Onnuri Energy Welfare that leverages the characteristics of the energy industry

We engage in locally tailored social contribution programs, making the most of the characteristics of the energy industry to provide support for the less privileged and realize social values. We strive to reduce urban gas charges to ease the financial burden on the shoulders of the less-privileged and do our best to enhance their energy welfare through the Onnuri Heat Efficiency Improvement Program and the program for the installation of fuel cells.



<Goal 7>
Supply of sustainable energy at reasonable price



<Goal 11>
Safe, resilient, and sustainable cities and residents



Heat Efficiency Improvement Program

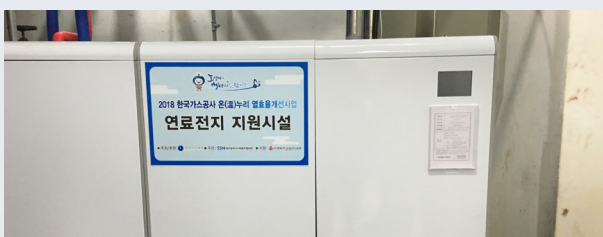
Our Onnuri Heat Efficiency Improvement Program replaces dilapidated heat insulations, boilers, doors/windows, and lightings found in low-income households and social welfare facilities to improve their environment for energy use. In 2019, we spent 2.98 bil. won to carry out heat efficiency improvement work at 92 low-income households and 184 social welfare facilities in 9 areas across the country. We have local businesses or social enterprises carry out the work of wallpapering and laying jangpan (flooring material) in an effort to contribute to the local economy.

Classification	2017	2018	2019
Low-income households	65	67	91
Facilities benefitting from welfare programs	96	92	184

Fuel Cell Installation program

We operate the Fuel Cell Installation program to promote energy welfare for social welfare facilities and disseminate the distribution of new/renewable energy. Since 2016, we have installed fuel cells in a total of 7 facilities, including a 10 Kw fuel cell each in 2 facilities (Saebyeotwon in Daegu and Hyosarang Seniors' Center in Gyeongbuk) in 2019. Highly efficient and environment-friendly, the fuel cells go a long way in reducing energy expenses.

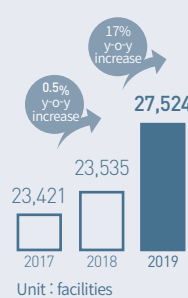
* A fuel cell is a system for the generation of heat and electricity through chemical reactions between hydrogen extracted from natural gas and oxygen in the air. It achieves at least 82% overall efficiency and 40% carbon dioxide reduction. It is a highly efficient, environment-friendly, new/renewable energy source.



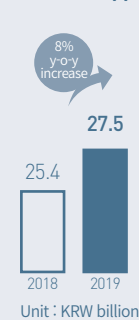
Expansion of the less-privileged benefitting from gas charge reductions

We strive to lessen the financial burden of less-privileged households by reducing urban gas charges in winter. This step covers not only the less-privileged including seniors, the disabled, and single-parent households but also those receiving social welfare benefits. In 2019, we provided the benefit to 27000-plus facilities, for a 17% y-o-y increase. We also expanded those eligible for energy voucher support worth 27.5 bil. won -- an 8% y-o-y increase -- in an effort to enhance welfare for the less-privileged.

Number of welfare facilities whose gas charges have been reduced



Amount of energy voucher support



Helping those living in doss-houses spend summer more comfortably

We operate a program designed to help the less-privileged spend summer more comfortably. We provided an "energy kit" consisting of an ice box, mineral water, mini fire extinguisher, and functional clothes to those living in doss-houses in ten areas across the country so that they can spend summer more comfortably. We also provided freezers and icemakers to their administrative offices. The mini fire extinguishers included in this kit are those that won first place in a competition for ideas related to social contribution programs. As part of job creation efforts designed to realize social values, we appointed people in charge of the delivery of these kits to monitor the status of the recipients.

Dissemination of Onnuri culture of sharing

Nurturing Dreams by Training Future Generations

We encourage children growing up in low-income households to nurture big dreams by providing them with a scholarship fund and operating the Onnuri Toy Library, among other efforts. We also try to provide more medical treatment support for young people from less-privileged households suffering from diseases as part of the effort to fulfill our social responsibilities as a world-class energy business.



<Goal 3 >
Better health coverage; better welfare for all



<Goal 4 >
Provision of good-quality education and lifelong learning opportunities



Seongsan Middle/High School (KG Mozambique Senior Manager Lee Won-seop)

Carrying out social contribution activities in linkage with our overseas programs

In Mozambique, which has developed the business related to a newly discovered gas field, we are operating a program to provide support for vocational schools designed to help locals develop self-reliance. We supplied educational equipment/materials to Abundante Elementary School near Maputo, the country's capital (2013-2015), and ran a vocational training class at Seongsan Middle/High School (2016-2019) as part of the program designed to improve the country's educational environment, create jobs, increase locals' income, and enhance the country's national competitiveness. We will continue to strive to train future leaders and develop the natural gas industry in developing countries.

Operation of the Onnuri Scholarship Program

We encourage students from less-privileged households to pursue their dreams by operating the Onnuri Scholarship Program. In 2019, the Program paid 110 mil. won to 224 students in Daegu and 330 mil. won to 108 undergraduates with good grades living near our places of business. In 2019, we launched a system for providing such support up to three years by subcategorizing the beneficiaries, i.e., those with good grades, those with artistic talents, and exemplary volunteers.



Presentation of KOGAS's Blue Lighthouse scholarship fund certificates (Nov. 2019)



Invitation and operation of Uzbek patients with cardiac disease (Nov., 2019)

Program to provide medical support to those from less-privileged households both at home and abroad

Other programs we provide include those designed to provide medical support, i.e., providing aid to disabled children, helping children suffering from severe diseases to receive operations, and helping children of developing countries suffering from a heart disease. Through the Onnuri R-Bank* Program, we provided rehabilitation assistive equipment (to 14 children) and free treatment on wheels (to 152 children) and paid medical expenses (for 20 children) in 2019. In addition, we paid a total of KRW 35 million for children suffering from heart diseases or leukemia in Daegu. We have also provided medical support programs for children in developing countries since 2012. A total of 16 children (4 Iraqis and 12 Uzbeks) have enjoyed the benefit until 2019.

* R-Bank is a program for repairing/reforming rehabilitation assistive equipment for handicapped children who have outgrown them and then leasing them to other children.

Dissemination of Onnuri culture of sharing

Creating “innovative and inclusive jobs” with win-win management

In line with the Korean government’s policy, KOGAS is realizing social values by creating jobs through social contribution programs. We come up with social contribution programs by finding out the needs of the beneficiaries through the local network with the local government, community welfare center, etc. and creating jobs through such programs. Our representative job creation programs include the construction academy program and job creation program for senior citizens. The program supporting unmarried single mothers is also connected with the job creation programs. In addition, KOGAS is contributing to the creation of jobs in the local community and revitalizing the local economy by strengthening the competitiveness of social enterprises.



<Goal 5>
gender equality and strengthening the ability of all women and girls



<Goal 8>
Guaranteeing sustainable economic growth, good-quality jobs, and employment

Program	Job	Activities	Performance	
			2018	2019
Senior Academy	(Senior citizens) Short-term, regular jobs	Disinfecting the Toy Library Producing baskets for toy rental	-	21
Toy Library	(Women who stopped working, unmarried single mothers) Working while taking care of children	Exclusive workers for the Toy Library (5 hrs/day) Jobs producing baskets for toy rental in the Toy Library	6	25
Construction Academy	(Homeless people) Teaching skills and arranging jobs	Arranging jobs in connection with the heat efficiency improvement project following mental education to practice the will for rehabilitation and training on construction skills	15	17
Relief Factory No. 1	(Vulnerable social group) Regular jobs for self-reliance	Assistant jobs at the HACCP-certified cooking common workshop	7	11
Hiring social workers	Offering sustainable good-quality social contribution works	Supplementing exclusive manpower for the heat efficiency improvement project	-	2
Total			28	76

Creating jobs for homeless individuals and those who live in compact rooms

KOGAS is operating the “Onnuri Construction Academy,” which is designed to offer jobs to homeless people and those who live in compact rooms after teaching them various construction-related skills for free. The trainees learn skills like carpentry, wallpapering, laying linoleum, waterproofing, and insulating, after which they are offered jobs or supported in business foundation to become economically independent. In 2019, we produced 44 trainees through the cool roof construction project, heat efficiency improvement project in the Daegu region, etc. and successfully arranged jobs for 17 trainees.

Laying the groundwork for the self-reliance of senior citizens, unmarried single mothers, etc.

KOGAS supported senior citizens in learning cleaning, disinfecting, and sewing skills in the “Onnuri Senior Academy” for employment. We also provided unmarried single mothers with employment training as well as mental and emotional education. In 2019, we created jobs for 21 senior citizens by conducting cleaning of the toys in the Onnuri Toy Library two or three times a month and producing baskets that will be used for toy rental. On the other hand, a total of 17 unmarried single mothers were taught how to sew, and the toy rental basket and souvenirs produced by the trainees were sold to the Toy Library of KOGAS so that they could have jobs and the groundwork for economic self-reliance could be established.

* KOGAS opened the first Onnuri Toy Library in 2014 in the building of the General Welfare Center in Dong-gu, Daegu, and it is operating Toy Libraries in 8 locations regions as of the end of 2019.



Launching ceremony of the Onnuri Senior Academy (July 2019)



Opening ceremony of the Relief Factory’s shop No. 2 (Dec. 2019)

Strengthening the competitiveness of social enterprises

KOGAS opened shop No. 1 of the Relief Factory* in December 2018 with the participation of 6 social economy enterprises and contributed to the revitalization of the local economy by creating jobs in the community and fostering social enterprises. In December 2019, we held the business agreement signing ceremony with the consortium of Daegu Metropolitan City and Nam-gu District of Daegu as well as a social café for a common brand and the launching show of the common brand for the promotion of the Relief Factory’s shop No. 2. This shop is a common production facility of the social economy food cluster. Based on the agreement, we created the Apsan Happiness Community Platform with Relief Factory’s shop No. 2 and established a mutual cooperation system for the promotion of the social café common brand and the community business. We will continue to contribute to the revitalization of the local economy and the creation of jobs by strengthening the competitiveness of the social economy enterprises in the community.

* The Relief Factory is a project implemented by KOGAS to support the social economy. The project supports the growth of the social economy consortium related to the food business into an upper market (public and large markets) by providing a HACCP-certified common workshop.

Strategies for job creation

With young people continuing to have a hard time finding jobs, the issue of job creation has become an important part of government policies. KOGAS has set “KOGAS Job Together for a Better Society” as its vision for job creation to realize social values through the creation of good-quality jobs. We are implementing the job creation task in connection with our mid- and long-term management strategies, aiming to create 90,000 good-quality jobs by 2025. In 2019 in particular, we changed our goal from creating indirect jobs to “direct jobs” in order to encourage the creation of good-quality jobs in the private sector.

Job Vision



“KOGAS Job Together for a Better Society”

Job Goal

Creating 90,000 good-quality jobs by 2025

3 strategic directions	Creating more jobs	Creating a better working environment	Creating a better working environment
8 major job tasks	<ul style="list-style-type: none"> • Creating jobs based on our business • Creating jobs in the environment-friendly energy field 	<ul style="list-style-type: none"> • Fair and equal system operation • Improving the working environment • Minimizing non-regular workers 	<ul style="list-style-type: none"> • Strengthening cooperation with SMEs • Expanding the local energy welfare • Activating the social economy
12 strategic tasks	<ul style="list-style-type: none"> 1-1 Expand manpower for new facilities and facility reinforcement 1-2 Create jobs in the private sector related to overseas projects 2-1 Expand manpower for the convergence energy business 2-2 Create jobs in the new infrastructure business 	<ul style="list-style-type: none"> 3-1 Strengthen fair recruitment 3-2 Expand equal jobs 4-1 Secure proper manpower 4-2 Create a flexible, safe working environment 5-1 Change non-regular workers to regular positions at an appropriate time 5-2 Form consensus between labor and management and improve workers' treatment 	<ul style="list-style-type: none"> 6-1 Mutual growth with small and medium partner companies 6-2 Joint advancement into downstream business private enterprises 7-1 Community social contribution activities 7-2 Implement local win-win projects 8-1 Foster social enterprises 8-2 Support the creation of customized jobs

Establishment of job networks

122 networks

(networks for the creation of jobs in the gas industry including production, supply, overseas projects, etc. of gas)

8 networks

(networks for the creation of inclusive community jobs according to the needs of senior citizens, homeless people, etc.)

Upgrading the job creation system

KOGAS is upgrading the job creation system by establishing job networks together with experts, citizens, and cooperation organizations. In particular, we continue to make efforts for job creation by collecting the opinions of the People's Participation Group composed of the Win-Win Cooperation Committee, Onnuri Committee, and Innovation Group by Citizens' Participation and consulting with the cooperation organizations of the community and the gas industry. In 2019, we did our best to create good-quality jobs by establishing differentiated job creation strategies such as clarifying the concept of the working period of employees, providing direct jobs for simple construction laborers, establishing the standard for innovative jobs by supporting business foundation and SMEs, and creating various types of inclusive jobs.

Establishing the standard for innovative and inclusive jobs

Clarifying the concept of the “working period of employees”	Providing direct jobs for “simple construction laborers”	Establishing the standard for “innovative jobs” by supporting business foundation and SMEs	Creating various types of “inclusive jobs”
<ul style="list-style-type: none"> • (Before) Limiting direct jobs to those who have worked for over 6 months • (After) Converting the working period of service workers who have worked for over 3 months into “one year” 	<ul style="list-style-type: none"> • Achieving the creation of direct jobs for simple laborers and 0% delayed payment of wages for subcontractors using the wage payment register and subscription to health insurance 	<ul style="list-style-type: none"> • Reflecting the standard of the Ministry of SMEs and Startups for the performance in job creation by business foundation (business foundation contest, attraction of investment by supporting the exploration of overseas sales channels, result of sales contracts, etc.) 	<ul style="list-style-type: none"> • Discovering jobs reflecting the needs of beneficiaries related to age, class, and employment type (Senior Academy, Construction Academy, flexible work hour system, etc.)

Efforts to create good-quality jobs

Expanding intern jobs for young people

205 jobs

(80% increase from the previous year (114 jobs))

Replacement employment for those on long-term leave

49 workers

(60% increase from the previous year (30 workers))

Creation of jobs in all business areas

3,081 jobs (2018)

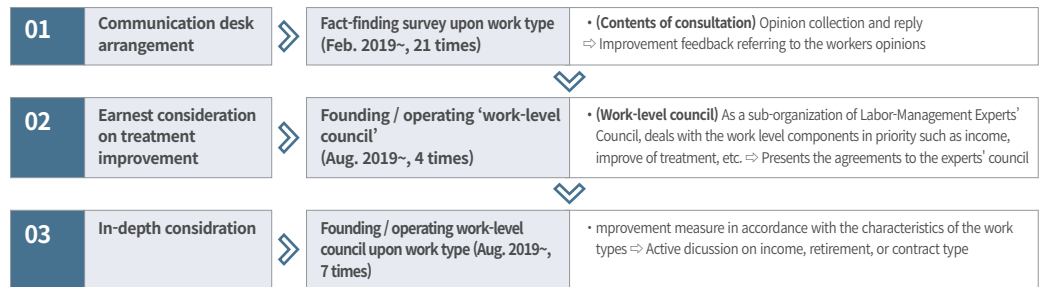
6,080 jobs (2019)

Creating an environment for job sharing

KOGAS is creating various kinds of jobs using reasonable human resource management methods such as management of the gap between the quota of employees and number of present personnel and improvement of working methods. We especially continue to create jobs by accurately analyzing the status of the gap between the quota of employees and number of present personnel and actively expanding replacement employment. We are also creating an environment for job sharing by improving working methods with flexible working, the work hour choice system, shift working, etc. In 2019, we hired 205 experience-type interns through job sharing, and 4 of them entered the company through open recruitment. In addition, we provided information about possible job opportunities in a timely manner by holding several explanatory sessions before the job application season, newly participated in the job fair for the handicapped, and expanded participation in the events held by universities to strengthen young people's employment competitiveness.

Communication efforts in the process of converting non-regular workers into regular workers

In August 2018, KOGAS finalized the 9 job types that would be converted into regular positions including cleaning, security, and facility maintenance through conflict settlement by the mediation of external experts. In October of the same year, we newly established the prior examination organization with the participation of the labor union in order to prevent excessively employing non-regular workers. In 2019, we prepared the plan to improve the treatment of workers by collecting their opinions on pending issues in each type of work and conditions of treatment for 21 times. We are continuing to make efforts to reach an agreement on controversial matters regarding the method of conversion. KOGAS will continue to do its best to come up with an optimal method to convert non-regular workers into regular workers by collecting the overall opinions of stakeholders using various channels with the Labor-Management Experts' Council and other hands-on meetings.



Creating jobs based on the business of KOGAS

KOGAS is actively creating jobs in connection with its business such as the natural gas infrastructure construction business and oil and gas field development projects. In 2019, we created 4,296 direct jobs related to the projects in Mozambique, Prelude of Australia, Zubair and Badra in Iraq, etc. We expect to be able to create 148 direct jobs for the next 8 years by receiving new orders in the overseas LNG bunkering business. Meanwhile, as a result of our efforts to create new jobs in all business areas including the domestic production and supply facilities construction areas and execution of new R&D projects, we created 6,080 direct jobs in 2019, a 97% increase compared to the previous year.

Performance in job creation in the private sector

Value chain	About the jobs	Performance in job creation in 2019		
		Direct jobs	Indirect jobs	Total
Overseas upstream (development, etc.)	• Site manpower related to the construction of Mozambique FLNG equipment in Korean shipyards • Insurance contracts for overseas construction projects for FLNG facilities in Australia and Mozambique (KRW 2.6 billion in 5 countries)	4,296	1,389	5,685
Overseas downstream (infra)	• Designer, manager, and site manpower from subcontractors for the LNG terminal in Kuwait	656	-	656
Domestic infra (production, supply)	• Site manpower of original contractor and subcontractors related to the construction of tanks and supply pipelines • Construction and extension work of production and supply facilities	542	5,670	6,212
Safety	• (Safety) Evaluation of the level of safety culture, establishment of business continuity management systems (BCMS), etc. • Separation of terminals in the capital area, open maintenance of LNG tanks, pipeline relocation work, etc. • (Environment) Consulting and research manpower to respond to the Emission Trading Scheme	197	708	905
LNG transport	• Manpower for the operation of two transport ships to Jeju and production of Korean-type cargo tanks (KC-1) • Building 2 small vessels (Jeju 1 & 2) (Applying vessel price* progress rate)		423	633
R&D, New projects	• Manpower for the operation of 20 hydrogen stations, technical development and research of new growth businesses, etc. • Establishment of hydrogen infrastructure, EERS 3D underground exploration, development of drones exclusively for pipeline patrol, etc.	210	2963	3,077
Inclusion and innovation	• Senior Academy, Toy Library, Construction Academy support projects, etc. • (Inclusion) Heat efficiency improvement project, etc. (Innovation) Supporting business fund for SMEs	114	122	187
Total (increase from the previous year)		6,080 (2,999 ↑)	8,608 (3,537 ↑)	14,688 (6,536 ↑)

HAPPY ENERGY ENJOYING TOGETHER



BUSINESS RELEVANCE

With the onset of the 2000s, Korea has witnessed the deepening of income bipolarization and a sharp rise in energy prices, and the conditions for energy consumption by less-privileged individuals worsened. In 2007, the government started running programs designed to provide such people with energy support in the form of an energy efficiency improvement program, price discount, and energy voucher. We believe that it is necessary to continue to pay attention and provide support by grasping people's needs to reduce energy blind spots.

We are living in a new era -- the rigid organizational culture of asking employees for endless sacrifice is long gone. In the current era, a rise in business efficiency can be expected when individual employees feel happy and satisfied with their daily lives. Businesses strive to attract human resources by offering conditions favored by employees in terms of welfare, work-life balance, opportunities for self-development, etc.

OUR APPROACH

We try to ensure that employees can find work-life balance through steps including maternity protection, support for childcare, and flexible work schedules. We also make an effort to hire new employees through a transparent, fair process and foster a desirable corporate culture through fair evaluation/compensation, improvement in health/working environment, and reinforcement of human resources management. Further, we do our best to enhance the level of satisfaction felt by people through service innovations that consider people's diverse needs and fulfill our social responsibilities by charging reduced fees for the less-privileged and providing energy welfare that has no energy blind spots. We are subject to the government's annual management evaluation including organizational/personnel management, labor-management relations, communication with people, etc. We establish performance indicators, objectives, and the like concerning our strategic tasks and continue to manage them diligently.

2019 KEY PERFORMANCES

Level of satisfaction with work-life balance

81.9

Unit: points

Labor-management communication index

71.5

Unit: points

Customers have rated their level of satisfaction (PCSI)

with KOGAS as **“good”** for four years in a row. (93.8 points)

OUR TARGET

- Making the organizational culture more efficient; open-minded culture taking root
- Communication efforts welcoming customers' participation; expansion of universal energy welfare

INNOVATION OBJECTIVE IN 2024

Organizational culture overall index

94.6

Organizational culture overall index
= Level of satisfaction with the organization + Level of satisfaction with result management + Level of integrity evaluation + Corporate culture index + Knowledge management result index

Number of employees who passed the capability evaluation

85

The number above equals the percentage of officers who pass the leadership capability evaluation.

Level of customers' satisfaction



S grade

INFORMATION SECURITY

Information security risk management

Promotion of proactive Information security strategy

In connection with the increasing cyber threat including disclosure of personal information, we do our best to enhance our reliability in this field by continuing to upgrade the level of our information security. We are undertaking this in a way that befits a leading public energy business in an effort to provide safe service. We have established a personal information management system, and we are taking steps to strengthen our relevant infrastructure and capability for proactively coping with any contingency situation. In order to systematically manage our company's cyber security strategy process, Senior Executive Vice President of Safety Technology among the executives with IT-related experience plays the role of Chief Information Security Officer (CISO) with related departments and divisions put under his direct control.

Security objective	Operation of a zero-defect information security system that allows zero cybersecurity incidences with 24/7 readiness to proactively cope with any contingency		
Directions	Back to basics in information protection	All-out guard against threats	Full attention to watertight self-security
Promotional strategies	Strengthening the personal information management system	Strengthening the information security infrastructure	Strengthening the capability for coping with information security contingencies
Focal points	<ul style="list-style-type: none"> Securing safety in each stage of feedback Removing loopholes 	<ul style="list-style-type: none"> Strengthening the omnidirectional protection of the business network Sophistication of the control network vulnerability management system 	<ul style="list-style-type: none"> Strengthening customized personnel security capability
Performance indicators	Not lower than 90 points in MOI's diagnosis	Not lower than 90 points in MOTIE's vulnerability evaluation	Rated "good" in MOTIE-initiated contingency training
Monitoring	Meetings to analyze the information protection-related major business	 Evaluation by vulnerability checking teams and outside experts	 Check of results by the relevant managing directors

Strengthening the information security infrastructure

We block factors that threaten our internal system using an information security system that is updated regularly. We have adopted a physical network separation method -- replacing the software-based method -- along with the Wireless Intrusion Prevention System (WIPS) in all operation units. We have adopted the watermark system for Digital Restrictions Management (DRM), printed matter-related security, and installed threat detection systems in 15 relevant devices including mail servers. These are examples of what we do to maintain a 24/7 defense against intrusions and threats. Further, we are strengthening the management of vulnerabilities in the control network. We garnered the highest rating in an evaluation of infrastructure security conducted by outside institutions in recognition of the security measures we have taken in the establishment of the control system.

Strengthening capability for information security

We are training security experts (called white hackers) using in-house education tools and strengthening our cyber security capability, taking part in the MOTIE-initiated exercise against malicious emails. We have employees adopt cybersecurity as part of their business lives and take steps to strengthen the face-to-face education for shift workers. We also have our subcontractors regard cybersecurity as part of their obligations throughout the work period. Thanks to such watertight cybersecurity, we received a prize from the Trade/Industry/Energy Minister for garnering the highest score in the 2019 Cybersecurity Technology Contest.

[Strengthening the personal information management system]

With regard to personal information occurring in the course of business, we make it a rule to process them safely with the application of information security technology and procedures throughout the entire process from collection to destruction. We collect personal information to the minimum possible extent under the law and keep them in encoded form. In the process of using them, we apply omnidirectional control such as no unauthorized access, preprocessing system of one-way encoding, etc. We operate a system that can destroy unnecessary information immediately upon checking. In 2019, we deleted 880,000 cases of unnecessary personal information. We also held customized cybersecurity education sessions for the relevant employees on a total of 59 occasions. We strive to strengthen our personal information management capability by checking the status from time to time and having violators attend a session of additional training. As a result of such efforts, not a single case of personal information leaks to unauthorized parties occurred in 2019.

Diagnosis of personal information management level

87 points in '18

→ **97.79** points in '19

(in the evaluation of 778 institutions nationwide)

Time required for coping with/taking steps against cyber threats

8.16 hours in '18

→ **5.43** hours in '19
(33% reduction)

REINFORCING HUMAN RESOURCES MANAGEMENT

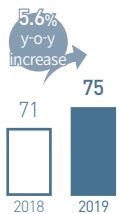
Fostering a corporate culture as a great workplace

We strive to foster an organizational culture that encourages work-life balance with the adoption of a flexible work system and by improving our business processes so that the 52-hour workweek can take root. We have adopted a flexible work system along with measures for maternity protection and baby care-at-work hours. We also strive to realize an organizational culture that makes employees happy, including strengthening education linked to the company's core values and expansion of opportunities for self-development.

Ways of promoting work-life balance

Tasks for execution in the direction of promotion	Strengthening measures for maternity protection and baby care support <ul style="list-style-type: none"> Expansion of support encouraging childbirth Improvement of the childcare leave system Preferential treatment of employees seeking transfer to another position to take care of an infant 	Improvement of the flexible work system <ul style="list-style-type: none"> Adoption of the Core Time system Expansion/Diversification of flex time types Setting guidelines for flex time 	Putting an end to the practice of long work hours <ul style="list-style-type: none"> Readjustment of human resources arrangement for balance in work volume Improvement of the corporate culture with the CEO encouraging employees to use the leave they earned and leave work on time
Performance indicators	<ul style="list-style-type: none"> Result of using childcare leave Result of male employees using childcare leave 	<ul style="list-style-type: none"> Percentage of employees using flex time Level of satisfaction with flex time 	<ul style="list-style-type: none"> Percentage of employees using their annual leave Level of satisfaction with work-life balance

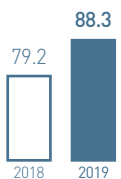
All employees using childcare leave



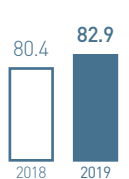
Male employees using childcare leave



Rate of utilizing flex time



Level of satisfaction with flex time

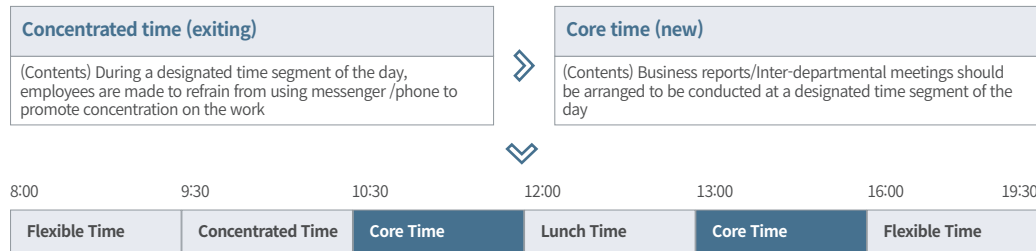


Continued maternity protection and childcare support

We are expanding support for childbirth and childcare in compliance with the government's policy of encouraging childbirth and to establish an organizational culture for work-life balance. We have added a leave of absence for checking the status of the fetus (2 days a month), for treatment of subfertility (3 days a year), and for infant care (10 days a year). Additionally, KOGAS has provided additional daycare facilities to previous benefits like the reduction of work hours during pregnancy, and payment of childbirth support money to reduce our employees' burden as they raise their children. Meanwhile, employees may use childcare leave for up to 3 years regardless of gender and split the leave period on and off as they wish, which is a result of improving the relevant system. As for employees returning to work after childcare leave, they may also continue to work at the previous department for at least one year, which is part of our organizational culture that considers such employees. The CEO himself -- through the in-house PA System or e-bulletin board -- also encourages employees to leave work on time on Family Love day (once a month) and use their annual leave as part of the effort to realize work-life balance.

Improvement of the flex time system in a way that enhances employees' concentration on work

We implement flex time, and our employees are allowed to adjust their work hours freely within the scope permitted by the company to meet their specific requirements such as child/family care, self-development, or long commutes to and from work. We have adopted a wide variety of work systems such as the flex time work system, alternative work schedule, compressed work system, smart work system, etc. to expand the scope of selection for employees instead of requiring them to follow the designated hours and places of work. In 2019, we adopted the core time system in a bid to foster the work environment for interdepartmental cooperation, along with an alternative work schedule system that allows commuting employees who live far away to leave work at 2:00 PM on Friday. We have found that such flexible work systems help employees manage work hours more efficiently and concentrate on their work.

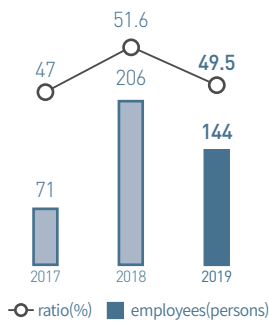


Putting an end to the practice of working long hours

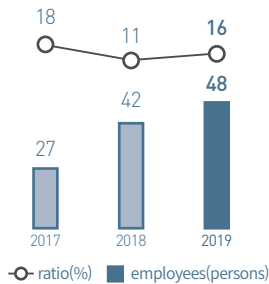
We strive to readjust the number of employees at departments where the workload is much heavier or lighter than others to avoid chronic long work hours at some departments. In 2019, we increased the number of employees by 21.4% for 15 departments whose workload is heavier than others in an effort to alleviate their workload. We operate an annual leave saving system that allows employees to save their days of annual leave up to eight days and use their entire annual leave of 15 to 25 days earned altogether toward the year-end. We continue to strive to foster an organizational culture that allows employees to consider KOGAS a great workplace. To that end, we encourage employees to take greater interest in their in-house club activities and take part in cultural sessions like the KOGAS Forum, special lectures, mini-concerts, and programs for building mental health with the help of experts.

Non-discriminatory working environment

Talented employees from outside the Greater Seoul Area



Percentage of high school graduates among those hired



High school graduate employees earning college diplomas

23 (in 2019)
 (cf. 6 in '17; 14 in '18)

At KOGAS, our ideal employees are those striving to be an authority in their field, ready to face the challenging future, to lead others through change, to collaborate with colleagues, and to realize success through cooperation. We base our personnel management on such factors.

Transparency and fairness in the recruitment of employees

In the recruitment of employees, we focus on their potential rather than factors like age, academic background, major, or hometown. In other words, we rely on blind recruitment and stress fairness and transparency, adopting the National Competency Standards (NCS) for customized employment. We operate a system for auditing the entire process of recruitment to thoroughly prevent irregularities. We strive to hire

the disabled, those who have provided distinguished service to the country, and locals with special talents. In 2019, the number of disabled we hired increased

7.2-fold year-on-year to 43 (3.97%) in excess of the mandatory obligation that public corporations must meet. We strive to lead others in training locals with talents in cooperation with local governments and universities. In 2019, those hired from outside the Greater Seoul Area and locals reached 49.1% and 17.1%, respectively, exceeding the mandatory obligation (35% and 21%) placed on public corporations.

* Rate of employees from Daegu compared to Mandatory recruitment : 26.1% (standard: 21%)
 Rate of non-capital areas employees:49.1% (standard 35%)

Fair evaluation and compensation

We try to operate a fair compensation system through the rational allocation of results centered on work value. In 2019, we reestablished the system of organizational structure centered on work and turned our work management system into a more sophisticated one to create an employee evaluation system based on work. Through such new arrangements, the realm of work value has been reflected more widely in the compensation system. This is evident in the graded payment of allowances to places of work based on the level of difficulty and improvement in work-related compensation for employees with plural assignments. We strive to provide employees with equal opportunities and reasonable remuneration as well as the same welfare benefits regardless of gender and academic background. We make it a rule to observe all the relevant laws and regulations including the Labor Standards Act and the Act on the Equal Employment for Both Sexes and pay equal wages for work of equal value for all employees regardless of gender.

Improvement in healthcare and the work environment

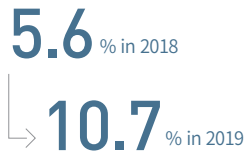
We operate a comprehensive healthcare system for employees to realize our goal of being an enjoyable and healthy workplace. Together with SNU Hospital, we conducted a questionnaire-based survey among all employees to help them relieve work-related mental stress in 2019. We also had outside exercise specialists run a 12-week program for building employees' basic physical strength. Moreover, we checked what our employees wanted concerning the improvement of in-house facilities. We installed Braille signs on stairs/bathrooms and parking spaces for pregnant women in response to employees' opinions. We will continue to improve the work environment so that employees can work in a safer and more pleasant workplace.

Creation of an organization culture free of discrimination

We strive to eliminate factors of unreasonable discrimination against women, high school graduates, indefinite-term contract employees, employees hired for special duties, etc. and provide adequate treatment for them. High school graduate employees are given a self-initiated opportunity to apply for a change in assignment and continue their studies in college. We also pay for their college tuition, assign them to a job that allows them to attend college at the same time, and allow them to work under a flextime arrangement. With regard to the need for equal opportunity for both genders, we operate the Gender Equality Committee and personnel system without discrimination. We try to foster a work environment that encourages women to continue working by providing measures like childcare leave, in-house daycare facilities, and preferential treatment in promotion opportunities. As a result, the ratio of females to both existing and newly hired employees and manager-level employees has increased. Beyond that, we continue to improve treatment for female employees, hold leadership education sessions for them, and listen to opinions on improving the relevant system through surveys and informal meetings held at different levels of workplaces. We will continue to work on fostering an organizational culture characterized by equality and zero discrimination.

Strengthening human resources management

Percentage of female low-level managers (chajang)



Training female leaders/experts

We operate a roadmap for training female managers and experts. We take extraordinary steps to train female candidates for directors by assigning them to core duties, raise the percentage of female members in the promotion committee, and provide an advantage to women when they compete with men for a higher position to increase the percentage of female managers. As a result, the percentage of women among those promoted to low-level management positions (chajang) increased twofold year-on-year in 2019. Likewise, women in their third year of service for KOGAS were appointed as team leaders under the plan to train them as future managers. The recent rearrangement of our employee education system included the launch of a class of Young Professionals. There were also new female employees promoted to Gr. 1 positions (cheojang)*, and female managers were assigned to core duties as part of the effort to realize the goal of gender equality in the organization.

*Percentage of women in Gr. 1 positions (cheojang): 22%

Realization of win-win labor-management relations

We reestablished our strategy for the development of labor-management relations with a focus on the need for win-win cooperation and on putting social values into practice in a bid to build more desirable relations between the two sides. Of particular note is that we designated 2019 as the first year of win-win labor-management relations with an emphasis on workers' safety and respect for workers. In 2019, representatives of employees and management signed a renewed agreement in recognition of the need to jointly pursue social values. The agreement includes clauses concerning respect for workers, realization of social values, fostering of a safe work environment, enhancement of safety levels in facilities, respect for human rights, work-life balance, etc. Thanks to such efforts, the level of the realization of social values was raised to 78.4 points in 2019 from 76.4 in 2018. We will continue to pursue future values shared by both sides, build more desirable labor-management relations, and foster an energized organizational culture.



Programs for training talented employees

We formulate strategies for the development of human resources as those who will play a leading role in the energy industry in the future and operate the relevant programs based on our strategic objectives and employees' needs. We strive to build KOGAS's business promotion capability by strengthening our capability and expertise as a world-class company and encourage employees to take the initiative to learn. We also foster a desirable organizational culture through the substantiation of our core/social values. Under the annual plans formulated from a mid-term perspective, employees strive to enhance their work capability and improve the educational environment.



Employee education carried out in 2019 in each field of capability

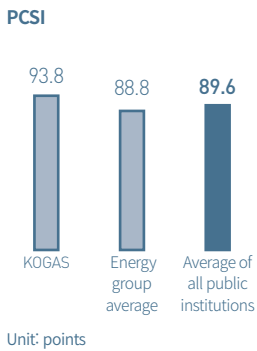
Strategic direction	Results of promotion of education	Expected effects	
Strengthening expertise	Future growth	• Launch of Training Programs for Industry 4.0 including Hydrogen, LNG Bunkering and Fuel Cells - 35 persons for 8 short-term courses and 4 persons for 3 long-term courses	Training a pool of human resources designed to build the new growth sector infrastructure linked to the launch of a new organization
	Overseas operation	• ELaunch of the E&P/liquefaction expert course - 63 employees in 16 resource development courses; 36 employees in 5 liquefaction courses	Diagnosis of business capability for independent operation 82.3% in '18 → 86.6% in '19
	Safety	• Expansion of safety education including a basic course in disaster safety and EHSW working-level knowledge of onsite business - 229 employees in 31 courses in '18 → 316 employees in 51 courses in '19	Enhancement of the safety culture 7.51/10 points in '18 → 7.63/10 points in '19
Strengthening global capability	Short-term	• Launch of a professional language course including the Commissioning Class in Kuwait (265 employees in 27 classes) - Execution of 3 overseas OJT courses including LNG Trading, LNG Plant, etc.	Education of locals engaged in the commissioning service in Kuwait (US\$2.1 mil.)
	Long-term	• Expansion of overseas expert courses like Resource Economy, MBA (Finance; Energy), etc. • 8 employees in 8 fields in '18 → 11 employees in 10 fields in '19	Equal to TOEIC-S (lv.7), OPic (IH) or higher -155 employees in '18 → 187 employees in '19
Sophistication of the round-the-clock learning system	Online course	• Provision of a platform for attending lectures using PC and mobile device simultaneously - 2,387 courses in '18 → 2,607 courses including energy management engineer, etc. in '19 (8.4% ↑)	Increase of people acquiring qualification certifications ((52% ↑) -99 employees in '18 → 150 employees in '19
	Work education	• Adoption of full-time lecturers for design/work education (four selected in May '19)	Provision of systematic education guidelines -29 common courses; 346 professional courses
Fostering a desirable organizational culture	Ability to cope with climate change	• Improvement of the ability to cope with climate change through phased education on change management • First (all employees) online education (4,066 employees) → Second (department-level) core values workshop (2,188 employees) → Third (manager) course for those who were promoted (275 employees)	Level of observance of core values (1.5% ↑) -87.6 points in '18 → 88.9 points in '19
	Social values	• Development of a standard education text designed to cooperate with LH, K-Water, KRC → Measuring the level of substantiation after online education development/execution (3,812 employees completed the course)	Improvement in the level of understanding social values -4.35/5 points (measured for the first time)
	Human rights-friendliness	• Education in four courses including Officers' human rights-related leadership - 9,322 employees completed the course in '18 → 12,100 employees in '19 (23% ↑)	In-house diagnosis of level of human rights (7.5%p ↑) -82.1% in '18 → 89.6% in '19

STRENGTHENING CRM

Promotion of strategies to innovate services for the public

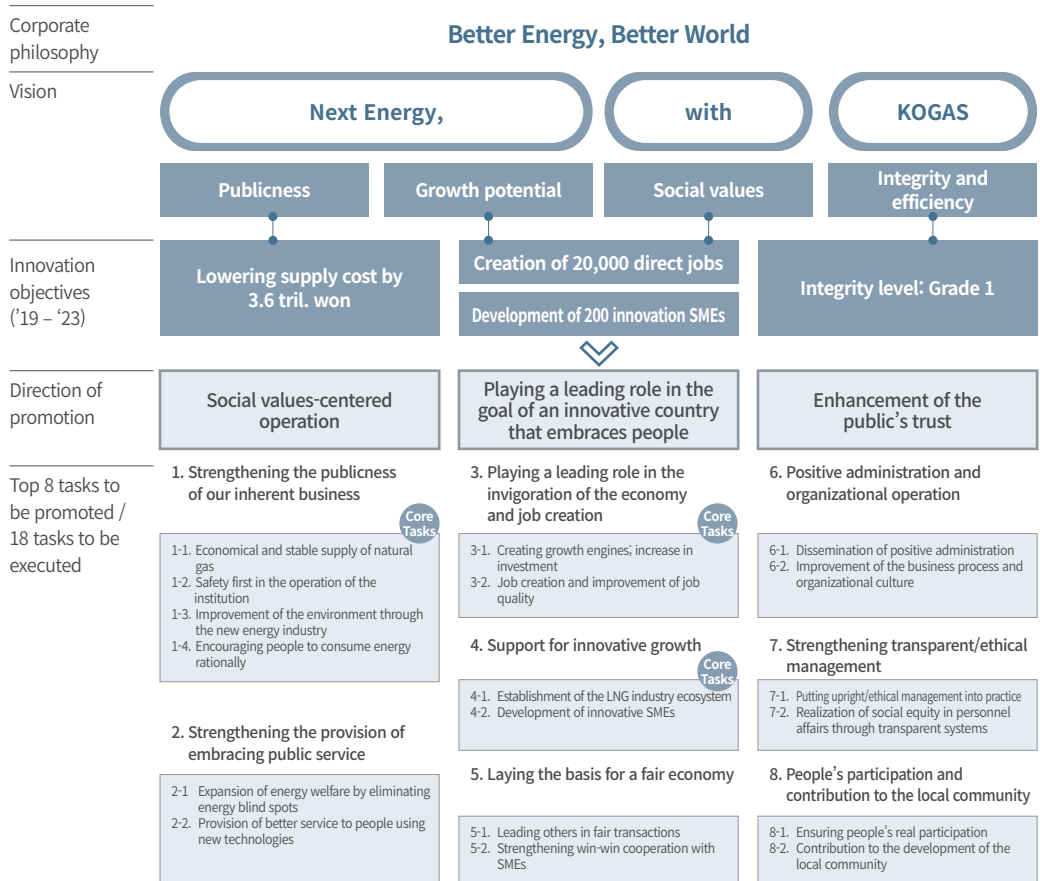
KOGAS rated “good” in the Public-service Customer Satisfaction Index (PCSI)

for **4** years in a row



Our customers include all those receiving our service directly and indirectly, including urban gas businesses as well as individuals. As a leading public energy business, we carry out service innovation activities that reflect the diverse needs of the public. In 2019, we launched the Marketing Planning Department, established two departments in charge of the individual fee system, and built an integrated structure encompassing raw material procurement, price design, and sales management to provide a customer-centered, one-stop service.

System of service innovation for the public



Finding solutions to joint pending issues for win-win relations with customers

We do our best for Customer Satisfaction Management through communication with our customers. We strive to operate channels of communication like workshops, informal meetings, and Customer Service Committee to provide better service to customers including urban gas businesses, power plants, and local governments. We analyze the content of voice of customers (VOC) to check matters that need to be improved. We do our best to realize the satisfaction felt by the people -- who are our end users -- through joint marketing activities with urban gas businesses. We also promoted the cooperative business of getting access to gas devices and attempted to develop CSV (creating shared value)-type demands by donating dryers to military installations and fuel cells to welfare facilities. We carried out a safety check of 123 tank lorry customers to help small-sized customer businesses use gas more safely. As a result of such efforts, we were rated “good” in the government’s customer satisfaction survey conducted in 2019 as in the preceding three years, befitting a business adopting the slogan “customer-centered management.”

Acquiring SQ certification

In December 2019, we acquired Service Quality (SQ) certification from the Korea Association for Service (KOAS), a certification institution under the Ministry of Trade, Industry, and Energy (MOTIE), following the one in 2016. Thus, we became the first domestic public energy business to acquire the certification twice. We garnered high scores in seven areas (i.e., leadership, service quality management strategy, customer information system, customer contact point service operation management, human resources and organization management, effective use of resources, and service management result).



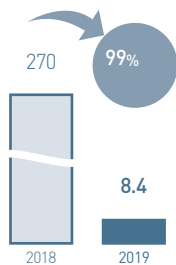
Certification as an excellent company in Standard Service Quality for 2 years in a row (Dec. 2019)

Active communication with customers and alleviation of people's energy price burden

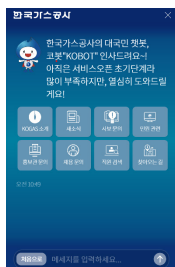
Support for typhoon-stricken areas by fee relief

3,646 households

(For a household whose house was destroyed completely: reduction of KRW 12,400/month; For a household whose house was 50% destroyed: reduction of KRW 6,000/month)



Unpaid gas fee (Unit : KRW billion)



KOBOT

Realization of energy welfare without blind spots

We try to find people who fail to benefit from energy welfare in a bid to spread welfare to a wider range of people. We integrated the government's welfare database and urban gas businesses' customer information databases into one. Together with urban gas businesses, we paid a visit to all individual end-users to establish a national welfare network without loopholes. Thus, we set up a one-stop service system, as a result of which welfare facilities benefitting from gas fee reductions increased by 17% year on year to a total of 27,524 in 2019.

Welfare network without loopholes



Providing gas fee reductions to households suffering from natural disaster

We strive to alleviate people's financial burden concerning energy expenses by operating our business more efficiently. Further, we help households suffering from a natural disaster like an earthquake or typhoon by lowering their gas fees. We accepted the government's proposal to postpone the collection of urban gas fees for three months, starting in April of this year, as part of the nationwide effort to overcome COVID-19.

We could afford room for such maneuverability thanks to the efficiency of our operations including the lowering of natural gas import prices based on our world-class purchasing power.

Enhanced level of customer satisfaction through the reflection of people's opinions

We provide programs like open exhibitions inviting people's participation so that a wide range of people's voices may be reflected in overall management in the hope that they will lead to innovative results. In 2019, we held a session for the selection of new business based on new ideas submitted during an international music festival in Daegu. We decided to consider "the business of providing the right of transportation to less-privileged people through a program for providing environment-friendly vehicles," which was selected from among a total of 84 ideas submitted. We also hold the Open Contest for KOGAS Publicizing Contents each year to publicize the importance of natural gas and have an opportunity to communicate with the people. The transparency of its judging process was enhanced with the public's participation. The prize-winning pieces are used for the PR of KOGAS at our PR halls and social media channels.

[Provision of a round-the-clock consulting service]

In the Open Contest for Ideas Suggested for KOGAS's Innovation, which was held in order to reflect good ideas contributed by the public in our overall management, an entry titled Invigoration of Communication and Participation through KOGAS's Chatbot Service won first place. Our chatbot service was started in December 2019 with the name KOBOT through our homepage. As a dialog-based system designed to understand the user's intention with AI, KOBOT is used to provide a round-the-clock consulting service in response to people's requests for information. At present, it remains at the infancy stage, but we will continue to improve its functions to enhance the level of customers' satisfaction by enhancing communication with our customers.

Background of promotion

- Request for a customized service in response to people's frequent requests for information
- Seeking to enhance the efficiency of consulting business and level of customer's satisfaction with the adoption of an AI-based channel for communication

Major contents

Existing features	Hiring-related FAQs	Urban gas-related inquiries in regions	Hiring-related FAQs
	Searching the homepage	Phone/Retrieval (average of 157.5 cases a month)	Homepage for the PR Hall
Improvements to be made	Implementation of KOBOT, an interactive chatbot that understands the user's intention		
Roadmap	Dec. '19	'20 - '21 (period of expansion)	'22 - '25 (period of deepening)
	Opening the service for people	(External) + (Simple internal business such as business trips)	Customized service recommended



한국가스공사 Kogas

SUSTAINABILITY FACT BOOK

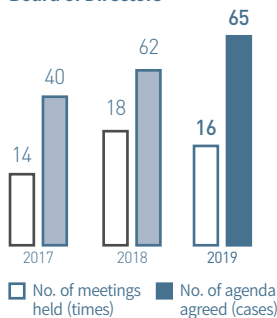
AS A LEADING PUBLIC COMPANY, KOGAS IS COMMITTED TO FULFILLING ITS SOCIAL RESPONSIBILITIES BY OPERATING A SOUND CORPORATE GOVERNANCE STRUCTURE, PROMOTING ADVANCED ETHICAL MANAGEMENT, AND REALIZING HUMAN RIGHTS MANAGEMENT THAT PAYS KEEN INTEREST TO THE WELLBEING OF THE SOCIALLY DISADVANTAGED. FURTHERMORE, WE ARE STRIVING TO STRENGTHEN OUR COMPETITIVENESS IN SUSTAINABILITY MANAGEMENT THROUGH PRE-EMPTIVE RISK MANAGEMENT DEALING WITH OUR NON-FINANCIAL ASPECTS AS EFFECTIVELY, TOO. IN A BID TO INCREASE TRUST IN OUR PERFORMANCE, WE WILL CONTINUE TO DISCLOSE ALL THE RELEVANT INFORMATION GENERATED IN THE COURSE OF CARRYING OUT OUR BUSINESS TRANSPARENTLY.

• Governance	72
• Integrity & Ethical Management	74
• Human Rights Management	77
• Risk Management	82
• Stakeholder Engagement	84

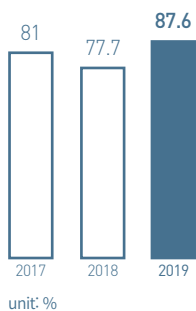
GOVERNANCE

Composition/ Operation of a sound Board of Directors (BoD)

Status of operation of the Board of Directors



Percentage of directors taking part in BoD sessions



Composition of BoD

KOGAS's BoD is the highest decision-making body in charge of making decisions on major strategies and policies as well as supervision and provision of management support for pending management issues. We operate the BoD under the Act on the Management of Public Institutions and our Articles of Incorporation. Our BoD is composed of not more than seven standing directors including the President and not more than eight non-standing directors, with the number of standing directors being less than half of the total number of directors. As of the end of 2019, our BoD is composed of a total of twelve directors, i.e., four standing directors including the President and eight non-standing directors. As a market-type public business, we appoint a senior non-standing director selected through deliberation and a decision by the Ownership Steering Committee as Chairperson of the BoD. At present, the number of our non-standing directors comes to twice that of standing directors. For the past 14 years since 2007, we have secured the independence of our BoD by electing a non-standing director as its Chairperson. Our independent directors are elected among those with sufficient KOGAS business-related knowledge/experience concerning not only economy, management, and law but also the field of energy including gas under the Guidelines pertaining to the Management of Public Enterprises/Quasi-Government Institutions. In the election of independent directors, we disqualify those who were in an important transaction with KOGAS or any director/employee of KOGAS within the past two years or who worked as an employee for a business competing with KOGAS.

* (Securing directors' independence) To strengthen the BoD's function of checking and enhancing the efficiency of the BoD's operation, etc., KOGAS's non-standing directors are not allowed to double as director, executive member, or auditor of another business. The following persons shall not be elected as a non-standing director of KOGAS: one holding shares of a corporation whose total amount of transactions with KOGAS comes to 10% or more of its total amount of assets over the past three business years; one holding shares amounting to 1% or more of said enlisted company's total number of stocks issued.

Efficient BoD operation

The term of office of KOGAS's President and director/auditor is three and two years, respectively. Two months prior to the end of the current term, we hold a session of the Executive Member Recommendation Committee. Those recommended by the committee are finally confirmed annually by the Minister of Strategy/Finance based on deliberation and a decision by the Ownership Steering Committee. Our BoD session is held once a month, with the attendance of 70% of the members in office constituting a quorum. The contents of a BoD session are disclosed through our homepage and the Management Information Disclosure System (www.alio.go.kr) unless they include confidential management information. The passage of an agenda item submitted to a BoD session requires consent of the majority of those in office. A director who has a special interest in the agenda item being discussed is not allowed to take part in the voting to prevent a conflict of interest.

Securing BoD members' diversity

In the election of a director, we put no restriction whatsoever including gender, race, ethnicity, nationality, country of origin, or cultural background on the candidates in an effort to secure the diversity of the BoD members under our Articles of Incorporation and the Executive Member Recommendation Committee Regulations. We offer equal opportunities to all who possess sufficient capacity and capability. Most notably, to help increase the percentage of our female executives in the short term, we have added the Ministry of Gender Equality and Family to our list of job posting sites for female executive candidates and increased female candidates' accessibility to our hiring information while maintaining at least more than one female executive in our board of directors at all times. In the longer term, we are doing our best to increase the proportion of our female executives to 20% while striking a balance in our executives' regional backgrounds as well. The first female non-standing director was elected in 2018, and the status was maintained in 2019.

BoD composition

(As of May 2020)

Classification	Name	Gender	Status	Term of office	Field of expertise/Experience
Standing directors	Chae HeeBong	M	President	Jul. 09, 2019 ~ Jul. 08, 2022	(Industry) Former Division chief at MOCIE
	Seong Yeonggyu	M	Standing directors	Nov. 19, 2019 ~ Nov. 18, 2021	(Industry) Former Chief of LNG Terminal Division, Former Chief of Busan and Gyeongnam District Division
	Lim Jongguk	M		Jul. 26, 2018 ~ Jul. 25, 2020	(Industry) Former Chief of KOGAS Overseas Business Division, Former Chief of KOGAS LNG Terminal Division
	Nam Yeongju	M	Member of the Audit Committee	Jan. 13, 2020 ~ Jan. 12, 2022	(Communication, policy) Former Secretary General, Office of the Ombudsman Korea
Non-standing directors	Heo Namil	M	Outside director	Jul. 30, 2018 ~ Jul. 29, 2020	(Management) Professor, Kangnam University; Former President, KAIBA
	Lee Donghun	M		Aug. 23, 2018 ~ Aug. 22, 2020	(Accounting) President, LEE Donghun Accounting Office; Former Accountant, Sandong Accounting Office
	Kim Changil	M		Aug. 23, 2018 ~ Aug. 22, 2020	(Law) President, Iru Law Firm; Former Senior Legal Adviser to MOLIT
	Lee Byeonghwa	M		Oct. 29, 2018 ~ Oct. 28, 2020	(Economy) Former Professor, Chosun University; Former Officer at the Planning and Budget Ministry
	Kim Euihyeon	M		Oct. 29, 2018 ~ Oct. 28, 2020	(Policy) Former Policy researcher, Trade, Industry, SMEs, and Startups Committee of the National Assembly
	Kim Jongcheol	M		Dec. 04, 2018 ~ Dec. 03, 2020	(Law; human rights) President, SaeSeoul Law Firm; Former Chair, Human Rights Committee of the Korean Bar Association
	Kim Hyeseon	F		Dec. 04, 2018 ~ Dec. 03, 2020	(Policy) Professor, Suncheon National University; Former member of the Financial Policy Advisory Committee of MOSF
	Ahn Hongbok	M		Nov. 21, 2019 ~ Nov. 20, 2021	(Accounting) Professor, Keimyung University; Former Vice President Korean Association of Tax and Accounting

Stricter manage supervision of non-standing directors

3 decisions on modifications concerning management supervision

Transparent BoD evaluation and remuneration

Under Article 14-5 (7) of the Public Service Ethics Act, where the total amount of shares held by the head, deputy director, or standing auditor of a public enterprise or the relevant stakeholder exceeds 30 mil. won, they should be sold or left in a trust. This is a clause stipulated from a government's perspective that puts public interest like anti-corruption above managerial benefit by letting a member of the management hold treasury stocks. Directors other than those stated above are allowed to hold said shares.

Shareholder composition

Operation of Subcommittees

We operate three subcommittees concerning audits, innovative growth, and overseas business in the BoD to secure expertise in the BoD's decision-making. Composed of non-standing directors, the subcommittees check and supervise our overall management in addition to enhancing efficiency in business operation. In 2019, we increased the number of the members of the Innovative Growth Committee to three and expanded its business including the sectors of innovative growth and realization of social values.

(As of Mar. 2020)

Classification	Composed of	Major functions
Audit Committee	One standing director and two non-standing directors	<ul style="list-style-type: none"> Reporting directors' violation of laws/articles of incorporation to the BoD Carrying out matters entrusted by the BoD; matters stipulated in the law/articles of incorporation to those to be assumed by the Audit Committee
Innovative Growth Committee (formerly known as Sustainable Management Committee)	Three non-standing directors	<ul style="list-style-type: none"> Matters related to the mid- to long-term management plan; major investment business Budget/Operating plan, management evaluation, PR, etc. Safety/Environment business/Operating plan Matters concerning ethical management and social contribution activities Matters concerning innovative growth and the realization of social values
Overseas Business Committee	Three non-standing directors	<ul style="list-style-type: none"> Overseas resources exploration, development, and production Deliberation or consulting on overseas industrial plants or other overseas business

We are equipped with the BoD Management System, which checks the contents of directors' activities (attendance records, management-related suggestions, expression of opinions, etc.) and their results. Thus, we strive to make fair, transparent compensation for the BoD members based on such checks. Every year, we arrange for the BoD members to engage in a self-evaluation through a survey and have the analyzed results reflected to the operation plan for the following year to allow the BoD to continue to develop. In December 2019, we developed a result management index composed of the number of cases of decisions on modification, attendance records, reports on pending issues, etc. in a bid for a more systematic result management for the BoD. We also carry out periodic result evaluations concerning members of the BoD and disclose the contents transparently in our sustainable management reports and e-disclosure system. Remuneration for standing directors including the President is composed of basic pay, performance-based pay, and a retirement allowance. The amount of remuneration is set per performance index including the financial results of management activities, outside evaluations, environmental, social, and governance (ESG), and annual evaluations of management results by the government. The level of execution of the CEO's management contract is subject to evaluation as per the government's management evaluation "leadership index" in connection with the need to enhance the management results on a mid- to long-term basis. Remuneration for directors is set and paid over three years as per the institutional grade and payment ratio based on the result of such evaluation. The "Leadership index" sets objectives like the result of conversion into environment-friendly energy, result of job creation, and result of putting matters concerning human rights/integrity into practice for each year. We continue to manage it to realize social values. We also pay an adequate level of service allowance to non-standing directors. The annual basic pay for the President, standing directors, and auditor is fixed as per the BoD's decision within the limit approved by the General Meeting of Shareholders (GMOs).

Unit: KRW 1,000

Amount of remuneration paid to BoD members in 2019

Position	Number of people	Total amount of remuneration	Per-person amount	Remarks
Registered directors* (excluding Outside directors and members of the Audit Committee)	3	623,239	208,413	
Outside directors (excluding members of the Audit Committee)	8	-	-	Service allowance: KRW 2.5 million /month
Members of the Audit Committee**	1	175,727	175,727	

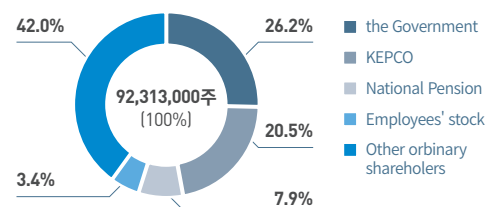
* KOGAS is a business subject to the Criteria for the Integrated Public Disclosure of Public Institutions set by the Minister of Strategy/Finance. Said amounts of remuneration stated here are the annual amounts calculated per said Criteria. The number of people is stated based on the total quota. As of the day the information is drawn up, the registered directors in office number three (excluding members of the Audit Committee). The amount paid on July 31 based on the management evaluation (based on full attendance) is added here. Thus, the amounts stated here may be different from what was actually paid.

** Lee Donghun and Heo Namil, who are independent directors, doubled as members of the Audit Committee as of the end of 2019. Allowance for doubling is not paid, so they are classified only as independent directors. Thus, the information here on the remuneration of members of the Audit Committee deals with the remuneration for standing members of the Audit Committee only.

(2019년 말 기준)

KOGAS was listed on the Korea Exchange (KRX) on December 15, 1999. Our legal capital amount stands at KRW 461.5 billion as of the end of 2019. Public shareholders (the government, KEPCO, National Pension, etc.) hold 54.6% of equity. The Korean government, which is the largest shareholder (26.15%), had held this status for the past four years.

Shareholders' equity holdings

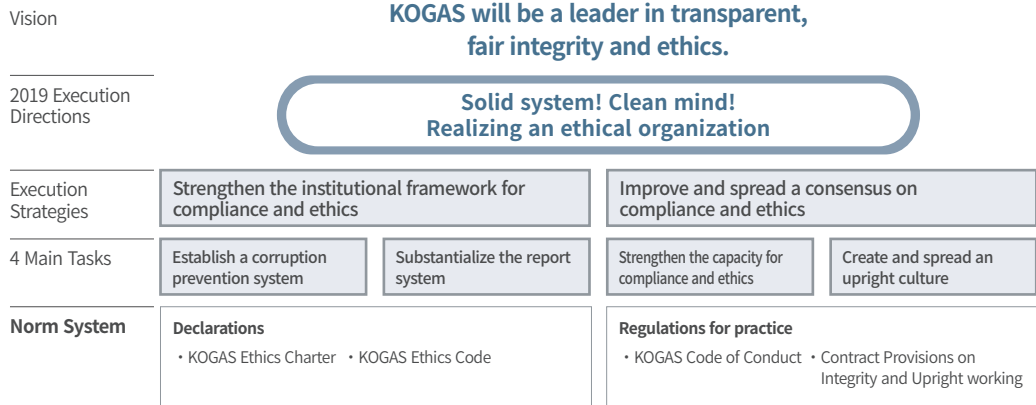


INTEGRITY & ETHICAL MANAGEMENT

Creating an environment for integrity and ethics

Implementing strategies for integrity and ethical management

For integrity and ethical management, KOGAS is performing the 4 main tasks according to the 2 major execution strategies under the vision of “a leader in transparent, fair integrity and ethics.” In 2019, we identified matters that need improvement by diagnosing the implementation system of 7 infrastructure items, including systems and education, through consulting with experts in integrity and ethics and redesigned the infrastructure for integrity and ethical management. KOGAS is making efforts to prevent corruption and create a clean corporate atmosphere by establishing the code of ethics to be the standard for value judgment and behavior of its executives and staff members and ensuring that they observe this code.



Organization for the supervision and execution of integrity and ethical management



Strengthening integrity and anti-corruption leadership

KOGAS is spreading the culture of upright working throughout the company with activities that enhance the leadership of people holding high-ranking positions and deciding the policy directions of the company. In 2019, the heads of the headquarters and departments spread messages on integrity in relay via the company’s electronic bulletin board to the employees under their leadership, with the company evaluating the degree of integrity of second-grade and higher officers and launching a campaign during the Integrity Week led by executives in order to enhance the integrity leadership. In addition, the standing auditor sent letters to external stakeholders to announce the will for integrity widely. The standing auditor also conducted “visiting education on integrity” for the employees of partner companies to publicize the power tripping behavior report center and implement education on the prevention of corruption. Meanwhile, KOGAS has newly established the “Anti-corruption Committee” and the “Power Tripping Eradication Committee” to prevent corruption and power tripping.

Strengthening the prevention and control of corrupt acts

KOGAS further strengthened the policy of severe punishment for the eradication of the 4 major misconducts including receipt of money & valuables or treatment and embezzlement of company money. If a misconduct is discovered, the boss of the wrongdoer will also be subject to disciplinary measures by collective responsibility and will be marked down in the competency evaluation. The person who commits the misconduct will be punished by demotion, extension of the period of prohibition of promotion, social service activities, etc. based on the decision on the disciplinary measure. Moreover, intensive auditing will be performed on areas susceptible to corruption such as finance, supply, production, and performance for the proactive elimination of the risk of occurrence of corruption and continuous reinforcement of internal control.

Area	Main points of the audit	No. of auditors (Yearly)
Finance	Settlement of accounts	• Effectiveness in operation of the internal accounting management system • Status and appropriateness of asset and debt accounting • Adequacy of examination of financial statements and slips 5(200)
	Tax affairs	• Types of occurrence and causes of additional tax and tax investigation • Improvement of problems in internal control procedures related to tax risk 4(60)
Supply	Facility construction	• Appropriateness of working procedures and maintenance of supply facilities • Establishment of fair transaction orders with partner companies 5(50)
Production	Terminal construction	• Control of inappropriate increases in project costs for a large-scale construction project • Cases of design and construction improvement 5(50)
Performance	Personnel operation	• Fairness and transparency in major areas of personnel management including recruitment • Rationality of the regulations on personnel management and compliance 4(60)



Integrity education for partner companies (Sep. 2019)

Creating an upright, ethical culture

Number of reports

(Unit: cases)

2017	2018	2019
52	82	89*

* Have been handled 100%.

Self-diagnosis of ethics level

(Unit: points)

2017	2018	2019
84.04	85.65	85.90

Promoting the reporting system

KOGAS is operating the combined online and offline Misconduct Report Center as part of the effort to block unethical behaviors in the early stage and strengthen the company's ability to autonomously address such issues. If a person reports any misconduct such as reckless management, damage from power tripping, illegal subcontracting, or solicitation, the report is automatically relayed to the person in charge in the auditor's office. We have enabled reporting misconducts easily anytime, anywhere using various methods including the e-People system, anonymous report system (Red Whistle), mobile report center, etc. In 2019, we improved the auditing method by diversifying the methods of on-site inspection and avoiding exposing the reporter during the actual auditing. We did this in order to protect the reporter and paved the way for the activation of a reporting culture by arranging the regulations to reward the reporter. In addition, we provided easily accessible, professional communication channels for law observance and ethical working, such as Q&A bulletin board on laws and company rules and appointment of a lawyer to create a good environment for working reasonably.

Operating a transparent recruitment test audit system

We are strengthening the monitoring of all processes of recruitment including the recruitment test in order to block fundamentally any irregularity that may occur during the process of recruitment. Notably, we have introduced the established recruitment test audit system (KOHAS) for the first time among Korean public institutions in order to root out recruitment irregularities. The system was selected as a superior case in the workshop hosted by the Anti-Corruption and Civil Rights Commission and a case for benchmarking by the monthly magazine of the Korea Personnel Improvement Association. It is now being disseminated to other organizations as an exemplary case.

Eliminating risks in all processes of recruitment



Internalizing ethics and integrity

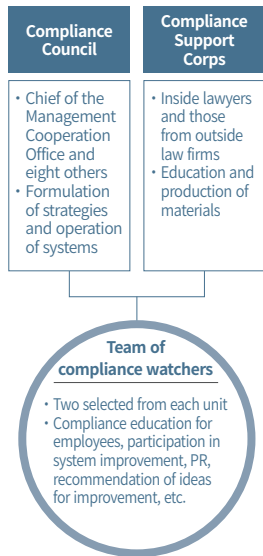
KOGAS is operating various ethics and integrity internalization programs for not only the executives and staff members of KOGAS but also the employees of partner companies and the general public in order to realize an upright KOGAS and an upright society. In particular, we designated the Integrity Week for the institutionalization of integrity awareness and eradication of power tripping. During the Integrity Week, we hold anti-corruption and integrity events such as a play about the eradication of power tripping, an integrity photo contest, and the distribution of integrity letters to citizens. Moreover, we open a workshop for partner companies' employees to share good integrity policies with them and explain about the Misconduct Report Center. In addition, we collected letters of promise on integrity from all employees working in overseas subsidiaries and conducted cyber education for them to instill anti-corruption and integrity awareness. The public institutions located in Daegu Innovation City held various joint events on ethics with the participation of citizens to boost the level of ethics.

Ethics and integrity spreading program

Executives & staff	Integrity by participation	Integrity by consensus	Integrity by sharing
	<ul style="list-style-type: none"> • Operation of Integrity Week - Integrity concert, play on the eradication of power tripping, etc. • Junior Board integrity and ethics workshop • New communication channel for counseling on law observance and ethics 	<ul style="list-style-type: none"> • Visiting integrity talk (16 times) • Integrity workshop for executives to enhance leadership (3 times) • Lifecycle integrity and ethics education (5 times) • Cyber education on integrity and ethics for all employees (twice) 	<ul style="list-style-type: none"> • Integrity photo contest • Publication of guidelines for the Anti-graft law • Contest on power tripping cases • Proposal of good integrity policies
Partner company	Workshop for partner companies		Education for investment companies
	<ul style="list-style-type: none"> • City gas companies: Share good integrity policies and give information on the report center • Construction companies: Education with plays based on interviews with partner companies 		<ul style="list-style-type: none"> • Collect letters of promise on integrity from the employees of all overseas subsidiaries and conduct cyber education • Self-education by each subsidiary: To be reflected in the managerial index of investment companies
The public	Joint activities of public institutions in Daegu Innovation City		Self-activities of KOGAS
	<ul style="list-style-type: none"> • Joint integrity campaign (3 times with the participation of citizens) - OX Quiz on the anti-graft law, operation of integrity counseling center, etc. • Operation of Anti-corruption Week with the participation of citizens (integrity play, concert, etc.) 		<ul style="list-style-type: none"> • Present superior integrity and ethics cases of KOGAS at the briefing session for citizens • Launch an integrity and ethics street campaign by cooperating with the private sector • Discover and publicize integrity contents using SNS

Fostering a culture of fair trade

Promotion system



Compliance watchers

We operate a team of compliance watchers to proactively cope with any possibility of irregularities. Composed of individuals selected from the corporate headquarters and places of business across the country, the team engages in the work of compliance education for their own employees, participation in system improvement, recommendation of ideas for improvement, etc. in a bid to build consensus for compliance among employees. We operate the compliance system in step with the strategies formulated by the Compliance Council composed of the Chief of the Management Cooperation Office and seven others and make compliance part of employees' business lives. We accomplish this by holding education sessions and distributing materials provided by the Compliance Support Corps, in which in-house lawyers and outside law firms participate.

Establishment of a KOGAS-type model of win-win cooperative transactions

We adopted a KOGAS-type model of win-win cooperative transactions in a bid to lay the groundwork for fair competition. First of all, we are establishing a model of win-win cooperative transactions by focusing on the reality of transactions with subcontractors to grasp the institutional factors inducing unfair transactions and improve them. In 2019, we focused on the execution of 25 tasks in the top 3 fields, i.e., model for transactions with subcontractors, blocking of private businesses' unfair acts, and internal rules. We were selected by the government as a leading institution engaging in exemplary transactions and asked to make a presentation at the Blue House.



ACRC's evaluation of KOGAS's overall integrity

2017	2018	2019
7.49 points (Gr. 4)	8.14 points (Gr. 3)	8.43 points (Gr. 3)

Evaluation of KOGAS's anti-corruption measures

2017	2018	2019
87.77 points (Gr. 3)	92.26 points (Gr. 2)	92.17 points (Gr. 2)

Establishment of a procurement system that reflects social values

We revised the Detailed Criteria for Procurement-related Qualification Screening -- which is an internal contracting system -- in a bid to expand social values in the procurement process. The focal point of the revision is the creation of more jobs in the private sector by lowering the bar for bidding for startups/small-sized businesses. The revision also offers preferential treatment in bidding to exemplary businesses that hire women and disabled individuals as well as those that reduce working hours. Through these efforts, KOGAS supports the economic activities of the socially and economically less-privileged. We revised the relevant guidelines in December 2019, making it a rule to attach an affidavit for the execution of integrity agreements in signing a contract and for a contracting department to draw up a checklist concerning unfair contracts, which was designed to block unfair acts prior to asking for placement of an order.

[Disclosure of violations of unfairness/anti-corruption requirements]

We disclose violations of requirements pointed out through internal inspections or by outside institutions (such as BAI, MOTIE, National Assembly, etc.).

The contents of disclosure include all specifics like letters asking for the appropriate steps, report on audit results, etc. excluding personal information. The relevant cases pointed out in 2019 include violations of the duty of good faith or integrity, inadequacy in the promotion of a contract, carelessness in procurement management, malpractice in purchasing, and violation of the code of conduct. For more details, please click the following

<http://www.alio.go.kr/popReportTerm.do?apbald=C0147&reportFormRootNo=2121>

HUMAN RIGHTS MANAGEMENT

Human rights management strategy and establishment of the relevant system

Promotion of human rights management strategy

We strive to disseminate a culture of respecting human rights as an institution regarded as an exemplary one in the application of NHRCK's manual. We enacted the Human Rights Management Charter to announce our relevant vision and commitment, and we developed systems for the relevant promotion including the formulation of a human rights management-related basic plan, mid- to long-term roadmaps, and enactment of regulations and detailed enforcement rules.

Objective

Realization of human-centered social values through the adoption/ dissemination of world-class human rights management

Roadmap of phased promotion	Introductory stage (‘18)	Maturation stage (‘19)	Stabilization stage (‘20)
	Establishment of a world-class human rights management system	Adoption/Execution of world-class human rights management	Improvement/Sharing/Dissemination of the human rights management system
Major tasks	<ul style="list-style-type: none"> Enactment of human rights-related norms (charter, regulations, and detailed rules) Establishment of a basic system (system for infringement remedies, etc. provided by the Human Rights Management Committee and Human Rights Consultation Center) Education on human rights sensitivity (for employees and stakeholders) Education for building working-class capability concerning human rights management Human rights impact evaluation (related to operation of the institution and major business) 	<ul style="list-style-type: none"> Improvement of norms and systems based on human rights impact evaluations (review of the manual for each sector) Expansion of human rights sensitivity (execution of education for each sector; Education for building working-class capability) Periodic checking of obligations for putting human rights into practice and checking the status (execution of the secondary operation of the institution; expansion of human rights impact evaluations in major businesses) 	<ul style="list-style-type: none"> Improvement of norms and systems based on human rights impact evaluations (review of the manual for each sector) Expansion of human rights sensitivity (execution of education for each sector; education for building working-class capability) Periodic checking of obligations for putting human rights into practice and checking the status (expansion of human rights impact evaluations in major businesses)

System for the promotion of human rights management



The 3rd Human Rights Management Committee (May 2019)

Important tasks in 2019

Substantiation of the human rights management system through a day-to-day evaluation system	Strengthening the effectiveness of the human rights remedy system through the establishment of a system for preventing infringements from recurring	Enhancement of stakeholders' human rights consciousness with a variety of programs
---	--	---

Substantiation of the human rights management system



Improvement of norms and systems in a human rights-friendly way

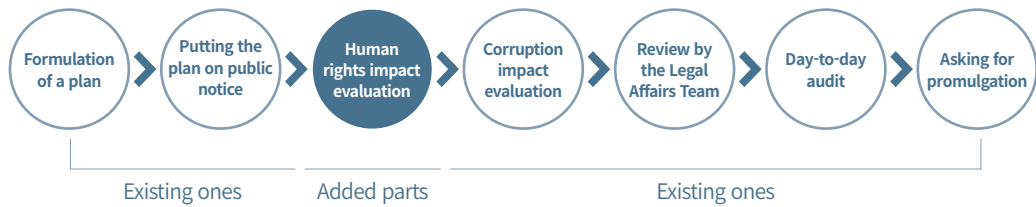
We strive to establish a system of human rights-friendly norms and improve the relevant systems/regulations. To that end, we revised nine major in-house rules based on their evaluation by human rights experts through consultations with 13 relevant departments. We inserted a new clause in the in-house rules concerning the need for prior consultation on sectors with a high likelihood of human rights infringement – such as supply and production facilities’ construction and operation -- and a new clause recommending the relevant measures like prevention of such infringement as required.

Improvement of 9 in-house rules in a human rights-friendly way

Conflict management operation guidelines	EHSQ management regulations	In-house rules management regulations
Guidelines for the prevention of sexual harassment in the workplace	Regulations on support businesses concerning supply facilities’ construction work	Regulations on support businesses concerning production facilities’ construction/operation
Employment rules	Contract business management guidelines	Guidelines for the open operation of information disclosure

We also added a procedure for human rights impact evaluations at the time of enactment/revision of our regulations in a bid to review in-house rules from a human rights perspective and block potential human rights risks.

Process for improving the way our in-house regulations are enacted/revised



Improvement of the manual and relevant guidelines for the operation of the Human Rights Consulting Center

We improved the manual and relevant guidelines for the operation of the Human Rights Consulting Center based on the results of experts’ diagnosis of our system of remedies for human rights infringement.

Major items improved

Principle for handling incidents of human rights infringement

- Ensuring the anonymity of petitioners; providing physical and institutional conditions for consulting that can prevent the victim from experiencing secondary damage
- Handling of incidents by an employee with the relevant expertise

Trying to settle an incident through an informal procedure via consulting involving the petitioner and the other party

Informal procedure

Trying to settle an incident through consulting

➤

Failure to settle

➤

Formal procedure

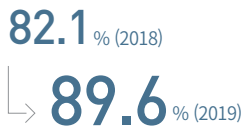
Receipt and processing of petition

Improvement of guidelines for human rights infringement consulting

- **Strengthening the function of consulting**
(Grasping the accurate situation of the alleged human rights infringement; checking whether there are other victims associated with the case submitted and how the other party views the situation, etc.)
- Making it obligatory to engage in follow-up management to prevent the recurrence of a similar case

Human Rights Impact evaluation

Self-diagnosis of our human rights management level



In-house process for human rights impact evaluation



Construction business impact evaluation

Diagnosis based on the construction sector checklist



Secondary institution-operated human rights impact evaluation

We carry out human rights impact evaluations to diagnose potential human rights risks in the operation of the institution's and our major business areas and to find ways to prevent and solve the problem. In 2018, we came up with a basic draft for our own human rights impact evaluation checklist* by referring to the manual provided by NHRCK. In 2019, we carried out secondary institution-operated human rights impact evaluations by making an improved version of the checklist, reflecting the result of the human rights status survey in-depth. A total of 25 departments carried out a self-check using the checklist, and it showed that our human rights level stood at 89.6% or a 7.5% y-o-y increase.

* Our human rights impact evaluation includes not only our employees but also all stakeholders related to our management activities such as locals (including children), migrant workers, and employees of our subcontractors/overseas subsidiaries, etc.

Continued improvement in human rights impact evaluations

NHRCK-provided manual	2018	2019
Checklist (158 items in 10 sectors)	Drafted our own checklist (190 items in 13 sectors)	Strengthening our institution-operated checklist (202 items in 13 sectors including employees' human rights newly added)
Human rights impact evaluation	Document-based evaluation and experts' evaluation mostly based on the checklist	Document (e.g., basic surveys like questionnaire-based survey/in-depth survey, etc.)-based evaluation and experts' evaluation

Expansion of human rights impact evaluations in major business sectors (supply/construction)

We expanded the execution of human rights impact evaluations in the construction sector to foster a construction work culture wherein workers are respected. In August 2019, we carried out human rights-related due diligence on jobsites in Jeondong-Cheongju and Incheon using the checklist for construction developed based on human rights status surveys and experts' advice. We also came up with ways to uphold human rights in design/contractual work sectors through discussion meetings. In addition, we launched a council designed to improve human rights at construction jobsites. In December 2019, we held a session of the Human Rights Management Committee that included the participation of top management and human rights experts, came up with 23 items required to improve the human rights situation at jobsites, and had them reflected in the business plan for 2020.

Phases of evaluation	Major items to be promoted
Status survey of construction jobsites (Aug. '19)	<ul style="list-style-type: none"> Coming up with a construction business checklist (117 items in 4 sectors) and onsite survey (subcontractors' 380 employees) Coming up with 12 tasks including human rights impact evaluation procedures, provision of adequate convenience facilities for workers, etc.
Human rights-related discussion meeting (Oct. '19)	<ul style="list-style-type: none"> Holding a discussion meeting to find ways to uphold workers' human rights Coming up with 11 tasks including the insertion of human rights in bidding appraisals, establishment of a safety management monitoring system for work in tunnels, etc.
Council for the improvement of human rights (Nov. '19)	<ul style="list-style-type: none"> Review of tasks for the improvement of human rights at construction jobsites by eight inside/outside Council members Enhancement of expertise/objectivity concerning tasks by outside experts' participation in the deliberation of tasks
Human Rights Management Committee (Dec. '19)	<ul style="list-style-type: none"> Fixing ways to improve human rights at construction jobsites through deliberation by top management and human rights experts Adoption of 23 tasks including expanding the locals-related human rights impact evaluation, establishing a safety management monitoring system for work in tunnels, etc. and having them reflected in the business plan for 2020.

KOGAS human rights impact evaluation checklist

Institution-operated human rights impact evaluation	Human rights impact evaluation in major business
<ul style="list-style-type: none"> Checklist (202 items in 13 sectors) (1) Establishment of a human rights management system (2) No discrimination in hiring (3) Guarantee of freedom of association/collective bargaining (4) No forced labor (5) No child labor (6) Ensuring industrial safety (7) Responsible supply chain management (8) Protection of locals' human rights (9) Ensuring environmental rights (10) Protection of consumers' human rights (11) Protection of information-related human rights (12) Protection of women's rights/maternity (13) Protection of employees' human rights 	<ul style="list-style-type: none"> Checklist (117 items in 4 sectors) (1) Establishment of a system for upholding human rights <ul style="list-style-type: none"> Planning · Plans for remedial steps · Follow-up evaluations and reports Stakeholders' participation (2) Adequacy of working conditions <ul style="list-style-type: none"> Employment contract · Working environment and conditions Rest and recreation Forced labor and violence · Health/Hygiene (3) Ensuring safety in construction jobsites <ul style="list-style-type: none"> Standard work procedure · Safety rules · Safety system Prevention of industrial disasters and compensation · Safety education (4) Checking for human rights infringements in sectors <ul style="list-style-type: none"> Work/Safety regulations in sectors · Safety facilities/gear Grasping the risk factors in the types of work/education

Fostering a culture for upholding human rights

Strengthening stakeholders' human rights management capability

We carry out customized/segmented human rights education for both insiders and outsiders working with us in a bid to disseminate respect for human rights. In 2019, we held education sessions for top-level managers and all employees to help them understand the need for human rights management better and disseminate the consensus for upholding human rights. Education sessions for top-level managers focused on the need to strengthen their human rights leadership. Those for employees in charge of human rights impact evaluations focused on the enhancement of their expertise in human rights. We also held such sessions for outside stakeholders including construction businesses, urban gas businesses, and locals. The in-depth education sessions that we held focused on industrial safety, improvement of the way we view the disabled, information security, and sexual harassment. In addition, we disclosed the result of our promotion of human rights management activities and exemplary cases through our homepage, workshops, and report meetings for people in an effort to disseminate the human rights management culture more widely.

Human rights education sessions held for inside/outside stakeholders

(Unit: persons)

Attendees	Contents of education	Number of attendees	
		2018	2019
Those from inside	Top-level managers	4	232
	Departments in charge	12	22
	All employees	2,104	3,880
Those from outside	Employees of construction businesses	-	85
	Those from customer businesses	-	13
	Locals	-	500

Sectors where our human rights education were carried out

Industrial safety rights	Rights to equality	Right for win-win development	Information right	Employees' human rights
Safety education provided where people require it for employees of KOGAS and our subcontractors (947 attendees)	Need to improve the way we view the disabled and to prevent child abuse (3,995 attendees)	Education on technologies required by SMEs and onsite job skills (253 attendees)	Education on information security and protection of personal information (3,319 attendees)	Need to prevent The four leading cases of violence including sexual harassment (3,993 attendees)

Result of human rights impact assessment in the construction sector (Promotion of improvement of human rights on 23 construction jobsites)

Major issues to be improved

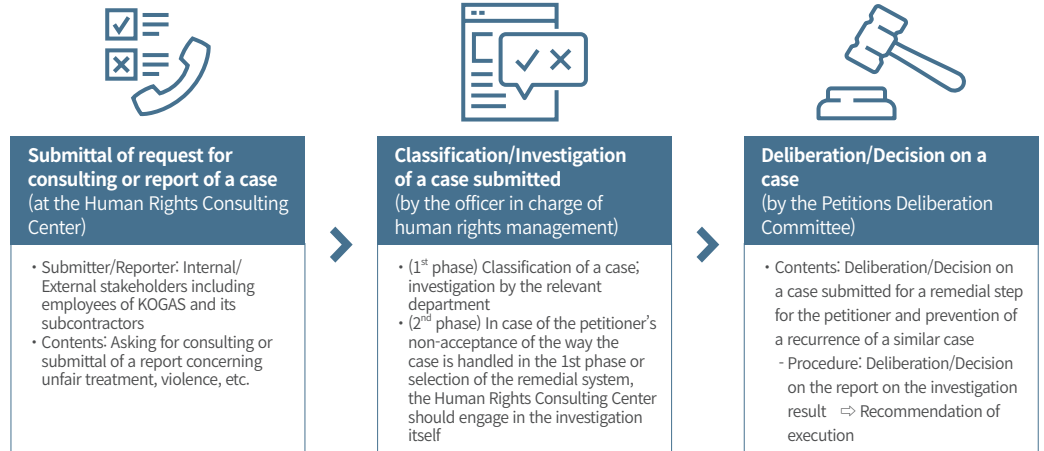
<p>Improvement in lighting design for administrative offices with no light pollution</p> <ul style="list-style-type: none"> • Improvement in lighting design 	<p>Establishment of an integrated safety monitoring system</p> <ul style="list-style-type: none"> • Adoption of integrated monitoring system 	<p>Execution of a program for enhancement of workers' health</p> <ul style="list-style-type: none"> • Health enhancement programs carried out in linkage with relevant institutions - Health consulting (Quit smoking program, prevention of diseases in cerebrovascular / musculoskeletal system, consulting for management of job stress and working environment - Onsite group / individual consulting
<ul style="list-style-type: none"> • Bird-eye-view of outside 	<ul style="list-style-type: none"> • Toxic gas detection system  <p>In linkage with the outdoor electronic signage</p>	<ul style="list-style-type: none"> • Use of local health management network 

Operation of remedies for human rights infringement

Organizations dedicated to the prevention of human rights infringement

We receive reports from both internal and external stakeholders in terms of human rights infringement through the relevant channels including the Human Rights Consulting Center, Petitions Deliberation Committee, etc. We also strive to find remedies for victims and prevent the recurrence of similar incidents through a relevant system such as deliberating on petitions. The Petitions Deliberation Committee in particular secures its independence and expertise as an organization, with outsiders constituting more than the majority of the members including its Chair.

Process of finding remedies for human rights infringement



[Case of coping with human rights infringement in 2019]

In February 2019, an employee of one of our subcontractors submitted a report on a case of human rights infringement to the Human Rights Consulting Center. We investigated the case through interviews with the petitioner, the other party, and the relevant colleagues. The Petitions Deliberation Committee asked the subcontractor to take adequate steps, and the subcontractor finally informed us of the steps they took.

In the aftermath of the case, we checked the improvements to be made in the process of coping with such cases and had the results reflected in the relevant manual and the contents of education carried out for employees in a bid to strengthen the effectiveness of human rights management. The step we took came to be recognized as an exemplary case concerning remedies for human rights infringement.

Spreading a culture of respecting human rights

Dissemination of the results of human rights management obtained in the public sector and of a culture of respecting locals' human rights

We strived to disseminate the execution of human rights management in the public sector by sharing/distributing the result of our promotion in this area. We also sought to enhance locals' human rights sensitivity by holding education and human rights programs.

Human rights-related programs executed in the local community

Gender equality/human rights-related film festival for locals in Daegu/Gyeongbuk

Education session sponsored by the City of Daegu for spreading a culture of human rights management and respect for human rights

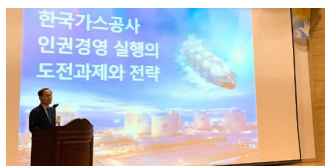
Education session concerning respect for workers targeting local undergraduates in Daegu/Gyeongbuk

Gender equality/ human rights-related stage play participated in by the locals in Daegu/Gyeongbuk

2019 Human Rights Management Forum (sponsored by NHRCK)

3rd Public Hearing on Businesses' Human Rights Management Guidelines (sponsored by the Justice Department)

2019 Human Rights Management Forum



Global Sustainable Management Workshop (sponsored by the UN Global Compact)

Workshop on issues and cases related to public institutions' realization of social values

UNGC Workshop



12th Asian Forum for Human Rights (sponsored by Human Asia)

Transferring know-how on the promotion of human rights management to 40-plus institutions upon request

Public hearing held by the Justice Department



RISK MANAGEMENT

Establishment of a risk management system

Risk management activities

(Risk management): Activities carried out for effectively preventing/monitoring and coping with a situation wherein loss or negative impact is likely to occur

(Crisis management): Activities carried out to cope effectively with/rehabilitate a situation wherein threat or harm is being posed

Promotion of major financial/non-financial risk management strategies

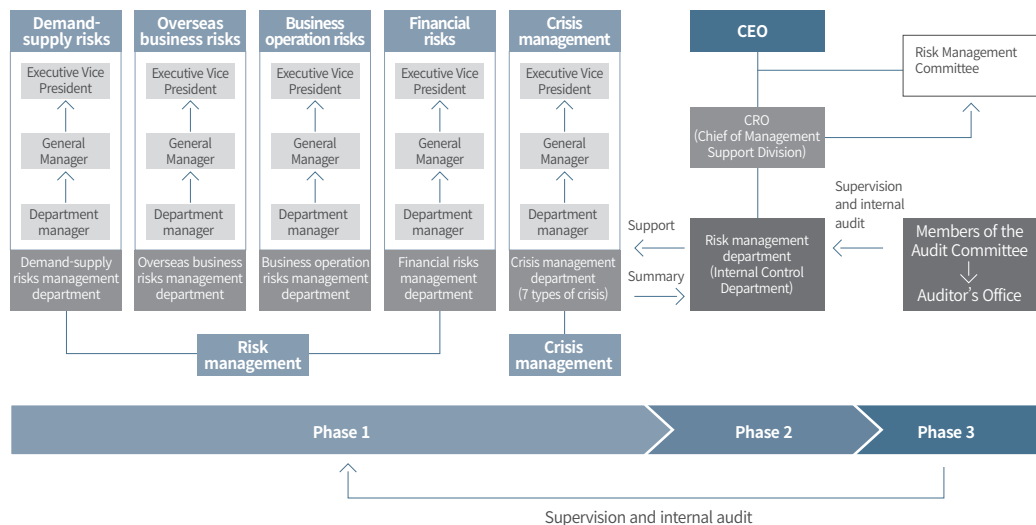
We strive to maintain the soundness and safety of our business through a phased management of risks by identifying, analyzing, evaluating, and coping with them throughout our operations in general. We define risks as a concept consisting of threats and crises and as a factor of uncertainty and lost opportunities that may thwart business strategies and objectives. We are managing 32 risk indicators and 7 crisis management indices* selected for emphatic management. We operate a risk management system to identify potential risks that may thwart the attainment of our business objectives, set the criteria for tolerating them, and have definite key actors cope with them using reasonable countermeasures.

- * **32 risk indicators in sectors likely to be vulnerable to risks:** Management of five financial sectors (debt ratio, exchange rate, interest rate, etc.) and 27 non-financial sectors (15 operation-related risks, 7 demand-supply risks, and 5 overseas operation risks)
- * **Crisis management (where risks have actually occurred):** Management of seven non-financial sectors (disaster, labor-management relations, collective civil complaints, domestic operation, overseas operation, and cybersecurity)

Operation of the risk management organization

Our Risk Management Committee is in charge of the overall control of risks and deliberation and decision-making of agenda items. The Chief of the Management Support Division, who also serves as the Chief Risk Officer (CRO), is in charge of company-wide risk management. The Internal Control Department -- which reports directly to the CRO -- establishes the risk management system and monitors the relevant onsite business. The Investment Risk Committee focuses on the review of risks associated with new investments. The risk management organization is established based on the "3 Lines of Defense" model. In Phase 1, each department carries out ordinary risk management business with support from the department in charge of risks. In Phase 2, the Internal Control Department establishes the risk management system and monitors the relevant onsite business. In Phase 3, the Auditor's Office supervises the procedural adequacy of risk management activities through periodic internal audits.

Risk management organization and system of reporting



Risk management principles

1. Carrying out independent, company-wide functions
2. Accurate identification, measurement, and evaluation of risks and their adequate management
3. Risk management done within the extent that the expense is balanced against the effect/benefit.
4. Setting and management of risk limit and management target
5. Documentation of risk management results; designation of employees in charge
6. Timely report; establishment of a reporting system

Risk monitoring and reporting system

Our system enables the Internal Control Department to manage risks through occasional reports on emergencies and periodic (quarterly) report on risks including plans to cope with them and information on changes in the situation made to it in accordance with the risk management process. We can cope with risks effectively and in a timely manner with reports like these made to the Internal Control Department upon occurrence of a sign of risk, like a change in conditions concerning an investment. Under the periodic report system, the relevant departments report the results of their respective risk management activities to the Internal Control Department, which submits an integrated report to the CEO and CRO, which ultimately reports to the Risk Management Committee. At its session, which is to be held at least once a year, the Risk Management Committee reviews the status of company-wide risk management and makes decisions on the agenda items submitted.

Proactive risk management

Efforts to strengthen risk management

In 2019, we improved the risk management business with changes in management status taken into account, including coming up with a system for the improvement of risk management in the investment business and setting risk indicators for inventory management associated with a decrease in demand for natural gas. We also strengthened risk management concerning overseas business in linkage with the analysis of onsite risk management results and performance evaluations. We will continue to operate the Enterprise Risk Management (ERM) system and strengthen the management of new risks through their comprehensive identification.

Checklist of risks in different sectors

<p>Countries where we operate</p>  <p>Confiscation/Nationalization, natural disaster, political/social unrest, inconsistency in policy/regulations, country defaults, labor shortage, insufficient infrastructure, civil complaints, border dispute</p>	<p>Laws/Regulations</p>  <p>Regulations on currency exchange/remittance/export/use of local goods/businesses, inadequate laws/systems, labor dispute, environmental regulations</p>	<p>Market</p>  <p>Lack of gas to be used as raw material, lack of market, drop in prices of goods, sluggish market</p>
<p>Finance</p>  <p>Exchange/Currency risks, PF and management capability, accounting/tax/insurance-related issues</p>	<p>Contract</p>  <p>Unfavorable business contracts signed with the local government (businesses), EPC/SPA contracts</p>	<p>Subcontractors</p>  <p>Participating businesses' default on contractual obligations, lack of business management capability, communication problems, customers' failure to pay</p>
<p>Technology</p>  <p>CAPEX exceeding the plan, facilities' insufficient performance, delay in work progress, insufficient technical analysis</p>		

Emerging Risks management

We set "future risks" to grasp the risks that may occur in our future management activities and carry out activities to cope with such risks. In 2019, we saw climate and environment changes such as greenhouse gas, dust particles, and cybersecurity risks as major future risks. The shift to the low-carbon economy will reduce the demand for natural gas and weaken our overall competitiveness, and vulnerability in cybersecurity will lead to the loss of external trust and business engines. We are positively coping with the risks through activities designed to create natural gas demand by playing a leading role in the hydrogen economy and promotion of the LNG bunkering business, promotion of business designed to strengthen the level of cybersecurity, management of the relevant indicators, etc.

Risks	Impact of the risks on our business	Risk reduction
<p>Risks associated with changes in the climate/environment (e.g., greenhouse gas, dust particles, etc.)</p>	<p>We judge the changes in climate/environment as emerging risks in step with the Paris Agreement of 2016 and changes in the energy policy paradigm associated with it, intend to increase investment in the new energy industry for the reduction of GHGs and improvement of air quality, etc. We will also prepare ourselves against the reduction of natural gas demand amid the government's policy for energy source conversion.</p>	<p>We have established a roadmap for the promotion of the hydrogen business, aiming to build 25 hydrogen production facilities and 700 km piping network by 2030. This sets the hydrogen business as the centerpiece of the new business for the promotion of entry into a clean society through the reduction of GHGs and dust particles. We also plan to continue to build LNG-charging infrastructure in areas like ports, cargo terminals, and rest areas that are frequented by trucks by 2022 to enhance the distribution of LNG cargo vehicles to improve the air quality. In addition, we are promoting the phased expansion of LNG bunkering infrastructure. We utilize the CERs purchase amount index to evaluate our operating risk of the environmental sector, monitor it on a quarterly basis, and arrange for the relevant departments to analyze the cause when the warning is issued and adopt a way to cope with it.</p>
<p>Cybersecurity risk</p>	<p>Security issues concerning the disclosure of our core technology and cyberterror on personal information and their leak to outside continue to increase. They are also becoming diverse and more intellectualized. We are under increasing pressure to strengthen our reliability and security measures for the protection of major information in our custody.</p>	<p>We have designated our cybersecurity level index, and we monitor it monthly/quarterly, arranging for the relevant departments to analyze the cause when the warning is issued and adopt a way to cope with it. We also manage cybersecurity risks -- which are becoming more intellectualized -- proactively and efficiently by strengthening the security system even further. The measures to achieve this include the complete blocking of the possibility of exposure of internal IP and improvement of the way files are taken in/out, along with the reestablishment of the internal network separation system.</p>

STAKEHOLDER ENGAGEMENT

Definition of stakeholders and how we communicate with them

Our stakeholders are individuals or organizations that may be influenced significantly by our activities or services. We classify our stakeholders into four types upon their values that our management activities might influence, and they are managed systematically. We strive to communicate with them positively through periodic meetings/workshops, advisory committees, and seminars/forums to grasp what their major interests are. We also operate the following customized channels of communication to cope with their demands more effectively by grasping their major interests by region or group:

<p>01</p> <p>Email-based complaints</p>  <p>Reports on</p> <ul style="list-style-type: none"> • Impolite employees • Wasting of money • Inconveniences • Asking for the disclosure of information 	<p>02</p> <p>Irregularity reporting center</p>  <p>Reports on</p> <ul style="list-style-type: none"> • Reckless business operation • Cases of illegal subcontracting • Irregularities • Dishonesty, matters for the public good • Bullying the less powerful 	<p>03</p> <p>Inquiries in general</p>  <ul style="list-style-type: none"> • Customers' suggestions • Questions about gas, investment, construction, hiring of employees, etc.
--	---	--

We always strive to address stakeholders' requirements more effectively. We will continue to listen to what stakeholders have to say and have their opinions reflected in our sustainable management activities.

Major results of our communication

Communication aimed at leading others in values



Definition	Stakeholders' group	Core needs	Communication channels	Major efforts for communication and results
Key actors in matters concerning people's convenience and benefit and growth of the gas industry	Executives and employees, labor union	Sharing the vision of the organization; improvement in the working environment	<ul style="list-style-type: none"> • Directors' Management Meeting; Management Committee • CEO Meeting (Luncheon Meeting, etc.) • Junior Board (quarterly), Innovative Leader Group (semiannually), Sharing pending Management-related issues (bimonthly) • Labor-Management Council (from time to time), Intranet, etc. • Integrated Team for Consulting (day-to-day) 	<ul style="list-style-type: none"> • Explaining the vision/strategies to directors/employees • Sharing information on the management environment /plan; Formation of consensus • Strengthening labor-management communication including joint workshops • Improvement of the labor communication index (70 points in '18 => 71.5 points in '19)

Communication aimed at cooperating with others in values



Definition	Stakeholders' group	Core needs	Communication channels	Major efforts for communication and results
Policy-related collaborative relations for the provision of service to the public	Individuals, Government, National Assembly	Energy welfare, social values, information disclosure, positive administration	<ul style="list-style-type: none"> • Discussion on pending business issues, forums, associations, report on mid- to long-term management strategies • Provision of support for the National Assembly's activities including oversight of the executive branch • Policy Council (day-to-day), Safety Check Corps (day-to-day), Environmental Measures Committee (monthly), Innovation Committee (semiannually), People's Innovation Corps (day-to-day) • PR based on social media like blogs, YouTube, etc. 	<ul style="list-style-type: none"> • Session for reporting the win-win subcontractor business to the public (6/26/19) • Establishment of the Joint Safety Management System for Underground Facilities in cooperation with the local government (City of Seoul) (July 2019) • Exploration of 11 new ideas at the Dalgubeol IF Innovation Forum 2020



Communication aimed at coexisting with others in values



Definition	Stakeholders' group	Core needs	Communication channels	Major efforts for communication and results
Contribution to the public's convenience through the gas supply; Mutually involving relationship for growth sharing	Urban gas businesses, power plant businesses, direct importers, local communities	Demand development, stable supply, improvement of system, customer satisfaction	<ul style="list-style-type: none"> CS Promotion Committee (semiannually), Customer Council (day-to-day) Onsite Explanatory Session, Business Explanatory Session Onnuri Win-Win Council (semiannually), Social Contribution Business Deliberation Committee (annually) 	<ul style="list-style-type: none"> Meeting between customer businesses and working-level officials of the local government (20 occasions), Discussion on improving operational strategies and sharing VOCs Understanding customer needs in advance and finding solutions to joint pending issues Listening to opinions on win-win subcontractor business

Value-based communication



Definition	Stakeholders' group	Core needs	Communication channels	Major efforts for communication and results
Support for creating results for the growth of the gas industry	Subsidiary companies, foreign relevant countries, contractors	Win-win cooperation, mutual growth, fair economy, no bullying of the less powerful	<ul style="list-style-type: none"> CSR Committee (semiannually) Committee for the Eradication of Bullying of the Less Powerful (semiannually) Accompanied Growth Council (annually) Korea Fair Trade Commission (semiannually) 	<ul style="list-style-type: none"> Announcement of methods for win-win cooperation in the top 5 sectors including hydrogen and discussion (Aug. '19) Establishment of an integrated supply-demand management system through cooperation of the private/public sectors and the government; expansion of areas of supply Information exchange and promotion of cooperation between KOGAS and small-sized subcontractors

APPENDIX

• Sustainability Performances	87
• GRI Standards Index	93
• Global Initiatives	96
• Third-party Assurance Statement	98
• Prizes and Awards/Memberships	100

SUSTAINABILITY PERFORMANCES

Economic Performance

Key Economic Indicators (based on consolidated financial statements)

Classification	Unit	2017	2018	2019
Sales	KRW	221,722	261,850	249,826
Operating Profit	100 million	10,352	12,769	13,345
Net income (loss)		(11,917)	5,267	583

Key Financial Indicators (based on consolidated financial statements)

Classification	Unit	2017	2018	2019	
Growth indicators	sales growth rate	%	5.04	18.10	(4.59)
	net income growth		(94.58)	144.20	(88.94)
Profitability indicators	return on total assets		(3.09)	1.37	0.1
	return on total capital		(14.03)	6.36	0.7
Stability indicators	current ratio		115.05	100.54	103.7
	debt ratio		356.24	367	382.6
	BIS ratio		21.92	21.41	20.72
Productivity indicators	productivity of capital		5.15	10.20	8.67

Summary of Consolidated Statement of Financial Position (based on consolidated financial statements)

Classification	Unit	2017	2018	2019	
Assets	current assets	KRW	75,822	99,249	92,328
	non-current assets	100 million	295,572	297,648	300,791
	total assets		371,394	396,897	393,119
Liabilities	current liabilities		65,904	98,712	89,005
	non-current liabilities		224,086	213,205	222,648
	total liabilities		289,990	311,917	311,653
Capital	paid-in capital		17,651	17,651	17,651
	other		60,482	64,277	60,882
	controlling interest (sub-total)		78,133	81,928	78,533
	non-controlling interest		3,271	3,052	2,932
	total capital		81,404	84,980	81,465

R&D

Classification	Unit	2017	2018	2019
R&D investments	KRW 100 million	679	518	568
Technology patents (accumulated)	Case	378	373	411

Economic Value Creation & Distribution (based on consolidated financial statements)

Calculation Criteria	Unit	2017	2018	2019
Sales	KRW	221,723	261,850	249,826
Operating profit	100 million	10,352	12,768	13,345
Net income (loss)		(11,917)	5,267	5,826
Employee wages and benefits		3,848	3,918	4,415
Dividends		-	1,192	333
Interest		8,295	7,854	8,046
Corporate tax		2,729	-	-
Community investment		171	186	182

SUSTAINABILITY PERFORMANCES

Environmental Performance

* The environmental performance reporting scope is calculated at 100% based on domestic business sites, such as the Institute of Gas Safety

GHG Emissions*

Classification	Unit	2017	2018	2019
Total GHG emissions	tCO ₂ e	911,539	1,051,868	667,156
Direct emissions		551,497	663,206	287,680
				(Goal: 529,487)
Indirect emissions		360,042	388,662	379,476
				(Goal: 346,148)

* The reason for a discrepancy in the direct emissions is that whereas the 2015-2017 sustainability report excluded the quantity caused by leaks in the calculation of direct emissions, the current report (2017-2019) includes all in the emission volume for the sake of consistency. The indirect emissions in 2018 includes some minor adjustments as required by the results of the conformity assessment carried out by the Ministry of Environment, Korea.

Energy Consumption

Classification	Unit	2017	2018	2019
Total energy consumption	TJ	12,624	14,557	12,775
Direct energy		5,187	6,583	4,972
Indirect energy		7,442	7,980	7,803

Classification	Unit	2017	2018	2019
Total energy consumption	MWh	2,227,225	2,660,610	2,194,691
Total non-renewable energy consumption		2,223,976	2,659,185	2,192,525
				(Goal : 2,135,017)
Non-renewable fuel consumption (purchased/consumed as energy sources)		1,440,833	1,813,858	1,368,333
Non-renewable electricity purchase		769,532	830,694	811,414
Steam/heating/cooling and other purposes		13,611	14,633	12,778
Total renewable energy purchase or production		3,249	1,425	2,166
Total energy consumption costs	KRW 100 million	1,419	1,736	1,547

Water Consumption

Classification	Unit	2017	2018	2019
Total water consumption	m ³	1,241,908,454	1,496,757,205	1,392,986,376
Seawater*		1,241,441,822	1,496,226,715	1,392,324,766
Freshwater		459,130	519,919	644,245
Other (Including surface water and groundwater)		7,502	10,571	17,365

* Partial change has occurred as the seawater usage data of Incheon branch's in 2018 had corrected due to minor errors

Emissions of Environmental Pollutants

Classification	Unit	2017	2018	2019
Natural gas sales	1K tons	32,162	36,219	33,596
Air pollutants*				
NOx	volume	212,995	311,538	192,398
	intensity	6.62	8.60	5.73
SOx	volume	1,175	1,535	1,239
	intensity	0.04	0.04	0.04
먼지	volume	3,548	4,606	3,729
	intensity	0.11	0.13	0.11
Water pollutants**				
BOD	volume	55.9	73.1	236.3
	intensity	0.002	0.002	0.007
COD	volume	61.3	52.9	101.1
	intensity	0.002	0.0015	0.003
SS	volume	124.5	84.2	144.6
	intensity	0.0039	0.0023	0.0043
Waste***				
general	ton	547	1,892	4,575
designated	ton	53	155	289
construction	ton	83,679	61,314	129,366
total	volume	84,279	63,361	134,230
	intensity	2.62	1.75	3.99

* In 2019, air pollutant emissions decreased due to reduced facility uptime due to rising winter temperatures.

** In 2019, we began calculating the total volume from all our sewage discharge facilities, which led to the increase.

*** Waste disposal is 100% outsourced. We began calculating the amount of recycled waste in 2019 (70,811 tons recycled in 2019 out of the total of 134,230 tons in 2019).

Chemicals Consumption

Classification	Unit	2017	2018	2019
Chemicals consumption*	1K tons	87,302	352,288	34,247,570
Natural gas sales	kg	32,162	36,219	33,596
Consumption intensity	kg/1K ton	2.71	9.73	1,019.36

* The volume increased in 2019 because of the inclusion of odorants and sodium hypochlorite.

Regulatory Violations

Classification	Unit	2017	2018	2019
Violations of regulatory obligations	case	0	0	0
Fine amounts	KRW	0	0	0

Social Performance

BOD Operations

Classification	Unit	2017	2018	2019
Board meetings	number	14	18	16
Resolutions	case	40	62	65
Deliberations	%	86	66	25
Amendments	case(%)	0(0)	1(2)	3(4.62)
Reports	case	21	21	24
Attendance	%	81	78	87.6
Non-standing directors' attendance	%	77	72	88.14
Substance of statements / motions delivered by non-executive directors	%	68	59	57.32

Employee Status

Classification	Unit	2017	2018	2019	
Total employees	person	3,752	4,096	4,225	
Employment types	Regular	males (incl. executive directors)	3,331	3,570	3,724
		females	411	472	501
	Irregular	males	0	27	0
		females	10	27	6
Contract types	Non-affiliated person		1,211	1,176	1,278
	Full-time employees		3,710	4,031	4,222
	Part-time employees		28.35	8.225	3.125
Work location	Domestic		3,644	3,985	4,111
	Overseas		108	111	114
Age	Those in their 30s or younger		1,410	1,705	1,821
	Those in their 40s		1,527	1,397	1,209
	Those in their 50s or older		815	994	1,195
Females	Executives		412	473	501
	Managers		4	7	7
	Ratio of executives		11.0	11.5	11.9
	Ratio of managers (total employees)		0.11	0.17	0.17
Social equity jobs	Those with disabilities		122	128	126
	High school graduates		521	540	552
	Persons of distinguished services to the State		367	385	392
	Local talents		1,756	1,883	2,069

※ The above figures are based on those posted on ALIO (All Public Information System In One).

SUSTAINABILITY PERFORMANCES

Employee Training Status

Classification	Unit	2017	2018	2019
Education and training costs	KRW 1 million	8,660	8,470	8,820
Training hours per person	hour	114	104	108.1
Training costs per person	KRW 1,000	2,530	2,078	2,087

Parental Leave Status

Classification	Unit	2017	2018	2019
Applicants for parental leave	person	56	71	75
Male applicants for parental leave	person	9	16	23
Return-to-work rate after parental leave	%	100	100	100
Retention rate after parental leave	%	100	100	100

Employee Performance Evaluation

Except for dispatched workers or long-term trainees outside the company, we systematically carry out employees' performance appraisal self-assessments and supervisors' evaluations of their performance about not only their work performance but also their career development efforts.

Classification	Unit	2017	2018	2019
Performance evaluation application rate	%	96.0	96.8	96.8

Employee Satisfaction

Classification	Unit	2017	2018	2019
Satisfaction with internal education programs	point	83.8	85.9	87.7
Satisfaction with HR system operations	point	70.6	72.1	74.0

Employee Retirement

KOGAS runs a retirement pension plan designed to help retired employees and their family members enjoy more stable later years. We enable our employees to choose from a defined benefit (DB) pension plan and a defined contribution (DC) pension plan. Furthermore, we implement an educational subsidy system to support the post-retirement life of those who have chosen the peak wage system so that they can plan and take appropriate courses offered by external professional institutions.

Classification	Unit	2017	2018	2019	
Retirement Pension	Amount of asset under management	KRW 100 million	2,494	3,065	2,985
	Number of participants in retirement pension	person	3,666	3,561	3,771
Retirees	on-time retirement	person	0	53	61
	early retirement	person	18	9	6

Labor Union Membership

KOGAS notifies the union in advance in writing of changes in the articles of incorporation and the corporate organization; alteration and abolition of regulations on working conditions; and agenda items and resolutions at general meetings of shareholders and board of directors related to labor union members' interests, as is specified in the collective agreement.

Classification	Unit	2017	2018	2019
Number of labor union member	person	3,186	3,242	3,650
Labor union membership rate	%	86.10	84.70	88.60

Employee and CEO Compensation

CEO compensation				KRW 233,794,000
Employee compensation	median value			KRW 78,718,840
	average value			KRW 86,894,000
CEO -to-worker compensation ratio	median value			2.97%
	average value			2.69%

* Source: The Integrated Report 2020 (5. Executive Salary Status and 6. Average Employee Salary Status in the 'Agency Operations' chapter).

Occupational Safety and Health

The Labor-Management Occupational Health and Safety Committee represents 90.1% of the company's total employees (4,272 persons as of the end of 2019). In accordance with Article 19 of the Occupational Safety and Health Act and Article 25-2 of the Enforcement Decree of the Act, the committee deals with matters related to the formulation of industrial accident prevention plans and the protection of employees' safety and health ahead of the purchase of any hazardous/dangerous machinery or equipment. KOGAS conducts health checkups once a year for employees to prevent the occurrence of disease in the workplace, and special health checkups are held once a year for shift employees and registered security guards.

Classification	Unit	2018		2019	
		Figure	Remarks	Figure	Remarks
Injury incidence rate*	%	0.02	1 case (commuting accident)	0.02	1 case
Absenteeism rate**	%	0		0	
Occupational fatalities	employees	person	0	0	
	contractors	person	0	0	
Lost time	employees	%	0.12	0.11	
	contractors	%	0.43	0.78	

* incident rate per 100 people

** 40 working hours per person/week X 52 weeks

Security Violations

Classification	Unit	2017	2018	2019
Customer security violations	case	0	0	0
IT infrastructure security incidents	case	0	0	0

Supplier Status

Classification	Unit	2017	2018	2019
No. of (first-tier) suppliers	No.	93	104	131
Self-assessment ratio	%	100	100	100

Purchase of Suppliers' Products

Description	Unit	2017	2018	2019
Product purchases from SMEs	KRW 100 million	2,705	3,229	3,522
Ratio of SME product purchases	%	29.1	34.5	32.0

Support for Suppliers' Competitiveness Enhancement

Classification	Unit	2017	2018	2019	
Joint R&D projects	cases	case	22	17	20
	participating companies	No.	21	16	20
	R&D budget	KRW 100 million	17	12	15
Training of SME suppliers' employees	technical/research personnel training	person	180	83	52
	job training	person	16	35	11
	online education	person	40	151	155
	Total	person	236	269	218

Customer Satisfaction

Classification	Unit	2017	2018	2019
Public-service customer satisfaction index (PCSI)	grade(point)	A(94.4)	A(93.5)	93.8*

* In 2019, the organization that manages the PCSI decided not to mark the level of customer satisfaction when reporting the survey results.

Product and Service Information and Labeling

KOGAS supplies natural gas to customers and provides its customers with material safety data sheets (MSDS) specifying the hazards, dangers, first aid measures, and handling methods for its products as well as posting the information on its website. KOGAS takes the measure in accordance with Article 41 of the Occupational Safety and Health Act, Article 37 of the Enforcement Decree of the Act, and Article 92 (2)-(10) of the Enforcement Rule. In 2019, KOGAS did not violate any relevant laws or regulations.

SUSTAINABILITY PERFORMANCES

Anti-Corruption and Violations

KOGAS has built an internal anti-corruption containment system to regularly monitor all its business sites and all its business activities. We also run an internal whistleblowing (reporting) system and engage in various advisory and surveillance activities through the integrity ombudsman and the integrity auditor among others in a bid prevent corruption and business risks.

Classification	Unit	2017	2018	2019
Violations of the anti-corruption rule	case	3	2	0
	person	3	2	0

Anti-corruption Education

Classification	Unit	2017	2018	2019
Completion of ethics education	person	3,422	3,324	3,514
Completion of online Code of Conduct education	person	6,877	7,242	7,662

Education on Human Rights Policies and Procedures

Classification	Unit	2017	2018	2019
Employee education on human rights (executives and staff members)	person	-	2,104	3,880
Hours of employee education on the company's human rights policies and procedures	hour	-	1	1
Proportion of employees educated on the company's human rights policies and procedures	%	-	95	99

Social Contribution Activities

Classification	Unit	2017	2018	2019
Total community service hours	hour	45,093	14,392	10,044
Community service hours per person	hour	14.4	3.5	2.4
Discount on gas bills	KRW 100 million	835	873	831

Job Creation through Social Contribution Programs (2019)

Classification	Project Cost (KRW 1 million)	Job Creation (person)	Remarks
Energy welfare (Onnuri Thermal Efficiency Improvement Program)	3,106	40	Indirect job creation included
Architecture Academy (Homeless Empowerment Program)	110	17	Direct job creation
Relief Factory and In-house Cafe	250	32	Direct job creation
Toy Library, Multicultural Family Support Program, Senior Academy	710	35	Direct job creation
Total	4,176	124	

Contributions

Classification	Unit	2017	2018	2019
Total donations (industry associations and tax-exempt organizations)	KRW 1 million	3,910	4,889	3,879

* No contributions to lobbying, interest representation or political activities

Top five source of contributions

Classification	Unit	2017	2018	2019
The Korea Gas Union	KRW 1 million	700	700	1,260
Korea Energy Economics Institute		700	1,000	1,000
Korea Energy Agency		700	800	600
Korea Foundation for Cooperation of Large & Small Business, Rural Affairs		405	476	310
Keimyung University		-	-	250
Foundation for Overseas Resources Development		610	1,366	-
Total		3,115	4,342	3,420

* KOGAS provides contributions for the development of related associations but does not provide any political contributions directly or indirectly.

GRI STANDARDS INDEX

GRI – 102: General Disclosures

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Organizational Profile	102-1	Name of the organization	6.3.10/6.4.1-6.4.5	6	
	102-2	Activities, brands, products, and services	/6.8.5/7.8	6, 8-11	
	102-3	Location of headquarters		6	
	102-4	Location of operations		33-34, 38-39	
	102-5	Ownership and legal form		6	
	102-6	Markets served		33-34, 38-39	
	102-7	Scale of the organization		6	
	102-8	Information on employees and other workers		89-90	
	102-9	Supply chain		55	
	102-10	Significant changes to the organization and its supply chain		-	None
	102-11	Precautionary Principle or approach		45-51, 82-83	
	102-12	External initiatives		93-97	
	102-13	Membership of associations		100	
Strategy	102-14	Statement from senior decision-maker	4.7/6.2/7.4.2	4-5	
Ethics and Integrity	102-16	Values, principles, standards, and norms of behavior	4.4/6.6.3	13, 74	
	102-17	Mechanisms for advice and concerns about ethics		75	
Governance	102-18	Governance structure	6.2/7.4.3/7.7.5	72	
Stakeholder Engagement	102-40	List of stakeholder groups	5.3	84-85	
	102-41	Collective bargaining agreements		90	
	102-42	Identifying and selecting stakeholders		84-85	
	102-43	Approach to stakeholder engagement		84-85	
	102-44	Key topics and concerns raised		30-31	
Report Method	102-45	Entities included in the consolidated financial Statements	5.2 / 7.3.2-7.3.4	87	
	102-46	Defining report content and topic Boundaries		30-31	
	102-47	List of material topics		30-31	
	102-48	Restatements of information	7.5.3/ 7.6.2	88	See footnotes for detailed data changes
	102-49	Changes in reporting		2	None
	102-50	Reporting period		2	
	102-51	Date of most recent report		2	
	102-52	Reporting cycle		2	
	102-53	Contact point for questions regarding the report		2	
	102-54	Claims of reporting in accordance with the GRI Standards		2, 93-95	
	102-55	GRI Content Index		93-95	
	102-56	External assurance		98-99	

GRI STANDARDS INDEX

GRI – 103: Management-Approach

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Management Approach	103-1	Explanation of the material topic and its Boundary	6 / 7.3.1 / 7.4.3 / 7.7.3 / 7.7.5	32, 40, 52, 62	
	103-2	The management approach and its components			
	103-3	Evaluation of the management approach			

GRI – 200: Economic

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Economic Performance	201-1	Direct economic value generated and distributed	6.8.1~ 6.8.3/ 6.8.7/ 6.8.9	87	
	201-3	Defined benefit plan obligations and other retirement plans		90	
Indirect Economic Impacts	203-1	Infrastructure investments and services supported	6.3.9/ 6.8.1/ 6.8.2/ 6.8.7/ 6.8.9	33~39	
	203-2	Significant indirect economic impacts		60~61	
Procurement Practices	204-1	Proportion of spending on local suppliers	6.4.3/ 6.6.6/ 6.8.1/ 6.8.2/ 6.8.7	91	
Anti-corruption	205-1	Operations assessed for risks related to corruption	6.6.1~6.6.3	74~76	
	205-2	Communication and training about anti-corruption policies and procedures		74~76, 92	
	205-3	Confirmed incidents of corruption and actions taken		76, 92	
Anti-competitive Behavior	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	6.6.1~6.6.2/ 6.6.5/ 6.6.7	76	

GRI – 300: Environmental

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Energy	302-1	Energy consumption within the organization	6.5.4/ 6.5.5	88	
	302-4	Reduction of energy consumption		47, 88	
	302-5	Reductions in energy requirements of products and services		22~23, 36~37	
Water	303-3	Water recycled and reused	6.5.4	88	
Biodiversity	304-2	Significant impacts of activities, products, and services on biodiversity	6.5.6	48~49	
	304-3	Habitats protected or restored		48~49	
Emissions	305-1	Direct (Scope 1) GHG emissions	6.5.5	47, 88	
	305-2	Energy indirect (Scope 2) GHG emissions		47, 88	
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	6.5.3	45, 88	
Effluents and Waste	306-1	Water discharge by quality and destination		46, 88	
	306-2	Waste by type and disposal method		46, 88	
	306-3	Significant spills		46	
Environmental Compliance	307-1	Non-compliance with environmental laws and regulations	4.6	89	

GRI – 400: Social

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Employment	401-1	New employee hires and employee turnover	6.4.3	60~61, 89	
	401-3	Parental leave	6.4.4	90	
Occupational Health and Safety	403-1	Workers representation in formal joint management-worker health and safety committees	6.4.6	41	
Training and Education	404-1	Average hours of training per year per employee	6.4.7/ 6.8.5	90	
	404-2	Programs for upgrading employee skills and transition assistance programs		67	
	404-3	Percentage of employees receiving regular performance and career development reviews		90	
Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	6.2.3/ 6.3.7/ 6.3.10/ 6.4.3	64~66, 72, 89	
Non-discrimination	406-1	Incidents of discrimination and corrective actions taken	6.3.6/ 6.3.7/ 6.3.10/ 6.4.3	65	To eliminate discrimination against temporary hires and indefinite contract positions, KOGAS applies the same annual pay system and welfare benefits in personnel management, training & education, etc. as its full-time employees.
Human Rights Assessment	412-2	Employee training on human rights policies or procedures	6.3.3/6.3.5	80	
Local Communities	413-1	Operations with local community engagement, impact assessment, and development programs	6.3.9/ 6.5.1~6.5.3/	26~27, 56~59, 92	
Customer Health and Safety	416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	6.7.1/ 6.7.2/ 6.7.4/ 6.7.5/ 6.8.8	91	
Customer Privacy	418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	6.7.1/ 6.7.2/ 6.7.7	62	

GLOBAL INITIATIVES

UN SGDs

The Sustainable Development Goals (SDGs) of the United Nations are the world's shared plan to end extreme poverty, reduce inequality, and protect the planet by 2030. KOGAS strives to fulfill its corporate social responsibilities by linking these UN SGDs with its various social value creation projects.

<p>1 NO POVERTY</p> <ul style="list-style-type: none"> - Easing gas cost burdens for low-income families - Resolving energy poverty problems through gas utilization efficiency, etc. - Priority support for marginalized and vulnerable citizens through the Onnuri Fund - Scholarship support for low-income children - Empowering people in developing countries through the operation of the Mozambique Technical School, etc. 	<p>2 ZERO HUNGER</p> <ul style="list-style-type: none"> - Supply of energy kits including bottled water and ice boxes for slum residents - Priority support for marginalized and vulnerable groups following the creation of the Onnuri Fund - Efforts to end hunger at home and abroad through continuous support of Korea Food for the Hungry International (KFHI) and the Korean Red Cross (KRC), among others 	<p>3 GOOD HEALTH AND WELL-BEING</p> <ul style="list-style-type: none"> - Children: Support for welfare improvement in local child centers, support for children with severe disabilities and the visiting R-BANK's initiatives, medical support for severely ill children, and support for children with heart disease in Uzbekistan, etc. - Adolescents: Scholarships for high school and college students, support for the Mozambique Technical School, etc. - Youth & Middle-Aged People: Thermal efficiency improvement project, hosting start-up conferences, support for social enterprises, Architecture Academy, etc. - Seniors: Senior Academy, distribution of silver carts
<p>4 QUALITY EDUCATION</p> <ul style="list-style-type: none"> - Free construction skills training for the homeless and shanty-town residents - Support for single-parent childcare and education - Education support for unmarried single mothers and improvement in the educational environment of Mozambique - Scholarships for low-income families and support for toy libraries 	<p>5 GENDER EQUALITY</p> <ul style="list-style-type: none"> - Support for women-led companies in bidding and contract execution - Providing jobs to women who experienced career interruptions and unmarried single mothers having to care for children (jobs in toy libraries) - Certification as a family-friendly company 	<p>6 CLEAN WATER AND SANITATION</p> <ul style="list-style-type: none"> - Promotion of environmental improvement activities to improve water quality - Performance of environmental preservation efforts such as stream cleaning activities - Support for residential sanitation improvement by vulnerable groups
<p>7 AFFORDABLE AND CLEAN ENERGY</p> <ul style="list-style-type: none"> - Promotion of universal energy welfare through gas supply in remote mountain/island communities - Realization of renewable energy expansion policy (establishment and operation of hydrogen fueling stations) - Support for installing fuel cells in social welfare facilities - Thermal efficiency improvement projects for vulnerable groups such as installing cooling and heating devices, LED replacement in addition to seasonal support for shantytown residents 	<p>8 DECENT WORK AND ECONOMIC GROWTH</p> <ul style="list-style-type: none"> - Self-reliance support for unmarried single mothers, heat wave monitoring team - Job placement for homeless individuals, shantytown residents and graduates of Senior Academy - Hiring operators of Onnuri Toy Libraries 	<p>9 INDUSTRY, INNOVATION, AND INFRASTRUCTURE</p> <ul style="list-style-type: none"> - Laying city gas pipelines (4,908km) across the country including Jeju; building 52 production bases including 72 storage tanks; and assisting the installation of city gas distribution systems - Promotion of sustainable industrial development through social investment in the spread of distributed power generation based on the fuel cell, among others
<p>10 REDUCED INEQUALITIES</p> <ul style="list-style-type: none"> - [International] Medical support for children in developing countries along with continuing promotion of capacity building for middle and high school students there - [Domestic] Offering scholarships to high-achieving underprivileged children, providing energy kits for vulnerable groups in severe heat, improving residential environments, and supporting heating costs 	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p> <ul style="list-style-type: none"> - [Regional Development] Holding GIF (Start-up Competition), CBC Start-up Competition, local innovation forums, and the Relief Factory, etc. - [Improvement of Residential Conditions] Toy libraries, thermal efficiency improvement projects, and construction of soccer fields, tennis courts, jokgu (a combination of football and volleyball) courts 	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p> <ul style="list-style-type: none"> - Support for sustainable consumption through the development of new technologies for smart gas meters, among others - Improvement of efficiency and safety through smart production bases - Stable supply of natural gas and efficient facility operation by expanding production and supply infrastructure
<p>13 CLIMATE ACTION</p> <ul style="list-style-type: none"> - Increased energy efficiency through eco-friendly facilities and process improvement - Efforts to create demand for natural gas, which is a clean fossil fuel, corresponds to the prevention of climate change and the implementation of emergency measures 	<p>14 LIFE BELOW WATER</p> <ul style="list-style-type: none"> - Prevention of marine pollution through the operation of the Environmental Emergency Response Committee - Improvement of marine environment through the LNG bunkering business - Establishment of a marine pollution control network and conduct monitoring of environmental impact assessment recommendations 	<p>15 LIFE ON LAND</p> <ul style="list-style-type: none"> - Construction of clean supply control centers without light pollution, and minimization of damage to the environment when laying gas pipelines - Improvement of onshore environments through the supply of large LNG vehicles - Environmental improvement by increasing demand for natural gas, a clean fossil fuel
<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p> <ul style="list-style-type: none"> - Providing opportunities for citizens to apply their ideas to business by holding social contribution project competitions - Selection and implementation of vulnerable group support programs based on the preferences reflected by funds raised by the Employee Fund (the Onnuri Fund Matching Grant Project) 	<p>17 PARTNERSHIPS FOR THE GOALS</p> <ul style="list-style-type: none"> - Efforts to strengthen partnerships with developing countries through KOGAS's overseas projects - Securing a driving force for sustainable management through the operations of the Social Value Committee for win-win cooperation - Strengthening partnerships through various consultative bodies such as the Win-Win Cooperation Committee and the Shared Growth Council 	

UNGC Membership and Support

KOGAS joined the United Nations Global Compact (UNGC), an international agreement that regulates the social responsibility of global companies, in 2007. We declared that we will steadfastly comply with the ten principles in the four areas including human rights, labour, the environment and anti-corruption.

Principles	Page
Human Rights	77~81
Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights.	
Principle 2 Make sure that businesses are not complicit in human rights abuses.	
Labour	64~67, 77~81
Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	
Principle 4 Businesses must eliminate all forms of forced and compulsory labour.	
Principle 5 Businesses must ensure the effective abolition of child labour.	
Principle 6 Businesses must eliminate discrimination in respect of employment and occupation.	
Environment	45~51
Principle 7 Businesses should support a precautionary approach to environmental challenges	
Principle 8 Businesses must undertake initiatives to promote greater environmental responsibility.	
Principle 9 Business must encourage the development and diffusion of environmentally friendly technologies.	
Anti-corruption	74~76
Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery.	

THIRD-PARTY ASSURANCE STATEMENT

To the Readers of the KOGAS Sustainability Report 2020:

Foreword

Korea Management Registrar, Inc. (“KMR”) has been requested by Korea Gas Corporation (“KOGAS”) to verify the contents of its KOGAS Sustainability Report 2020 (“the Report”). KOGAS is responsible for the collection and presentation of information included in the Report; KMR’s responsibility is to carry out assurance engagement on specific data and information in the assurance scope stipulated below.

Scope and standard

KOGAS describes its efforts and achievements with regard to its corporate social responsibility activities in the Report. KMR performed type2, moderate-level assurance using AA1000AS (2008) and SRV1000 from the KMR Global Sustainability Committee as assurance standards. KMR’s assurance team (“the team”) evaluated adherence to the Principles of Inclusivity, Materiality, and Responsiveness as well as the reliability of the selected GRI Standards indices described below. Moreover, we thoroughly reviewed the reliability of related documents and records -- energy, water consumption, waste generation, and occupational injury and illness rate. The professional judgment of the team was exercised as materiality criteria.

The team checked whether the Report has been prepared in accordance with the “Core Option” of GRI Standards, which covers the following:

- GRI Standards Reporting Principles
- Universal Standards
- Topic-specific Standards
 - Management approach of Topic-specific Standards
 - Economic Performance: 201-1, 201-3
 - Indirect Economic Impacts: 203-1, 203-2
 - Procurement Practices: 204-1
 - Anti-Corruption: 205-1, 205-2, 205-3
 - Anti-Competitive Behavior: 206-1
 - Energy: 302-1, 302-4, 302-5
 - Water and Wastewater: 303-3
 - Biodiversity: 304-2, 304-3
 - Emissions: 305-1, 305-2, 305-7
 - Effluents and Waste: 306-1, 306-2, 306-3
 - Environmental Compliance: 307-1
 - Employment: 401-1, 401-3
 - Occupational Health and Safety: 403-1
 - Training and Education: 404-1, 404-2, 404-3
 - Diversity and Equal Opportunity: 405-1
 - Non-Discrimination: 406-1
 - Human Rights Assessment: 412-2
 - Local Communities: 413-1
 - Customer Health and Safety: 416-2
 - Customer Privacy: 418-1

This Report excludes data and information of joint corporation, contractor etc., outside of the organization, i.e., KOGAS, as the report boundaries.

Our approach

In order to verify the contents of the Report within the agreed-upon scope of assurance in accordance with the assurance standard, the team carried out assurance engagement as follows:

- Reviewed the overall report
- Reviewed the materiality test process and methodology
- Reviewed the sustainability management strategies and targets
- Reviewed the stakeholder engagement activities
- Interviewed people in charge of preparing the Report

Our conclusion

Based on the results we have obtained from material reviews and interviews, we had several discussions with KOGAS on the revision of the Report. We reviewed the Report’s final version in order to confirm that our recommendations for improvement and our revisions have been reflected. In reviewing the results of the assurance, the assurance team could not find any inappropriate contents in the Report with regard to compliance with the principles stipulated below. Nothing has come to our attention that gives us reason to believe that the data included in the verification scope are not presented appropriately.

- **Inclusivity**
 Inclusivity refers to the participation of stakeholders in developing and achieving an accountable, strategic response to sustainability.
 - KOGAS is developing and maintaining stakeholder communication channels in various forms and levels as part of its commitment to be responsible for the stakeholders. The assurance team could not find any critical stakeholder left out by KOGAS during this procedure.

- **Materiality**
 Materiality involves determining the relevance and significance of an issue to an organization and its stakeholders. A material issue is one that will influence the decisions, actions, and performance of an organization or its stakeholders.
 - KOGAS is determining the materiality of issues found through stakeholder communication channels through its own materiality evaluation process, and the assurance team could not find any critical issues left out in this process.

- **Responsiveness**
 Responsiveness refers to the response of an organization to stakeholder issues affecting its sustainability performance; it is realized through decisions, actions, and performance as well as communication with stakeholders.
 - The assurance team could not find any evidence that KOGAS’s countermeasures for critical stakeholder issues were inappropriately recorded in the Report.

We could not find any evidence that the Report was not prepared in accordance with the “Core Option” of GRI standards.

Recommendation for improvement

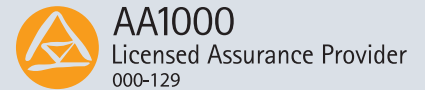
We hope the Report is actively used as a communication tool with stakeholders and recommend the following for continuous improvements:

- Korea Gas Corporation (KOGAS) reconstructed key topics identified through materiality assessment and its strategies in a harmonious way to provide clear description of key achievements. As part of the effort to realize social value -- which is a hot issue among public organizations -- it set mid- to long-term goals and reported annual quantitative performance. It also created a special page in the report to present key achievements. KOGAS is advised to develop mid- to long-term sustainability strategies and make continuous effort to achieve KPIs for the enhancement of its sustainability.

Our independence

With the exception of providing third-party assurance services, KMR is not involved in any of KOGAS’s profit-oriented business operations in order to avoid any conflicts of interest and to maintain its independence.

July 7, 2020



CEO

PRIZES AND AWARDS/MEMBERSHIPS

Prizes and Awards

Name of Award	Host	Year
Selected as an excellent public corporation in the securities market	Korea Exchange	2019
Won the grand prize at the Korea Innovation Grand Awards in the field of Social Innovation	The Dong-A Ilbo	2019
Won the designation of the best institute in disaster management evaluation and the presidential commendation	Ministry of the Interior and Safety	2019
Won an excellence award at the Public Institution Social Value Creation Contest in the field of social economy friendly city	Ministry of Employment and Labor, Korea Social Enterprise Promotion Agency	2019
Won the designation of the best institute in disaster management evaluation and the presidential commendation	Ministry of the Interior and Safety	2018
Won the grand prize at the Management Grand Awards in the field of reliable management	KMA Consultants Inc.	2018
Won the top prize at the Retirement Pension Grand Prizes	Maeil Business Newspaper	2018
Won the grand prize at the Korea Innovation Frontier Awards in the field of social innovation	The Dong-A Ilbo	2018
Won the prime minister's award for the early supply of natural gas to Saemangeum District (Jeonbuk Regional Headquarters)	Office for Government Policy Coordination	2017
Won the prime minister's award at the Korea Energy Efficiency Awards (Pyeongtaek Terminal Division)	Korea Energy Agency	2017
Won the Social Contribution Grand Prize	Daegu Metropolitan City	2017
Won the MOTIE Minister's award at the Korea CSR Film Festival	Ministry of Trade, Industry and Energy (MOTIE)	2016
Designated as the best contractor for construction disaster prevention	Korea Occupational Safety and Health Agency	2016
Won the highest rank in the national infrastructure disaster management evaluation	Ministry of Public Safety and Security	2016
Won the 1st Place recognition among the country's Best Companies to Work for	GWP KOREA	2016
Certification as an excellent company in Standard Service Quality	MOTIE	2016
Won the MOTIE minister's award for contributions to the energy voucher project	MOTIE	2016
Won the Prime Minister's commendation on World Standards Day 2016	The Ministry of Environment	2016
Won the Prime Minister's award at the Korea Safety Fair	Ministry of Government Administration and Home Affairs	2016
Won the integrated ISO certification (ISO 8001, ISO 14001, ISO 29001, OHSAS 18001)	Korea Gas Safety Corporation, British Standard Institution (BSI)	2016

Memberships

Name of Association	Joining Year
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
The Korean 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 Association (KOGAS Incheon Terminal Division)	2013
Korean-American Association	2014
Korea-Indonesia Partnership Council	2014
IGU (International Gas Union)	2014

BETTER ENERGY, **BETTER WORLD**

KOGAS Sustainability Report 2020

Representative	Hee-Bong Chae
Publisher	Korea Gas Corporation
address	120 Cheomdan-ro, Dong-gu, Daegu, Korea (41062)
Tel	+82-053-670-0114
Website	www.kogas.or.kr



본 보고서는 환경을 생각하여 FSC® 인증 종이를 사용하고 있으며
공기를 잉크로 인쇄되었습니다.

