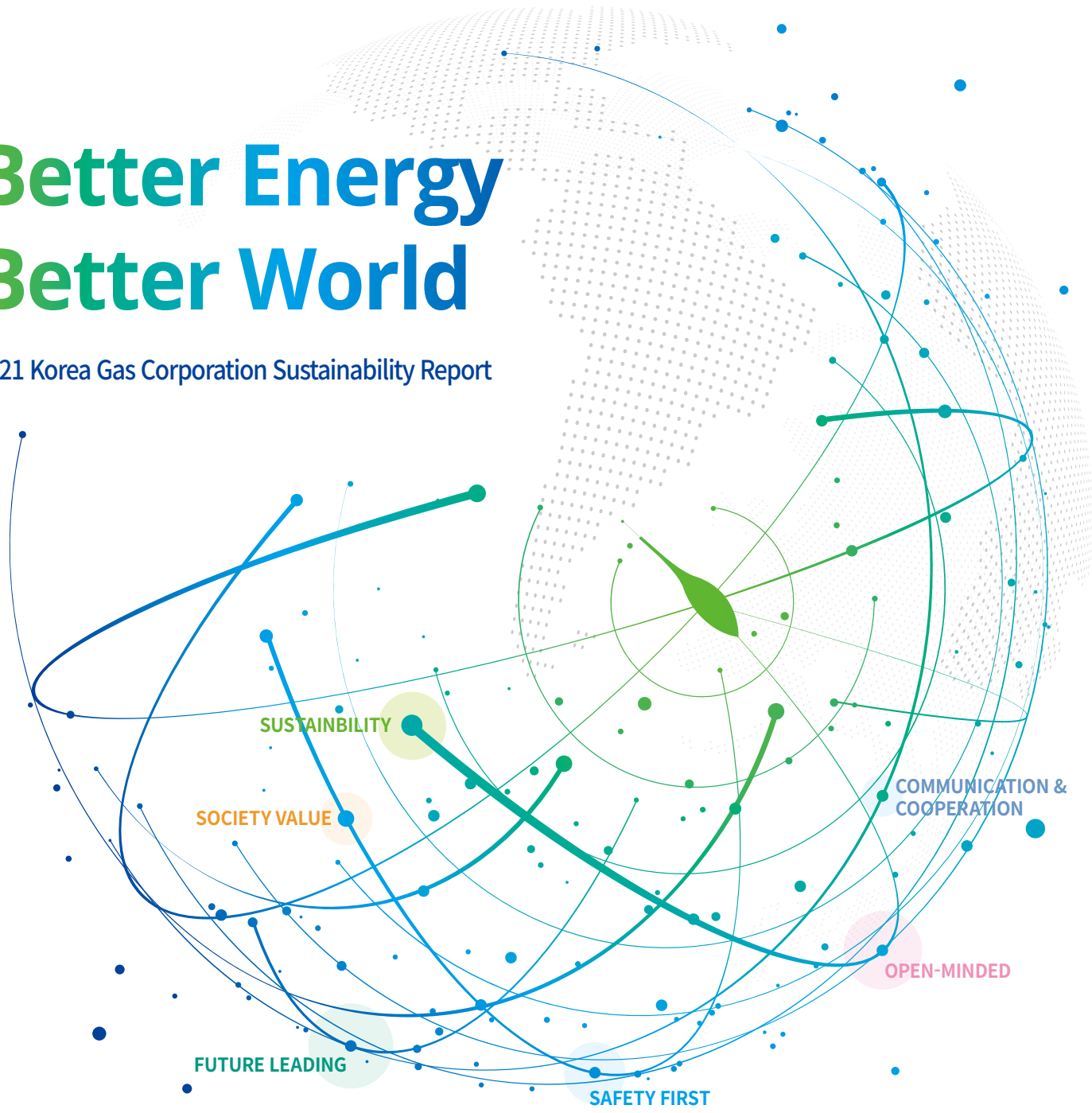


Better Energy Better World

2021 Korea Gas Corporation Sustainability Report



About this Report

Korea Gas Corporation (hereinafter KOGAS) seeks to boost the transition to green energy by leading the natural gas industry based on our corporate philosophy, “Better Energy, Better World,” and fulfill the company’s social responsibility as a public enterprise that continuously creates social value. KOGAS pursues economic, environmental, and social values in a balanced manner in our business operations and our achievements are disclosed transparently in our annual Sustainability Report. This report is the 15th Sustainability Report published by KOGAS.

Reporting Period and Scope

This report has been drawn up based on the sustainable management results data from January 2020 to December 2020. In terms of quantitative results, the report provides data from the most recent three years, beginning with 2018, in order to show the changes in trend. As for qualitative data, results from the first half of 2021 are included, if deemed meaningful to disclose. The report covers our corporate headquarters, domestic business sites, and the KOGAS Research Institute in terms of scope, and overseas business data are included, should they be needed. There have been no major changes in company size, organizational structure, and ownership structure during this reporting period. Where there have been changes in the data disclosed in the preceding reports, we specified the reason for change on the applicable page.

Reporting Criteria and Verification

This report follows the core option of the GRI Standards, the international standard for sustainability reporting. The contents of this report have been duly verified by an independent verification institution to enhance the credibility and quality of the report. The results of the verification are included in the Appendix section.

Additional Information

Further details are available on the KOGAS website. For queries on our sustainable management activities or opinion on this report, please contact us using the following details:

Website	http://www.kogas.or.kr
Address	Korea Gas Corporation, 120, Cheomdan-ro, Dong-gu, Daegu, Republic of Korea, Postal Code: 41062
Department	Corporate Social Responsibility Department, Corporate Social Responsibility Planning Team
Email	kyg6860@kogas.or.kr
Phone	+82-53-670-0607
Fax	+82-53-670-1527


Better Energy Better World

2021 Korea Gas Corporation Sustainability Report

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CEO's Message



〰

KOGAS will move up the carbon neutral society by realizing 'Vision 2030' through the transition to green energy.

〰

Dear respected shareholders, customers, partner companies, and KOGAS employees,

I send my words of deepest gratitude for your unwavering support and encouragement for KOGAS.

Last year, KOGAS reaped meaningful fruits and made progress despite the volatility and uncertainty in the global economy caused by COVID-19. We successfully completed the construction of Incheon Base Zone 4 to improve the stability of domestic natural gas supply, and our competitiveness was recognized both internally and externally through the 730,000-ton/year contract signed with the Korea District Heating Company (KDHC) upon implementation of the individual rate system for natural gas used for power generation. KOGAS was selected by the government as the “organization dedicated to hydrogen distribution,” which allowed us to construct an economical hydrogen supply network. We were also named the company to receive government subsidy for LNG bunkering ship construction, through which we will contribute to popularizing LNG as an environment-friendly fuel for transportation.

Our external efforts in achieving sustainability and creating social value were also recognized. We received the Minister of Environment’s Citation as an Excellent Institution in 2020 Greenhouse Gas Reduction, the Minister of SMEs and Startups’ Award for our effort in mutual growth and community cooperation, and the Minister of Trade, Industry, and Energy Award in the Public Institution Reform Division.

2020 will be remembered as the origin year of KOGAS’ change, with us taking a leap as a new institution. Since establishment, the company has been implementing strategies to become a global low-carbon energy company with the spirit of challenge, passion, and dedication. As we face the global paradigm shift of transition to green energy, we wish to take a bold and challenging next step. KOGAS established Vision 2030, “Everywhere Green Life, H2 KOGAS”, and took our first step of the journey toward the sustainable future. We would like to share this hope and promise from us with you, our stakeholders.

First, we will make bold and preemptive investments to become the leader in the hydrogen industry.

KOGAS will continuously build a variety of hydrogen production bases and hydrogen stations until 2030 for economic hydrogen production, thereby transforming our business into the B2C model. We plan to produce green hydrogen overseas using green energy like solar PV and bring in 1,210,000 tons of hydrogen annually until 2040. Through R&D and M&A, we will secure source technology of the hydrogen business such as water electrolysis and hydrogen liquefaction technologies.

Second, KOGAS will ramp up performance in new energy projects.

KOGAS plans to break away from the business structure focused on LNG supply and develop LNG bunkering demand through marketing activities and organic cooperation with relevant enterprises. To stay in line with the trend of gas-electricity convergence, we will actively pursue overseas GTP (Gas to Power) projects. We will also promote various business models that utilize LNG cold energy.

Third, KOGAS will establish a vision and strategy to become a carbon neutral enterprise by 2045.

Along with global climate change policies, carbon neutrality is a critical requirement for sustainable growth. To achieve carbon neutrality, KOGAS will move up overseas new and renewable energy source development and green hydrogen production and implementation. We will also expand the scope of carbon emissions reduction management, thereby reducing the proportion of fossil fuel businesses in phases.

Fourth, KOGAS will actively push for digital transformation to be ready for the post-COVID-19 era.

By creating an efficient working environment that utilizes digital technology, we will innovate our corporate culture. Operation efficiency achieved through digital transformation in all our business areas including import, transport, production, supply, overseas projects, and new growth will help us reduce costs and redesign our operation methods.

Fifth, KOGAS will be a company that actively creates social value.

KOGAS’ vision in social value creation is to be “Korean people’s happy partner in realizing clean energy welfare.” Our goals under this vision are obtaining the highest grades in Safety-Cap and integrity evaluations and creating 19,000 jobs by 2030. We will work towards fulfilling this vision and pursue projects through which we can make contributions to the society.

All constituents of KOGAS will work to realize Vision 2030 with courage and a challenging spirit. We will spare no effort in living up to our stakeholders’ expectations and becoming a trusted global carbon neutral company. Moreover, we will fulfill our mission of promoting people’s benefit and convenience and realizing energy welfare, and create a “better world” by continuously supplying “better energy” that is clean and safe.

We ask for your continued interest and support.

Thank you.

Hee-bong Chae,
President & CEO of Korea Gas Corporation

채희봉



KOGAS, Delivering dreams and Hope

Today's KOGAS creates tomorrow.

A clean energy company that contributes to the lives of our citizens

KOGAS was established to improve our citizens' convenience, benefit, and welfare by supplying natural gas, a clean energy source. Over the last 38 years, KOGAS has been making contributions in the energy aspect of the lives of Koreans by building LNG receiving terminals and natural gas piping networks, regasifying imported LNG, and stably supplying regasified LNG to city gas companies and power plants. LNG is mostly imported from the Middle East (Qatar, Oman, Yemen, Egypt), Southeast Asia (Indonesia, Malaysia, Brunei), Russia (Sakhalin), Australia, and the United States.

KOGAS has been continuously driving the "Nationwide Natural Gas Supply Project" in order to improve welfare and convenience of our citizens. Beginning with the Pyeongtaek Thermal Power Plant in 1986, KOGAS started to supply natural gas to the metropolitan area in 1987, central region in 1993, Yeongnam and Honam regions in 1995, the West Coast regions in 1999, and the Gangwon region in 2002. With the completion of the construction of the main pipeline nationwide, we were able to build a single annular pipeline network, thereby stably supplying gas where needed.

Moreover, the company started to supply gas to areas that did not previously receive gas and the Jeju area, in 2009 and 2019, respectively. KOGAS is thus continuously driving projects that expand the supply network in order to realize energy welfare and contribute to the balanced development of regions. As of December 2020, the length of pipeline in operation is 4,945km and we supply natural gas to 19,250,000 (92% penetration rate) households in 211 cities and counties (gun). Going forward, KOGAS will continue to lead the global energy industry and create future values in the energy sector, thereby opening a better world.





KOGAS will lead Korea's hydrogen economy.

KOGAS has led Korea's energy industry with its excellent facilities and technology. As an environment-friendly energy corporation creating a better world with better energy, KOGAS will play a leading role to help our society proceed to become a hydrogen economy society.

KOGAS is soaring to make the second leap forward in the new paradigm of green energy transition. Hydrogen is in the limelight globally, as it has high energy conversion efficiency and is an outstanding energy source that helps reduce greenhouse gas. KOGAS has been strengthening the foundation to drive hydrogen businesses through efforts such as establishing the "Hydrogen Business Execution Roadmap" and materializing the company's plans for leading the hydrogen economy. KOGAS has been working on building an efficient and stable hydrogen distribution system as the company was named the organization dedicated to hydrogen distribution in 2020. In January 2021, KOGAS newly established Vision 2030, "Everywhere Green Life, H₂ KOGAS." This corporate vision reflects the company's will and determination to become a hydrogen-oriented public company by supplying green energy to all places where are customers are, thereby creating a clean environment and life for Korean citizens. Through leading investments and business strategies for each step of the way, KOGAS will take part in the entire cycle of the hydrogen industry, from hydrogen manufacture and production to pipeline network construction and operation and hydrogen distribution. Moreover, the company will expand new energy businesses such as LNG cold energy promotion and also expand the supply of LNG bunkering and trucks using LNG, which contribute to addressing climate change and reducing fine dust, to take the lead in opening the low-carbon, green energy era.



KOGAS Profile

KOGAS Overview











KOGAS is Korea’s representative energy-based public enterprise established in 1983 to supply natural gas safely and steadily to the Korean people, with the corporate philosophy of “Better Energy, Better World.” Since supplying natural gas to the Pyeongtaek Thermal Power Plant in 1986, KOGAS has continued to expand the provision of natural gas nationwide and reached 92% natural gas penetration rate.

(As of the end of Dec. 2020, Consolidated Financial Statements)

Company Name	Korea Gas Corporation (KOGAS)
Representative	Hee-Bong Chae
Establishment Date	August 18, 1983
Grounds for Establishment	Korea Gas Corporation Act (Act No. 3639, Enacted Dec. 1982)
HQ Location	120, Cheomdan-ro, Dong-gu, Daegu, Republic of Korea

Type of Corporate Body	Stock company
Sales	KRW 208,337 hundred million
Operating Profit	KRW 898.9 billion
Total Equity	KRW 7735.1 billion
Number of Employees	4,225

Key Business Areas

 <p>Production and supply of city gas and purification and sales of by-products</p>	 <p>Exploration, transportation, and import/export of natural gas</p>	 <p>Production and distribution of hydrogen energy</p>	 <p>Research and technical development (R&D) for related business areas</p>	 <p>Overseas projects related to the businesses above</p>
 <p>Construction and operation of LNG terminals and natural gas distribution network</p>	 <p>Exploration and import/export of liquefied petroleum gas (LPG)</p>	 <p>Development and import/export of hydrogen energy</p>	 <p>Projects commissioned by central or local governments</p>	 <p>Businesses related to the exploration and development of petroleum resources</p>

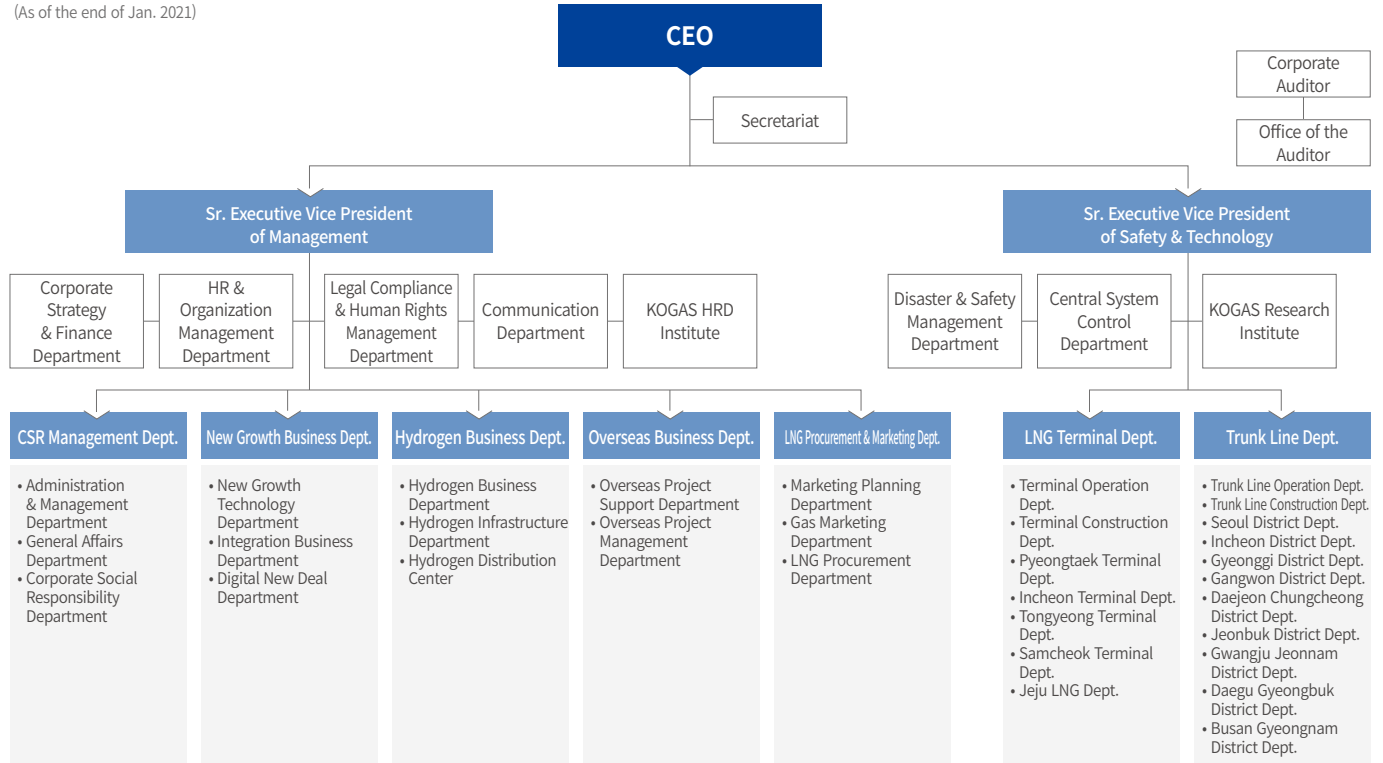
Key Milestones of KOGAS

1980's Base Building	1990's Expanding Growth	2000's~2020 Becoming a World Class
<p>1983. Aug. Establishment of KOGAS</p> <p>1986. Oct. First import of LNG</p> <p>Nov. Commencement of natural gas distribution to power plant operations (Pyeongtaek Thermal)</p> <p>1987. Feb. Commencement of the city gas supply (Seoul metropolitan area)</p> <p>Apr. Completion of terminal and distribution facilities constructions in Pyeongtaek</p>	<p>1990. May Completion of the R&D Center</p> <p>1993~1999 Commencement of natural gas supply in the central region (Daejeon, Cheonan, Cheongju), Yeongnam and Honam regions (1995), Busan area (1996), West Coast and Southern regions (1999)</p> <p>1994. Jun. National flag LNG carrier placed in commission</p> <p>1997. Oct. Completion of the Incheon Production Base</p> <p>1999. Dec. Listed on the Korea Stock Exchange</p>	<p>2002. Oct. Completion of the Tongyeong Production Base</p> <p>Nov. Commencement of city gas supply in the Gangwon region</p> <p>2004. Jan. Secured 10 million households as natural gas customers</p> <p>2005. Aug. Equity investment in Myanmar Sector A-3</p> <p>2006. Jul. More than 10,000 natural gas buses in operation</p> <p>2007. Dec. KOGAS Vision 2017 Proclamation Ceremony</p> <p>2008. Feb. Conclusion of the agreement on the establishment of a JV for the Uzbekistan Surgil Project</p> <p>2009. Oct. Equity investment in the offshore and onshore pipeline for gas field in Myanmar</p>

Organization Structure

In order to ensure the company plays its role as a leader of the future energy industry, KOGAS restructured the organization, newly introducing the Hydrogen Business Department and the Hydrogen Distribution Center. In January 2021, KOGAS stepped up and expanded the hydrogen business organization from team to department and also established the energy transition system by newly organizing the Hydrogen Distribution Center and the Digital New Deal Department. The company is reorganizing its structure to renew its identity as a customer-oriented energy business operator.

(As of the end of Jan. 2021)



- 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 the DJSI Asia Pacific Level and named No. 1 in the Gas Sector
- 2014. Mar. Successfully hosted "Gastech 2014" at Kintex
- Oct. Secured hosting of the 2021 WGC (World Gas Conference)
- Oct. Headquarters moved to Daegu Innovation City
- 2015. Oct. Commencement of commercial operations at GLNG, Australia
- 2016. Jan. Declared Vision「KOGAS 2025」
- Oct. Received the Prime Minister's Citation on World Standards Day

- 2017. Jun. Commencement of Stage 3 commercial operation of the Samcheok Production Base with 270,000 kℓ storage tank (the largest capacity in the world)
- 2018. Sep. Included in the DJSI Asia Pacific Level for six consecutive years
- Dec. Won the General Grand Prize in the Korea Management Awards
- 2019. Apr. Established the hydrogen business execution roadmap
- May Selected as "the Best Institution" in the disaster management evaluation by Ministry of the Interior and Safety (Presidential Citation)
- Jun. Won the grand prize in the social innovation category at the Korea Innovation Awards for two consecutive years
- Oct. Jeju LNG Base commenced supplying natural gas
- 2020. Jul. Named the organization dedicated to hydrogen
- Dec. Received the Presidential Citation of Merit for Industrial Technology Promotion

2020 KOGAS Business results

KOGAS delivers safe and steady supply of natural gas to Korean citizens through continuous demand forecasting and production management. In preparation of the upcoming future energy era, KOGAS will actively propel various domestic and overseas projects and develop green technology for the transition to green energy, thereby securing a new and sustainable engine for growth.

Achievements

Import Sales

1. Enhanced energy benefit for Korean citizens by saving KRW 432.7 billion in import costs in 2020 and securing economical long-term contracts
2. Improved price competitiveness and financial solvency of city gas for commercial and retail power generation
3. Created new demand (1.42 million tons annually) by concluding 4 supply and acquisition agreements

Production Supply

4. Addressed risk of discontinuance in gas supply in the Seoul metropolitan area using AI-based optimal natural gas distribution system
5. Cost down! Effect up! Improved metering accuracy and customer satisfaction
6. Expecting improved design quality, thanks to SMEs' technological enhancement and fair competition
7. Established a bridgehead to enter the global LNG plant market by developing a Korean liquefaction process model

Overseas Business

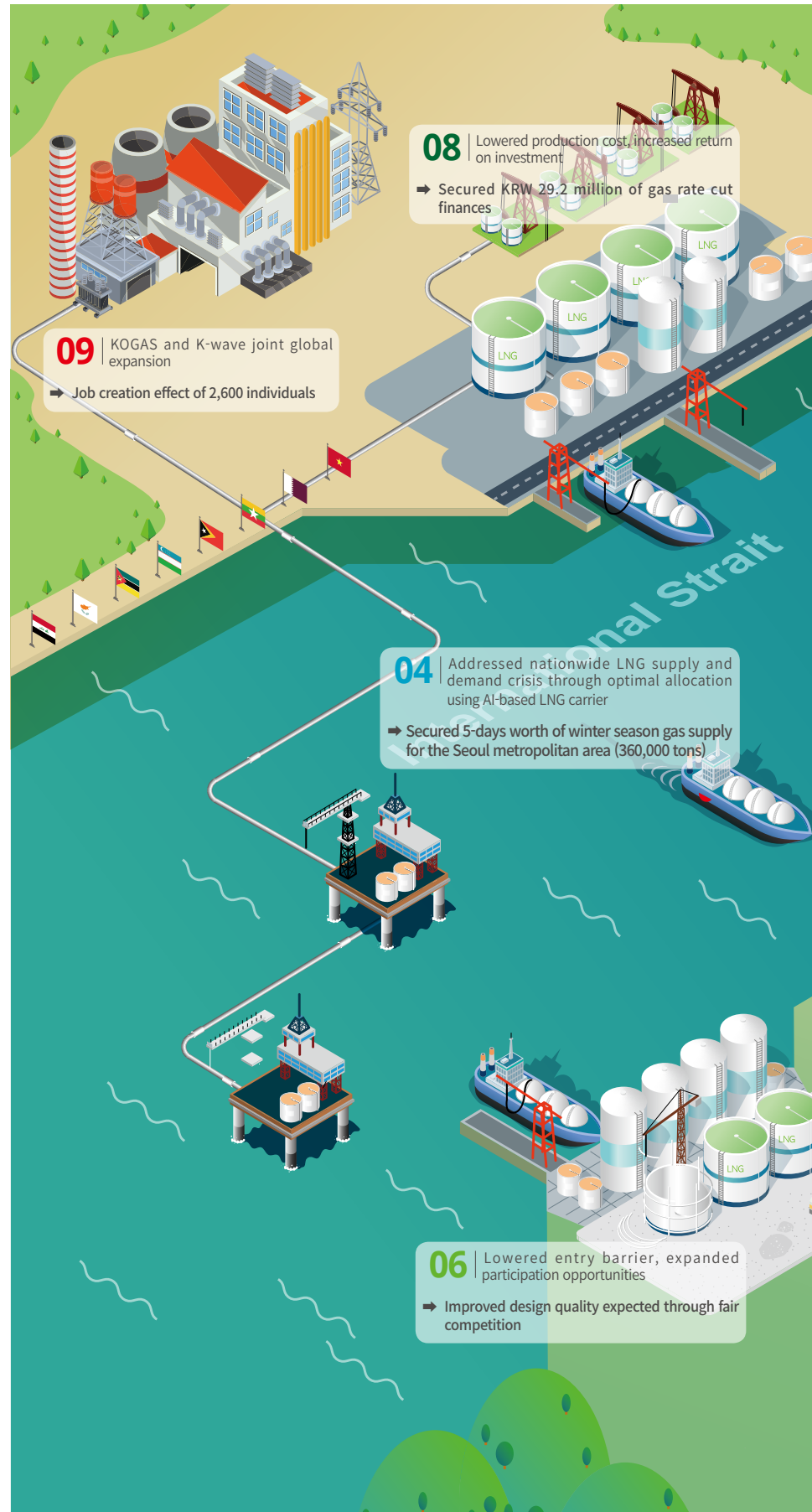
8. Improved energy convenience and benefit for Korean citizens and contributions to strengthening the financial soundness
9. Creation of 2,600 new jobs expected, thanks to the realization of the Vietnam GTP business

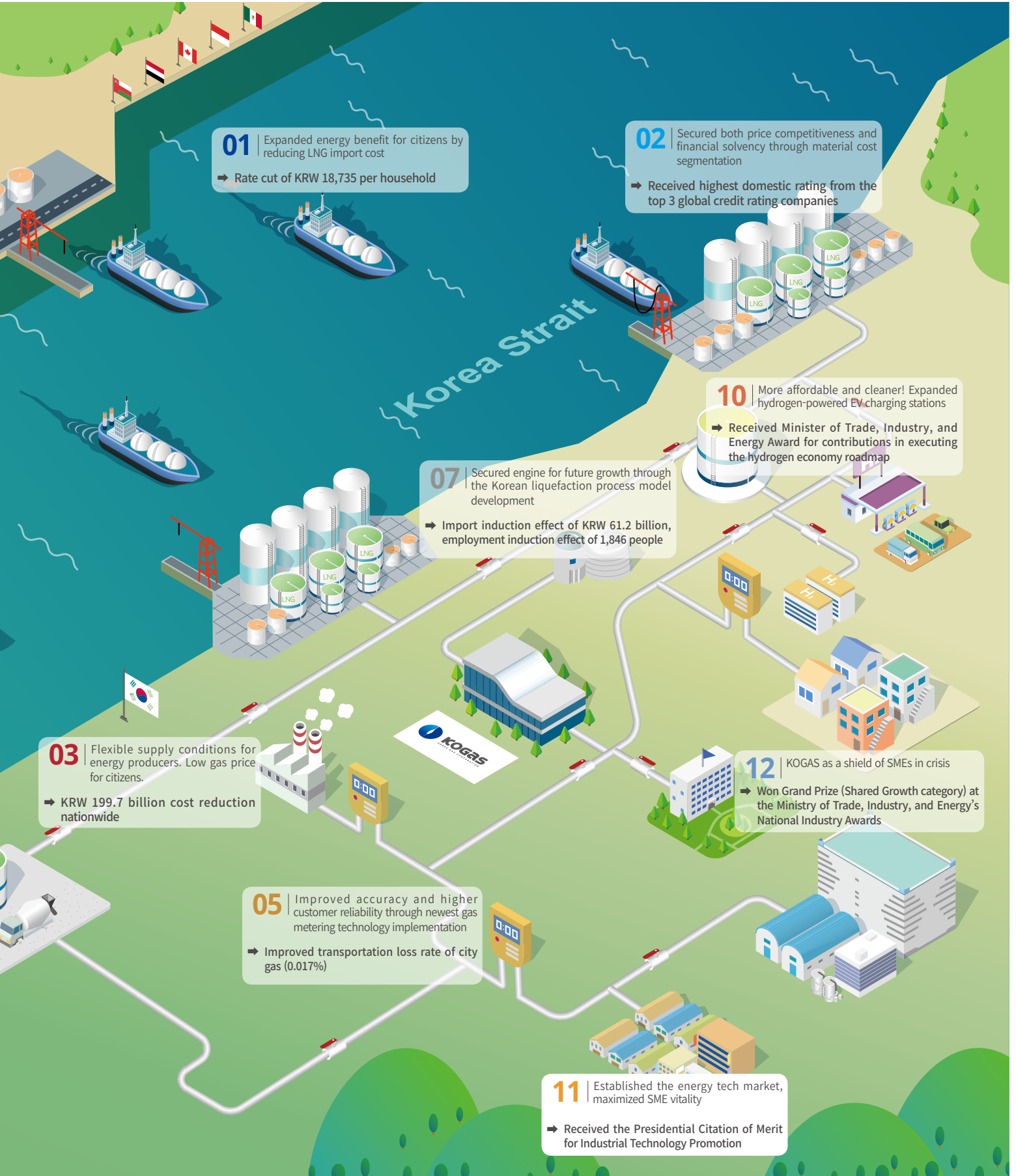
Innovative Growth

10. • Received the Minister of Trade, Industry, and Energy Award for contributions in executing the hydrogen economy roadmap
• Received the Minister of Environment's Institutional Citation for contributions in greenhouse gas reduction
11. Received the Presidential Citation of Merit for Industrial Technology Promotion (new technology commercialization promotion division)

COVID-19

12. COVID-19 Win-Win Cooperation Package support worth KRW 284.3 billion (129% achievement rate)





01 | Expanded energy benefit for citizens by reducing LNG import cost
 → Rate cut of KRW 18,735 per household

02 | Secured both price competitiveness and financial solvency through material cost segmentation
 → Received highest domestic rating from the top 3 global credit rating companies

07 | Secured engine for future growth through the Korean liquefaction process model development
 → Import induction effect of KRW 61.2 billion, employment induction effect of 1,846 people

10 | More affordable and cleaner! Expanded hydrogen-powered EV charging stations
 → Received Minister of Trade, Industry, and Energy Award for contributions in executing the hydrogen economy roadmap

03 | Flexible supply conditions for energy producers. Low gas price for citizens.
 → KRW 199.7 billion cost reduction nationwide

12 | KOGAS as a shield of SMEs in crisis
 → Won Grand Prize (Shared Growth category) at the Ministry of Trade, Industry, and Energy's National Industry Awards

05 | Improved accuracy and higher customer reliability through newest gas metering technology implementation
 → Improved transportation loss rate of city gas (0.017%)

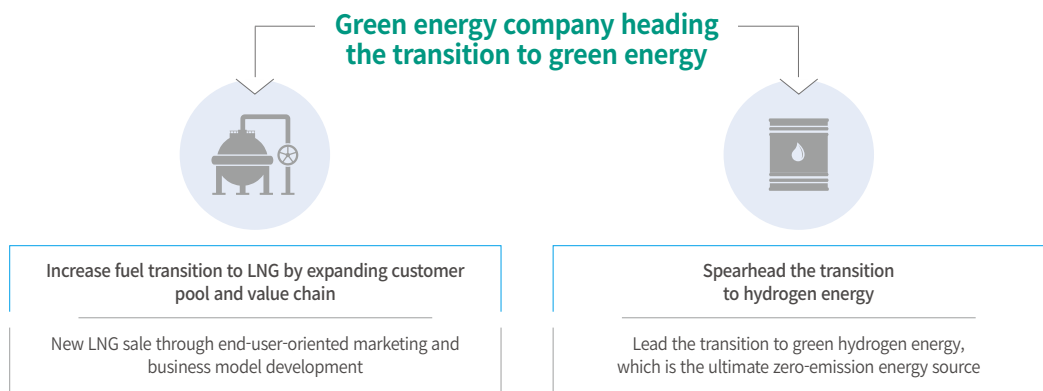
11 | Established the energy tech market, maximized SME vitality
 → Received the Presidential Citation of Merit for Industrial Technology Promotion

Vision & Strategy

KOGAS 2030

KOGAS newly established “Vision 2030 and 4 Core Values” in order to determine the company’s future vision and business growth direction centered on environment-friendly LNG and hydrogen. As a green energy enterprise leading the transition to eco-friendly energy, we will not only actively expand our LNG business but also spearhead the eco-friendly hydrogen value chain. KOGAS will lead the transition to hydrogen-oriented energy and present and realize intuitive and ultimate goals that we must achieve by expanding LNG demand. The goal will take citizens, government, and companies into account, and by working toward the goal, the company will supply hydrogen and LNG wherever needed, heading the effort to deliver a clean and heartwarming world to all.

2030 Vision

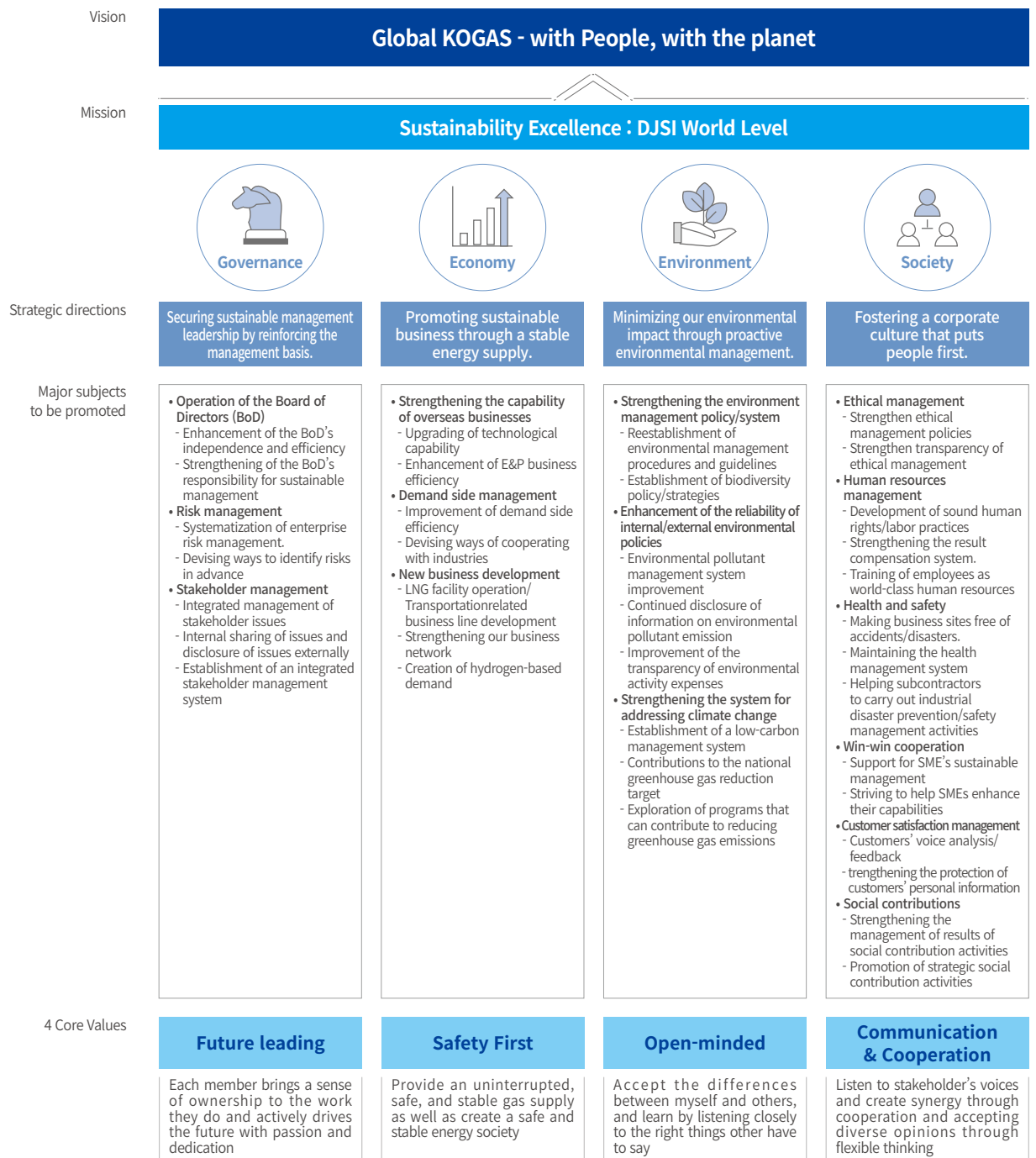


KOGAS Vision 2030

Vision	Everywhere Green Life, H₂ KOGAS				
Core	Future leading	Safety first	Open-minded	Communication & Cooperation	
Vision Goal (Business Goal)	Vehicle fuel cost per household 60% reduction	+	National greenhouse gas reduction 10 million tons	+	Operating profit 3 trillion won
Vision Slogan	H₂ Leading, New Business Expanding				
Strategy Goal	Hydrogen supply KRW 4,000/kg	New business sales KRW 2.2 trillion	Gas supply price 20% reduction	Debt ratio 230%	Social value contributions Highest grade
Strategy Direction	Lead the hydrogen industry	Expand new businesses	Improve product and facilities competitiveness	Strengthen internal competence	Deliver social value
20 Strategic Subjects	<ul style="list-style-type: none"> • Build an autogenous hydrogen network • Expand fuel cell power generation • Produce and secure green hydrogen • Secure core hydrogen technology 	<ul style="list-style-type: none"> • Expand supply of LNG for transport • Participate in overseas GTP business • Develop businesses that utilize LNG • Activate LNG trading 	<ul style="list-style-type: none"> • Strengthen steady supply • Strengthen competitiveness in natural gas imports • Safe and economical use of production and supply facilities • Conduct overseas energy projects 	<ul style="list-style-type: none"> • Improve financial solvency • Improve business management system • Digital transition of the work environment and facilities • Enhance natural gas-based core technology 	<ul style="list-style-type: none"> • Proactive disaster and safety management • Carbon emissions management and greenhouse gas reduction • Job creation and sharing • Expand mutual win-win cooperation

Sustainable Management Strategy

KOGAS has adopted a sustainable management strategy with the vision, “Global KOGAS – With People, With the Planet,” and manages sustainability 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 Department. Important decisions on matters concerning the establishment and promotion of strategies and the results thereof are made by reporting them to the ESG Committee (formerly the Committee of Sustainable Management) on a regular basis. We will listen to our stakeholders’ valuable opinions, fulfill our social responsibilities, and continue to create social value.



KOGAS Social value Highlights

Strategic Planning

investment in hydrogen economy

KRW 3.2 trillion

1.13 million tons of carbon reduction



Revitalizing the hydrogen economy by establishing the KOGAS hydrogen business strategy

In order to take off as a country leading the hydrogen economy, the government devised the Hydrogen Economy Roadmap (1.94 million tons/year and KRW 4,000/kg by 2030). To realize this roadmap, the support of public institutions in providing large scale hydrogen supply is critical. KOGAS will supply affordable hydrogen to all corners of the country through our strategy on the construction of 25 hydrogen production bases. We will also contribute to the government's goal to achieve net zero emissions by 2050 by becoming a hydrogen-producing country. This will be done by producing and bringing in green hydrogen through the establishment of large-scale solar PV power plants in Australia, the Middle East, and North America. In 2020, KOGAS was awarded with two prizes from the Minister of Trade, Industry and Energy: one for our contributions in revitalizing the hydrogen economy, and another for implementing the Hydrogen Economy Roadmap.

Lenient supply conditions for power producers and affordable gas price for the people

After implementing the individual rate system, KOGAS signed "The Agreement on Individual Rate LNG Supply and Acquisition for Power Generation" with Korea District Heating Corporation (KDHC). Under the individual rate system, KOGAS supplies LNG gas by linking the LNG supply contract to each power generator of the demanding party. KOGAS fixed a 15-year contract with KDHC to provide LNG supply of approximately 400,000 tons per year at KDHC's three new cogeneration plants. Individual rate system contracts are the fruits of KOGAS' steady supply and price competitiveness achieved using the company's know-hows and global networking. Through the conclusion of four LNG supply and acquisition contracts, there was a KRW 199.7 billion increase in citizen benefit (out of the amount to be paid by consumers), thanks to what was saved through the contracts secured.



Strategic Planning

Improved convenience and benefit for citizens with the individual rate system

KRW 199.7 billion

Less burden on consumers

Jobs

Direct/indirect job creation for

9,018 people

Minister of Employment and Labor Award

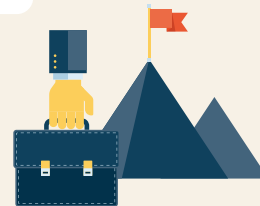


Job creation through social contributions and win-win cooperation

In order to deliver social value by creating quality jobs, KOGAS focused on not only increasing the number of jobs in the private sector of each value chain but also on strengthening the company's ability to create jobs and improving the quality of jobs. As a result, KOGAS created a total of 9,018 jobs in the private sector in 2020, including 5,468 direct hires. In particular, the company provides support for small business owners in the local community and stores in traditional markets so they can penetrate the online market, connects socially vulnerable groups to jobs fitting for them, and creates safe jobs in the effort to promote social economy enterprises. We create jobs by practicing this kind of win-win cooperation and making contributions to the society, thereby creating social value. These efforts earned the company the Minister of Employment and Labor's Citation at the Public Institution Social Value Creation Contest.

New opportunities for start-ups: finding direction at KOGAS

KOGAS was named an excellent organization in the 2020 Open Data Disclosure Status Evaluation conducted by the Ministry of the Interior and Safety. We have held internal contests and conducted public demand survey to identify where open data is needed, and we have been disclosing quality open data in cooperation with other public organizations. Moreover, KOGAS has discovered and fostered start-ups by holding the Open Data Utilization Contest. We will continue to disclose additional open data and work on improving data quality in the effort to provide valuable data to the citizens.



Provide growth engines for start-ups

Outstanding results in the open data disclosure evaluation

Innovation Effort



Win-win Cooperation

KOGAS Win-Win Cooperation Package

KRW 284.3 billion

Minister of Trade, Industry, and Energy Citation

Saving our Private Ryan: Supporting small business owners and SMEs in the COVID-19 crisis

To support SMEs, small business owners, and socially vulnerable groups struggling from reduced sales and income caused by the spread of the pandemic, we rolled out the “KOGAS Win-Win Cooperation Package to Overcome COVID-19” and created a KRW 284.3 billion supporting effect. The package provided support in four categories: disinfection, liquidity, sales, and livelihood. KOGAS preemptively supplied daily necessities and goods and equipment related to preventing the spread of infectious diseases to Daegu citizens (disinfection), gave an emergency loan of KRW 160 billion to the Shared Growth Fund to support SMEs’ liquidity (liquidity, sales), and provided social financing support to small business owners with KRW 350 million collected through salary returns from our executives and employees (livelihood). As a result, the company was awarded with the Korea Commission for Corporate Partnership Chairman’s Award in the Shared Growth division at the National Sustainability Management Conference.

Creating a safe workplace and charging people with happiness

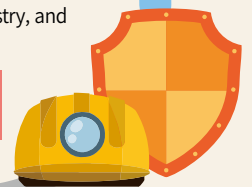
KOGAS acquired the highest grade in Safety-Cap (safety management rating system) which was introduced by the government to promote the establishment of preventive safety systems and induce voluntary upgrade of safety level at the workplace. KOGAS was the first ever public institution to implement the mobile safety risk report application, “KOGAS Safety Alert.” The introduction of the application activated the report of safety risks and reduced the number of safety accidents at our partner companies from 9 cases in 2019 to 4 in 2020. Not only that, KOGAS received the highest grade in terms of personal information protection system among public institutions and was thus selected by the Ministry of the Interior and Safety as an exemplary case in the personal information guidance inspection.

KOGAS Win-Win Cooperation Package

KRW 284.3 billion

Minister of Trade, Industry, and Energy Citation

Safety and Environment



Leading carbon neutrality by implementing the GHG reduction roadmap

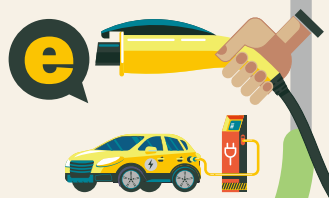
Through various energy reducing projects such as LNG vaporization system improvement, pre-cooler installations, and unused energy recycling, KOGAS reduced greenhouse gas emissions by 10.8%, compared to 2019. We also pushed for internal development and standardization of fugitive emission factor (Tier 2) in the natural gas industry sector, through which we are hoping to cut carbon emissions and even reduce carbon cost through utilization by other players in the industry. KOGAS is accelerating the transition to an environment-friendly business structure through efforts such as the launch of the carbon neutrality task force in order to achieve carbon neutrality by 2045. Thanks to these efforts, KOGAS was named the 2020 Outstanding Greenhouse Gas Reducing Company and received the Minister of Environment citation.



Greenhouse gas reduction

-10.8 % Reduction
(compare to 2019)

Safety and Environment



Innovation Effort

Energy sharing service

CO₂ reduction of 30,000kg annually

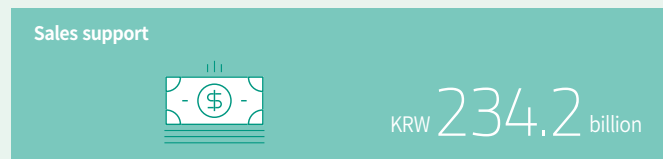
Sharing KOGAS: sharing excess energy with our neighbors

KOGAS has been running new forms of social contribution projects that are tailored to our local communities and utilize new and renewable energy. For example, we provide excess solar PV energy for free charging of EVs over weekends and holidays. The company reflected opinions of the Citizen Participatory Innovation Group and relevant organizations in Incheon and provided two express chargers and EV charging services with a reservation system to our neighbors for free over weekends. We have witnessed wonderful feedback from EV drivers in the local community who experienced inconvenience due to the lack of charging infrastructure prior to our sharing project. KOGAS will continue to develop local community contribution models and actively play our part in the government’s green energy promotion policy.

Overcoming COVID-19: KOGAS to serve as an umbrella

KOGAS' measures to revitalize the local economy

Even amidst the spread of COVID-19, KOGAS is doing its utmost to ensure there is no issue in gas supply—our key responsibility—all the while overcoming the pandemic-caused crisis with the local community. To help SMEs, small business owners, and socially vulnerable groups, we created the “KOGAS Win-Win Cooperation Package.” With this KRW 284.3 billion package of 24 action plans, we were able to provide support in efforts to overcome the crisis in various ways. The support and activities included in our win-win package were: funding support for SMEs struggling from economic slowdown; mask donations to prevent COVID-19 infections; COVID-19 test kit export support; aid for SMEs, small business owners, and socially vulnerable groups; and the operation of the Mutual Growth Fund. We will continue to do our best in actively sharing and working with the local community in order to minimize damage caused by the pandemic and overcome the crisis.



Supported 689 SMEs and small business owners with funds, etc.

To relieve the serious financial crunch that SMEs and small business owners in the Daegu and Gyeongbuk region are experiencing due to COVID-19, as well as to help revitalize the local economy, KOGAS additionally created a win-win loan fund of KRW 40 billion in partnership with the Industrial Bank of Korea. With this addition to the Mutual Growth Fund that we have been running since 2015, the loan fund increased to KRW 160 billion, and we used it to offer loans at an interest rate lower than the market interest rate. By doing so, we mitigated SMEs and small business owners' repayment burden. As a result, 689 SMEs and small business owners hit by the pandemic received loan support of KRW 157.7 billion in total and each company was exempt of up to KRW 12 million in interest.

Advanced placement of orders and exemption of deferment compensatio

20% of construction, service, and purchase orders that KOGAS had planned to place in the second half of the year to support SMEs' sales, have been placed or purchased in advance in the second quarter of the year. These early contracts are equivalent to KRW 79.2 billion. In cases of temporary nonfulfillment of contract due to difficulties caused by COVID-19, we applied the regulations flexibly, within boundaries permitted by relevant laws, such as exemption of compensation of deferment and temporary upward adjustment of lowest bid rate for small contracts under KRW 200 million. KOGAS also provided support to 17 companies and small business owners in the Daegu region vulnerable to the impact of the pandemic due to their revenue structure reliant on face-to-face sales. The company helped them find new sales channels online through entry into e-commerce platforms such as Naver Store and WeMakePrice so they may step away from their vulnerable revenue structure.



Subjects eligible	Areas of support	Support Provided	Details
SMEs	Liquidity support	<p>Created KOGAS' own support package prior to government instructions or policy announcement</p> <ul style="list-style-type: none"> - Proactive response to minimize impact of COVID-19 - Substantive support provided through support package categorization by victim type, etc. 	<p>Liquidity support: KRW 46.4 billion</p> <ul style="list-style-type: none"> - Provided funds support to 689 SMEs and small business owners
Small business owners	Sales support	<p>Support through system improvement</p> <ul style="list-style-type: none"> - Early orders of investments and early execution of business budget - Win-win order checklist management 	<p>Sales support: KRW 234.2 billion</p> <ul style="list-style-type: none"> - Early placement of orders, exemption of compensation of deferment, etc.
Socially vulnerable groups	Disinfection support	<p>Support through burden-sharing</p> <ul style="list-style-type: none"> - KOGAS executives and employees' voluntary return of pay - Deferral of city gas bill payments 	<p>Disinfection support: KRW 1.76 billion</p> <ul style="list-style-type: none"> - Includes preemptive support of KRW 1.7 billion in the early stage of COVID-19 outbreak, including mask donations (apprx. 580,000 masks) and urgent supply of daily necessities
	Livelihood support		<p>Livelihood support: KRW 3.7 billion</p> <ul style="list-style-type: none"> - Deferral of city gas bill payments (960,000 customers), etc.

Practicing social distancing, but closing the safety gap

Along with “Emergency Measures to Revitalize the Economy” devised to support SMEs, small business owners, and socially vulnerable groups struggling with pandemic-caused sales and income decrease, KOGAS rolled out the citizen safety service. Social distancing reduced offline activities and lowered people’s interest in facilities safety, but KOGAS contributed to enhancing Korean citizens’ safety-first awareness and reducing insensitivity to safety risks through the company’s safety-related talent donation. For traditional markets and socially vulnerable groups, we conducted emergency safety examinations and made improvements to gas safety facilities and vulnerable districts through programs such as gas-related accident prevention campaigns, thereby raising safety awareness. Going forward, we will fulfill our social responsibility as a public enterprise through community-centered win-win cooperation as “the happiness partner and safety net of Koreans” and by building trust through burden-sharing.



Donations of 580,000 masks, emergency daily necessities, etc.

In the early months of the pandemic, KOGAS moved quickly to provide KRW 1.7 billion worth of goods including daily necessities and 580,000 masks to the socially vulnerable groups and citizens in the Daegu area to help contain the spread of the virus. Our executives and employees voluntarily collected cash contributions and delivered it to the Community Chest of Korea in Daegu so the donation may be used for residential treatment center operations or to supply medical equipment such as protective gowns, goggles, and masks to medical teams in Daegu working relentlessly at the frontline to treat patients and prevent the spread of the virus.

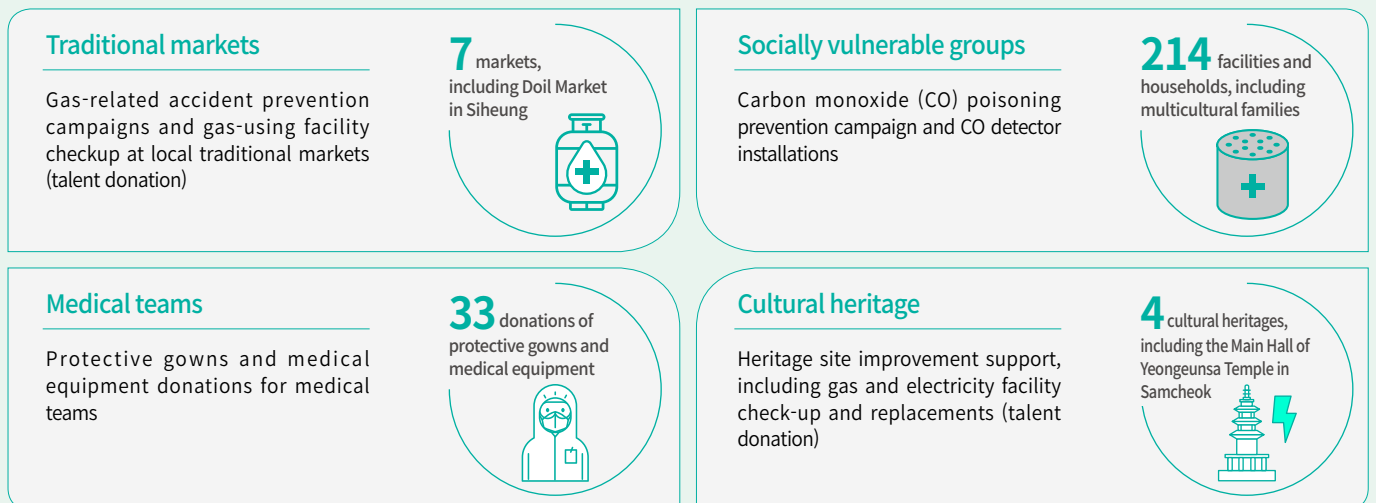
Deferral of city gas bill payment for 960,000 customer

Since April 2020, when the pandemic began to hit people’s livelihoods, KOGAS has been deferring city gas bill payments for small business owners and socially vulnerable households around the country. We deferred the 3-month payment deadline by three times and allowed payment in equal installments over the course of 6 additional months, which helped reduce the burden of city gas bill payments for 960,000 small business owners and vulnerable households. We also reduced rent by 50% for small business owners and SMEs who are tenants of KOGAS-owned facilities.

2020 Support Results



Closing safety gaps through safety talent donations



Sustainability & Social Value

Future Leading Energy of hope for the Future	20
Safety First Safe and low-carbon Clean Energy	30
Communication and Cooperation Win-win Energy for Mutual Growth	40
Open-Minded Happy Energy to Enjoy Together	50



“Everywhere Green Life, H₂ KOGAS” is KOGAS’ new vision for 2030. We will solidify our identity as a hydrogen-centered green energy company that creates a clean environment and clean life for the people by supplying green energy to places where our customers are. Also, as “Korean citizens’ happy partner realizing clean energy welfare,” we will lead efforts in creating social value. Our goal is to create 19,000 jobs and obtain the highest grades in Safety-Cap and integrity evaluations by 2030. By fulfilling these three social value goals, we will make greater contributions to the society and the people.



MATERIAL ISSUE

01 Future Leading Energy of hope for the Future



Our Target

- Strengthen public interest of gas
- Revitalize new energy businesses
- Expand energy transition
- Strengthen R&D of future energy technology

2025 Medium and long-term business goals

Import cost savings

KRW **898.5** billion

Overseas business ROI

56.8 %

Transitioned transportation fuel sales

9,535,000 tons

Comprehensive level of new growth technology

95.8 %

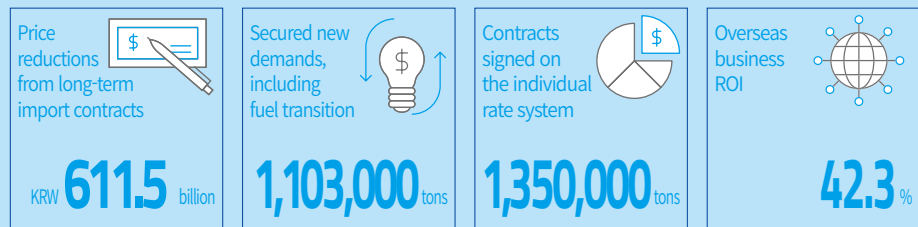
Business Relevance

With greenhouse gas reduction and the transition to low-carbon economy and new and renewable energies becoming global requirements, hydrogen is garnering attention as a future energy source, as it has high energy conversion efficiency and is effective in greenhouse gas reduction. It is expected that the utilization value of hydrogen will become higher as it will be used in all areas that call for energy systems, including vehicles, planes, and fuel cells. There will be continued challenges such as global energy transition requirement and the development of environment-friendly technology. Under such circumstances, the role of public energy business will become more important in line with the need to enhance people's convenience and benefit and realizing energy welfare through stable supply of natural gas.

Our Approach

KOGAS is spearheading the establishment of hydrogen-related infrastructure in order to invigorate the domestic hydrogen economy in line with the current global trend. An economical and realistic way to mass-produce hydrogen is reforming natural gas. KOGAS has gas pipelines connected through out the country and supply stations at key sites, which may be utilized to build hydrogen infrastructure and distribution network in an economical and effective way. KOGAS, established a strategy to lead Korea's hydrogen economy and to expand our new energy businesses through the transition to environment-friendly energy. By diversifying our products (natural gas + hydrogen) and identifying new markets, we will take off as a truly all-around energy company.

2020 Key Performances



Leading the hydrogen industry

Fostering the hydrogen industry, the future of energy

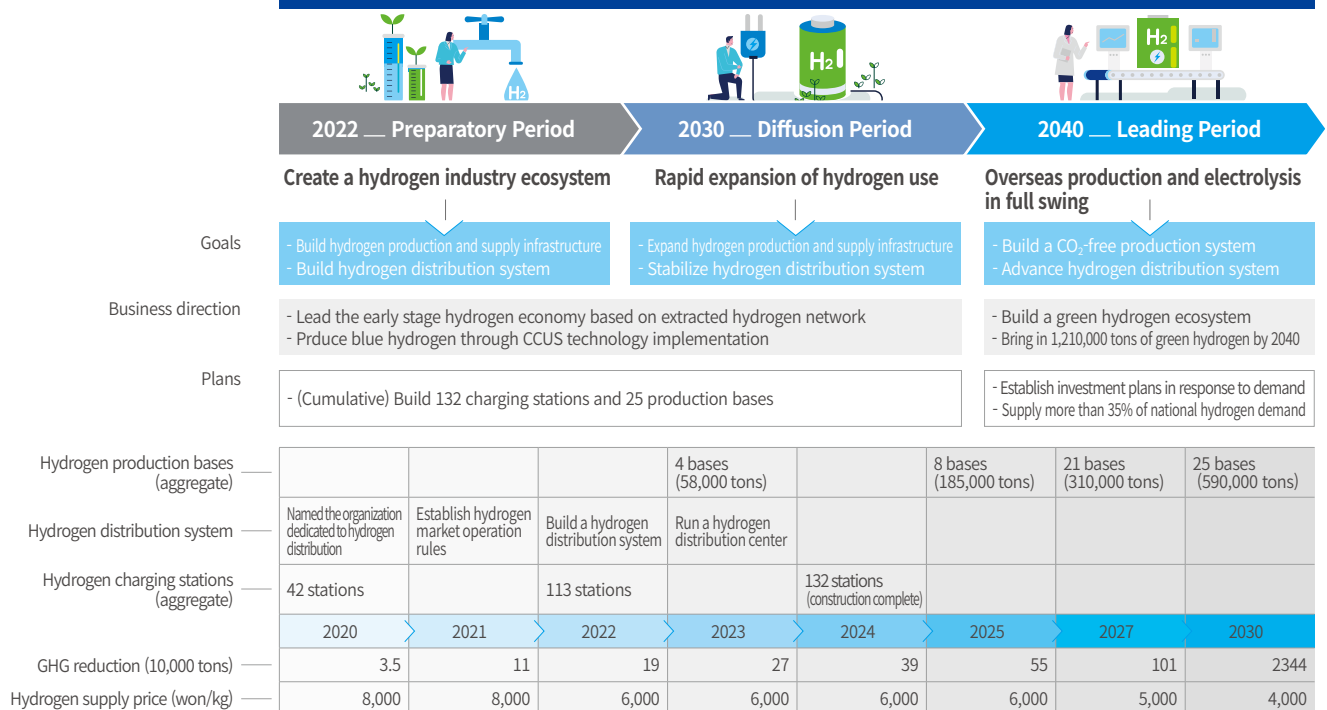
Driving economic revitalization by fostering the hydrogen industry

The government expects that the hydrogen industry will create 420,000 jobs and an economic value of KRW 43 trillion annually in 2040. To turn this expectation of hydrogen-driven economy into reality, the construction of infrastructure required by the hydrogen industry's value chain of "production-distribution-utilization" is needed. KOGAS owns a natural gas pipeline network of 4,908km connected throughout South Korea and 412 stations located at key points around the country. These existing infrastructures may be utilized for the production and transportation of hydrogen. Based on the know-hows acquired through 30 years of safe and stable operation of the natural gas business, KOGAS will play a leading role in operating hydrogen facilities and safety management in order to accelerate Korea's entry into a safe and clean energy society. The company will also develop new markets and push for innovative growth in the future to advance as a combined energy company. KOGAS will drive Korea's hydrogen economy, from hydrogen energy production and supply to distribution.

KOGAS hydrogen business execution strategy

KOGAS established the "Hydrogen Business Execution Strategies" and "KOGAS Vision 2030" in April 2019 and 2021, respectively. In accordance with the established strategies and vision, KOGAS will actively participate in all aspects of the hydrogen industry, including hydrogen production, supply, and technology development, thereby driving the hydrogen economy revitalization as a public organization. The company is also working on gaining technology independence in the hydrogen industry. To achieve this goal, we established and are following a phased technology development roadmap. The roadmap includes content on production, storage, transport, and utilization, including natural gas development technology localization, carbon capture and recycling technology development, and electrolysis technology research. We will establish a hydrogen industry safety management system at the level of advanced countries and focus on leading the international standard regarding safety.

Propelling the hydrogen industry with preemptive investments and strategies customized to each period



Named the organization dedicated to hydrogen distribution

KOGAS has been solidifying the foundation for our hydrogen business. In 2018, the Korea Gas Corporation Act was revised to include hydrogen business in its business activities and specified the plans to lead the hydrogen economy by establishing the "Hydrogen Business Execution Roadmap." In July 2020, the government launched the Hydrogen Economy Committee and selected KOGAS as the exclusive institution dedicated to hydrogen distribution. The company thus turned to hydrogen business for our key future business. As the company responsible for hydrogen distribution, we are ramping up our hydrogen business, including the restructure and expansion of the organization responsible for hydrogen businesses from Hydrogen Business Team to Hydrogen Business Department.

Hydrogen project business models

Main Business Models

- Hydrogen production base
- Hydrogen fuel cell



Support/Expansion Business Models

- Build hydrogen charging infrastructure
- Bring in overseas green hydrogen



Establishing foothold as a company leading the hydrogen industry

Focusing on hydrogen production and distribution

In preparation for future increase in hydrogen demand, KOGAS plans to build bases for extracted hydrogen production in the short term. In the long run, we will focus on expanding water electrolytic hydrogen to cut GHG emissions and secure economic feasibility while also working on bringing in hydrogen from overseas markets. First, KOGAS will secure the ability to supply large volumes of hydrogen by building multi-fuel charging stations and strategic hydrogen production bases to supply hydrogen to metropolitan areas by 2030. We are currently building strategic production bases in the Changwon and Gwangju Metropolitan City regions with goals to start producing hydrogen by 2023. We have received orders for 40 charging stations thus far, mostly from Hynet, to expand hydrogen charging infrastructure, and 5 stations are currently in operation, including in Sejong. KOGAS also pushed on with our own charging station network expansion project in Gimhae and Daegu. In Gimhae, we built an on-site hydrogen refueling station that includes hydrogen production and shipment facilities, and in Daegu, we built an off-site hydrogen refueling station near the KOGAS head office. Both stations are scheduled to begin operation this year (2021). Moreover, to expand the diffusion and use of environment-friendly hydrogen, KOGAS will secure and commercialize large-scale water electrolysis technology by 2030 in phases. We will also import hydrogen produced overseas, build a green hydrogen supply network, and supply that hydrogen to produce and supply CO₂-free hydrogen.

Constructions of strategic hydrogen production bases

KOGAS is currently building hydrogen production bases in Changwon and the Gwangju Metropolitan City through open calls for participation of local governments. The bases are set for completion by the end of 2022, and KOGAS plans to pick up speed in our hydrogen production and supply businesses. By building strategic hydrogen production bases, the company will secure a stable hydrogen supply system and contribute to realizing the government's hydrogen economy invigoration policy.

Examples of middle and large-scale hydrogen production base construction

(2023 Production Goal)

<p>Changwon Hydrogen Production Base</p> <p>5,000 m³/h</p> <p>[Produce 3,650 tons/year] Can charge 24,300 vehicles (cars)</p>	<p>Gwangju Hydrogen Production Base</p> <p>2,000 m³/h</p> <p>[Produce 1,460 tons/year] Can charge 9,700 vehicles (cars)</p>	<ul style="list-style-type: none"> • Liquefaction bases (4 bases) • Transportation bases (12 bases) • Multi bases (9 bases)
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Constructions of extract-type hydrogen production bases

KOGAS will build 25 middle and large-scale strategic production bases using the natural gas infrastructure by 2030. By doing so, we will prepare nationwide hydrogen production and supply network in the right time. Also, by enlarging production equipment and saving the cost of materials, we will lead production cost reduction, thereby securing hydrogen price competitiveness.

Extraction-type hydrogen production base construction plan

Our goal is to build 25 strategic hydrogen production bases by 2030 to supply hydrogen to large cities.

- ~2022**

Changwon, Gwangju Production base construction complete

Begin construction of new hydrogen production base
- 2023~2030**

Production to commence in Changwon and Gwangju in 2023

Construction of a total of 25 strategic hydrogen production bases, including 12 transportation bases and 9 multi bases

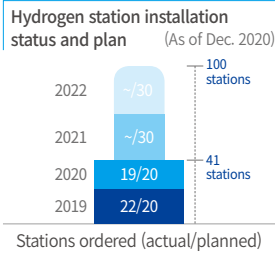
Station	Gimhae on-site hydrogen charging station	Daegu KOGAS HQ hydrogen charging station
Charging/storage capacity	50 kg/h	*can charge 10 cars/hour (Nexo hydrogen vehicle)
Charging method	On-site Hydrogen produced and supplied to the station on-site	Off-site Hydrogen supplied externally
Operation Plan	Commercial operation to begin in July 2021	Commercial operation to begin in March 2022

Hydrogen station construction and operation business

We plan to promote the diffusion of hydrogen vehicles by building charging infrastructure such as hydrogen charging stations. We will build and operate 132 charging stations by 2030 through our own constructions and partnerships with private entities. Two hydrogen charging stations, directly run by KOGAS, will be built and put into operation in Gimhae and Daegu Metropolitan City, each in 2021 and 2022, respectively.

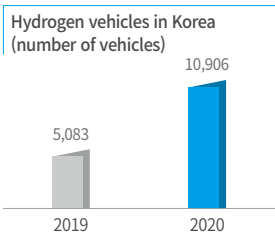
Fuel cell power generation business

Using the five LNG production bases in Incheon, Pyeongtaek, Dangjin, Tongyeong, and Busan, we will build fuel cell power generation plants totaling 500MW in capacity and produce clean energy.



Overseas green hydrogen production and import plan

To ensure economic feasibility and secure a stable supply of hydrogen at the same time, we must develop a business model involving hydrogen production and import from overseas countries. KOGAS is striving to secure large-scale green hydrogen production and liquefaction source overseas through cooperation with global companies. Considering renewable energy utilization efficiency, installation cost, and complaints, it is more economical to produce hydrogen in areas like the Middle East, Australia, and Mongolia, where natural energy resource is abundant, than doing so in Korea. To secure price competitiveness of hydrogen and ensure that large amounts of hydrogen may be supplied to transportation, energy, and various other industries, KOGAS plans to produce and bring in green hydrogen from overseas countries at more affordable costs. Our goal is to begin green hydrogen import in 2030 and reach 1,200,000 tons in imported volume by 2040.

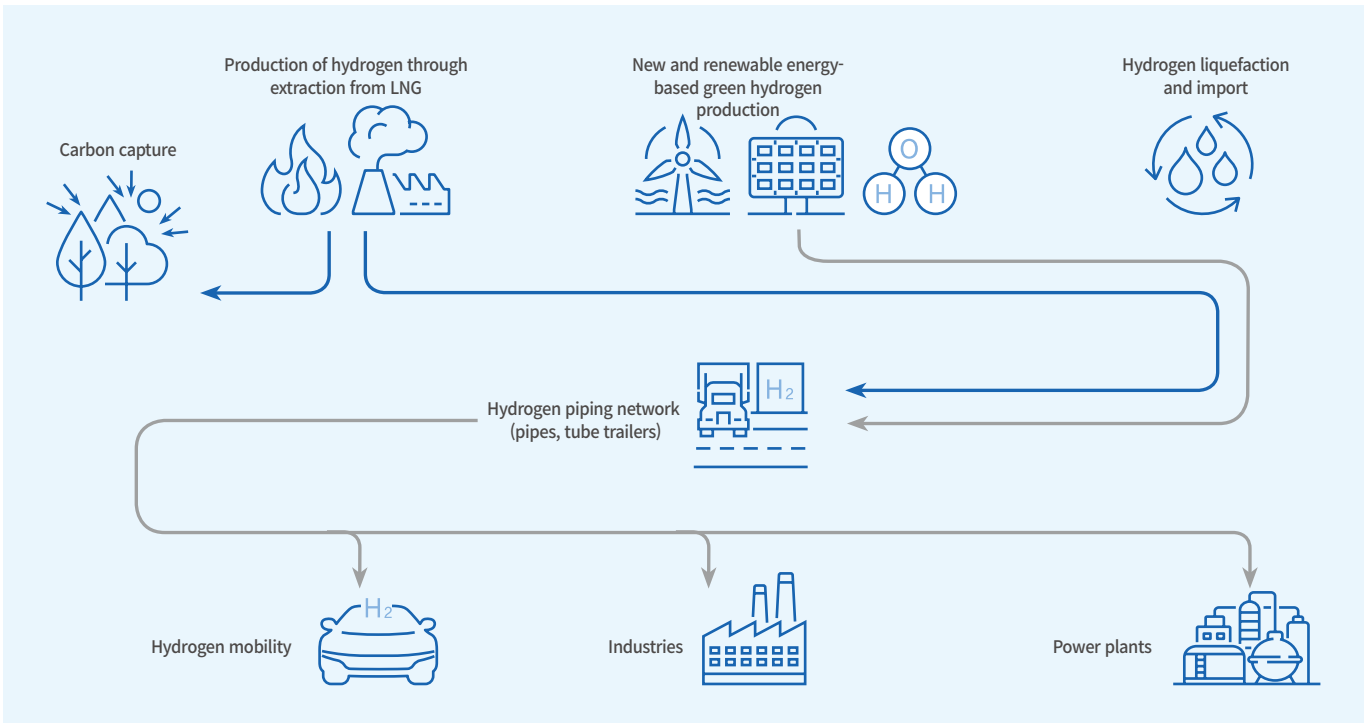


Increasing the number of hydrogen vehicles and charging stations

KOGAS is working on popularizing ecofriendly hydrogen vehicles and adding charging stations for user convenience. Our plan is to construct and operate 132 charging stations by 2030 through both private cooperation and our own installation projects. Among them, two stations will be built and run as stations directly managed by KOGAS, with one in Gimhae (2021) and another in Daegu (2022). In 2020, KOGAS drove the founding of HyNet, a special purpose company (SPC) established through public-private partnership of 13 hydrogen-related companies for hydrogen charging station construction and operation. Thanks to the charging station additions made through HyNet, 10,906 hydrogen vehicles came on the road in 2020, which is a 115% increase year-on-year, and the installation of 16 hydrogen stations came with GHG reduction effect of 9,472 tons a year.

Alongside these advances, KOGAS signed an MOU with the Hyundai Motor Group on securing hydrogen business competitiveness and expanding a sustainable hydrogen infrastructure. Through this partnership, we will gather our efforts to develop relevant technology. The key content of the agreement includes technology development and the discovery of joint business opportunities regarding overall hydrogen-related infrastructure, including green hydrogen import and the founding of a joint venture for combined fuel charging stations for commercial hydrogen-powered EVs. We also agreed to popularize commercial hydrogen-powered EVs by building LNG-based combined hydrogen stations. Going forward, KOGAS will secure core hydrogen technologies, establish joint ventures to expand hydrogen-related infrastructure, and create an open platform-based ecosystem through cooperation with research institutions, the government, and domestic and foreign companies, to become a global enterprise in the hydrogen industry.

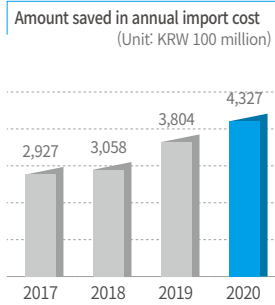
Hydrogen import business model



Sustainable operation of the energy business

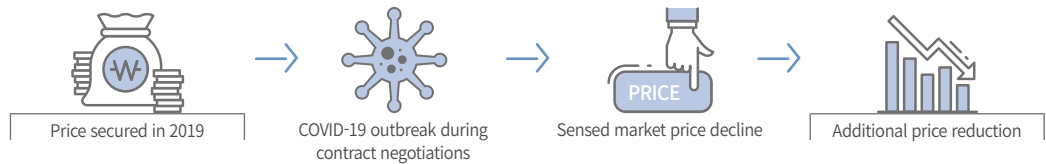
Stable and economical LNG import

Contributions to people's energy convenience and benefit by saving LNG import cost



KOGAS imports LNG worth approximately KRW 15 trillion a year to supply common energy for city gas and power generation. By lowering city gas and electricity cost through LNG import cost reduction, we wish to help improve energy convenience and benefit for the people. In the market environment where oil price plummeted after the pandemic outbreak, KOGAS adjusted the time of import by price. We also carried over existing contract volume and spot purchased low price LNG when reduced LNG demand and price fall were witnessed around the world. By doing so, we saved KRW 432.7 billion on import costs. Also, as the outlook on LNG supply and demand changed due to COVID-19, we agreed on further price discounts when signing new long-term LNG contracts. We agreed on a price discount of KRW 71.1 billion per year compared to the price secured in 2019. With this, KOGAS lowered the common energy bill by KRW 18,736 per household for all 23 million households using city gas in 2020, thereby contributing to energy convenience and benefit of the people.

Low price contract secured in 2019 → Agreed on further price discount, reflective of 2020 market information



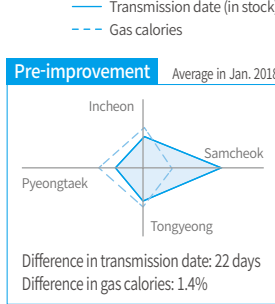
First individual rate system contract with Korea District Heating Corporation (KDHC)

KOGAS signed an MOU with KDHC on LNG supply based on the individual rate system and promised to supply 400,000 tons of natural gas per year for 15 years to KDHC's three new cogeneration plants. The individual rate system refers to a system under which KOGAS signs a separate contract with each power plant at different rates in supplying LNG. With this system in place, it is expected that KOGAS will be able to respond flexibly and actively to various requests of power generators, in line with the rapidly changing global LNG market trend. By signing 4 supply and acquisition agreements with KDHC, KOGAS created new demand of 1.42 million tons a year and created a KRW 199.7 billion increase in citizen benefit (out of the amount to be paid by consumers), thanks to what was saved through the contracts secured.

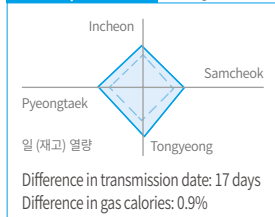
Addressed the supply and demand crisis using an AI-based system for optimal distribution to LNG carriers

Increases in temperature anomalies caused by climate change, gas-fueled power generation following the energy transition policy, and direct imports by the private sector have rapidly boosted the number of elements to take into consideration in natural gas analysis. As a result, the existing prediction method has reached its limit. With accurate demand predictions using big data analysis, KOGAS is now able to bring in and automatically distribute LNG carriers, assign LNG carriers without error, and supply high quality gas. Thanks to this optimal distribution of natural gas backed by artificial intelligence, we closed the monthly variation in gas transmission date by region by 5 days and monthly variation in gas calorie by region by 0.5% in 2020. We were thus able to prevent the discontinuance of gas supply in the metropolitan area.

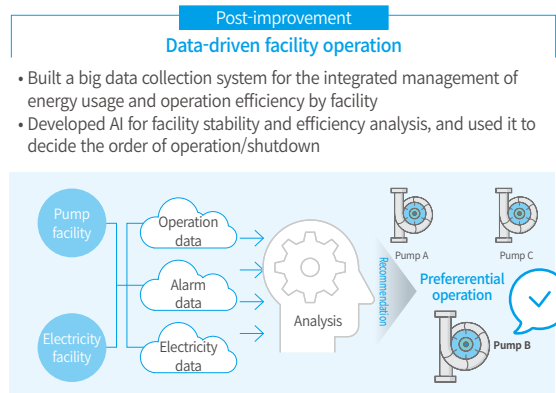
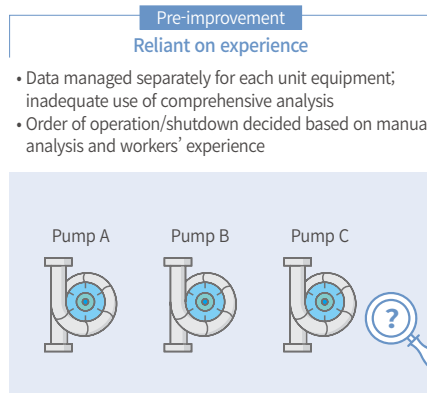
Optimal LNG distribution backed by AI



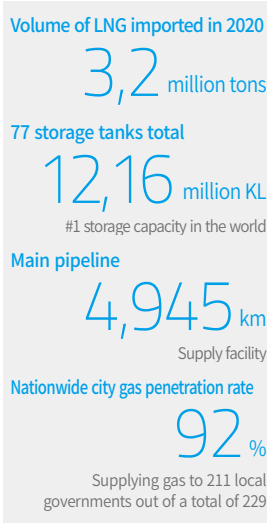
Post-improvement



Optimal operation of equipment based on AI



Safe and convenient natural gas infrastructure



Installation of stable facilities for uninterrupted supply of LNG

Our production bases and pipe networks sit at optimal locations nationwide to supply natural gas stably. As of the end of December 2020, KOGAS owns a total of 77 storage tanks (12.16 million kℓ) at 5 LNG terminals located nationwide, which is the largest scale LNG storage facility in the world. By 2031, the company will secure additional storage tanks through new LNG terminal constructions. Natural gas regasified at LNG terminals are decompressed to an appropriate pressure level, and then safely supplied to power plants and city gas companies via the national annular piping network. Supply networks are generally annular in shape in order to ensure gas supply even in emergencies such as supply stoppage. As of the end of 2020, the length of the main pipeline stood at 4,945km, and the goal is to complete the extension to a total of 5,382km by 2023.

Smart factory construction at the Dangjin LNG terminal

KOGAS, which already has the largest LNG storage facility in the world, is currently constructing another LNG terminal in Dangjin, targeted for completion in 2025. The Dangjin LNG terminal, which will create new jobs and help revitalize the local economy, is being built as a smart factory. All on-site facility data will be collected by a big data system in the cloud, and AI algorithms will operate and control the smart factory. It will be the world's first smart LNG terminal, with all LNG processes - from LNG receiving to processing and handling - managed by smart technology and IT infrastructure such as big data and AI. Once completed, the Dangjin terminal is expected to open a new chapter of the world gas industry.

Nationwide piping network

(As of March 2021)

Incheon LNG Terminal

- Largest single base transmission capacity in the world
- Largest single base storage capacity in the world
- Storage tanks:
 - 100,000kℓ × 10 tanks
 - 140,000kℓ × 2 tanks
 - 200,000kℓ × 11 tanks
- Dock · unloading facilities:
 - One 75,000-ton berth
 - One 127,000-ton berth
- Regasification transmission capacity: 6,210 tons/hr

Pyeongtaek LNG Terminal

- Storage tanks:
 - 100,000kℓ × 10 tanks
 - 140,000kℓ × 4 tanks
 - 200,000kℓ × 9 tanks
- Dock · unloading facilities:
 - One 75,000-ton berth
 - One 127,000-ton berth
- Regasification transmission capacity: 4,680 tons/hr

Samcheok LNG Terminal

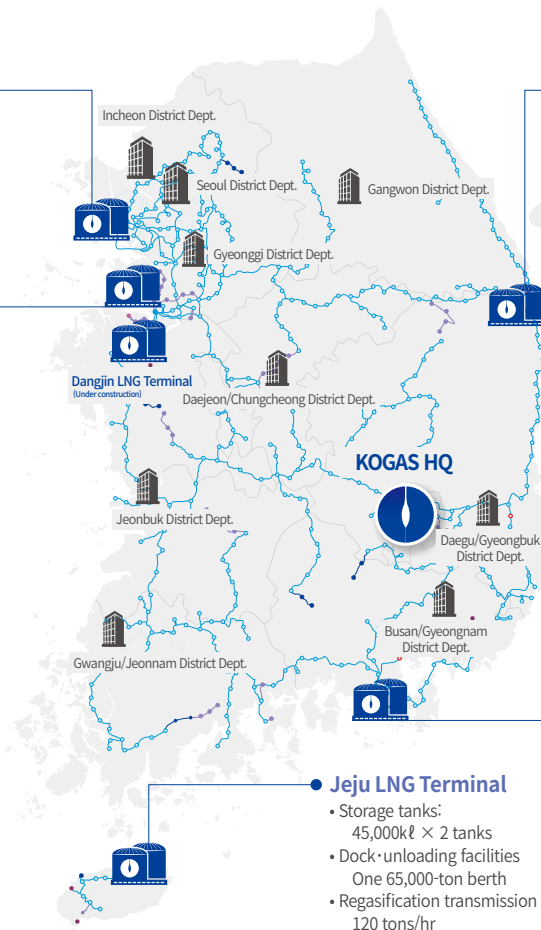
- Storage tanks:
 - 200,000kℓ × 9 tanks
 - 270,000kℓ × 3 tanks
- Dock · unloading facilities:
 - One 127,000-ton berth
- Regasification transmission capacity: 1,320 tons/hr

Tongyeong LNG Terminal

- Storage tanks:
 - 140,000 kℓ × 13 tanks
 - 200,000 kℓ × 4 tanks
- Dock · unloading facilities:
 - One 75,000-ton berth
 - One 127,000-ton berth
- Regasification transmission capacity: 3,030 tons/hr

Jeju LNG Terminal

- Storage tanks:
 - 45,000kℓ × 2 tanks
- Dock · unloading facilities:
 - One 65,000-ton berth
- Regasification transmission capacity: 120 tons/hr



Gas Leakage Rate (% As of the end of Dec. 2020)



Expanding new energy businesses

Strengthening our competitiveness in technology development

KOGAS is gaining technological competitiveness in the overall energy industry through continued innovation and investment in the promotion of Korea’s natural gas industry and new energy technology development for the future. We are not only developing technology to supply natural gas stably, which is our key business, but also promoting new business support and technology commercialization through the advancement of foundational technology. As a preemptive response to the energy paradigm shift, we established the Hydrogen Business Department, Hydrogen Technology Research Center, and M&A team. We are also actively responding to changes through projects such as the comprehensive research on new future businesses, with focus on green energy. KOGAS will continue to give our best in technological innovation to secure technology required in new energy businesses and lead the energy market overseas.

Technology development through open innovation

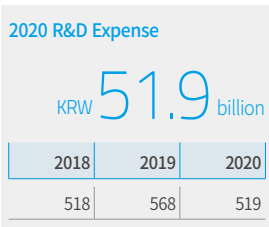
To secure hydrogen-related technology and advance gas infrastructure-related technology, KOGAS is expanding its open development programs through efforts such as SME technology development and joint development between the industry and academia. To successfully carry out our main job of supplying natural gas safely and reliably, we are working on providing multifaceted technology support. KOGAS’ support include: the construction of smart factories using AI, big data, and IoT assessment; securing facility safety using multipurpose pipe robots; and business related to utilizing KOGAS’ existing infrastructure, such as LNG cold energy system and bunkering. We are also responding to internal and external changes and new requirements such as the need to boost hydrogen economy and achieving carbon neutrality. Our efforts in that aspect include: water electrolysis-based green hydrogen production and liquefaction technology development; liquefied hydrogen storage technology and terminal design technology; CO₂ capturing and conversion to useful substance; and other technology development to build foundations for new growth businesses. Through continued open cooperation in technology development for the improvement of technological competitiveness in our key businesses and the successful execution of new growth businesses, KOGAS will secure foundational technology and lead the new technology ecosystem.

Smart facility operation using new technology

KOGAS is witnessing growth in the size of our gas production facilities and an increase in operation costs caused by outdated facilities. There is also the possibility of issues related to safe operations breaking out unexpectedly, anytime and anywhere. We introduced a facility analysis/diagnosis/operations system using 4th Industrial Revolution technologies in order to respond proactively to these matters. This system will maximize the efficiency of our production facility operations and establish a more stable foundation for gas supply.

AI-based main piping safety management system

Unauthorized used of excavators in construction projects near our piping network supplying natural gas throughout the country may damage the pipes and lead to accidents. AI-based main pipe safety management system uses multiple drones that fly autonomously on the specified route and patrol the area surrounding the main pipes. Video data collected by the drones are sent to the control center in real time through the LTE network. Videos filmed by drones that recognize objects through AI-based systems are analyzed at the control center to identify excavating equipment. Once risk is detected, warning messages are broadcast through the drones. Machine learning based on video data provided by KOGAS demonstrated 95% accuracy in excavation equipment detection. Beginning in 2024, main pipe safety will be managed with drones. This will help prevent safety accidents and strengthen people’s trust in us, in turn.



Status of intellectual property Rights and technology transfer (Unit: cases)

Industrial Property	2018	2019	2020	
Patent	Applied	62	46	34
	Registered	30	52	43
Programs	1	1	5	
Technology Transfer (maintain contract)	19	28	35	



Automatic voyage assignment system for LNG carriers and integrated stock management system

- Big data-based LNG stock and calorie management by base
- Established the optimal voyage assignment program



Power equipment diagnosis system

- Real time malfunction diagnosis and prediction of power equipment, including cables and transistors
- Installation complete in all production bases; Prevented 7 power outage and gas supply stoppage incidents



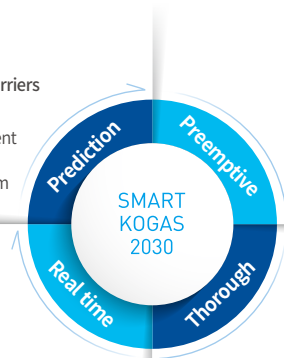
Early warning system for equipment failures

- Predict equipment failures by analyzing equipment operation patterns based on big data
- Developed failure prediction program; in pilot operation at the Pyeongtaek base



Drone-enabled pipe patrol system

- Pipeline network surveillance using drones in sections unable to access in person
- Pilot operation in 13 sections (4 sections added in 2021)



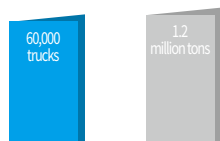
Green fuel transition business goal (until 2030)

LNG bunkering business



LNG supply for bunkering Fine dust reduction

LNG truck business



LNG trucks LNG sales



Korea's #1 LNG-tuned truck



LNG bunkering

Transition to low-carbon, eco-friendly fuels

The global energy market is going through a major energy transition from fossil fuel-based energy to environment-friendly energy such as natural gas and renewable energy. To secure an engine for innovative growth in the future and to lead the domestic energy industry, KOGAS is working on a range of new businesses, including hydrogen business and the expansion in the supply of natural gas for land and marine transport. We plan to focus our investment in new businesses tied to natural gas such as LNG bunkering, LNG trucks, gas-powered air conditioning, and fuel cells, injecting approximately KRW 1 trillion until 2025. These endeavors will not only address the fine dust issue caused by transportation means but also equip us with a new future growth engine through various businesses for the shift to ecofriendly fuel.

LNG bunkering business: addressing the issue of fine dust from ships




The international maritime organization (IMO) adopted a new regulation reducing the limit of sulfur content of ship fuels from 3.5% to 0.5% in 2020 in order to cut sulfur oxide emissions. It is expected that there will be a greater demand of LNG bunkering as a result of ship fuel transition to LNG. KOGAS prepared the legal and institutional foundation for the use of LNG as ship fuel, established Korea LNG Bunkering Co. Ltd (KOGAS' bunkering subsidiary), and will build a loading facility for bunkering at the 5th production base in Dangjin. We also plan to operate more bunkering ships in addition to Jeju 2, which is currently in use as a LNG bunkering ship. The new ships are currently being built for operation, with ship-building subsidy from the government; as such, we are working on revitalizing the LNG bunkering business. KOGAS also successfully completed the world's first "STS LNG loading verification test" for LNG carrier gas trial, subsequently securing operational know how and technological reliability.

LNG trucks business: addressing the issue of fine dust caused by land transportation

KOGAS has been pushing forward the LNG truck project, through which we aim to improve the in-land air condition by substituting truck fuels from diesel to LNG, as they account for 68% of domestic fine dust emissions from the transportation sector. It has been revealed that LNG trucks have fine dust (PM), NOx, and CO₂ reduction effect of 100%, 96%, and 19%, respectively, compared to diesel trucks. KOGAS completed the construction of large size LNG trucks with high horsepower (400 horsepower) jointly developed with the Korea Association for Natural Gas and Fuel Cell Electric Vehicles. We plan to supply 60,000 large LNG trucks by 2030 and record 1.8 million-ton in natural gas sales.

LNG cold energy cluster: utilizing LNG cold energy

Cold chain logistics business is expanding due to the growing demand of fresh and frozen food, cold chain delivery, and COVID-19 vaccine distribution. Cold energy is also gaining attention as future energy, as environment-friendly energy is quickly gaining momentum. KOGAS intends to create a new energy ecosystem using cold energy that was once discarded in the natural gas supply process and we will move quickly to start construction of a cold chain logistics center utilizing cold energy from LNG. We are also working on the gas air conditioning business to prepare for the national electricity supply issue in the summer season. Gas-powered air conditioners use gas instead of electricity as the power source for cooling in the summer season and for heating in the winter season. With this substitution, we can lower peak electricity and contribute to stabilizing the electricity supply and demand. KOGAS is also working hard to increase the penetration of gas-powered cooling by providing a range of policy-side support in cooperation with the government, including subsidizing gas-fueled air conditioning system installations, mandating public institutions to install gas air conditioners, and encouraging gas air conditioning system installation at large buildings.

Project	Details	Results
LNG Bunkering 	<ul style="list-style-type: none"> Successful completion of the STS (ship-to-ship) LNG loading verification test (to LNG carrier) - 1st in the world LNG bunkering subsidiary company establishment complete (KRW 29 billion invested) 	<ul style="list-style-type: none"> Business operation capability verified Will supply 550,000 tons by 2030
LNG Trucks 	<ul style="list-style-type: none"> Model diversification (mixer trucks), engine performance improvement (up by 80 horsepower) Participated in the company selection for the fuel transition of Busan Port yard tractors 	<ul style="list-style-type: none"> Supplied 100 yard tractors (Fine dust reduction by 99% compared to diesel fuel use)
Cold Energy Cluster 	<ul style="list-style-type: none"> Belstar Superfreeze Consortium created First ever submission of project plan to a private-initiated business 	<ul style="list-style-type: none"> Begin project in 2023 Supply 766,000 tons of cold energy annually

Overseas projects

Promotion of overseas projects by choice and concentration

KOGAS is actively implementing 25 overseas projects in 13 countries to gain energy independence and secure resources economically and stably. The company has secured the highest level of 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 middle stream and downstream infrastructure business areas. These include LNG liquefaction business, operation of overseas LNG terminals, construction and operation of overseas city gas pipelines.



Canada

KOGAS is currently operating natural gas exploration, production, and liquefaction projects in Canada. KOGAS has had the permanent mining right for the Umiak licensed block, located northwest of Inuvik City, since 2011, which is when KOGAS began the project. The company has been producing natural gas stably in the Horn River gas field since 2012. Meanwhile, the LNG Canada Project, the first project of LNG export from Canada, is also under way. KOGAS is building a liquefaction plant on the west coast of Canada to transport LNG to Korea or to export it to other Asian countries. The company has a 5% share in the business. KOGAS obtained all required approvals from the Canadian government, including LNG export permit (40 years), and began construction of the liquefaction plant. Production is set to begin in 2024, and we are preparing to produce competitive LNG using ample resource of natural gas in Canada.



Mexico

The order for the Manzanillo LNG Terminal Project 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 its power capacity. The project is drawing a lot of attention as a critical piece for the improvement of Mexico's energy industry. It is the first ever case of overseas LNG terminal investment and technology export made possible through cooperation with private companies that cannot penetrate foreign markets independently.

• ROI of Mexico Manzanillo Project: **82%** (as of December 2020)



03 Overseas resource exploration projects

1. Mozambique, Area 4
2. Cyprus, offshore blocks (#2, 3, 9)
3. East Timor, offshore block E
4. Indonesia, Krueng Mane offshore block

09 Overseas resource development/production projects

1. Canada, North Pole Umiak gas field
2. Canada, Horn River
3. Uzbekistan, Surgil gas field
4. Iraq, Mansuriyah gas field
5. Iraq, Akkas gas field
6. Iraq, Badra oil field
7. Iraq, Zubair oil field
8. Myanmar, blocks A-1/A-3
9. Indonesia, Senoro gas field

08 Overseas LNG projects

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
8. Australia, GLNG

04 Overseas infra projects

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

Entry into the overseas GTP business market

There has been a growing number of GTP (Gas to Power) project orders among developing countries recently. GTP project combines gas import, construction and operation of terminals and pipelines, and power plant operation and maintenance (O&M). KOGAS plans to create results in the GTP business, in line with the recent trend of gas and power convergence. To compete against global competitors in the market with our competence in natural gas procurement and terminal construction/operation, KOGAS plans to raise our business awareness by organizing a consortium with other global companies and power producers and also strengthening our competitiveness in receiving order. The progress our GTP business was rather slow in 2020 due to the pandemic. However, in 2021, we installed the ASEAN Vietnam Office and have been quickly moving forward with GTP businesses in Vietnam, Thailand, and the Dominican Republic, in partnerships with domestic power producers and energy companies. Going forward, we plan to establish a bridgehead for entry into LNG power markets in emerging countries overseas.

Global Projects

KOGAS procures LNG from natural gas production sites overseas, and then supplies gas to domestic power producers and city gas companies through our gas pipe network and tankers. Our overseas LNG business commenced in 1996 in the form of equity investment in the Oman LNG project and expanded to 8 LNG projects in 7 countries today. As of the end of 2020, 25 overseas projects are under way in 13 countries, with cumulative investment standing at USD 11.978 billion. Through the restructuring of our overseas projects, we were able to reorganize our business portfolio to one that focuses on the core business and have been improving our overseas project performance. We will stabilize our overseas projects to secure resources, thereby providing a stable supply of natural gas in the country, securing the engine for future growth, and continuing our entry into new markets.

IRAQ: Zubair and Badra oil fields

second rounds of international bidding hosted by the Iraqi government in 2009 and signed the contract in 2010. The goal is to produce a total of 4.7 billion barrels of crude oil at the Zubair block for 25 years from 2010 and a total of 610 million barrels of crude oil at the Badra block for 20 years from 2010.

- ROI of Iraq Zubair **108%** (as of December 2020)
- ROI of Iraq Badra **52%** (as of December 2020)

Mozambique

confirmed to have natural gas reserves in the three gas fields of Mamba, Coral, and Agulha. KOGAS decided to invest in the development of floating LNG in the Coral gas field (PIIP: approximately 16 trillion Tcf) in June 2017 and 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 **84%** (as of December 2020)

Amount of oil and gas resources acquired



217 kmillion tons
(As of 2020, 2P+2C)

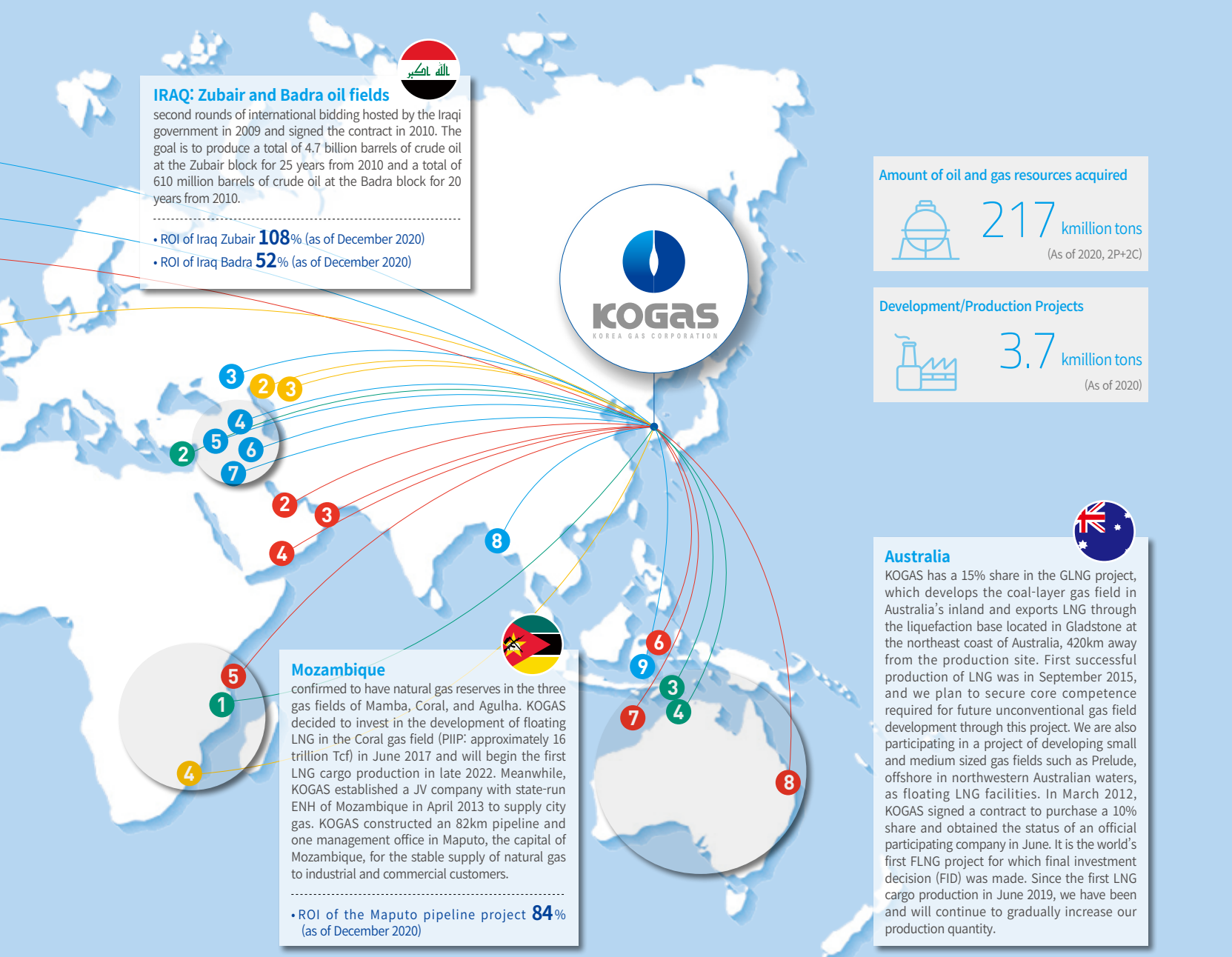
Development/Production Projects



3.7 kmillion tons
(As of 2020)

Australia

KOGAS has a 15% share in the GLNG project, which develops the coal-layer gas field in Australia's inland and exports LNG through the liquefaction base located in Gladstone at the northeast coast of Australia, 420km away from the production site. First successful production of LNG was in September 2015, and we plan to secure core competence required for future unconventional gas field development through this project. We are also participating in a project of developing small and medium sized gas fields such as Prelude, offshore in northwestern Australian waters, as floating LNG facilities. In March 2012, KOGAS signed a contract to purchase a 10% share and obtained the status of an official participating company in June. It is the world's first FLNG project for which final investment decision (FID) was made. Since the first LNG cargo production in June 2019, we have been and will continue to gradually increase our production quantity.



MATERIAL ISSUE

02 Safety First

Safe and Low-carbon Clean Energy



Our Target

- Leading disaster safety management
- Carbon emission management & GHG reduction

Mid-and long-term management goals for 2025

Safety-Cap

Objective **Cap5**

Accident rate

0 %

GHG emission reduction rate

(compared to 2017) **24.8** %

Business Relevance

Global response to climate change is shifting the way the world produces and consumes energy. Continued efforts of countries around the world to achieve the goals of the Paris Agreement are predicted to accelerate energy transition. With the emergence of LNG (liquefied natural gas) as a transportation fuel, the world-wide transition to environment-friendly energy is gaining momentum. Compared to other fuels, natural gas is relatively safe but its proactive safety management remains important as its use involves the potential risk of gas leaks or fire.


Our Approach

KOGAS fulfills its role as an energy-based public enterprise and its social responsibilities for environmental safety-centered business system, national carbon neutrality, and collaborative global response to climate change, in the belief that response to climate change is a corporate survival strategy as well as an irreversible global trend. We prioritize safety and the environment in the entire process ranging from natural gas production to supply. We actively promote low-carbon and eco-friendly activities based on our systematic environmental management and climate change strategies designed to minimize negative environmental impacts arising in our business management process. We also implement a stronger safety management of our business sites through accident-free campaigns and efforts to foster a safety culture, while operating a system for a 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.


2020 Key Performances

Attaining a world-class safety culture 

7.81 point

Accident rates at outsourcing construction sites 

0.26 %

GHG emission reduction rate 

(compared to 2019) **10.8** %

Low-Carbon management

Striving to cope with climate change

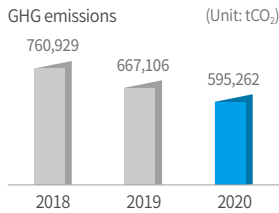
Strategies and systems to pursue low-carbon management

KOGAS selected 5 strategic tasks and 12 tasks for execution as part of its low-carbon management strategies with the aim of “contribution to the improvement of the quality of people’s lives by proactively coping with climate change.” We make decisions on low-carbon management via a 2-step deliberation process. The Climate Change/Energy Working-level Committee comprised of working-level department heads reviews pending issues concerning low-carbon management, and then the Climate Change/Energy Executive Committee—a decision-making body, determines the final strategies and deliberates on key issues concerning response to climate change.



GHG reduction activities of business sites

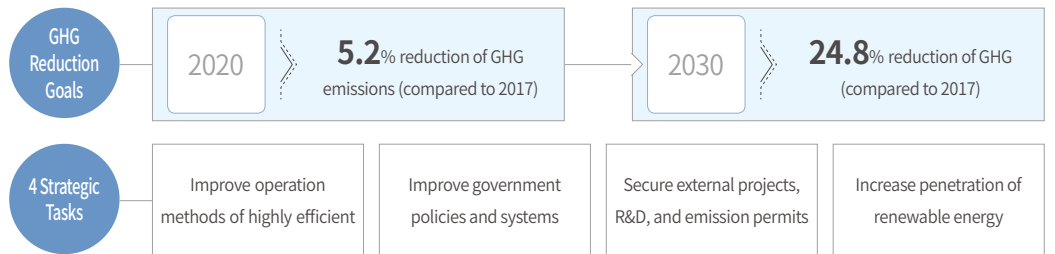
- Operation based on fuel reduction
- Improvement of facilities and equipment for high efficiency
- Use of recycled energy
- Enhancement of energy efficiency of lights and buildings



* Discrepancies arise between the total emissions of business sites specified in the statement and the total direct and indirect emissions by a margin of a decimal point.

Establishment of 2030 GHG reduction roadmap

With the government’s push for the goal of 2050 Carbon Neutrality, companies are taking on greater responsibilities for GHG emissions and the need to proactively respond to climate change is growing such as keeping fossil fuel consumption to a minimum for a shift toward a low-carbon and eco-friendly society. KOGAS has established “the 2030 GHG reduction roadmap” for coping with climate crisis and reducing carbon emissions and set its target to reduce emissions by 24.8% below 2017 levels by 2030. To that end, we are practicing 4 strategic tasks such as improving equipment for high-efficiency/operation methods and expanding new/renewable energy. In 2021, in tandem with the declaration of commitment to carbon neutrality by the US and other major countries, KOGAS plans to redouble its efforts to move toward an environmentally-friendly business structure centered on climate change response with the aim of achieving “2045 KOGAS Carbon Neutrality,” 5 years earlier than the national “2050 Carbon Neutrality” strategy.



Operation of new/renewable energy-based power generation facilities

We comply with the mandatory 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. We have built facilities of photovoltaic, wind power and fuel cell to generate power on our own for partial cooling/heating of our workplaces. As for GHG emissions from LNG bases and gas supply management offices across the country, the relevant records are systematically managed with ECO₂ View.

GHG reduction in 2020



Status of new/renewable energy facilities
(As of December 31, 2020)

Certification	Capacity	Places
Solar PV	2,688.8kW	77
Solar thermal	606.8m ²	5
Geothermal (for air-conditioning)	1,424.6kW	2
Geothermal (for heating)	1,459.0kW	3
Wind power	15.7kW	5
Fuel cell	301.0kW	2

Performance of KOGAS GHG reduction roadmap

KOGAS is making carbon reduction efforts in line with its own GHG reduction roadmap through various energy-saving projects. We reduced GHG emissions by 10.8% below 2019 levels by improving the LNG evaporation system, installing pre-coolers, and recycling unused energy, among others. Most notably, our power generation facilities using new/renewable energy sources enable the expansion of renewable energy. As a result, we achieved an annual GHG reduction of 1,000 tons using solar PV power (716kW), etc. These efforts earned the company a Minister of Environment’s Citation in 2020 for its contribution in GHG reduction.

Improvement of equipment for high-efficiency/operation methods	Standardization of the national evaporative fugitive emission factor of natural gas
<ul style="list-style-type: none"> • Fossil fuel use reduction driven by improvement of vaporization system <ul style="list-style-type: none"> – Use of hot waste water at power plants, increase of capacity of open rack vaporizer, etc. • Energy savings by expanding the operation of liquefier (pre-cooler) <ul style="list-style-type: none"> – 60% reduction of facility uptime by maximizing efficiency of re-liquefaction of boil-off gas (reduction of 1,500 tons at Pyeongtaek site alone) • Collecting and recycling of unused energy <ul style="list-style-type: none"> – Collecting condensate water from storage tanks and recycling boilers 	<ul style="list-style-type: none"> • (Background) Inaccurate calculation of emissions caused by leaks <ul style="list-style-type: none"> – Emissions by other institutions (overseas upstream) are included in the total emissions. • (Improvement) Development & enactment of the evaporative fugitive emission factor (Jan. 2020) • (Achievement) Alleviation of burden on the public through cost savings related to carbon credits <ul style="list-style-type: none"> – Approx. 88% GHG reduction compared to using the existing factor – Savings of around KRW 17.2 billion by 2030, reflecting gas fees
Securing carbon credits through emissions reduction businesses	Expansion of new/renewable energy
<ul style="list-style-type: none"> • Registration of internal GHG reduction projects & additional credit allocation <ul style="list-style-type: none"> – Implementation of 9 projects including installation of power-saving facilities, etc. (approx. 3,000 tons) – Third-party verification, certification by ME, additional emissions allowance allocation 	<ul style="list-style-type: none"> • Establishment of PV/small hydro power plants <ul style="list-style-type: none"> – PV (716kW), small hydro power (150kW) – Effect of reducing GHG by 1,000 tons annually

Status of GHG emissions

KOGAS set its GHG emissions reduction target of 2020 at 624,772 tCO₂eq in absolute quantity, down by 5.2% against the total emissions in 2017. In 2020, we exceeded our target with the total emissions of Scope 1 and Scope 2 at 595,255 tCO₂eq, down by 10.8% below 2019 levels. KOGAS data on GHG emissions is disclosed in statistics on GHG emissions by the Ministry of Environment, preliminary information disclosure on its website as well as its sustainability report.

	2017	2018	2019	2020
Direct GHG	299,474	372,267	287,642	206,510
Indirect GHG	360,115	388,662	379,464	388,752
Total	659,589	760,929	667,106	595,262
Remarks	The figures above are recalculated as per the application of changes to guidelines on greenhouse gas calculation in January 2020, and therefore, are different from the emissions disclosed in the prior year.			

Promotion of strategies to cope with climate change

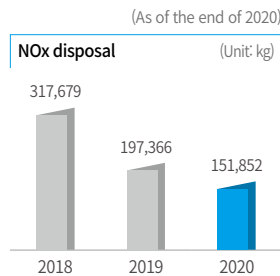
KOGAS selected a list of risks for each of the 6 climate impact factors (heat waves, cold waves, heavy rain and snow, strong wind, and sea level rise) that affect gas facilities and established various detailed plans based on 3 strategies and systemically promoted them to reduce the impact of climate change.

Vision Objective Top 3 strategies Detailed tasks for execution by team	Supply of safe/clean energy through adaptation to climate change						
	Supply of natural gas, which is stable and sustainable						
	<table border="0" style="width: 100%;"> <tr> <td style="background-color: #0056b3; color: white; text-align: center; padding: 5px;"> Climate change impact assessment </td> <td style="background-color: #0056b3; color: white; text-align: center; padding: 5px;"> Strengthening the capacity for coping with climate change </td> <td style="background-color: #0056b3; color: white; text-align: center; padding: 5px;"> Establishment of a system for the prevention of negative results caused by climate change </td> </tr> <tr> <td style="padding: 5px;"> <ul style="list-style-type: none"> • Spatial information-based evaluation of areas vulnerable to extreme weather events • Detailed impact evaluation of sea level rise • 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 </td> <td style="padding: 5px;"> <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 • Development of a process for evaluating impact of climate change • 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 classification • Improvement of the subdivision of the system for coping with disasters and manual revision </td> <td style="padding: 5px;"> <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 by load • Training in on-site measures in case of a special weather report • Preventive maintenance for areas subject to frequent special dry weather warning </td> </tr> </table>	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	<ul style="list-style-type: none"> • Spatial information-based evaluation of areas vulnerable to extreme weather events • Detailed impact evaluation of sea level rise • 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 • Development of a process for evaluating impact of climate change • 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 classification • Improvement of the subdivision of the system for coping with disasters and manual revision 	<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 by load • Training in on-site measures in case of a special weather report • Preventive maintenance for areas subject to frequent special dry weather warning
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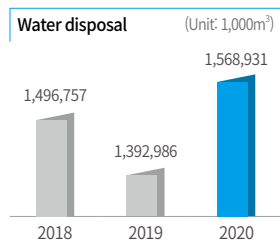
Reduction of the environmental impact on our places of business

Management of air pollutants

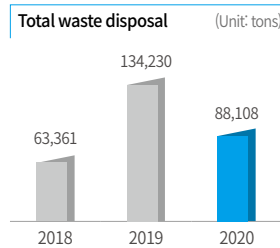
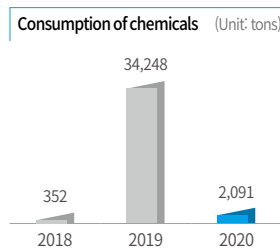
It is inevitable that facilities like Submerged Combustion Vaporizers (SCVs), Seawater Heaters (SWHs), and boilers among our natural gas production/supply facilities emit air pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx), dust particles, etc. We manage the level of each pollutant using 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 Terminals, which are located in the Greater Seoul area, are classified as those subject to total air pollution management under the Air Quality Control Act. Thus, we ensure that each of them is operated within the total permissible emission volume of NOx set for each business site.



* Decrease in operation of facilities such as SCV, etc.



* Increase in operation of facilities using seawater such as ORV, etc.



* Decrease due to facility management & construction work performance

Water pollutant management

Processing most of the wastewater generated in our facilities is outsourced to other businesses. 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, and conduct exercises 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

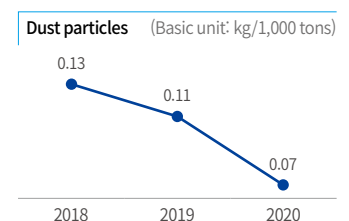
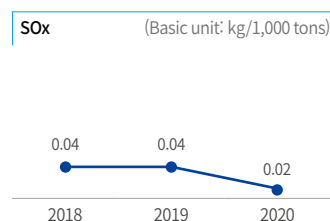
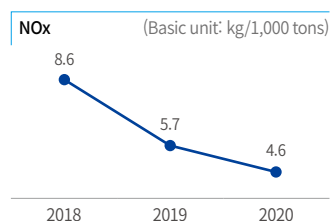
We check toxicity/safety-related matters in the purchase/production/import of chemical substances required in the process of production/supply of natural gas. We use a small amount of non-toxic substances such as sodium hydroxide (NaOH), hydrochloric acid (HCl), potassium hydroxide (KOH), etc. The odorant put into our gas supplied to end users for the detection of gas leaks and the sodium hypochlorite put for the prevention of the adhesion to 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 other management activities like construction work and process them separately according to their types and usage. In the works we initiated, we require the contractors to use recycled aggregates to facilitate the reuse of resources. Our company-wide resource-saving efforts include prohibiting the use of single-use items in offices and imposing an extra environmental charge on using them at the in-house café.

Biodiversity management

For any projects and operations that may affect the surrounding ecosystem, we conduct environmental impact assessment to identify potential risks to sustainable development. When operating a business site after construction, we implement post-environmental impact assessments for post-management & monitoring and share the results with stakeholders. Furthermore, KOGAS operates no businesses in international protected areas, wetland protected areas, etc. in order to conserve biodiversity. As a part of local communities, each of our business sites is committed to win-win cooperation with various environmental protection activities, making strenuous efforts to follow biodiversity policies. These activities include environmental cleaning activities of "1 mountain, 1 stream, 1 coast for each business site," restoration programs of habitats for "1 endangered species for each business site," as well as restoration of the coast of Wolcheon, etc.



Sharing of environmentally-friendly value with the local community

KOGAS has made a commitment to protecting biodiversity and preventing deforestation, and each of our business sites strives to meet the commitment. First, for any projects and operations that may affect the surrounding ecosystem, we conduct environmental impact assessments and develop environmental conservation and ecosystem protection plans. 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.

Sharing solar PV energy for EV charging

#KOGAS seeks to “Enjoy Together” by sharing spare energy with neighbors

We engage in new types of social contribution activities tailored for respective local communities by using new and renewable energy sources. A notable example is our service of using spare PV energy to charge EVs for free. We reflected opinions of relevant institutions in the city of Incheon and People’s Innovation Corps in developing the charging service. With 2 fast chargers and a reservation system for visit, the service is well received by local EV users struggling with lack of charging infrastructure. The effect of enhanced conveniences for the local communities and PV energy savings are estimated to reach around KRW 10 million. KOGAS will continue to devise new social contribution models for local communities with its open mind and innovation so that the company is fully in line with government policies of promoting environmentally-friendly energy sources.



- EV charging sharing service for local communities on weekends & holidays
- 2 fast EV chargers (enough to fully charge 1,190 vehicles)

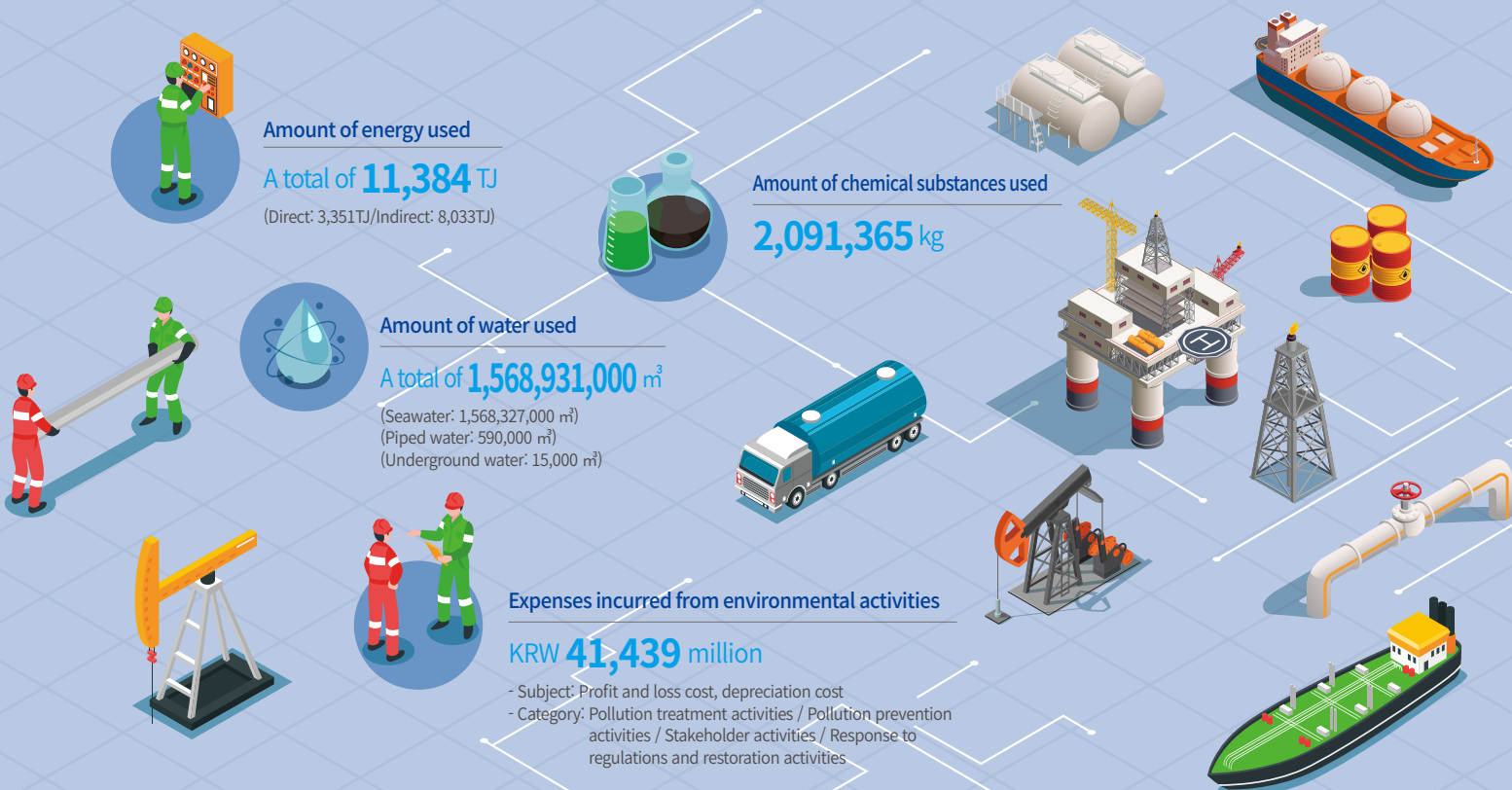
Achievement



Grand prize
for the best case of innovation in public institutions by the Ministry of Trade, Industry and Energy (MOTIE)

Environmental value

INPUT



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.

Restoring the coast of Wolcheon in Samcheok

Our Samcheok Terminal Division is building an artificial beach and anti-flooding facilities to restore lost Wolcheon coastal areas in Samcheok. Construction work of Samcheok LNG Terminal disrupted currents along the shoreline, causing coastal erosion and carrying away sands to nearby areas. In response, we decided to commit KRW 23.7 billion to the restoration project for the coast of Wolcheon of Wondeok by 2021 to build two groins and one 533-meter-long detached breakwater designed to prevent sand loss and fill up with 45,000m³ of sand.

Our plan is to restore the coastal natural environment and protect the marine ecosystem by constructing a detached breakwater in parallel with the shoreline to absorb the wave power as well as a groin perpendicular to the shoreline. We will also supply sand from other areas through nourishment and installing seawater exchange facilities. As of the end of 2020, a length of 330 m was restored, and we strive to bring back the beautiful marine environment of the east coast and to improve residential environments for the locals in Wolcheon, making it a local landmark.



월천연안 복원공사 착공식
19. 9. 26 ● 시행사: 연평가스공사 ● 시공사: 가산토건(주), (주)우실용
Restoration work of the coast of Wolcheon in Samcheok

- Restoration of the lost coast of 400m in length reflecting the opinions of local residents
- Periodic monitoring of nearby ecosystems and water quality

Achievement



Restoration of the natural environment and creation of a local landmark

OUTPUT

ISO 14001 - Company-wide | ISO 50001 - Company-wide | Institution of excellence in GHG reduction (ME)

Air pollutant emissions

(Amount of natural gas used: 32,367 tons)



GHG emissions

A total of **595,255 tCO₂e**

(Direct: 206,510 tCO₂e/Indirect: 388,752 tCO₂e)



NOx

148,880 kg

(Basic unit: 4.6kg/1,000 tons)



SOx

743 kg

(Basic unit: 0.02kg/1,000 tons)



Dust particles

2,229 kg

(Basic unit: 0.07 kg/1,000 tons)

Water pollutant emissions

private sewage treatment facilities

wastewater discharge facilities

BOD

10.5 ppm

SS

9.0 ppm

T-N

14.9 ppm

T-P

2.1 ppm

Coliform count

64.6

TOC

9.2 ppm

SS

7.1 ppm

Waste disposal



Business sites

10,878 tons

(Basic unit: 0.33tons/1,000 tons)



Designated waste

98 tons

(Basic unit: 0.003tons/1,000 tons)



Construction

77,132 tons

(Basic unit: 2.38tons/1,000 tons)



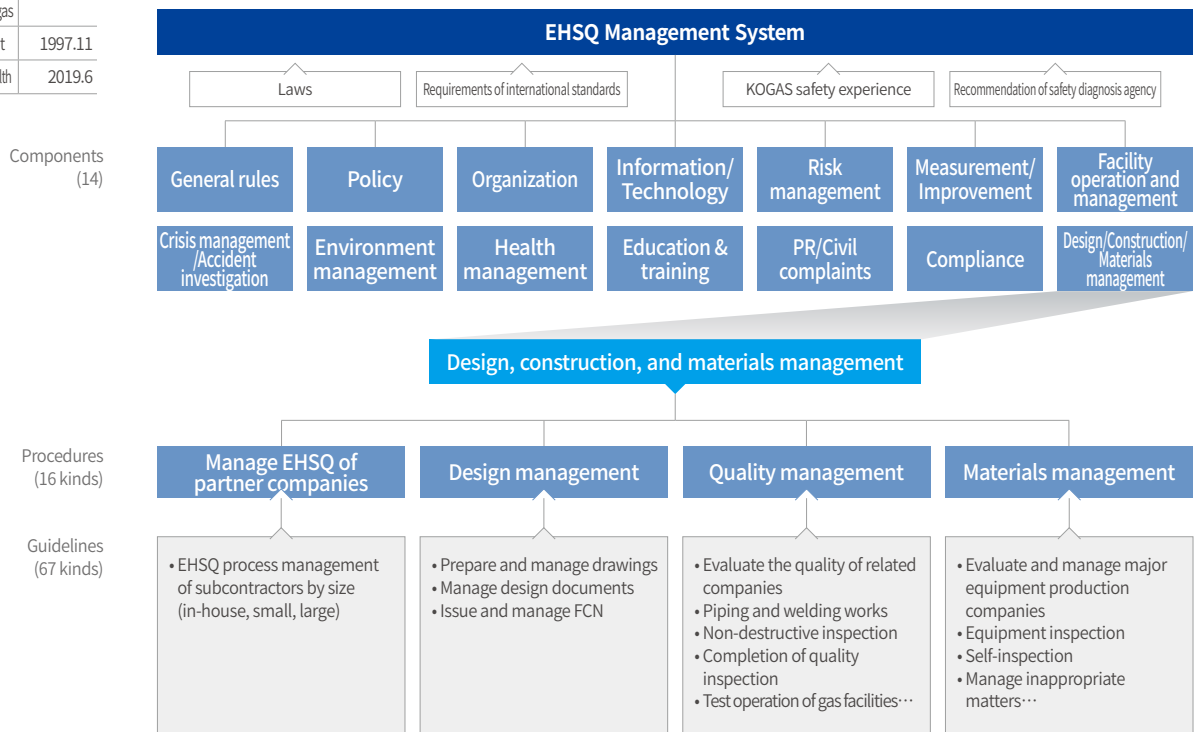
Upgrading workplace safety management

KOGAS-EHSQ Management System

KOGAS's safety management system international certifications

Certification	Area	First certification date
ISO 9001	Quality	1997.10
ISO 29001	Quality of petrochemicals and natural gas	2013.11
ISO 14001	Environment	1997.11
ISO 45001	Safety and health	2019.6

We, at KOGAS, prioritize safety and the environment in the entire process ranging from natural gas production to supply. We are operating a unique EHSQ (environment, health, safety, and quality) Management System we designed to integrate environment, safety, health, and quality affairs, placing the highest value on “human and respect for nature.” This system has enabled an integrated and efficient management of environment, safety, health, and quality issues. As a result, it minimized risks and boosted productivity at sites and was recognized externally by acquiring and maintaining certifications such as ISO 9001, ISO 14001, ISO 45001, ISO 29001.



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 7.81 in 2020; this represents a high level of “administrative culture,”—a level of adopting the excellent safety health management system and successfully leading its operation. We have encouraged all employees to join in activities for accident prevention and safety. We have also showed that our leaders lead by example by delivering the safety message from CEO and holding “Ask about Safety,” a special roundtable talk with Senior Executive Vice President of Safety Technology. With these efforts, we strive to achieve the world’s highest level of safety culture by displaying the management’s strong commitment to safety and health.

* The average of 251 Korean companies including GS Caltex, Hanwha Chemical, Hanwha Total, and S-Oil was 5.67, 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.

Achieving global-level safety culture

ISRS-C **7.81** points
 (higher than the previous year's 7.63 points by 0.18 points)

Division	'09	'10	'11	'12	'13	'14	'15	'16	'17	'18	'19	'20	Final ('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	7.7	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	7.81	8.0



Safety management rating of public institutions
Safety Cap4
 (highest rating in the same group of public institutions)

Vision

Directions of implementation

Site activities

Strengthening the implementation of safety management

Fostering innovation of energy safety

KOGAS has acquired and maintained ISO 45001 certification to implement global-level safety and health management strategies aiming at “Zero Accident and Zero Disaster” and preventing safety accidents and disasters that can occur in the process of production of natural gas and construction of the supply network. Since formulating the “energy safety innovation” plan in 2020 to build a system of safety management innovation at all levels of core energy businesses such as hydrogen/fuel cell, we have operated a task force team for safety innovation to demonstrate and realize its commitment to safety. The task force team is comprised of 10 members in total including professionals with an average of more than 20 years of experiences in safety, outside experts, as well as the CEO. Driving innovation in energy safety focuses on realizing on-site safety management, creating a safety workplace in collaboration with partner companies, developing a manual for safety management in new growth areas, and devising a win-win safety model based on diagnosis of all areas ranging from the organization, disaster response, and partner companies.

Safety Management Implementation Strategy



Mid- and long-term goals of safety management

(2025 goals)

Safety level*

Safety Cap 5

KOGAS accident rate

0 %

No. of serious accidents of partner companies

0 case

* Reason of creating a new KPI: pre-emptively reflected the introduction of a safety management rating system for public institutions by the Ministry of Economy and Finance (in Jun. 2020)

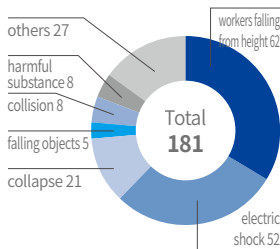
Safety management of high-risk, accident-prone areas

We implement safety management with a focus on high-risk, accident-prone facilities and tasks to create an employee-centric safety culture and to make workplaces free of concerns about industrial disasters. In 2020, we identified and removed 181 risk factors via a labor safety inspection consulting such as suffocation in closed pipes, collapse of heavy equipment during crane operation, collapse of a scaffold and falling objects at construction sites. And then, we took the initiative in pre-emptively preventing safety accidents by introducing a remote monitoring system using a surveillance camera and a VR safety training.



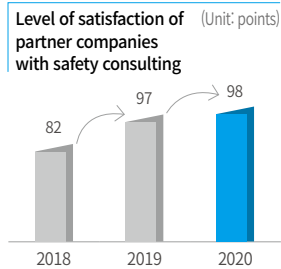
Implementing VR safety training

Risk factors identified in 2020 (Unit: number of cases)



Introduction of anonymous mobile safety risk report application “KOGAS Safety Alert”

With the aim of creating a safe work environment together with workers, we became the first public institution that launched a mobile safety risk report application. “KOGAS Safety Alert”—which was designed to promote safety-related reporting/improvement among employees of partner companies—guarantees anonymity, and the Korea Business Ethics Institute is entrusted with its operation and gives an award for best safety reporting every year. The application has promoted safety-related reporting and reinforced the safety network, recording 10 more reports compared to the previous year. As a result, the number of safety accidents of partner companies dropped to 4 from 9 year-on-year in 2020. These efforts led KOGAS to achieve Safety Cap 4 in the safety management rating system which was unveiled by the government to facilitate the establishment of a preventive safety system and to encourage voluntary measures for higher safety levels.



Rated as the **best** among 55 institutions in the disaster management evaluation of public institutions.
(received President's Citation)

Building a safety culture focused on employees of small and medium-sized partner companies

We reinforce our activities for safety checks concerning partner companies with a view to completely prevent industrial disasters. We have come up with steps that will put safety first in our work carried out with partner companies including stipulating the strict compliance of safety regulations in the contract conditions and regularly providing safety information/education to small-sized partner companies. In particular, we developed and provided “4C Safety Package for partner companies”—which aims to provide those with low levels of safety management with our advanced safety and health system—to enhance their safety levels. In addition, we are fostering the capability and culture for safety by guiding them with revisions to the Occupational Safety and Health Act and safety guidelines for each work process through “Growing Together,” a safety consulting for small and medium-sized partner companies.

* 4C Safety Package: Classify dangerous/risk factors in functions (C1 :Classification) and make a safety check list (C2 :Check), and then provide a safety consulting (C4 : Consulting) for small and medium-sized partner companies (C3 : Client)

Securing facility safety proactively

We strive to prevent safety accidents through thorough safety diagnosis and improvements in national infrastructure facilities, multiple-use facilities, government buildings, etc. Regarding national infrastructure facilities including 77 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 equipment parts as possible, and there has not been a single case of a gas facility accident over the past four years. We carry out safety checks of multiple-use facilities such as the Gas Science Museum periodically along with emergency evacuation training. In addition to this, we check embedded gas pipes using innovative technology for underground exploration as well as updated technology and programs for analysis of the consequence and danger of accidents in a bid to secure gas facility safety.

Formation of safety culture-related consensus

Fostering a culture of safety with Safety Check Day

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 sites. We hold safety education sessions to prevent disasters at our workplaces and remind employees of the importance of safety consciousness. We opened on-site sessions of safety education, explanatory meetings, and safety assessment education at partner companies' places of business. We reformulate the contents of safety education as required. Other safety education we provide includes those for safety managers/supervisors and those held under the sponsorship of the Corporate Headquarters.

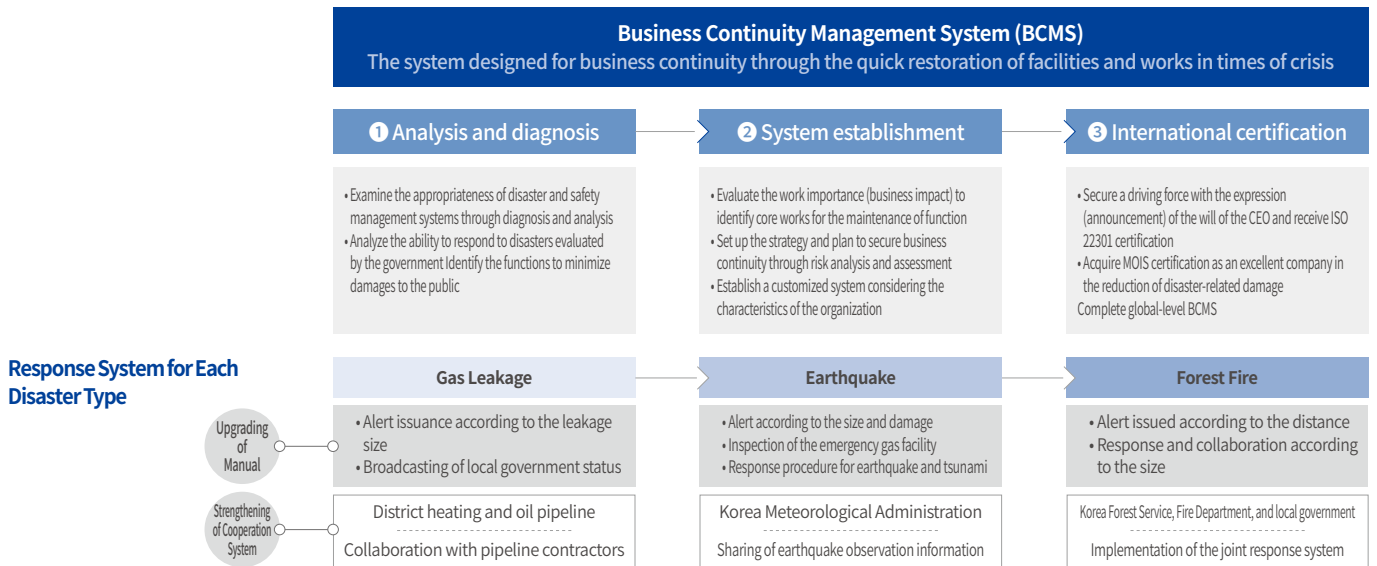
Efforts to ensure public safety free of safety concerns

We carry out gas-related safety campaigns together with regional governments and public institutions. We also implement activities for greater safety to prevent fires and safety accidents in vulnerable local facilities through private-public-community partnership. We endeavor to win the trust of the members of the local community by operating Safety Check Corps engaging residents in addressing concerns over the risk of gas facilities and promoting safety via the online Gas Science Museum. We volunteer to raise awareness of the importance of gas safety in traditional markets, vulnerable groups, and cultural properties, and operate 7 education facilities, providing hands-on experiences on gas safety for children and teenagers.

Upgrading the disaster management system

Gaining public confidence in disaster management system

KOGAS has a specific disaster response system in place 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 target facilities of exercises and implementing drills with the participation of the public. In 2019, we acquired ISO22301 certification, an international standard for the Business Continuity Management System (BCMS), and based on the BCMS, KOGAS was certified as a best-performing company in disaster mitigation by the Ministry of the Interior and Safety (MOIS) in 2020. Moreover, KOGAS achieved Safety Cap 4 under the safety management rating system for public institutions by the Ministry of Economy and Finance, in recognition of conducting 3 rounds of special labor safety inspection, and its top rating from seismic survey of supply pipeline and good performance in safety assessment of facilities. Moreover, we participated in the Safe Korea Exercise led by the MOIS, and carried out 56 joint drills to cope with gas leak and fire with related institutions, gaining public confidence in the disaster management system.



Improving the independent system to investigate sources of disaster

We enhanced the accident investigation system in 2020 to increase responsibility for safety & health of an ordering entity and to prevent the recurrence of the same accidents. Before, the responsibility for general disasters went to heads of business sites, while Senior Executive Vice President of Safety Technology was in charge of serious major disasters. However, after the improvement, CEO oversees the overall accidents and disasters. Furthermore, we newly created the safety innovation committee dedicated to investigating accidents and dramatically upgraded the work process of accident investigation to enable an immediate report to respective heads of institutions when an accident takes place, with the expression of the commitment of the CEO to safety management. In particular, we launched the accident investigation committee comprised of 5 outside experts to deliver the results of analyzing sources of accidents. This was to conduct an objective and impartial investigation and to strengthen the development and implementation of measures to prevent the recurrence of similar accidents. Thanks to such efforts, the number of disaster dropped to 1 in 2020 from 9 in 2019 since the creation of the accident investigation organization in July 2020.

Ensuring safety of gas facilities to prevent forest fire

With the increasing trend of large-scale forest fires due to climate change, we operate the forest fire impact evaluation system for gas facilities. We developed our own evaluation system to assess radiant heat and impact of forest fires, and based on the results, we give risk ratings of gas facilities, reinforce the forest fire monitoring system, and acquire the ability to extinguish fire. Particularly, we continue to enhance our capabilities to protect gas facilities through efforts to increase our monitoring and capacity to cope with fire such as sharing the forest fire control system with the Korea Forest Fire, operating 24-hour surveillance cameras, and purchasing fire engines. As a result, in 2020, KOGAS was awarded a citation from the Korea Forest Fire for its excellence in sharing the forest fire control system with relevant institutions. Going forward, we will make every effort to safeguard the lives and properties of citizens by protecting gas facilities.



Forest fire modeling

MATERIAL ISSUE

03 Communication and Cooperation Win-Win Energy for Mutual Growth



Our Target

- Expanding mutual growth/ win-win cooperation
- Job creation & sharing

Mid- and long-term management goals for 2025

Job creation

6,565 jobs

Win-win cooperation index

89.13 %

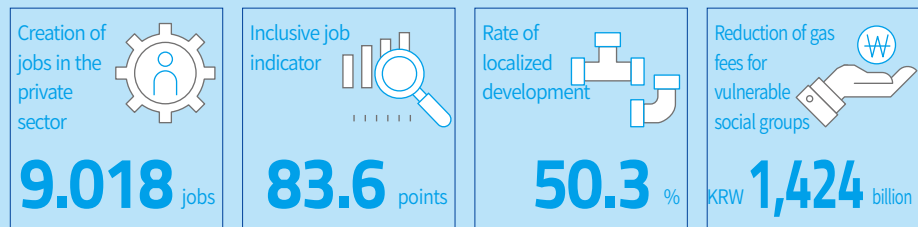
Business Relevance

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 must consider social value comprehensively in the process of establishment and implementation of various policies and evaluate performance through periodic review when executing policies reflecting social values. Social values include win-win cooperation between large companies and SMEs, creation of quality jobs, revitalization of the local community, and provision of opportunities for socially vulnerable citizens. Public enterprises are thus implementing these practices 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 enhance the competitiveness of SMEs by supporting the localization of gas equipment, technological independence in all processes, development 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 managed the goals and performance indicators of strategic tasks.

2020 Key Performances

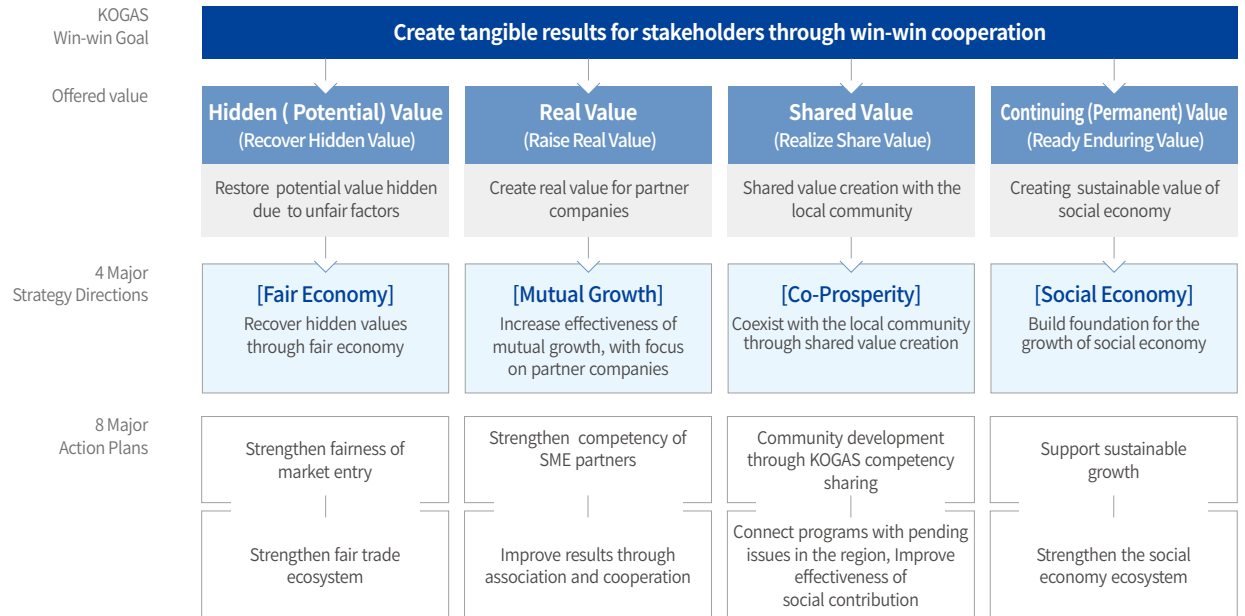


Spreading the culture of mutual growth

Creating a win-win natural gas ecosystem

Win-win cooperation strategy establishment

KOGAS's vision for mutual growth is "creating tangible results through win-win cooperation." Under systematic strategies and tasks identified under our Team Plus win-win cooperation model, we are providing support tailored to SMEs that can be of actual help.



Establishment of a trust-based best practice model

Since 2019, KOGAS has been running the Win-Win Cooperation Committee, with participation from the CEO and SMEs, in order to establish the public institution best practice and lead the establishment of a fair economy through identification and improvement of unfair trade practices at partner companies. To manage our fair trade project performance and identify new tasks, we hold regular meetings of the Hands-on Consultative Group for Fair Trade, which is made up of subcommittees in charge of relevant tasks. By holding these meetings, we are strengthening our task execution abilities. Promoting fair trade by lowering bidding entry barrier and easing contract guidelines, paying a reasonable unit price and supporting the growth of SME partners, and creating a construction site environment where workers' dignity and value are respected are also among our efforts to build a trust-based fair economy ecosystem.

Expanding purchases from social economy enterprises

KRW **125** billion (2020)
307% increase in 5 years

Issuance of partner company certificates

KOGAS distinguishes partner companies supplying 5 items, including natural gas ball valve, with 19 specifications as our major suppliers. We issue partner company certificates to them so they can complement their weak marketplace awareness and enhance their marketing. In 2020, we identified and issued the certificate to 108 companies, and the number of issued certificates increased to 124 in 2021. In addition, we are making efforts to provide our partner companies with convenience and speediness in customs clearance, using the "Authorized Economic Operator (AEO)" system.

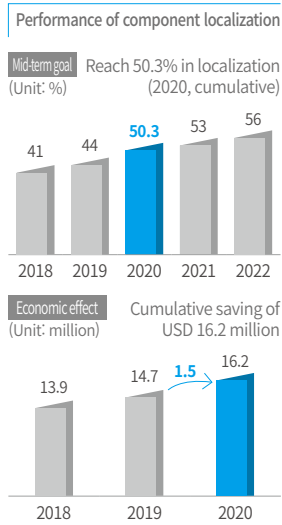
Creating a purchasing environment for win-win cooperation

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. In 2020, our purchase from social enterprises reached KRW 12.5 billion.

Supporting SMEs in strengthening competitiveness

Component localization of core LNG equipment

KOGAS established the “Strategy for the Localization of Technologies and Equipment” and “Measures to Promote Production Equipment Component Localization” to lower foreign dependence of natural gas equipment and strengthen the technical competitiveness of SMEs. We are working strategically, in cooperation with SMEs, to localize the core equipment components. As of the end of 2020, we completed localizations of 677 items (cumulative) out of 1,346 core components in LNG production equipment, achieving 50.3% localization rate. By actively developing key LNG equipment such as SCV low Nox burner and promoting the purchase of products developed locally by SMEs, we aim to reach 56.2% in components localization by 2022.



Improvement in business results through the manufacturing innovation program

KOGAS is driving our partner companies’ turn to profit and improvements in business results by drastically expanding the 3-Combo support program for SMEs’ manufacturing innovation. In 2020, we expanded the program to 41 companies and provided support in: equipment purchase for productivity improvement; promotion of export through consulting and equipment advancement; and smart factory manufacturing equipment automation. As a result, companies we supported recorded 30% increase in sales and 20% increase in exports, year-on-year. In 2020, we not only actively made purchase of products related to technology development, but also permitted the free use of KOGAS’ patents, including 8 new cases of technology transfer (5 free cases), 2 contract renewals, and 25 cases of status quo cases. Through these efforts, we were able to promote mutual growth with SMEs.

3-Combo Manufacturing Innovation Program

	Combo - 1	Combo - 2	Combo - 3
Manufacturing Innovation Program	Equipment purchase support	Export promotion support	Manufacturing automation support
Support details	Industry Innovation Movement Project <ul style="list-style-type: none"> Implement productivity-enhancing equipment Purchase on-site test equipment 	Productivity Innovation Partnership Project <ul style="list-style-type: none"> Consulting and equipment advancement Overseas certification acquisition 	Smart Factory Construction Support Project <ul style="list-style-type: none"> Automation of manufacturing equipment IT-connected smart factory construction
Eligible companies	Small-scale businesses	Companies preparing for export	Companies preparing for 4th industrialization and automation

Joint expansion overseas through KOGAS partnering

By sharing information on overseas projects and helping SMEs register patents in foreign countries and acquire foreign certification, KOGAS helps them open new markets overseas. We also provide support in purchase consulting, exhibitions, and general consulting. In 2020, 98 domestic SMEs took part in hull manufacturing and design of the offshore gas field development project in Mozambique (2,283 jobs, KRW 172.9 billion increase in sales). In the same year, 96 SMEs participated in the plant construction part of the Al-Zour LNG Terminal construction and operation project in Kuwait (289 jobs, KRW 107.3 billion increase in sales). Through these opportunities, we helped SMEs struggling with overseas market penetration receive and sign foreign orders, thereby contributing to profit generation.

Service-based support for overcoming the COVID-19 crisis

KOGAS is overcoming the COVID-19 crisis with SMEs by providing a wide range of financial exemptions and support. Through the Mutual Growth Fund and Win-win Fund, we provided emergency liquidity aid to SMEs hit by the pandemic. We are also providing disinfection and welfare support, online and offline market opening, employment support, and share results.



Scholarships granted to children of employees at SME partners

① Disinfection and welfare support for SME partners <ul style="list-style-type: none"> Emergency support of protective equipment against viruses Scholarships for employees’ children Employee vacation fund 	② Online/offline market openings <ul style="list-style-type: none"> Online conferences with foreign companies (5 countries, including Singapore) Domestic exhibition/conference support (Supported a total of 11 participations) Introduction and operation of online product mall 	③ Employment support and results sharing <ul style="list-style-type: none"> Expand support in long-term employment of key talent (added youth employees) Provide financial support at low interest rate for companies with increase in employment (Exemption effect of upto 32%) Expand results and profit sharing
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Sustainable Supply Chain Management

Establishment and Operation of Supplier Code of Conduct

To strengthen compliance, which serves as the basis of KOGAS and suppliers' mutual growth, we established and shared the Supplier Code of Conduct. The Code of Conduct sets forth environmental, human rights, safety & health, and ethical standards that our suppliers must abide by. The standards are to be followed by our suppliers, its employees, agents, and subcontractor, and we recommend that they comply with statutory requirements, contents of the Code of Conduct, and KOGAS' requirements. We expect that KOGAS and our suppliers will all gain global competitiveness by abiding by the Supplier Code of Conduct.

The process of identifying potential risks at partner companies

In order to secure equipment/devices with quality certifications for the safe supply of gas and to improve the efficiency of the bidding business, KOGAS operates the key equipment/device producer registration system that evaluates the subject companies' manufacturing abilities and management status in advance. As of January 2021, 26 manufacturers are registered for 5 key equipment under 19 standards. We carry out regular evaluations (twice a year) of manufacturers of key equipment/devices based on the applications submitted. There are five stages in the regular evaluation: application registration, document-based evaluation, notice of results, and qualified manufacturer finalization (manufacturer registration). Document-based evaluation includes evaluations of technical capability and management status. Those who pass the document-based evaluation will be evaluated on-site to check whether declarations in the documents submitted are true and also undergo status survey including sample tests. Based on the results, final qualifiers are named.

KPI	Self-assessment ratio of critical suppliers
Target	100%
Target Year	2021
KPI	Joint research and development
Target	<ul style="list-style-type: none"> • Number of cases: 20 • Participating companies: 20 • R&D budget: 1,400 million KRW
Target Year	2021
KPI	Training employees of SMEs partners
Target	<ul style="list-style-type: none"> • No. of participants in technical/research training: 40 • No. of participants in on-the-job training: 40 • No. of participants in online training: 200
Target Year	2021



Strengthening the supply chain: ESG risk management

KOGAS systematically establishes strategies and directions for supplier management, and we are managing risks in the supply chain by reflecting environmental, social, and governance (ESG) factors in our strategies when doing business with partner companies and key raw material suppliers. We factor in elements of ESG in the decision-making process concerning supplier selection and management. As for construction services, we conduct status surveys of subcontractors twice a year, in line with the Subcontractor Management Guideline. These surveys serve as due diligence on subcontractor management, work environment, compensation for workers, safety and workers' health conditions, environmental management, and complaint handling. A comprehensive evaluation is conducted for construction projects valued at more than KRW 5 billion. If there are violations of regulations, disciplinary actions are taken immediately, and if no remedial steps are taken, the subject company receives penalty points, which will work to its disadvantage in bidding. With regard to suppliers of major equipment and devices, we first evaluate them based on the following 5 business capabilities: quality system, supply delivery records, management status, manufacturing capability, and bidding method. We also check their sustainable management activities and results as part of the integrate management of risks in the supply chain. If already registered companies or those wishing to register with us are found with potential risks, such as the failure to receive ISO 9001 certification or failure to meet the disaster rate requirement, they do not qualify for registration. In 2020, 16 major equipment and device suppliers were subject to sanctions for reasons such as delay in delivery.

2020 Supply Chain Status
(Unit: companies)

Category	2020
Number of partner companies (tier 1 suppliers)	498
Number of major partner companies (Critical tier 1 suppliers)	26

* Major partners refer to those supplying the following 5 items under 19 standards: valves, insulation joints, metering equipment, controlling equipment, pressure regulation equipment



Community Support

Strategic Social Contribution Activities

Social Contribution Strategy

We carry out a variety of social contribution activities to fulfil our social responsibility as a public enterprise with the aim of 'leading the creation of social value and contributing to the development of communities and public good.' For this, we created a social contribution brand called Onnuri, which means "warm world," and have been providing a wide range of support for socially vulnerable groups. We are also running energy-related win-win programs for local communities including those in the following areas: energy welfare, local cooperation, future generation nurturing, citizen and employee participation. We will continue to engage in cooperative activities with the local communities to realize social values and contribute to the revitalization of the local economy.

Our slogan for social contribution

Our objective for social contribution

Green Energy, Happy World

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

Areas

Projects

Related UN SDGs*

Key Performance Indicators (KPI)

Energy Welfare	Local Cooperation	Future Generation Nurturing	Citizen Employee Participation	Disaster Recovery
<ul style="list-style-type: none"> Fuel cell installation Heat efficiency improvement program Compact room seasonal support program 	<ul style="list-style-type: none"> Startup Contest Relief Factory Coffee waste energy Green New Deal startups Construction Academy Toy library operations Jobs for senior citizens E-commerce support 	<ul style="list-style-type: none"> Scholarship programs R-Bank Support for children with critical medical conditions Support for child patients from Uzbekistan New global social contributions LNG mentoring 	<ul style="list-style-type: none"> Support for the movement of persons with disabilities Happy House Unmarried single mothers independence support Onnuri Fund (single parent and multicultural families, etc.) Onnuri Volunteer Corps Corporate card cash points 	<ul style="list-style-type: none"> Prevention of the spread of COVID-19 and emergency support Normalizing public economy Others
SDGs 1, 2, 3, 6, 7, 10, 11, 12, 15, 17	SDGs 1, 3, 4, 7, 8, 9, 10, 11, 13, 15, 17	SDGs 1, 2, 3, 6, 10, 11, 14, 15, 16, 17	SDGs 1, 2, 3, 6, 10, 11, 14, 15, 16, 17	SDGs 1, 2, 7, 10
<ul style="list-style-type: none"> Amount saved annually through the heat efficiency improvement project: KRW 65.6 million Sales of social economy organizations that took part in the construction work of the heat efficiency improvement project: KRW 2,093 million Sales of social economy organizations that participated in the compact room seasonal support project: KRW 510 million 	<ul style="list-style-type: none"> Satisfaction of Onnuri Construction Academy beneficiaries: 80 points Safe Factory Sales: KRW 659 million 	<ul style="list-style-type: none"> Number of scholarship program beneficiaries: 322 (domestic) Level of outsider satisfaction with the quality of service provided as part of our social contribution programs (toy library satisfaction level: 86.3 points) 	<ul style="list-style-type: none"> Number of ecofriendly hydrogen vehicles in operation to support the movement of persons with disabilities: 2 (new) Corporate card cash point returns: KRW 100 million 	<ul style="list-style-type: none"> COVID-19 support: KRW 1,771 million, including masks Year-end and New Year's donations: KRW 100 million

* Those marked in red under each strategy area are key management projects in line with the UN SDGs.



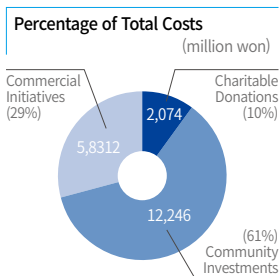
Business stabilization loans for small business owners hit by COVID-19

Organization leading our social contribution activities

The main engine of our social contribution activities is the Onnuri Volunteer Corps, composed of KOGAS employees. The Corp was launched in 1999 and celebrated its 21st anniversary in 2020. As of December 2020, it has a total of 21 teams, with 7 from the corporate headquarters and 14 from other business sites. Through volunteer activities in connection with local welfare organizations and labor-management joint volunteer activities, we provide financial support and help for marginalized groups, in our effort to demonstrate the true spirit of sharing.

Promotion of voluntary fundraising campaigns among employees

To share the difficulties caused by COVID-19 that the local community is experiencing, executive-level employees and regular employees at KOGAS voluntarily returned a certain amount of their pay as donations to the COVID-19 fund. 10 executive-level employees (executives and directors) returned 15% of their monthly pay for 8 months, from May to December 2020, each reaching a total of 120% return of one full month pay and collecting KRW 380 million in donations, total. Using these returned and donated funds, we operated a no interest loan program for small business owners in the Daegu area, struggling with sharp decline in sales. Employee donations of KRW 190 million was provided to supply protective gears for medical teams and fund operations of residential treatment centers. As the representative public enterprise of Daegu, KOGAS is striving to overcome this difficult time with Daegu residents by supporting small business owners and the recovery of the local economy.



Energy Welfare # Local Cooperation

KOGAS engages in a wide range of locally tailored social contribution programs, making the most of the characteristics of the energy industry to support socially vulnerable groups and to create social value. Given we are an energy company, we strive to improve energy welfare of socially vulnerable groups through projects such as the Onnuri Heat Efficiency Improvement Program and Compact Room Quarter Seasonal Support Program. We are also keeping in line with the government's policy stance by creating jobs through our social contribution projects, thereby realizing social value. We are developing social contribution projects by understanding the need of our project beneficiaries first through local networks such as local governments and welfare centers and create project-related jobs.



Goal 7
Access to affordable and sustainable energy



Goal 11
Safe, resilient, and sustainable cities and human settlements

Heat Efficiency Improvement Program

Onnuri Heat Efficiency Improvement Program, which has been in operation since 2010, is a key social contribution program of KOGAS. Through this program, we replace insulators, boilers, doors and windows, and LED lights at old social welfare facilities and low-income family residences to improve their energy usage environment. In 2020, KOGAS funded KRW 2.1 billion for heat efficiency improvement work at 71 low-income households and 167 social welfare facilities. By giving priority to local businesses or social enterprises in wallpaper hanging and laying linoleum flooring jobs, KOGAS also contributes to revitalizing the local economy.

238 beneficiaries

(71 low-income households,
167 social welfare facilities)
repair support

KRW 2.1 billion in sales

Participation of
21 social enterprises

Jjokbang (compact room) Quarter Seasonal Support Program

Since 2015, KOGAS has been supporting jjokbang (compact room) residents in the summer and the winter through the "1 Company 1 Hope Village" project. We expanded the scope of beneficiaries by starting the "Compact Room Quarter Summer Survival Project" in 2019, and in 2020, we provided 5,716 people living in 10 compact rooms around the country with the Onnuri Share Box twice a year, once in the summer and another in the winter. Items in the Summer Onnuri Share Box included thin underwear for the summer, food, and drinks. Items in the Winter Onnuri Share Box included lightweight padded coats and cotton masks. We spent KRW 510 million to purchase these items from 9 businesses, including social enterprises.

5,716 beneficiaries

10 compact room
quarters around
the country

KRW 5.1 billion in sales

Participation of
9 social enterprises

Job creation for the homeless and compact room residents

KOGAS runs the Onnuri Construction Academy, which provides free training on various construction skills and offers jobs to the homeless and compact room residents. Trainees are trained at social enterprises on carpentry, paper hanging, laying linoleum flooring, waterproofing, and insulation. After 6 months of training, they can secure jobs that will give them economic independence, whether through employment or starting their own business. In 2020, we had 23 trainees in cool roof construction projects and heat efficiency improvement programs in the Daegu area, and 18 of them successfully secured jobs.



Construction Academy

(Unit: # of people)

Laying the foundation for independence of senior citizens, unmarried single mothers, and other socially vulnerable groups

KOGAS supports senior citizens through the Onnuri Senior Academy, which trains them on cleaning, disinfecting, and sewing skills to help them find jobs. For unmarried single mothers, we provide employment training and mental and emotional training. In 2020, we cleaned and disinfected toys at the Onnuri Toy Library 2-3 times a month and produced handmade masks and KOGAS totes for promotion, which created jobs for senior citizens. We held trainings on sewing for unmarried single mothers, and the toy rental baskets and souvenirs they made were sold at the KOGAS Toy Library. As such, we are creating jobs and laying the foundation for their economic independence.

* KOGAS opened the first Onnuri Toy Library in 2014 at the General Welfare Center in Dong-gu, Daegu. As of the end of 2020, there are toy libraries in operation at 8 locations.

Project	Details	Results
Job Creation	Heat Efficiency Improvement	25
	Construction Academy (employment at social enterprises, etc.)	18
	Job creation for senior citizens / Silver cart	46
	Saessak Mom- unmarried single mother support program	14
	Jjokbang (compact room) Quarter Seasonal Support Program	10
	Subtotal	113
Job Retention	E-commerce support for small business owners	17
	Assign personnel exclusively in charge of toy libraries	8
	Personnel to support energy welfare programs	5
	Subtotal	30
Total		143

Nurturing Future Generations # Citizen Employee Participation

KOGAS supports the dreams and hopes of our future generations through programs for low-income family children and students, including scholarships and the Onnuri Toy Library. We expanded medical support for sick children from socially vulnerable groups both inside and outside the country to nurture healthy future generations. We are also working hard to fulfill our social responsibility as a global energy company through continuous delivery of education contribution projects tied to overseas resource development projects.



Goal 3
Ensure healthy lives and promote well-being for all at all ages



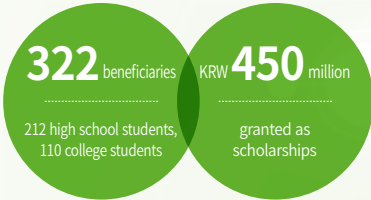
Goal 4
Ensure inclusive and equitable quality education and promote life long learning opportunities for all

The Onnuri Scholarship Program

KOGAS supports the endless potentials and dreams of students from underprivileged households by providing them with scholarships through the Onnuri Scholarship Program. In 2020, we granted KRW 165 million to 212 high school students from socially vulnerable families in the Daegu area and sponsored KRW 280 million as scholarships to 110 low-income family college students in our business site neighborhood with high level of academic achievement.



University student scholarship certificate presentation ceremony



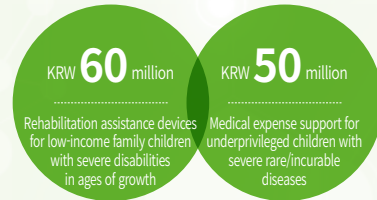
Medical support program for those from socially vulnerable groups at both home and abroad

KOGAS continuously sponsors medical support programs such as providing assistive devices for children with disabilities and funding surgeries for child patients in critical medical conditions and child patients in developing countries with heart diseases. We also run the Onnuri R-Bank project, which sponsors medical expenses and growth-tailored rehabilitation assistive devices for children with severe disabilities and limited movement from low-income families. In 2020, we provided rehabilitation assistive devices to 9 patients and covered medical expenses of KRW 20 million for 10 patients. KRW 50 million was funded to 34 child patients from underprivileged households in the Daegu region suffering with heart diseases, leukemia, or other rare/incurable diseases.



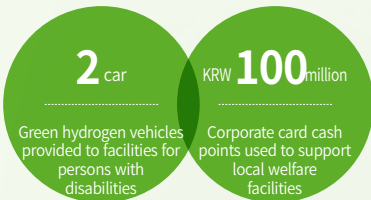
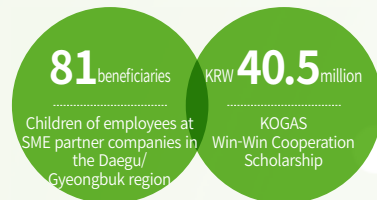
Medical support

* We support medical welfare by repairing and remodeling assistive rehabilitation devices that no longer fit children with disabilities because of their growth, and then rent them out to other children..



Scholarships for children of employees at local partner SMEs

As part of the KOGAS Win-Win Cooperation Package for overcoming COVID-19, we gave scholarships to children of employees at our small and medium-sized partner companies. We granted KRW 40.5 million in scholarship to 81 students selected upon our review of the financial status of 19 small and medium-sized partner companies in the Daegu/Gyeongbuk region and the number of children in the employees' families. 30 some people including KOGAS CEO Hee-bong Chae, employee representatives of partner companies, student beneficiaries, and representatives from the Daegu Association of Social Workers attended the scholarship granting ceremony.



Citizen employee participation and the Onnuri Volunteer Corp

KOGAS is disseminating the employee culture of voluntary sharing and expanding our social contribution projects based on communication and participation of our stakeholders. In 2020, we launched a new project supporting persons with disabilities' rights to movement by providing hydrogen vehicles to two facilities for disabled people. Also, all corporate card cash points from the previous year was paid as Daegu Region Vouchers, which contributed to the revitalization of the local economy. The Onnuri Volunteer Corp purchased Onnuri Vouchers for 24 sister welfare facilities in 1:1 ties with the teams under the Volunteer Corp, provided coal briquettes for heating to low-income households (125 households, KRW 30 million), shared kimchi (1,400 households, KRW 30 million), and gave out Christmas gift bundles to children (KRW 2.4 million).



Santa's gift bundles for children

KOGAS to head local development with its new energy industry project, “Green Energy Campus”

To establish the foundation of the energy-based new industry ecosystem, KOGAS plans to build a “Green Energy Campus” in cooperation with 9 public institutions that relocated to the Daegu Innovation City. This project was selected as the government’s “Measure for Innovation City Invigoration Led by Public Institutions,” thus securing funds. The project will be carried out with focus on building the foundation for the hydrogen industry and promoting win-win technology cooperation. The goal is to nurture local talent and foster local industries related to hydrogen manufacturing/storage/transportation technology and natural gas advancement.

Under the leadership of public institutions, the K-R&D Campus, which sits at the core of this project, will be built on idle land in the Daegu Innovation City, with participation from universities and private companies. Preparations for the establishment of the hydrogen distribution center, green energy-based R&D and business establishing support, industry-university-research institute cooperation will take place at this campus. The construction of the K-R&D Campus building (1 basement floor and 5 floors above ground) on idle land in front of the KOGAS headquarter office is scheduled for completion in 2024. The building is a large-scale complex facility, planned with considerations to coexistence with the local community and activation of the hydrogen economy. The complex will house the Natural Gas Research Center, Technical Center, New Growth Business Center, Promotion and Experience Center, and Mutual Cooperation Center. We expect that the Green Energy Campus for Daegu Innovation City revitalization will create direct and indirect economic values, including an economic effect of KRW 287.5 billion, 1,959 jobs, and founding support for 78 companies.

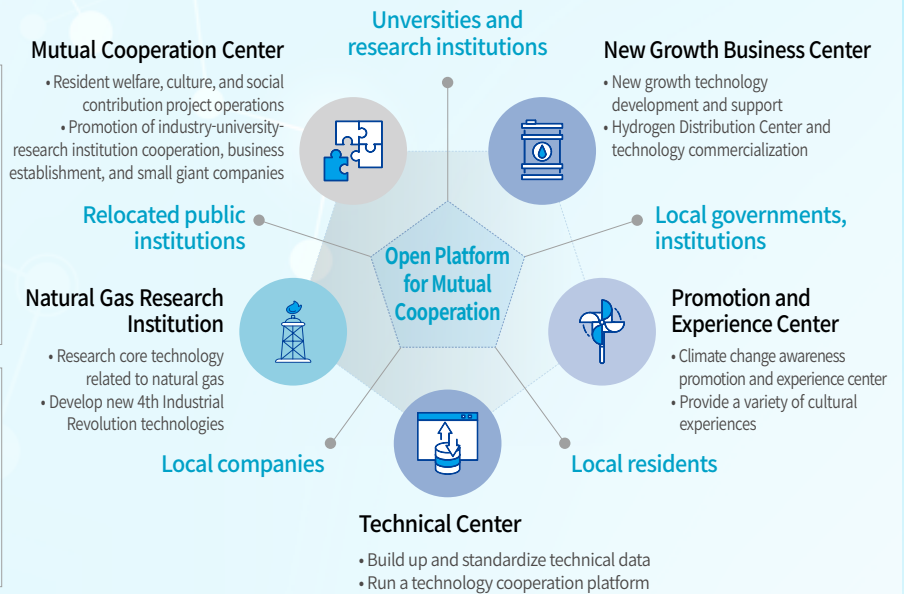


“Green Energy Campus” Project for the revitalization of the Daegu Innovation City

Overview
Build a open platform for mutual cooperation that allows multilateral cooperation between public institutions, local universities, companies, and local governments, with hydrogen and other green energy projects of KOGAS serving as the intermediary

Key Initiatives

- 1 Construct the K-R&D Campus (**hardware**)
- 2 Establish the hydrogen industry foundation (**hardware + software**)
- 3 Execute win-win technology cooperation projects (**software**)



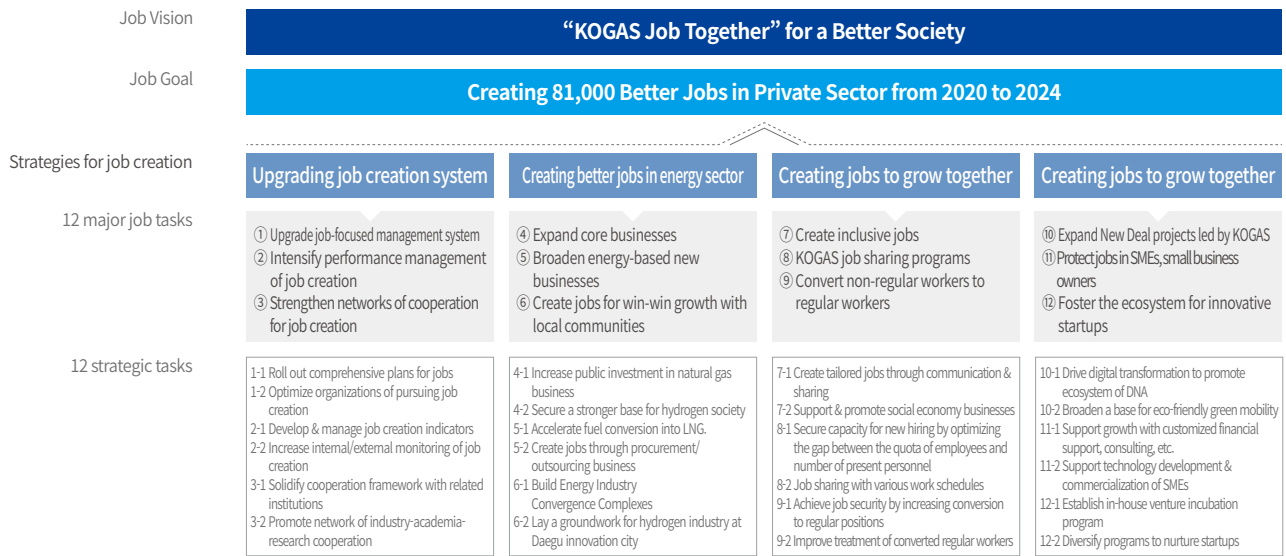
Selection and implementation of key initiatives for the Green Energy Campus

Key Initiatives	Details	Progress in 2020 (Complete)	Expected Effects
1 Construct the K-R&D Campus	<ul style="list-style-type: none"> Build a large-scale complex facility based on green energy R&D on idle land in the Daegu Innovation City Project Period: Jan. 2021 – Dec. 2024 Budget: Apprx. KRW 88.6 billion 	<ul style="list-style-type: none"> Approvals including site usage change complete Agreed on construction cost sharing with the city of Daegu 	<ul style="list-style-type: none"> A large-scale open communal facility that can be utilized by local communities (attract startups, develop innovative technology, etc.)
2 Establish the foundation for hydrogen industry	<ul style="list-style-type: none"> Build the hydrogen industry ecosystem in the Daegu region through initiatives such as hydrogen station installation in the Daegu Innovation City, preparation for the establishment of the Hydrogen Distribution Center Period: Sep. 2020 – Dec. 2021 	<ul style="list-style-type: none"> Build Daegu Innovation City hydrogen station and promotion center Support purchase of hydrogen tube trailers Final selection as the organization dedicated to hydrogen distribution 	<ul style="list-style-type: none"> Transformation of Daegu into a key hydrogen economy city Reinforce participation from local SMEs in the hydrogen industry (2020 performance record: 27 companies, KRW 41.2 billion)
3 Implement win-win technology cooperation projects	<ul style="list-style-type: none"> Deliver projects to be included in the K-R&D campus program, including support for green energy-based R&D and business establishment, promotion of industry-university-research institute cooperation, and promotion of SMEs Period: Aug. 2020 – Dec. 2024 	<ul style="list-style-type: none"> Finalized 2 projects for 2021 <ul style="list-style-type: none"> – Support Green New Deal startups – Support hydrogen-related R&D at SMEs 	<ul style="list-style-type: none"> Produce and incubate business content for K-R&D Campus Incubate SMEs and venture companies and revitalize the industry

Reestablishing strategies for job creation

The government’s policies for job creation and better quality of jobs have become a crucial social issue. KOGAS has set “KOGAS Job Together for a Better Society” as its vision for job creation to realize social values through the creation of quality jobs, and overhauled its strategies for job creation in line with government policies. We moved a step further from creating more jobs in the private sector for each value chain, and set up a roadmap for job creation with the aim of creating 81,000 better quality jobs in the private sector from 2020 to 2024, with a focus on boosting capabilities for job creation and quality of jobs.

KOGAS Job Creation Plan



Upgrading job-focused management system and process

KOGAS is upgrading the job-related management system by establishing job networks together with experts, citizens, and partner institutions. In 2020, we formulated a comprehensive decision-making framework by adding 5 new departments for job creation, etc. and enabling the Social Value Committee to oversee the process of proposing policy directions and gathering opinions from internal/external stakeholders. Moreover, KOGAS took various steps to create quality jobs. We have improved the bidding process as well as systems related to support for startups and worked to eliminate unfair contracts. With a view to address the unfair business practice of requiring prior performances in the bidding process, we separately placed an order or increased a joint contract for large-scale plant constructions, outsourcing the design of the Dangjin base to a company with no record of previous performances, which was the first of its kind. We have also introduced the Employee Safeguard System to root out unfair contracts and recruited startups for the support group of technology development to boost the growth of start-ups. Going forward, we will continue to make strenuous efforts to create various types of inclusive jobs in SMEs and startups, etc.

Improving system for creation of quality jobs

Improve bidding process

Addressing business practices of requiring performance records

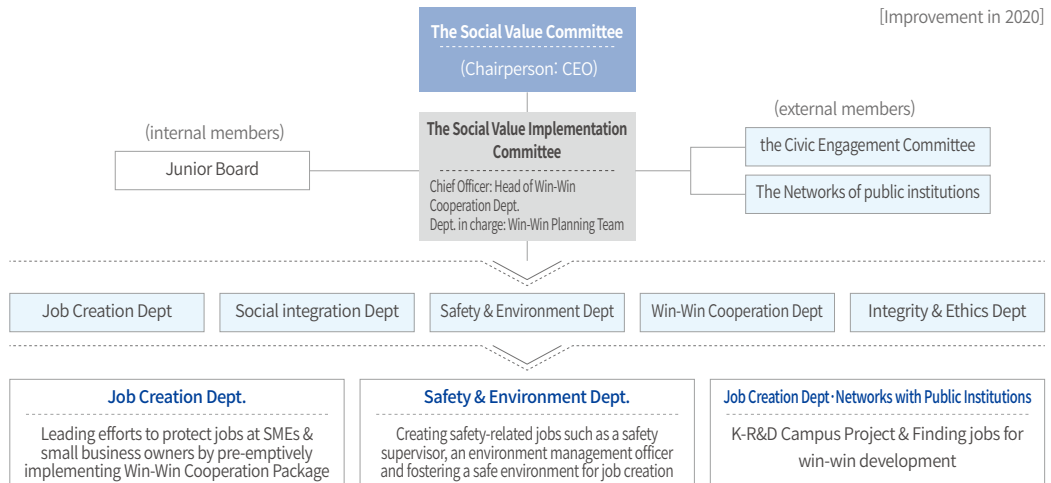
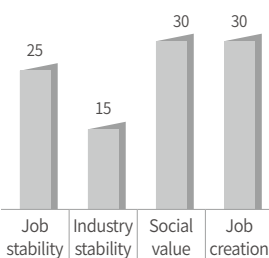
Eradicate unfair contracts

Introducing the Employee Safeguard System

Support growth of startups

Recruiting startups for projects

Reforming Job Indicators (Unit: Point)



Efforts to create quality jobs

Creating an environment for job sharing

Expanding intern jobs for young people

267 jobs
(30% increase from the previous year of 205)

Replacement employment for those on childcare leave

91 person
(21% increase from the previous year of 75)

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 2020, we realized job sharing by converting 79 employees into the peak wage system, adding 17 personnel, and hiring additional 102 employees, continuing our efforts to create new jobs and minimize the gap between the quota and current headcounts. In addition, we provided information about job opportunities in a timely manner by holding several briefing sessions before the job application season, newly participated in the job fair for those with disabilities, and expanded participation in the events held by universities to enhance young people's competitiveness in the job market.

Minimizing non-regular workers and converting them to regular workers

KOGAS has continued to do its best to come up with an optimal solution 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 working-level meetings, while sticking to the principles when pursuing conversion of non-regular workers into regular workers. In 2020, 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 29 times. In addition, we abolished the guideline of hiring temporary workers when the headcount exceeds the quota of employees by operating a preliminary screening system for employment of non-regular workers, minimizing the ratio of non-regular workers with the share of regular positions at 99.6% in 2020.

Achievement in creating better jobs

Jobs created in all business areas in 2020

6,080 job(2019)
→ 9,018 job(2020)

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 2020, we created 3,797 direct jobs related to the projects of Coral South FLNG in Mozambique, LNG terminal in Al-Zure of Kuwait, etc. We expect to create 727 direct jobs associated with pipeline relocation of Dangjin base construction, operation of supply-related safety supervisors/environment management officers. Meanwhile, in addition to new jobs created in all business areas ranging from the domestic production, supply facilities construction, and execution of new R&D projects, we created 9,018 jobs in 2020, a 48% increase year-on-year, as a result of our efforts to pursue KOGAS Win-Win Cooperation Package to Overcome COVID-19 and to create customized inclusive jobs.

Performance in job creation in the private sector

Classification	Areas	Details of jobs	Indirect jobs	Direct jobs	Total
Expansion of public investment	Domestic infra business	Construction of supply facilities for additional areas without supply, and pipeline relocation, operation of LNG carriers	2,695	895	3,590
	Overseas business	Mozambique Coral South FLNG, LNG terminal in Al-Zure of Kuwait, Zubair project	76	3,797	3,873
	Creation of an ecosystem for startups	Achievement of KC-2 technology development & business performance of localized trucks, etc.	48	66	114
KOGAS New Deal	Digital New Deal	Outsourcing of technologies in data infrastructure & information security, etc.	23	114	137
	Green New Deal	Establishment of hydrogen infrastructure for manufacturing and supply, SPC for construction and operation of hydrogen stations	298	480	778
	Support socially disadvantaged people	Employment of dedicated social workers, or jobs related to projects for better heat efficiency and construction academy, etc.	21	83	104
	Promotion of social economy	Job creation through expansion of the market for social economy enterprises, etc.	-	30	30
	Win-win with local communities	Construction of WGC 2022, K-R&D Campus	57	-	57
	Cooperative support for SMEs	Cooperative technology development, support for job creation in SMEs (Provision of funds)	314	21	335
	Total		3,532	5,486	9,018

MATERIAL ISSUE

04 Open-Minded Happy Energy to Enjoy Together



Our Target

- Innovating the way we work
- Advancing a management system for ICT utilization

Mid- and long-term management goals for 2025

Organizational culture overall index

87.3 point

Public data opening

89.13 %

Global human rights management

Building a sustainable human rights culture

Business Relevance

Korea has witnessed a rising income polarization and soaring 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 only when individual employees feel happy and satisfied with their daily lives. In response, 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 find work-life balance through various measures of maternity protection, support for childcare, and flexible work schedules, etc. 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. Furthermore, 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 of organizational/personnel management, labor-management relations, communication with people, etc. We steadily manage our strategic tasks based on our performance indicators, objectives, etc.

2020 Key Performances

Level of satisfaction with work-life balance 

85 point

Labor-management communication index 

75.5 point

Customers have rated their level of satisfaction (PCSI) with KOGAS as **Excellent** for five years in a row 

Diagnosis of personal information management level was rated as **Highest** for two years in a row 

Reinforcing human resources management

Fostering a corporate culture as a great workplace

Fostering a culture of practicing work-life balance

We strive to realize a corporate culture that encourages work-life balance by strengthening childcare support, ending long working hours, and creating an environment for flex time with the adoption of a variety of systems. We have adopted various flexible work schedules to expand measures for maternity protection and childcare time. And especially amid the COVID-19 situations, we have introduced working from home and diversified the flex time system to avoid lack of childcare so that employees can work free of the limitations of time and space.

	1 Increasing support for pregnancy/childbirth/childcare and use of childcare leave	2 Establishing work-life balance by ending the practice of long working hours	3 Realizing a flexible work environment free of the limitations of time/space
Tasks for execution in the direction of promotion	<ul style="list-style-type: none"> - Expansion of support for pregnant employees - Use of childcare leave without discrimination - Preferential treatment of employees seeking transfer to another position to take care of an infant 	<ul style="list-style-type: none"> - Establishment of a CEO reporting system - CEO-led campaign to encourage employees to leave on time on Family Love day - Expansion of types of leaving work early 	<ul style="list-style-type: none"> - Diversification of flex time schedules - Introduction of working from home and enhancement of work environments using technologies of 4th industrialization.
Performance indicators	[Quantitative] Level of satisfaction with work-life balance, level of satisfaction with flex time [Qualitative] KOGAS was certified as a family-friendly corporation by the Ministry of Gender Equality and Family, and also chosen as a company putting work-life balance into practice by the Ministry of Employment and Labor & JobPlanet.		

Increasing support for pregnancy/childbirth/childcare

We are expanding support for childbirth and childcare to be in line with government policies of encouraging childbirth and to establish an organizational culture of work-life balance. In addition to benefits like reduction of work hours during pregnancy, and payment of childbirth support money as well as a leave of absence for checking the status of the fetus (2 days a month) and for treatment of subfertility (3 days a year), we introduced a leave absence for infant care (10 days a year) and one additional daycare facility to reduce our employees' burden as they raise their children. Meanwhile, employees may use their 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, or they may be assigned to a department they wish to work at, with desired duties, which are part of our organizational culture that considers such employees.

Performance of operating a family-friendly system
(Unit: persons, days)

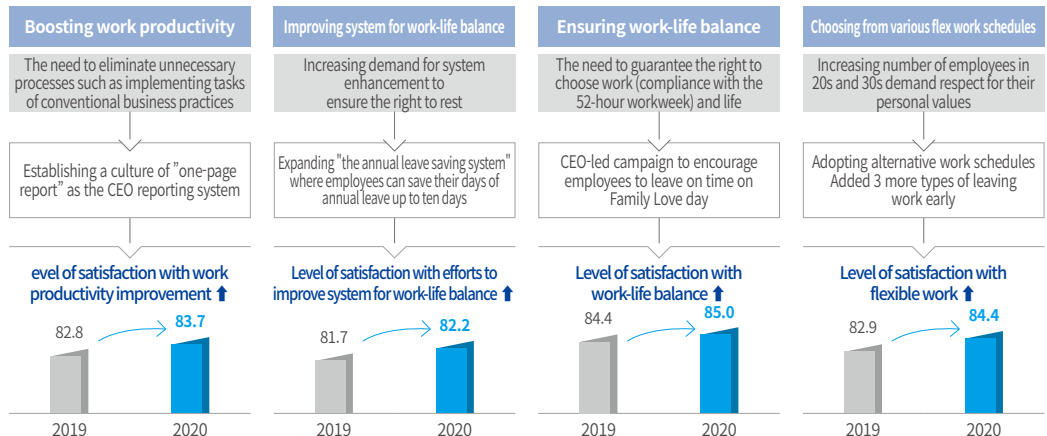
	2019	2020
Pregnancy		
reduction of work hours during pregnancy	23	30
leave of absence for checking the status of the fetus	136	158
leave of absence for treatment of subfertility	13	17
Childbirth		
Using maternity leave 100%	19	21
Using paternity leave	108	161
Childcare		
Operating childcare facilities	205	222
flexible childcare service	4	8

Ending the practice of working long hours and improving the flex time system

We strive to enhance an organizational system and embrace a culture of a work-life balance. In 2020, we adopted a culture of "one-page report" as a part of the CEO reporting system, expanded the annual leave saving system that allows employees to save their days of annual leave up to ten days, and added three more alternative work shifts, in a bid to alleviate their workload and improve work environments. Moreover, we implement flex time so that our employees can 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.

KOGAS was recertified as Best family-friendly company by the Ministry of Gender Equality and Family

96.6 point
(2.3 points higher than the average of public institutions)



Non-discriminatory working environment

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 2020, we exceeded the mandatory employment ratio for social equity in all areas including those hired from outside the Greater Seoul Area and people with disabilities, high-school graduates, etc.

Exceeding the mandatory employment ratio for social equity

Classification		Mandatory employment ratio (number of target employees)	2020 (Unit: %, persons)
Youth interns	Youth interns	5.5% of the total quota (235)	6.3% (267)
	High-school graduates	9.8% of those hired (10)	9.8% (10)
Local talents	Locals	24% of mandatory employment target (14)	30% (18)
	Employees from non-capital areas	35% of those hired (36)	55% (56)
Social equity	Those eligible for employment support	9% of regular employees (369)	9.3% (381)
	Those with disabilities	3.4% of regular workers	3.8% (159)

Fair evaluation and compensation

We try to operate a fair compensation system through the reasonable performance allocation centered on work value. 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 Equal Employment Opportunity Act and pay equal wages for work of equal value for all employees regardless of gender. In 2020, we reestablished the work-based organizational system and turned our work management system into a more sophisticated one to create an employee evaluation system based on work. We have formulated a roadmap for a shift toward the work-based remuneration system, aiming to settle KOGAS model of job-based compensation system by increasing the ratio of work value-based remuneration of all employees to 30% from the current 7% by 2026.

Improvement of employee healthcare and the work environment

We operate a comprehensive healthcare system for employees to realize our goal of being an enjoyable and healthy workplace. We provide mental and health counseling sessions with outside experts for employees as well as programs to promote better health of employees in partnership with specialized institutions. Meanwhile, we check the needs of our workers and continue to improve the work environment accordingly. We keep enhancing the convenience of vulnerable workers by operating the anonymous reporting system for partner companies, distributing items for safety and health, providing a COVID-19 Survival Kit as well as equipment related to preventing infectious diseases for all non-regular employees, and installing parking spaces for pregnant women, etc.

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 to study 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 the 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 women to both existing and newly hired employees and manager-level employees has increased. Beyond that, we continue to improve treatment for female employees and hold leadership education sessions for them, listening to opinions on improving the relevant system through surveys and informal meetings held at different levels of workplaces.

Ideal employees of KOGAS

- Employees with integrity abiding by the principles and honesty
- Trusted employees practicing considerate thinking and collaboration
- Employees leading the growth of the organization with challenging spirit
- Global talent unlocking the future with creativity

Level of satisfaction with hiring system

76.8

(0.4 points higher than the previous year)

Strengthening human resources management

Training female leaders/experts

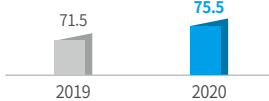
Number of female promoted to low-level managers (deputy general manager) (Unit: persons)

7 in 2019 → 12 in 2020
(71% higher than the previous year)

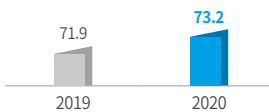
We operate a roadmap for training female managers and experts. We take extraordinary steps to train female candidates for directors by assigning them to core duties, raise the percentage of female members in the promotion committee, and provide an advantage to women when they compete with men for a higher position to increase the percentage of female managers. As a result, the number of female managers in higher than level 2 positions rose from 8 to 11 by 37% and the number of female managers promoted to low-level management positions of level 3 soared from 7 to 12 by 71% year-on-year in 2020. There were also new female employees promoted to Grade 1 positions (department head)*, and female managers were assigned to core duties as part of our continued efforts to realize the goal of gender equality in the organization.

Realization of win-win labor-management relation

The labor-management communication index (Unit: point)



Level of satisfaction with issue resolution (Unit: point)



In 2020, 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. We devised three key strategies of creating social values backed by labor-management cooperation, building a labor-management culture of communication/empathy, fostering a healthy workplace, while aiming at “labor-management relations of win-win cooperation based on participation and trust.” Most notably, in 2020, with a view to expand the participation of employees in management, we agreed to introduce the system of workers visiting the board of directors meeting and granted union members the right to observe board meetings as well as the right to speak with approval from the chairman, laying the foundation for the worker director system. Thanks to these efforts, both the labor-management communication index and a level of satisfaction with issue resolution increased to 75.5 and 73.2 points, respectively.

Programs for training talented employees

We operate the HR development programs based on our strategic objectives and employees’ needs to nurture talented employees who will play a leading role in the future energy industry. 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 by embracing our core/social values. Under the annual plans formulated from a mid-term perspective, we do our best to enhance employees’ work capabilities and improve the educational environment, boosting their level of satisfaction with education.

Employee trainings carried out in 2020 in each field of capability

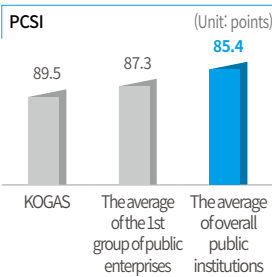
Strategic direction		Promotion of education	Performance & expected effects
Strengthening expertise	Future growth	<ul style="list-style-type: none"> (short-term) Launch of new courses including evaluation of business feasibility & corporate value (long-term) 7 employees in hydrogen fuel cell, etc. 	<ul style="list-style-type: none"> Development of a talent pool for establishment of infrastructure of new growth engine businesses in line with newly created organizations
	Safety	<ul style="list-style-type: none"> Expansion of safety education including a basic course in disaster safety and EHSW working-level knowledge of onsite business 	<ul style="list-style-type: none"> Improvement of global safety culture level - 7.63/10 points ('19) → 7.81/10 points ('20)
Strengthening global capability	Language skills	<ul style="list-style-type: none"> Work-related intensive speaking course for overseas business departments (4 days a week for 3 months) 	<ul style="list-style-type: none"> Participation of 24 employees from 12 departments - 14% higher language performance / 89.8 points in levels of using language skills in day-to-day work
	Business Optimization	<ul style="list-style-type: none"> Development of materials for international conference in preparation for WGC Launch of training programs regarding discussions about KOGAS-related topics and business meeting methods 	<ul style="list-style-type: none"> Increase in work-specialized courses (11% ↑ y-o-y) - Improvement 6.5/10 points, a level of satisfaction 93 points
Fostering a desirable organizational culture	Social values	<ul style="list-style-type: none"> Educational courses to embrace social values (discussion sessions as part of training sessions for 143 promoted employees in Gr. 3/4/6 positions) 	<ul style="list-style-type: none"> KOGAS was rated “excellent” in mutual growth rating.
	Human rights-friendliness	<ul style="list-style-type: none"> Raising awareness of human rights-related leadership (education using real-life cases) / mutual respect & equality (comradeship with the disabled/gender equality) Protection of employees’ human rights (prevention of sexual harassment/violence) 	<ul style="list-style-type: none"> Establishment of the evaluation system for human rights management activity index (90 points in '20)

Strengthening CRM

Promotion of strategies to innovate services for the public

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

for 5 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. We launched the Marketing Planning Department, added 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.

Establishment of an open communication system with 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 have held the Open Contest for Ideas Suggested for KOGAS’s Innovation every year since 2018, in order to reflect good ideas contributed by the public in our overall management. In 2020, we launched KOGAS’s Chatbot Service named “KOBOT,” which won the first place in the 2018 contest, to provide services for the public on our official website. We will do our best to deliver social values by steadily expanding participation of the public as well as communication channels and exploring new businesses which can be helpful for both the public and the local community.



Open Contest on Innovative Ideas for KOGAS

Delivering transparent management via preemptive information sharing

We practice transparent management through proactive information disclosure of our overall operations encompassing business execution, organizational management, etc. We strive to follow fair and transparent work processes by strengthening investment decision-making procedures, serving as an external member for expansion of information disclosure in case of contract/bidding, and operating a win-win cooperation committee with partner companies. In 2020, KOGAS newly created and held the committee of working-level business investment review for 6 times, recorded 73 information disclosures regarding contracts, and increased the number of external members by more than 30%. Moreover, we actively implement the real-name business system, the preliminary information disclosure system, the request for information disclosure, among others, to fulfill the right to know of the public. As for the request for information disclosure, the rate of disclosure increased by 16.3% from the previous year, and the rate of backlog recorded 0% in 2020. Thanks to these efforts, KOGAS witnessed an increase in the external integrity level by Anti-Corruption & Civil Rights Commission (ACRC) for three years in a row and was chosen as an “excellent institution” in the comprehensive evaluation of information disclosure by the Ministry of the Interior and Safety (MOIS).

KOGAS was rated

“excellent”

in the comprehensive assessment of information disclosure by the MOIS

Classification		Tasks for execution
Disclose!	Real-name business system	• Disclosure of status of major business projects & real names of a person in charge
Access!	Preliminary information disclosure system	• Selection and disclosure of top 10 interests of the public on websites to enable easy public access to information
Request!	Request for information disclosure	• Swift processing of requests for information disclosure (rate of backlog 0%, rate of disclosure up by 16.3%p.)

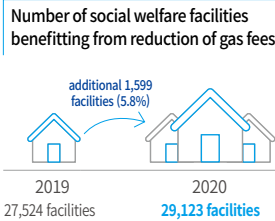
Building customer trust by deploying emerging technologies in gas measurement

We have seen a growing need to deal with customer complaints about measurement errors due to a temporary gas reflux caused by the gap in gas pressure in the process of operation/suspension of power generation facilities of customers. In a bid to find the best solution to the gas reflux problem, KOGAS adopted a two-way measurement system of ultrasonic flowmeter to gauge the quantity of gas in reverse direction and in turn, to automatically calculate the amount of reflux gas. In addition, KOGAS signed a joint agreement on the measurement method with its customers and addressed the issues by verifying its customized designs and performances. As a result, we improved levels of customer satisfaction as measurement errors decreased, and the rate of gas loss dropped to 0.017% from 0.082% driven by addressing difficulties with gas calculation.

Promotion of people's energy welfare

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 loop-holes. Thus, we set up a one-stop service system, as a result of which welfare facilities benefitting from gas fee reductions increased by 5.8% year-on-year to a total of 29,123 in 2020 despite the COVID-19 situations.



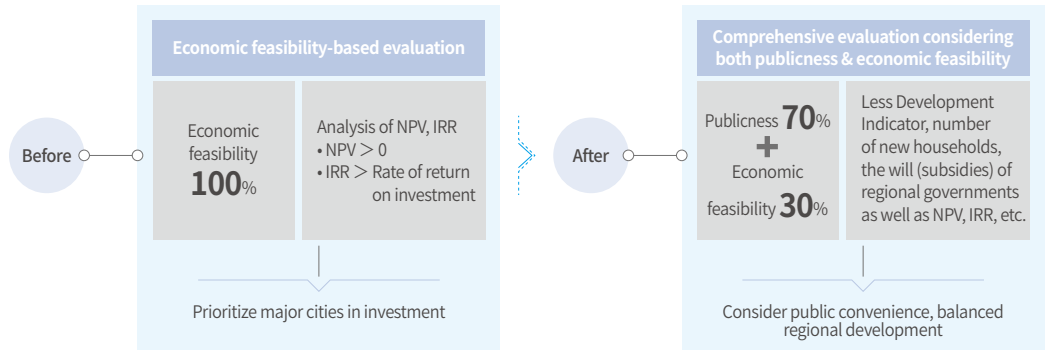
Alleviation of the burden of gas charges on households suffering from COVID-19

KOGAS has postponed the collection of urban gas fees to help small-sized businesses and the less-privileged suffering from the persistent COVID-19 pandemic, easing the burden of heating costs. We deferred the collection of gas charges for 3 months for 3 times, from April to June, from September to December in 2020.

Supply of city gas with no blind spots

KOGAS improved its criteria for investment in gas infrastructure to supply gas to remote areas and other regions with low profitability. We revamped our previous criteria for investment which was only centered on economic feasibility to comprehensively evaluate publicness and economic feasibility. The new standards reflect publicness and economic feasibility with the ratio of 7:3 by looking at Less Development Indicator, the number of new households, the will of regional governments, among others, laying a systematic foundation for a wider distribution of city gas to regions with no access to city gas. As a result of the improvement, in November 2020, the board of directors decided to supply city gas to Gapyeong-gun and Boseong-gun.

Improvement of gas infrastructure investment criteria



Improvement of customer eco-friendliness

GHG emissions fell by **5,000 tons** in 2020
(energy savings at KOGAS)

NOx emissions fell by **48 tons** in 2020
(efforts to reduce air pollutants from gas heating & cooling)

Practicing environmentally-friendly activities together with customers

We, at KOGAS, implement various eco-friendly activities such as energy efficiency enhancement projects designed by KOGAS to build a clean environment together with our customers. In preparation for the government's push for enactment of EERS policies, KOGAS focused on distribution of gas AMI, replacement of industrial boilers, and improvement of heat efficiency among vulnerable groups, etc. with a view to explore and conduct businesses for higher energy efficiency of gas. In 2020, we replaced 37 industrial gas boilers with facilities with high efficiency, added heat insulations at social welfare facilities for 238 times, and replaced 183 household boilers of vulnerable groups into new ones with first-class energy efficiencies. The annual energy saving effect from these efforts is expected to reach 20,536 Gcal. Moreover, we provided subsidies to pay for replacement of a large-scale absorption chiller & heater with a low-NOx burner to reduce air pollutants generated from using gas. In 2020, we reduced NOx emissions, which are the main contributors of particulate matter and ozone, by 48 tons annually with the replacement of 237 chilling & heating equipment.

* EERS (Energy Efficiency Resource Standards): The EERS policy aims to obligate energy suppliers such as KOGAS and KEPCO to meet energy reduction targets by granting them the targets and giving penalties or incentives depending on their performance against the targets. (pilot test underway from '19 to '21)

** Gas AMI (Advanced Metering infrastructure): The advanced metering system uses a two-way communication network and provides gas consumption data for customers such as gas fees for usage by specific time zones, etc., to lead them into voluntary energy-saving efforts and demand response.

Information security

Information security risk management

Promotion of proactive information security strategy

In response to the increasing cyber threats including personal data leaks, we do our best to enhance our credibility in this field as a leading public energy enterprise by continuing to upgrade the level of our information security and provide safe services. We have established a personal information management system, and we taken 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.

Goal

Establishment of information security system considering information security and work efficiency

security level ↑

convenience ↑

Strategies for execution

Upgrading level of personal information protection

Responding to emerging cyber threats with new technologies

Key tasks

- Reinforcement of personal information management system in all areas
- Complete protection of new personal information related to COVID-19

- Creation of a safe, contactless IT work environment
- Application of security control backed by latest technologies & physical network separation

Upgrading level of personal information protection

We make sure that personal information generated in the course of business is processed 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. In 2020, as increasing amount of personal information needed protection in line with IT-focused government policies amid the COVID-19 pandemic, we maintained our personal information protection architecture at the highest level in all areas. We also ensure our internal controls comply with the relevant regulations by completely encoding a data base of personal information and conducting the internal phishing email exercise for employees with access to personal information, and revising our policies, guidelines, and manuals. As a result of such efforts, not a single case of personal information leaks to unauthorized parties occurred in 2020.

Diagnosis of personal information management level

97.8 point in 2019
→ 99.7 point in 2020
(Highest rating for two years in a row)

Reinforcement of 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 obtained 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.

NIS cyber response exercise

Level D in 2019 → Level A in 2020
(Highest level of cyber response)

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 for 4 times. We have employees adopt cybersecurity as part of their day-to-day duties and take steps to strengthen offline educations for shift workers. We also reinforce information security management of our partner companies throughout the overall business processes. Thanks to such watertight cybersecurity, we received the Minister of Trade/Industry/Energy's Citation in information security inspection in 2020.

Advancing response to cyber threat

Types of attack	Threats & Implications	Responses
DDoS	• Increase in attacks on public institutions such as DDoS, etc. → the need for collaboration with the private sector including telecommunications companies, etc.	• Development of response measures against potential DDoS attacks (TF team to respond to DDoS, 2 combined exercises involving telecommunications companies)
Malicious code	• Spike in variant malicious code such as ransomware, etc. → the need to analyze large amounts of patterns and logs	• Adoption of big data-driven integrated security control (log processing efficiency is up 300%, 1 billion items were processed in less than 10 seconds.)
Website hacking	• Websites are relatively easy targets for hackers, with huge potential impacts. → respond to the attack with white hackers of KOGAS	• Training 8 white hackers (187 actions taken to address vulnerabilities using white hackers)

Management Report

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Governance

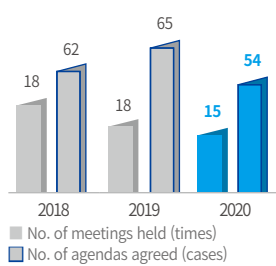
Composition/Operation of a sound Board of Directors (BoD)

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 April 2021, our BoD consists of twelve directors with 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. Thus, 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. Also, 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.

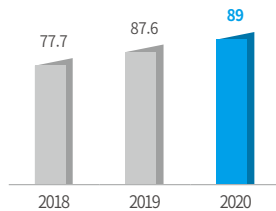
* (Securing directors' independence) To strengthen the BoD's function to keep in check, we have independence securing guidelines in place. For instance, one holding shares amounting to 1% or more of said enlisted company's total number of stocks issued, one holding shares of a corporation whose total amount of transactions with KOGAS comes to 10% or more of its total amount of assets over the past three business years are disqualified, and to enhance the efficiency, KOGAS's non-standing directors are not allowed to double as director, executive member, or auditor of another business.

Status of Operation of the Board of Directors



Meetings in 2020 were conducted safely and focused on critical agendas to prevent the spread of COVID-19

Percentage of directors attending BoD sessions (Unit: %)



Securing Diversity of BoD

In the election of a director, we put no restriction whatsoever including gender, race, ethnicity, nationality, country of origin or cultural background of the candidates in an effort to secure 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, we are rolling out more aggressive inclusive measures to help increase the percentage of our female executives. For instance, 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 setting our goal of 20% female BoD and doing our best to achieve diversity in gender and regional backgrounds. With first female non-standing director being elected in 2018 and three female standing directors being elected in the first half of 2021, making 25% female BoD, we are achieving diversity of BoD and also securing expertise on related subject.

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 website 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.

BoD Composition

(As of the end of April 2021)

Classification	Name	Gender	Status	Term of Office	Field of Expertise / Experience
Standing Director	Chae Hee-bong	M	President and CEO	2019.7.9 ~ 2022.7.8	(Industry) Former Division Chief at the Ministry of Trade, Industry, and Energy
	Sung Young-kyu	M	Standing Director	2019.11.19 ~ 2021.11.18	(Industry) Former Chief of LNG Terminal Division, Former Chief of Busan and Gyeongnam District Division
	Lee Seung	M	Standing Director	2020.10.13 ~ 2022.10.12	(Industry) Former Director of KOGAS Audit Office, Former Chief of Incheon District Division
	Nam Young-joo	M	Member of the Audit Committee	2020.1.13 ~ 2022.1.12	(Communication, policy) Former Secretary General, Office of the Ombudsman Korea
Independent Director	Kim Eui-hyun	M	Chairman of BOD	2018.10.29 ~ 2021.10.28	(Policy/Industry) Former Policy Researcher of Trade, Industry and Energy Committee of National Assembly
	Ahn Hong-bok	M	Outside Director	2019.11.21 ~ 2021.11.20	(Accounting) Professor at Keimyong University Accounting and Taxation, Former Vice President of Korea Association of Tax & Accounting
	Kim Suyi	F	Outside Director	2021.2.15 ~ 2023.2.14	(Industry) Professor at Hongik University Commerce and Economics, Former Vice President of Korean Resource Economics Association
	Jeon Sang-heon	M	Outside Director	2021.2.15 ~ 2023.2.14	(Policy) Special Professor at Suseong University Police Administration, Former Representative of Presidential Committee for Balanced National Development
	Oh Seon-hee	F	Outside Director	2021.2.15 ~ 2023.2.14	(Law/Human Rights) Member of National Human Rights Commission's Administrative Appeals Committee
	Song Moon-kyou	M	Outside Director	2021.4.1 ~ 2023.3.31	(Industry) Member of Ministry of Science and ICT's Research and Development Business Evaluation Committee
	Kim Hyun-jin	F	Outside Director	2021.4.1 ~ 2023.3.31	(Policy) Former Member of Ministry of Finance and Economy's Advisory Committee for Fiscal Policy
	Kim Young-min	M	Outside Director	2021.4.1 ~ 2023.3.31	(Industry, law) Former Registered Director of Gyeongbuk Economic Promotion Agency, Former Attorney of Banseok

* Please refer to our website for more details (Website: <http://www.kogas.or.kr/portal/contents.do?key=2447>)

Operation of Subcommittees

We operate three subcommittees concerning audits, ESG 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.

(As of June 2021)

Stricter management supervision of non-standing directors

2 decisions
on modifications concerning management supervision

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 of the BoD Carrying out matters entrusted by BoD; matters stipulated in the law/articles of incorporation to those to be assumed by the Audit Committee
ESG Committee	Three non-standing directors	<ul style="list-style-type: none"> Environment and hydrogen-related business, carbon neutral plan Transparency/ethical management and social value realization plan Evaluation of ESG and improving governance Safety management responsibility plan
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

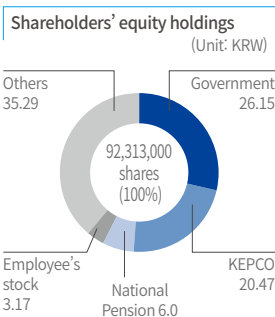
Transparent BoD Evaluation and Remuneration

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. Since December 2020, based on the result management index composed of attendance records, the number of cases of reports on pending issues, management-related suggestions, we strive 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 create social values. We also pay an adequate level of service allowance to non-standing directors. The annual basic pay for the CEO, standing directors, and auditor is decided as per the BoD's decision within the limit approved by the General Meeting of Shareholders (GMOs).

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 stakeholders exceeds KRW 30 million, 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.

(As of the end of 2020)



All issued shares (92,313,000) are composed of common stock. Therefore one shareholder holds one vote. The 4,675,760 treasury stocks deposited by the issuance of new exchangeable securities on August 22, 2014 are currently held directly in our account as the redemption of the exchangeable securities is completed. In addition, we decided to acquire treasury stocks in April 2020 and completed the acquisition of 1,810,290 shares by June of the same year.

Amount of remuneration paid to BoD members in 2020 (Unit: KRW 1,000)

Position	Number of People	Total Amount of Remuneration	Per-person Amount	Remarks
Registered Directors* (excluding Outside Directors and Members of the Audit Committee)	3	502,834	167,611	
Outside Directors (excluding Members of the Audit Committee)	8	-	-	Service allowance: KRW 2.5 million /month
Members of the Audit Committee	1	165,596	165,596	

* 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 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).

Shareholder Composition

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, local governments, etc.) hold 54.55% of equity. The largest shareholder among them is the Korean Government, holding 26.15% of equity.

Integrity and ethical management

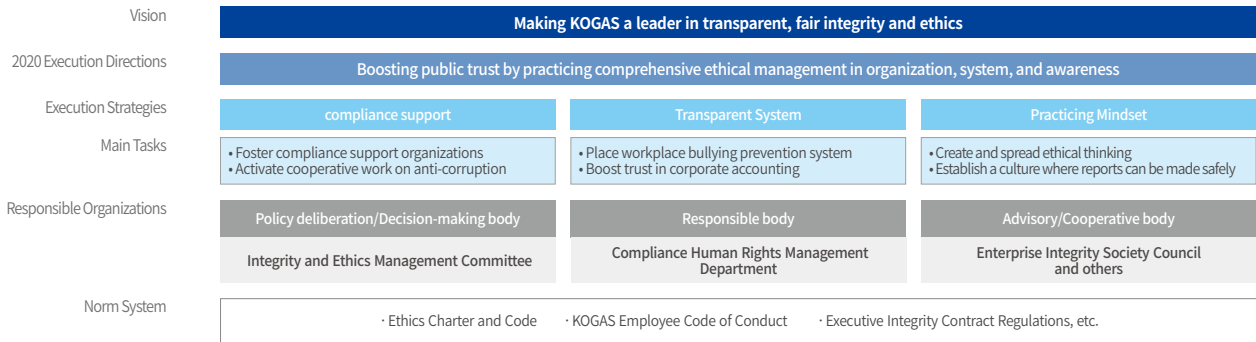
Status of Operation of the Board of Directors

• http://www.kogas.or.kr/portal/downloadFile.do?REAL_NAME=general_principles_of_ethics.pdf&FILE_NAME=윤리강령.pdf

Creating an environment for integrity and ethics

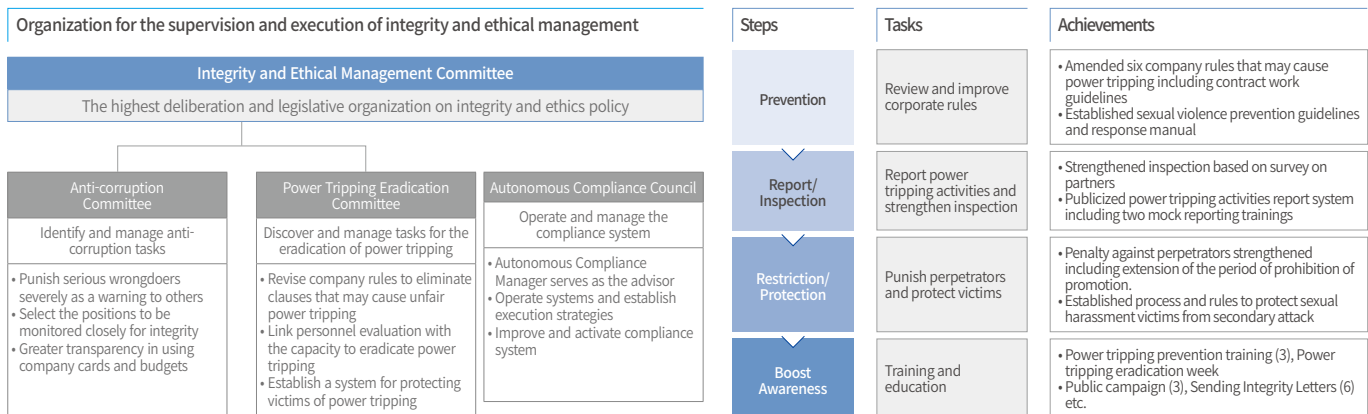
Implementing strategies for integrity and ethical management

For integrity and ethical management, KOGAS is performing the 3 main tasks according to the 3 major execution strategies under the vision of “a leader in transparent, fair integrity and ethics.” 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. In 2020, to prevent legal risks, the ethical management organization was expanded to “Compliance Human Rights Management Department” to include legal roles such as compliance, while reviewing company rules to prevent factors causing corruption and amending seven rules including contract guidelines, as part of efforts to enhance ethical management.



Establishing Win-win Culture without hierarchical relationships

KOGAS strives to move away from asymmetrical top-down relationship which operates on rank and positions and establish a horizontal organizational culture and create a win-win relationship with our partners. In 2020, our “Power Tripping Eradication Committee” established strategies to create a culture without hierarchical relationship and identified 14 challenges. The guidelines pertaining to personnel regulations, workplace sexual harassment and sexual violence prevention were amended to strengthen penalty against the perpetrators, such as, restricting opportunities for promotion. In addition, we launched the “TF for Improving Unreasonable Construction Practices” to revise construction management regulations and subcontract management guidelines and introduced income direct payment system to prevent any delayed payments.



Strengthening the prevention and control of corrupt actions

KOGAS further strengthened the policy of severe punishment for the eradication of the four major misconducts including receipt of money & valuables or treatment and embezzlement of company money. If a misconduct is discovered, the manager 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 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.

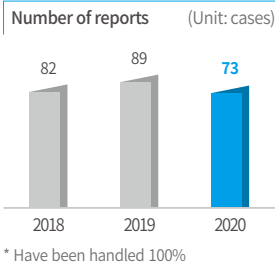


Integrity Culture Campaign

Creating a culture of ethics and integrity

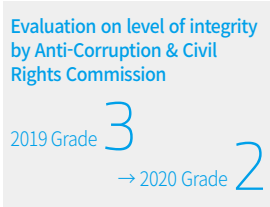
Promoting the internal reporting protection system

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 2020, we focused mainly on enhancing training and promoting to boost trust in our internal reporting system. Based on actual report cases, we have carried out two mock reporting trainings and engaged in continuous promotional activities of compensation and protection systems for reporters, including creating reporter protection manual and sending out Integrity Letter.



Operating a trustworthy personnel-recruitment 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, KOGAS is the first Korean public institution to have introduced the established recruitment test audit system (KOHAS) which was to root out recruitment irregularities. In 2020, we enhanced transparency in personnel system by increasing participation of external members and improving existing systems, such as increasing the number of open positions (four positions in new businesses), increasing the proportion of external member's participation in special promotion review process to 40% and enhancing transparency in the selecting process of awardees. All of these efforts were chosen as exemplary cases of personnel innovation in 2020 and went on to win Prime Minister's Citation Ribbon.



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, the entire staff members and executives of KOGAS take part in the integrity training and hold integrity and anti-corruption campaigns for the general public and provide integrity training for partner companies, including integrity and ethics discussion and informing about the 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.

Self-diagnosis of ethics level (Unit: points)

Year	2018	2019	2020
Score	85.65	85.90	86.69

Ethics and integrity spreading program



Fostering a culture of fair trade

Promotion System	
Compliance Council <ul style="list-style-type: none"> Chief of the Management Cooperation Office and eight others Formulation of strategies and operation of systems 	Compliance Support Corps <ul style="list-style-type: none"> Inside lawyers and those from outside law firms Education and production of materials
Compliance Protectors <ul style="list-style-type: none"> Two selected from each department, team and place of business Compliance education for employees, participation in system improvement, PR, recommendation of ideas for improvement, etc. 	

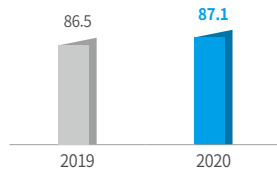
Compliance Protectors for autonomous law compliance

We operate the “Compliance Protector” system, an autonomous misconduct prevention system, to proactively cope with any possibility of irregularities. “Compliance Protector” consists of two members each from the headquarters and nationwide branches. The Protectors engages in the work of compliance education for their own employees, participation in system improvement, recommendation of ideas for improvement, etc. In 2020, we launched Autonomous Compliance Council and reshuffled the Compliance Protector team to establish the compliance and ethics awareness system. In addition, in order to enhance legal capacity, managers are obligated to take 20 hours of training and we enhanced legal support function by providing legal consulting 411 times (128 up from the previous year).

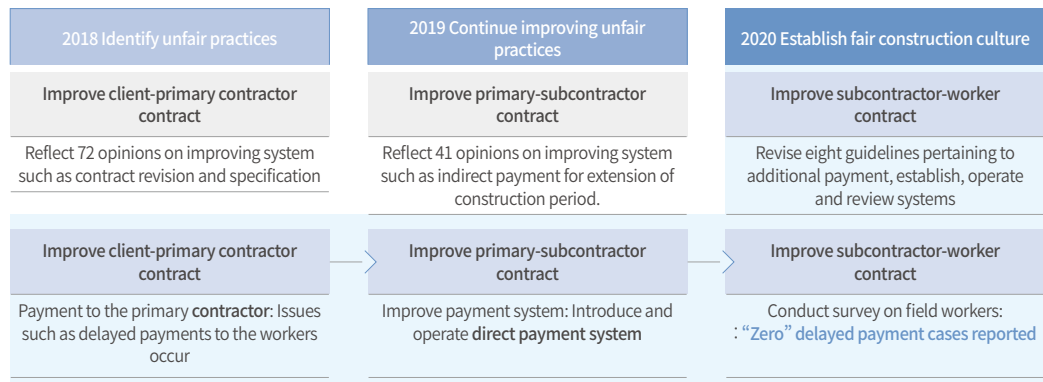
Institutionalization of exemplary trade model and overhaul of unfair system

KOGAS introduced “KOGAS-type exemplary trade model” to create an environment for win-win cooperation and growth and established the foothold for fair competition. We are in the process of institutionalizing win-win cooperative trade model by intensively reviewing the current trade practices with partner companies and identifying systematic factors which induce unfair trade. In 2020, we identified and carried out eleven tasks to eradicate power tripping and unfair practices, including easing administrative burden for contracting party and providing more information for bidders. In addition, by introducing “TFT for improving unfair practices in civil, governmental, public areas” we achieved “zero” delayed payments by introducing and operating the direct payment system as an effort to improve the payment system for contracts between subcontractors and workers.

Satisfaction level of bidding parties (Unit: points)



Roadmap for eradicating unfair practices



Expand bidding opportunities for SMEs and local businesses

KOGAS is expanding bidding opportunities for SMEs, local businesses and small business owners by improving contract system. In order to expand separate orders in case of requesting a contract, it is obligated to check the availability of expansion in advance and specify reasons in case it is unavailable. Also, we introduced joint participation points for unsuccessful companies to encourage joint contract. In addition, in order to provide opportunities to local businesses and small business owners to win orders first, we introduced extra bidding points for local businesses. Thanks to these efforts, we saw eight separate orders worth KRW 41.9 bil (three orders worth KRW 7 bil in 2019) and two joint contracts worth KRW 7.7 bil. Moreover, to secure adequate profit for contracting party and to support fund liquidity, we increased the lowest bid rate by 10.3% to 87.9% for service and goods qualification evaluation and eased front payment rules to increase front payment rate. We also support economic activities of social and economic minorities by enhancing bidding preference standards for companies with the highest women and disabled employment rate and companies that introduced reduced working hours early, to expand social value in the procurement process.

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). The content 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 2020 include violations of the duty of good faith or integrity. Please click on the link below for further details.

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

ACRC’s evaluation of KOGAS’s overall integrity (Unit: points)

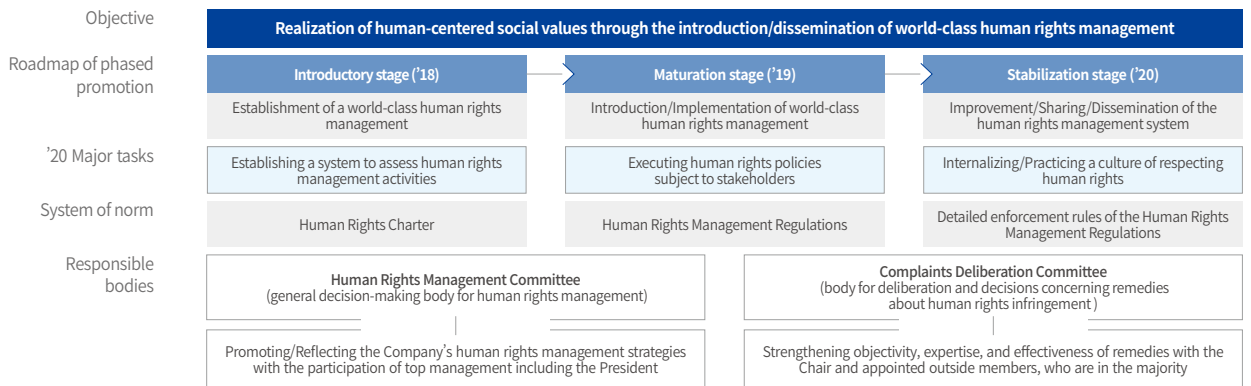
2018	2019	2020
8.14 points (Grade 3)	8.43 points (Grade 3)	8.62 points (Grade 2)

Human rights management

Establishment of human rights management strategy and system

KOGAS's human-centered human rights management system

We strive to disseminate a culture of respecting human rights based on our knowledge and skill to advance human rights management. To this end, systems and mechanisms have been formulated and implemented, including a human rights management-related basic plan and mid-to-long-term roadmaps, along with the enactment of regulations and detailed enforcement rules. We also operate the Human Rights Management Committee, which includes CEOs and other top executives, as a general decision-making body for human rights management, and the Complaints Deliberation Committee responsible for deliberation and decisions concerning remedies about human rights infringement with outside members in the majority.



Establishing a system to implement and evaluate human rights management

We have established a system of review, evaluation, and feedback on human rights risks to effectively implement human rights management and execute such a system. In 2020, the "KOGAS Human Rights Impact Assessment Implementation Manual" was adopted to enhance the efficiency of human rights risks inspection processes. Along with this manual providing human rights impact analysis cases by value chain and tasks for each evaluation step, we also developed "KOGAS Human Rights Management Activity Indicator" as part of our evaluation and feedback system that contains checklists for four sectors such as implementation rate for human rights tasks, communication with stakeholders, and frequency of activity involvement.

Preventing in-house human rights infringement and strengthening remedies

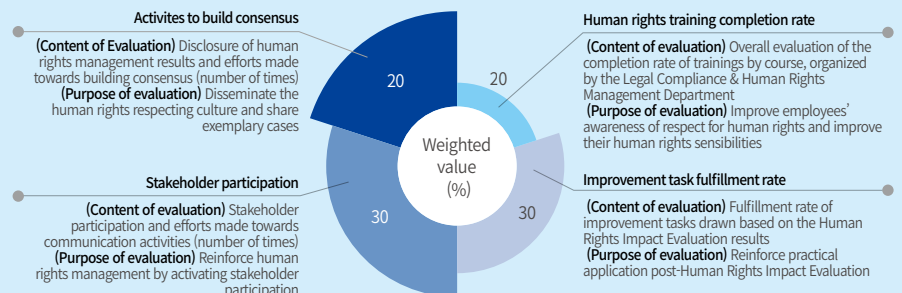
We strive to develop norms in a human rights-friendly way and improve relevant systems and regulations moving forward. In 2020, we enacted integrated guidelines for the prevention of sexual harassment and violence in the workplace to avoid secondary damage and entrusted the responsibility of counseling for in-house bullying and sexual harassment to external consultation centers. At the same time, a professional consultation training program was provided to help 22 staff members complete the course designed to improve the capability of in-house counselors for workplace difficulties. In addition, we created a manual on our own for the prevention of sexual harassment and violence, disseminating information on procedures, punitive actions, roles of each group of members, and related legal cases across the Company.



KOGAS Human Rights Activities Indicator

KOGAS is implementing human rights training, system improvement, stakeholder participation, consensus building, etc. to practice business management that respects human rights. We established quantifiable indicators that effectively measure efforts made to help human rights management take root in each area and use them for evaluation and feedback.

KOGAS Human Rights Activities Indicator Organization

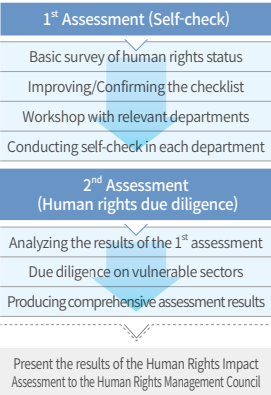


Self-diagnosis of our human rights management level

89.6% (2019)
→ 92.4% (2020)

* The proportion of positive answers ("Yes") among the responses (Yes/Improvements Needed/No/No Information/Not Applicable) from self-assessments conducted using the institutional operation checklist in 13 areas was quantified.

In-house process for human rights impact assessment



Key Business Human Rights Impact Assessment Checklist

- 1 Update checklist (additional categories for risk inspection)
- 2 Factual survey on human rights protection conditions (On-site workers and local residents)
- 3 Human Rights Impact Self-assessment
- 4 Draw recommendations and areas for human rights improvement (1st)
- 5 Hold technical discussions on human rights design
- 6 Draw recommendations and areas for humans rights improvement (2nd)
- 7 Deliberation and adoption of tasks for improvement by the Consultative Group on Human Rights Improvement
- 8 Deliberation and adoption of tasks for improvement by the Human Rights Management Committee

Impact assessment for construction business

Diagnosis based on the construction sector checklist

composed of **129** items
in **5** sectors

In-depth human rights impact assessment

Conducting institution-operated human rights impact assessment

We conduct human rights impact assessments to diagnose potential human rights risks in our institutional operation and major business areas and find ways to prevent and solve issues. Our human rights impact assessment has been performed for two major business areas of institutional operation and construction. For institutional operation, we improved our checklist to assess 13 areas with 211 items with an in-depth due diligence conducted robustly. In carrying out such due diligence, our particular focus went to notable human rights policy-related contracts, HR, and communicating with our employees to further promote human rights awareness on job sites.

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

Continued improvement in human rights impact assessment

NHRCK-provided manual	2018	2019	2020
Checklist	190 items in 13 areas	202 items in 13 areas	211 index items in 13 areas (With the participation of 26 departments responsible for human rights policies)
Human rights impact assessment	Document-based and experts' evaluation mostly based on the checklist	Document (e.g., baseline surveys such as questionnaire-based or in-depth surveys)-based evaluation as well as experts' assessment	Enhanced on-site surveys - Due diligence on teams responsible for major human rights policies (e.g., contracts, HR) - Interviews with employees in business offices to promote human rights awareness on job sites

Expanding human rights assessment in major business sectors (supply/construction)

We expanded human rights impact assessment to reach the construction sector to foster a construction work culture wherein workers are respected. In 2020, we adjusted the checklist for construction to cover five areas with 129 index items. Our sector-wide evaluation included the human rights of nearby residents who can be directly or indirectly affected by construction projects to expand the scope of review for risks and involvement of stakeholders related to the construction sector. We also devised ways to uphold human rights in the design and installation segment through discussion meetings during due diligence on job sites and established a council dedicated to improving human rights at construction sites to discuss human rights management agenda in advance. Thanks to these efforts, as of 2020, we have established design standards for detailed designs of supply stations with consideration of human rights and found ways to improve vulnerable processes and working conditions in confined spaces at construction sites. From 2021, all these will be gradually implemented in our business operation and monitored.

Findings of human rights impact assessment in the construction sector

KOGAS is working to identify and address potential human rights risks by assessing the impact of human rights on construction sites and implementing design approaches that put humans at the center. Moving forward, we continue these endeavors to advance our human rights management system and enhance the level of our activities to assess and prevent human rights risks.



Key tasks for the supply network construction division

- Improve the process of Human Rights Impact Assessment
Promote human rights management at each construction site; establish human rights impact evaluation standards for construction documents; strengthen inspection of labor contract propriety
- Construction site safety assurance and human rights improvement
Professional safety training; human rights improvement by area (machine/civil engineering and construction); prevention of industrial disasters; safety assurance for workers and local residents
- Draft of human rights improvement design for supply stations
Improve spatiality, usability, and indoor air quality of supply stations



Key tasks for production-related construction division

- Strengthen safety management at construction sites
Implement real-name scaffolding system; install toe-board when working on scaffolding; reinforce fixing devices in preparation for strong winds and typhoons
- Construction of safe production bases
Expand use of incombustible material; introduce new nondestructive testing method; install temperature sensor for safety valve movement detection, etc.
- Adopt designs that respect human rights in buildings
Improve working environment at substations and waterproofing methods, etc.

Fostering a culture for upholding human rights

Strengthening stakeholders' human rights management capability

In efforts to proliferate the consciousness of human rights, we provide human rights education customized for those inside and outside the Company with a detailed curriculum by sector. Our education programs involve all top-level managers and employees to advance the understanding of human rights management and spread consensus on the respect of human rights. In particular, different focuses were placed in education for each group: strengthening human rights leadership for top-level managers; and enhancing human rights expertise for those responsible for human rights impact evaluation. In 2020, we published a monthly online magazine titled "Monthly Human Rights" on our website to check and share in-house human rights-related issues every month. And among all the slogans on human rights management we collected from all employees, "You are respected. A Better World With KOGAS" was selected as our new slogan.

Records of human rights training sessions for inside and outside stakeholders

(Unit : persons)

Attendees	Contents of training	Number of attendees	
		2019	2020
Top-level managers	Strengthening human rights leadership with contents such as the current status of promotion of human rights management both in and out of the country	232	281
Departments in charge	Enhancing the human rights expertise of those responsible for human rights impact evaluation	22	26
All employees	Advancing the understanding of human rights management and spreading consensus on the respect of human rights	3,880	3,985

Note: Human rights training for external entities is not included as such education sessions did not take place due to COVID-19.

Human rights training by sector

Right to industrial safety	Right to equality	Right to win-win development	Right to information	Employees' human rights
Safety education for our employees and subcontractors provided at job sites (2,058 attendees)	Education to improve the understanding of the disabled and to prevent child abuse (4,016 attendees)	Education on technologies required by SMEs and onsite job skills (376 attendees)	Education on information security and privacy protection (3,889 attendees)	Education on the prevention of four major violence, including sexual harassment (4,037 attendees)

Remedies and compensation measures in cases of human rights infringement

Operating a body dedicated to the prevention of human rights infringement

We receive reports from internal and external stakeholders in human rights infringement through relevant channels, including a center for sexual harassment-related grievances and other complaints, the Human Rights Consulting Center, and the Petitions Deliberation Committee. Institutional measures, such as deliberation on petitions, are also in place to find remedies for victims and prevent the recurrence of similar incidents. The Petitions Deliberation Committee, in particular, serves as a dedicated body for pre-deliberation on human rights infringement with outside members in the majority, including the Chair, ensuring independence and expertise.


Process of finding remedies for human rights infringement

 **Receiving requests for counseling and reports of incidents**
(Human Rights Consulting Center)

- Receiving requests for counseling and reports of incidents
- Contents: Unfair treatment, violence, or any other forms of human rights-related issues

 **Classifying/Investigating cases**
(Officers responsible for human rights management)

- (1st phase) Classifying cases by division of works / Investigating cases by the relevant department
- (2nd phase) In case that the petitioner refuses to accept the way the case is handled or selects the remedial system, the Human Rights Consulting Center moves to engage in the investigation.

 **Deliberating/Determining a case**
(Petitions Deliberation Committee)

- Contents: Deliberating/Determining a case submitted to provide a remedy for the victim and to prevent the recurrence of a similar case
- Procedures: Deliberating/Determining on a report of investigation findings → Producing recommendations to follow

Performance in the promotion of KOGAS's human rights management in 2020

Key tasks	Key performance	Performance analyses
Making norms and systems more human-rights friendly	Development of KOGAS Human Rights Management Activity Indicator (April 2020)	Established the evaluation system for human rights management activities
	Strengthening human rights policies to foster a culture of upholding human rights in the workplace	Advanced the execution system for human rights management
Building consensus among internal and external stakeholders on respecting human rights	Establishment of KOGAS's human rights impact assessment execution manual (April 2020)	Enhanced the expertise and efficiency of the human rights impact evaluation
	Implementation of in-depth human rights impact evaluation with document-based evaluations and on-site due diligence in parallel (November 2020)	Improved the level of human rights in the Company
	Performing human rights impact evaluation for the major sectors (construction) (November 2020)	Laid out design standards for all stakeholders at construction sites with consideration of human rights
Building consensus among internal and external stakeholders on respecting human rights	Working on areas for improvement according to the results of the 2019 evaluations (within this year)	Strived to carry out human rights tasks that include the spread of human rights management in the supply chain
	Providing human rights education customized for each group (throughout the year)	Improved human rights sensitivity through customized human rights education
	Supporting human rights education for external stakeholders (throughout the year)	Strived for the protection of the human rights of the Company's stakeholders
Disclosing and sharing achievements & building a feedback system	Adopting programs to foster a human rights friendly culture (throughout the year)	Internalizing human rights management through efforts, such as sharing human rights issues and status and launching campaigns
	Sharing achievements in the promotion of human rights management through the Sustainable Management Report (throughout year)	Releasing the Sustainable Management Report on the Company's website
	Expanding human rights policies for external stakeholders (throughout the year)	Bolstering the management of subcontracting to ensure fairness
	Adopting programs to foster a human rights friendly culture (throughout the year)	Achieving 90 points in the Human Rights Management Activity Indicator in 2020

Risk management

Establishing a risk management system

Promoting major risk management strategies

Risk management activities

- (Risk management): Activities to effectively prevent, monitor, and responding to conditions that may cause losses or negative impacts
- (Crisis management): Activities to effectively prevent and restore conditions affected by threats or harm

We have endeavored to maintain the soundness and reliability of our business by managing risks that may occur across the management of the Company through different measures in each phase such as identification, analyses, assessment, and review. By our definition, risk refers to a comprehensive concept of both threats and crises and a cause of uncertainty and loss of opportunity that can thwart business strategies and goals. We are managing 32 indicators for risk management and seven indicators for crisis management 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.

- * **Risk management with 32 indicators (for sectors highly vulnerable to risks):** Five financial sectors (debt ratio, exchange rate, etc.) & 27 non-financial sectors (15 operational risks, seven demand-supply risks, and five overseas operational risks, five domestic business risks)
- * **Crisis management (in case of real risk situations):** Seven areas such as disasters, labor-management relations, supply and demand, collective complaints, and cybersecurity in and out of the country



Risk Occurrence Situation

At KOGAS, the Risk Management Committee is responsible for the general management of risks and deliberation and determination on agenda items. The Vice President of Business Management, who also serves as the Chief Risk Officer (CRO), is in charge of company-wide risk management. The Risk Management Committee (also the Internal Control Department) establishes the risk management system and monitors the relevant on-site 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 responsible for risks. In Phase 2, the Internal Control Department establishes the risk management system and monitors the relevant on-site business. In Phase 3, the Auditor’s Office supervises the procedural adequacy of risk management activities through periodic internal audits risks and deliberation and determination on agenda items.

Risk monitoring and reporting system

Our system enables the Internal Control Department to manage risks through occasional reports on emergencies and periodic (quarterly) reports on risks, including plans to cope with them and information on changes in the situation made to it per the risk management process. We can cope with risks effectively and timely with reports like these made to the Internal Control Department upon the occurrence of a sign of risk, such as changes 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.

Efforts to bolster risk management

In 2020, KOGAS improved risk management indicators to evaluate a combination of risk factors comprehensively when prioritizing overseas businesses. Along with strategic values and profitability, we also reflected a wide range of risk factors that can arise from overseas businesses. To foster a culture of risk management in business sites overseas, we continued to link our analyses of on-site risk management results with our achievement evaluation to strengthen our risk management of overseas businesses. The expansion of the business into a new market was also considered a major risk requiring management, including responses to the COVID-19 crisis, a stronger overseas business portfolio, and GTP business models.

Risk checklist by sector

[Countries where we operate]	[Law/Regulations]	[Markets]	[Subcontractors]	[Finance]	[Contract]	[Technology]
Confiscation/ Nationalization, natural disasters, political/social unrest, inconsistent policies/regulations, country defaults, labor shortage, insufficient infrastructure, civil complaints, border disputes	Regulations on currency exchange/remittance, regulations on the export/use of goods/businesses, inadequate laws/systems, local labor dispute, environmental regulations	Lack of gas to be used as raw material, lack of markets, drop in prices of goods, markets with sluggish demand	Default of operators in participation on contractual obligations, lack of business management by operators, inefficient communication issues, customers' failure to pay	Exchange/Currency risks, PF and management capability, accounting/tax/insurance-related issues	Unfavorable business contracts signed with the local government (businesses), EPC/SPA contracts	CAPEX exceeding the plan, underperforming facilities, delay in work progress, inadequate technical analyses

Regular risk management education for non-executive directors

Upon appointing a non-executive director, a general report on KOGAS's risk policies, etc. is provided and training sessions are provided to increase the understanding of risk management. After appointment, education is provided to improve the understanding of non-executive directors by reporting details of major issues and sharing information every time when major issues arise. In particular, in case of overseas business with high risk, Overseas Business Committee is established within the BOD to provide risk-related education through regular quarterly meetings. In addition, through risk reporting and advice, non-executive directors are trained to clearly recognize and judge the company's risks.

Independent of risk management function

KOGAS establishes institutions so that important decisions can be made independently through an independent risk management committee and the CRO, who is the vice president of business management, separated from the business division. KOGAS's risk management organization has a 3-Lines of Defense structure. A department in charge of the first stage that performs daily risk management tasks and takes primary responsibility for risks, manages the risk management system and supports on-site risk management tasks. There is a coordination department as the second line to support risk management task for the business and manage risk management system. There is Audit Office on the third line to conduct audit on the procedural suitability of risk management activities. In addition, the risk management system establishment and management function and daily risk management tasks are separated to be performed by different departments, and the risk management general manager, decision-making body, and related regulations are separately prepared to ensure independence within the business area.

Emerging risk

Alongside managing present risks, KOGAS also defines emerging risks that may appear in the next 3 to 5 years, analyzes risk factors that may arise from them, and decides on how to respond to them.

Category	Emerging Risk 1	Emerging Risk 2
Risk	Expansion of the hydrogen industry market	Digital technology and information security
Description of Risk	KOGAS is entering the hydrogen industry as a result of climate change and the shift of the industry and society to green energy; yet, risk concerning financial solvency is expected due to business profitability and large-scale investments.	Digitalization can be applied to various areas such as gas distribution/management and rate system management. If we are not equipped with digital competency, it is possible that we encounter disadvantages in terms of productivity and production costs. Yet at the same time, digitalization entails a growing chance of core information leakage.
Major Impacts	Hydrogen business is emerging as a new business option as a result of growing demand and requirement for new and renewable energy and green energy caused by climate change. KOGAS is aware of this change and is reviewing the entry into the hydrogen industry while scaling up our production facilities and investing in hydrogen distribution center and hydrogen station constructions. However, if market activation is delayed, it is possible that we see risks from the financial solvency side, such as return on investment.	IT-based management of KOGAS' core businesses, including improvements in gas distribution efficiency and gas leakage, is linked to energy efficiency improvement, cost reduction, and safe business operations. If we fail to transition to digitalized business management, it is possible that the efficiency of businesses that use various data will decline constantly. However, systems that are managed digitally are potential targets of cyber attacks. Should there be a cyber attack on KOGAS, there may be social chaos, given the company manages Korea's gas resource.
Mitigation Measures	We are securing technical skills through internal research on hydrogen technology and cooperation with relevant organizations and trying to secure price competitiveness by building hydrogen infrastructures in advance.	We are building a digital organizational culture that uses network platforms, IoT, and big data, while working on improving the efficiency of the overall business through digital operations.

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 manage them systematically. We strive to communicate actively with them 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 identify key interests by region or group and deal with their demands more effectively. 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.



The 1st Hydrogen Economy Committee



KOGAS Mutual Growth Forum

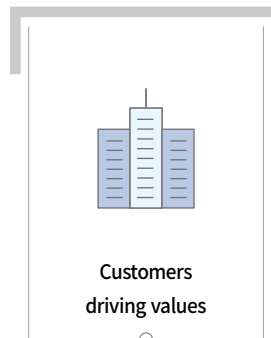


The 2nd Big data & AI Start-up KOGAS Contest

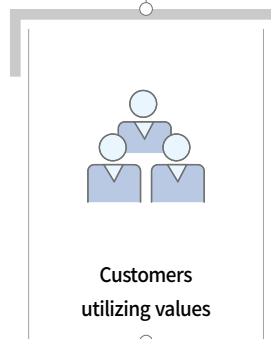


KOGAS Junior Board

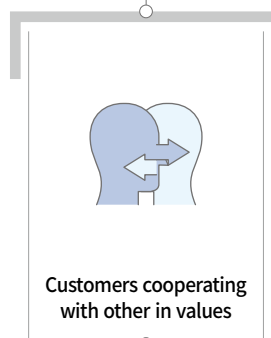
Major results of our communication



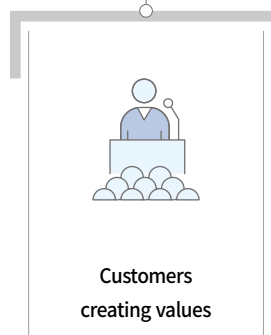
Stakeholder group	Core needs	Communication directions	Communication channels	Major results
Government	<ul style="list-style-type: none"> Transition into environment-friendly energy invigoration of the economy 	<ul style="list-style-type: none"> Leading new energy-related businesses expansion of cooperation and investment 	<ul style="list-style-type: none"> Hydrogen Economy Committee, exchange meetings on promotion of hydrogen economy, Gyeonggi International Forum, Energy Valley Forum (3) 	<ul style="list-style-type: none"> Legislation of the hydrogen-related act to promote the hydrogen economy Creation of green hydrogen business model of private-public-community partnership
Regional governments			<ul style="list-style-type: none"> Regional City Gas Telecommunication Council 	<ul style="list-style-type: none"> Distribution of 10,000 smart gas meters



Stakeholder group	Core needs	Communication directions	Communication channels	Major results
Individuals	<ul style="list-style-type: none"> Publicness, efficiency, improvement of services 	<ul style="list-style-type: none"> People's participation, real-time communication 	<ul style="list-style-type: none"> The Open Contest for Ideas (4) 	<ul style="list-style-type: none"> Making PR materials more accessible to people with disabilities, the online Gas Science Museum
Customers			<ul style="list-style-type: none"> CEO meeting with the Private Development Association, Working-level Council (3) Gas supply Deliberation Committee (4) 	<ul style="list-style-type: none"> Launch of the individual rate system & execution of its first contract Supply of gas to an additional 10,688 households in isolated areas such as Gapyeong, etc.



Stakeholder group	Core needs	Communication directions	Communication channels	Major results
Partner companies	<ul style="list-style-type: none"> Mutual growth, social values 	<ul style="list-style-type: none"> Win-win cooperation, regional development 	<ul style="list-style-type: none"> Mutual Growth Council & Forum (involving 38 executives and staff members of medium-sized companies) Increase of on-site visits to partner companies by the management (6) 	<ul style="list-style-type: none"> Opening of mutual growth mall (in July), launching joint marketing Introduction of the anonymous safety risk report application for partner companies
Local communities			<ul style="list-style-type: none"> CEO meeting with the Private Development Association, Working-level Council (3) Gas supply Deliberation Committee (4) 	<ul style="list-style-type: none"> Establishment of Energy Campus (collaborative project)



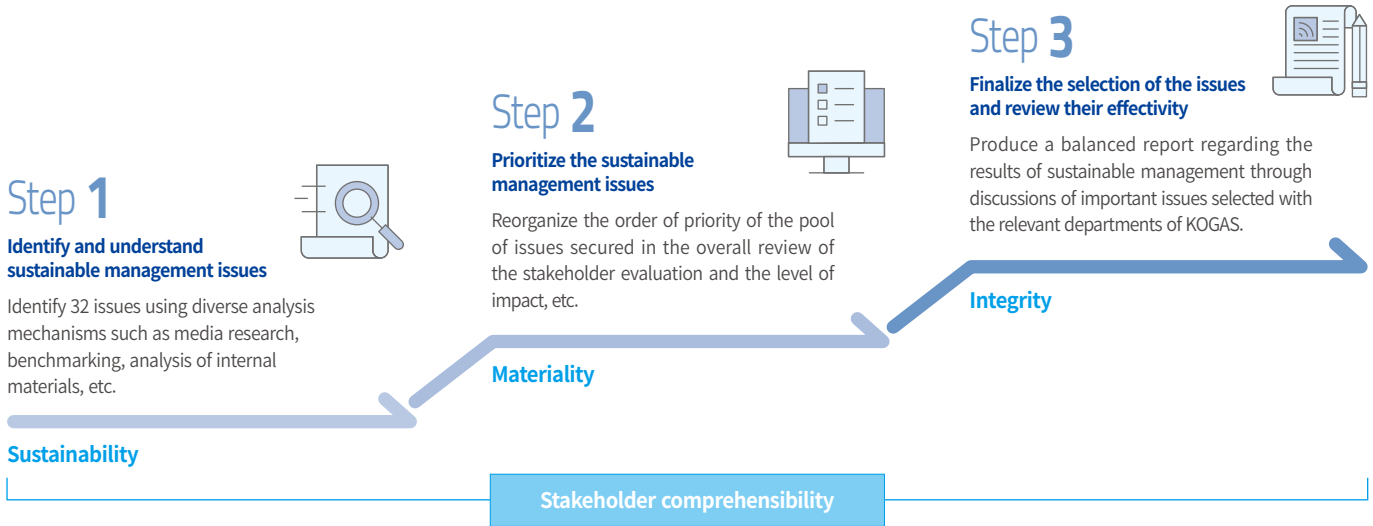
Stakeholder group	Core needs	Communication directions	Communication channels	Major results
Executives and employees	<ul style="list-style-type: none"> Management improvement, Work-life balance 	<ul style="list-style-type: none"> Sharing the vision and results Improvement of organizational culture 	<ul style="list-style-type: none"> Junior board, informal meetings for different levels of title, anonymous discussion session 	<ul style="list-style-type: none"> Improvement of level of satisfaction of the organization/employees (74.4 → 76.6 points)
Labor union*			<ul style="list-style-type: none"> Labor-Management Council (4), Explanatory session on pending management-related issues (10) On-site empathy communication meetings (3 times for each region) 	<ul style="list-style-type: none"> Increase in labor-management communication index (71.5 → 75.5 points) Establishment of hub center for labor respect, development of application for labor-management relations

* All KOGAS employees (with the exception of Level 2+ employees, employer, and persons who act in the interest of the employer) are mandated to join the labor union, and collective agreement applies equally to all employees.

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 deeper understanding of potential issues related to our business based on an international standards analysis, benchmarking 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 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.

<p>Media research</p> <p>Analysis of media articles on KOGAS's management and other relevant activities. (Jan. 2020 - Apr. 2021)</p>	<p>Benchmarking analysis</p> <p>Analysis of exemplary cases and relevant trends in reports made by those in the same industry and relevant institutions both in and outside the country.</p>	<p>Review of sustainable management-related international standards</p> <p>Identification of major issues of international standards related to the sustainable management.</p>	<p>Questionnaire-based surveys on stakeholders</p> <p>A survey of our stakeholders was conducted from 12-19 May 2021 to judge important issues. (1,120 internal/external stakeholders responded to the survey.)</p>	<p>Review of internal materials</p> <p>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.</p>
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Results of the survey

Diagnosis of our sustainable management

(1) Level of communication with stakeholders for sustainable management; extent to which stakeholders' expectations are reflected in corporate management

Classification	percent
Very positive	38.7
Positive	30.8
So-so	21.4
Negative	5.6
Very negative	3.5
Total	100

(2) Level of sustainable management execution

Classification	percent
Reactive	11.0
Perfunctory	14.5
Defensive	23.5
Positive	27.0
Proactive	24.0
Total	100

(3) Necessities for sustainable management

Classification	percent
To reduce the business's expenses and risks	11.0
To maximize the business's corporate value by optimizing its competitive advantage	17.7
To enhance opportunities for the creation of future value	41.9
To create shared values with diverse stakeholders	28.5
Other	0.8
Total	1.7

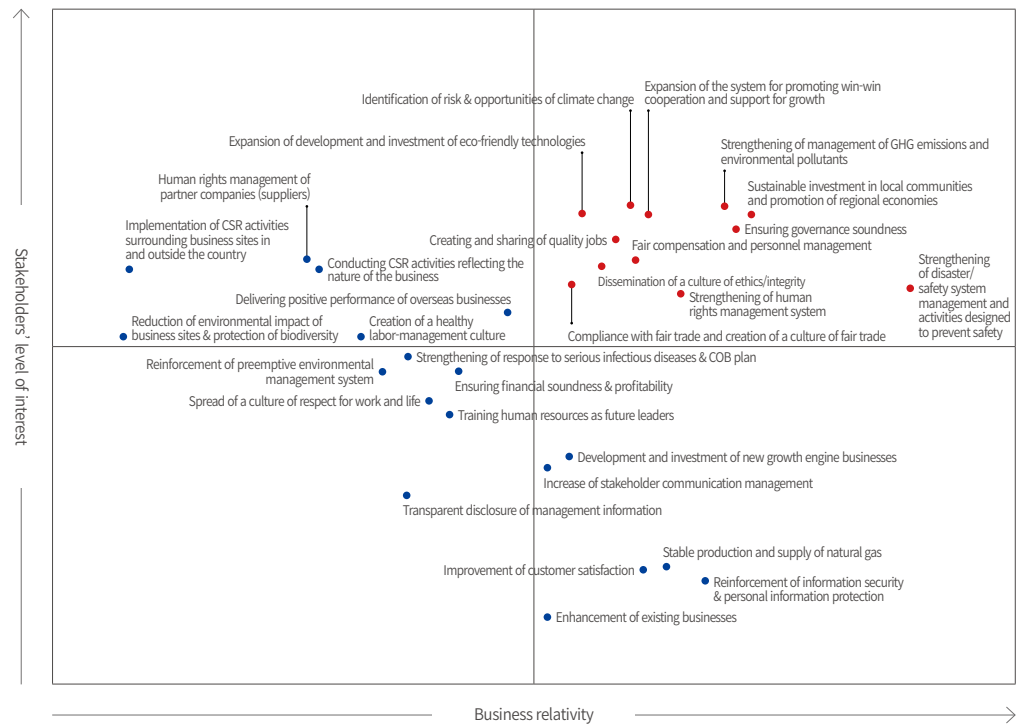
(4) Areas where major social values are created

Classification	percent
Public interest	16.6
Win-win cooperation	15.9
Safety	13.8
Environment preservation	9.3
Health & welfare	7.2
Contribution to local communities	6.0
Total	100

Step 2

Prioritizing 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. In 2019, top issues were strengthening safety accident prevention activities, expanding the win-win cooperation system, and stable natural gas production and supply. In 2020, the top-level issues have been changed climate change risks and opportunities, eco-friendly technology development and investment, and disaster and safety system management.



Step 3

Finalize the selection of the issues and review their effectivity

As for the 10 key issues, we examined the areas in which they impact our operations (e.g. finance, operation, strategies and reputation) and reflected our findings in the contents of this report.

Ranking	Concerned stakeholders	Major issues	GRI Topic	Area of impact*	Contents of report
6	Government institutions, shareholders/investors, local communities	Identification of risk & opportunities of climate change	GRI 201-2	Finance, operation	Future-leading: Energy of Hope for the Future
7	Government institutions, shareholders/investors	Expansion of development and investment of eco-friendly technologies	-	Finance, operation	
1	Directors/employees, government institutions, partner companies	Strengthening of disaster/safety system management and activities designed to prevent safety	GRI 403	Reputation	Safety First: Safe and Low-carbon Clean Energy
3	Government institutions, shareholders/investors, local communities	Strengthening of management of GHG emissions and environmental pollutants	GRI 305	Finance, reputation	
2	Local communities	Sustainable investment in local communities and promotion of regional economies	GRI 203	Risk	Communication and Cooperation: Win-win Energy for Mutual Growth
5	Partner companies	Expansion of the system for promoting win-win cooperation and support for growth	GRI 204	Operation, reputation	
8	Government institutions, local communities, people	Creating and sharing of quality jobs	GRI 203-2	Risk	Open-Minded: Happy Energy to Enjoy Together
9	Directors/employees	Fair compensation and personnel management	GRI 405-1	Operation	
10	Directors/employees, partner companies	Strengthening of human rights management system	GRI 412	Operation, reputation	Human rights management
11	Government institutions, directors/employees, partner companies	Dissemination of a culture of ethics/integrity	GRI 205	Reputation	Integrity/ethical management
4	Shareholders/investors	Ensuring governance soundness	GRI 102-18	Finance	Governance

* Finance: Impact that is directly or indirectly related to the company's financial gain/loss in the short term
 Operation: Impact on business operations, activities, and processes
 Reputation: Impact on trust and our reputation among stakeholders such as local communities and customer

Appendix

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Sustainability performances

Economic Performance

Key Economic Indicators (based on consolidated financial statements)

Classification	Unit	2018	2019	2020
Sales	KRW 100 million	261,850	249,826	208,337
Operating Profit	KRW 100 million	12,769	13,345	8,989
Net income (loss)	KRW 100 million	5,267	583	(1,607)

Key Financial Indicators (based on consolidated financial statements)

Classification	Unit	2018	2019	2020	
Growth indicators	sales growth rate	%	18.10	(4.59)	(16.61)
	net income growth	%	144.20	(88.94)	(375.64)
Profitability indicators	return on total assets	%	1.37	0.1	(0.45)
	return on total capital	%	6.36	0.7	(2.02)
Stability indicators	current ratio	%	100.54	103.7	104.4
	debt ratio	%	367	382.6	364.24
	BIS ratio	%	21.41	20.72	21.54

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

Classification	Unit	2018	2019	2020	
Assets	current assets	KRW 100 million	99,249	92,328	75,279
	non-current assets	KRW 100 million	297,648	300,791	283,819
	total assets	KRW 100 million	396,897	393,119	359,098
Liabilities	current liabilities	KRW 100 million	98,712	89,005	72,128
	non-current liabilities	KRW 100 million	213,205	222,648	209,618
	total liabilities	KRW 100 million	311,917	311,653	281,746
Capital	paid-in capital	KRW 100 million	17,651	17,651	17,651
	other	KRW 100 million	64,277	60,882	57,159
	controlling interest (sub-total)	KRW 100 million	81,928	78,533	74,810
	non-controlling interest	KRW 100 million	3,052	2,932	2,541
	total capital	KRW 100 million	84,980	81,465	77,351

R&D

Classification	Unit	2018	2019	2020
R&D investments	KRW 100 million	518	568	519
Technology patents (accumulated)	Case	373	411	430
Number of R&D positions	person	106	106	94

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

Calculation Criteria	Unit	2018	2019	2020
Sales	KRW 100 million	261,850	249,826	208,337
Operating profit	million	12,768	13,345	898,855
Net income (loss)	million	5,267	5,826	(160,683)
Employee wages and benefits	KRW 100 million	3,918	4,415	4,570
Dividends	KRW 100 million	-	1,192	333
Interest	KRW 100 million	7,854	8,046	7,124
Corporate tax	million	95,517	58,107	(108,215)
Community investment	KRW 100 million	186	182	174

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	2018	2019	2020
Total GHG emissions	tCO ₂ e	760,929	667,106	595,262 (Goal: 624,772)
Direct emissions	tCO ₂ e	372,267	287,642	206,510 (Goal: 287,119)
Indirect emissions	tCO ₂ e	388,662	379,464	388,752 (Goal: 337,653)

* Reason for change in past data: Past data was revised following the changes in KOGAS' emissions factor and vent/leak emissions calculation standards in line with the changes made to the greenhouse gas calculation guidelines in January 2020

Energy Consumption

Classification	Unit	2018	2019	2020
Total energy consumption	TJ	14,563	12,775	11,384
Direct energy	TJ	6,530	4,926	3,351
Indirect energy	TJ	8,033	7,849	8,033

Classification	Unit	2018	2019	2020
Total non-renewable energy consumption	MWh	2,659,187	2,192,650	1,777,673 (Goal: 2,117,658)
Non-renewable fuel consumption (purchased/consumed as energy sources)	MWh	1,813,859	1,368,395	930,820
Non-renewable electricity purchase	MWh	830,694	811,414	830,706
Steam/ heating / cooling and other purposes	MWh	14,634	12,841	16,147
Total renewable energy purchase or production	MWh	2,920	2,699	3,199
Total energy consumption costs	KRW 100 million	1,664	1,538	1,347

Water Consumption

Classification	Unit	2018	2019	2020
Total water consumption ¹⁾	m ³	1,496,757,205	1,392,986,376	1,568,931,030
Seawater	m ³	1,496,226,715	1,392,324,766	1,568,326,557
Freshwater	m ³	519,919	644,245	589,917
Other (Including surface water and groundwater)	m ³	10,571	17,365	14,556

Emissions of Environmental Pollutants

Classification	Unit	2018	2019	2020			
Natural gas sales	1K tons	36,219	33,597	32,367			
Air pollutants ²⁾	NOx	Volume	kg	311,538	192,398	148,880	
		Intensity	kg/1K ton	8.6	5.73	4.6	
	SOx	Volume	kg	1,535	1,239	743	
		Intensity	kg/1K ton	0.04	0.04	0.02	
	Dust	Volume	kg	4,606	3,729	2,229	
		Intensity	kg/1K ton	0.13	0.11	0.07	
Water pollutants ³⁾	Individual sewage treatment facility	BOD	Concentration	ppm	5.7	6.2	10.5
		SS	Concentration	ppm	4.7	5.9	9
		T-N	Concentration	ppm	12.6	13.1	14.9
		T-P	Concentration	ppm	1.7	2.4	2.1
		Colon bacillus bacterial count	Concentration	Number of bacteria	322	37.3	64.6
	Wastewater discharge facility ⁴⁾	COD	Concentration	ppm	2.9	3.6	-
		TOC	Concentration	ppm	-	-	92
		SS	Concentration	ppm	53.3	1.2	7.1
	Waste ⁵⁾	General		Ton	1,892	4,575	10,878
Designated			Ton	155	289	98	
Construction			Ton	61,314	129,366	77,132	
Total		Volume	Ton	63,361	134,230***	88,108	
		Intensity	Kg/1K tons	1.75	3.99	0.33	

1) Increase in the operation of equipment that use seawater such as seawater ORV in 2020

2) In 2020, air pollutant emissions decreased due to reduced facility uptime resulting from rise in temperature in the winter season. Reduced operation of equipment such as combustion SCV in 2020.

3) Measured water pollutant concentration disclosed beginning in 2020.

4) Change in the standard of permitted emissions of water pollutants in the Water Environment Conservation Act: COD ->TOC (January 1, 2020)

5) Waste disposal is 100% outsourced. We began calculating the amount of recycled waste in 2019. (70,811 tons of waste was recycled out of 134,230 tons, which was the total amount of waste in 2019.) Decreased in line with the number of facility repair and constructions in 2020.

Chemicals Consumption

Classification	Unit	2018	2019	2020
Chemical consumption*	kg	352,288	34,247,570	2,091,365

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

Regulatory Violations

Classification	Unit	2018	2019	2020
Violations of regulatory obligations	Case	0	0	0
Fine amounts	Fine amounts	0	0	0

Social Performance

BoD Operations

Classification	Unit	2018	2019	2020
Board meeting	number	18	16	15
Resolution	case	62	65	54
Deliberations	%	66	25	7
Amendments	case (%)	1 (2)	3 (4.62)	2 (3.7)
Reports	case	21	24	22
Attendance	%	78	87.6	89
Non-standing director's attendance	%	72	88.14	87
Substance of statements/motions delivered by non-executive directors	%	59	57.32	59

Employee Status

Classification	Unit	2018	2019	2020		
Total employee	person	4,096	4,225	4,225		
Employment types	Regular	males (incl. executive directors) person	3,570	3,724	3,712	
		females	person	472	501	513
	Irregular	males	person	27	0	0
		females	person	27	6	0
	Non-affiliated person	person	1,176	1,278	1,363	
Contract types	Full-time employees	person	4,031	4,222	4,213	
	Part-time employee	person	8,225	3,125	12.35	
Work location	Domestic	person	3,985	4,111	4,142	
	Overseas	person	111	114	83	
Age	Those in their 30s or younger	person	1,705	1,821	1,821	
	Those in their 40s	person	1,397	1,209	1,031	
	Those in their 50s	person	994	1,195	1,373	
Females	Executives	person	473	501	513	
	Managers	person	7	7	10	
	Ratio of executives	%	11.5	11.9	12.1	
	Ratio of managers (total employee)	%	0.17	0.17	0.24	
	Ratio of managers (total manager)			2.7	3.7	
Social equity jobs	Those with disability	person	128	126	151	
	High school graduates	person	540	552	515	
	Persons of distinguished service to the State	person	385	392	386	
	Local talents	person	1,883	2,069	2,108	

※ All employees of Korea Gas Corporation are of Korean nationality.

※ In 2020, Share of women in management positions in revenue-generating functions - 4.4%

※ In 2020, Share of women in STEM-related positions (as % of total STEM positions) - 6.0%

Employee Training Status

Classification		Unit	2018	2019	2020
Education and training costs		KRW 1 million	8,470	8,820	6,790
Training hours per person		hour	104	108.1	96.7
Training costs per person		KRW 1,000	2,078	2,087	1,614

Training Completion Status

Classification		Unit	2020
Job Level	Executive of Level 2+	Hours	85.7
	Level 3 (Deputy General Manager level)	Hours	105.2
	Level 4 employees or lower	Hours	98.7
	Researcher	Hours	84.3
Gender	Male	Hours	95.5
	Female	Hours	103.3

* New item of report as of 2020. Past data omitted.

Parental Leave Status

Classification		Unit	2018	2019	2020
Applicants for parental leave		person	71	75	91
Male applicants for parental leave		person	16	23	28
Return-to-work rate after parental leave		%	100	100	98.9
Retention rate after parental leave		%	100	100	100

Employee Performance Evaluation

Classification		Unit	2018	2019	2020
Management by objectives		%	96.8	96.8	95.2
Multidimensional performance appraisal		%	31.8	31.6	15.93
Comparative ranking of employees within one employee category		%	31.8	31.6	15.93

Employee Satisfaction

Classification		Unit	2018	2019	2020
Satisfaction with internal education programs		point	85.9	87.7	86.5
Satisfaction with HR system operations		point	72.1	74.0	76.0

Employee Retirement and Internal Hires

Classification		Unit	2018	2019	2020
Retirement Pension	Amount of asset under management	KRW 100 million	3,065	2,985	3,100
	Number of participants in retirement pension	person	3,561	3,771	3,655
Retirement Rate	Total employee retirement rate	%	2.19	2.35	3.05
	Voluntary employee retirement rate	%	0.66	0.67	0.75
Open position filled by internal candidates		%	76.17	80.35	93.31

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	2018	2019	2020
Number of labor union member		person	3,242	3,650	3,856
Labor union membership rate		%	84.70	88.60	90.20

Employee and CEO Compensation

Classification		Unit	2020
CEO compensation		KRW 1,000	199,370
Employee compensation	median value	KRW 1,000	80,465
	average value	KRW 1,000	88,327
CEO -to-worker compensation ratio	median value	%	2.48
	average value	%	2.26

* 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 90.2% of the company's total employees (4,274 persons as of the end of 2020). 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		2020	
		Figure	Remarks	Figure	Remarks	Figure	Remarks
Injury incidence rate*	%	0.02	1 case (commuting accident)	0.02	1 case	0.02	
Absenteeism rate**	%	0		0		0	
Occupational fatalities	employees	person	0	0		0	
	contractors	person	0	0		1	
Lost time	employees	%	0.12	0.11		0.11	
	contractors	%	0.43	0.78		0.79	

* incident rate per 100 people

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

Security Violations

Classification	Unit	2018	2019	2020
Customer security violations	case	0	0	0
IT infrastructure security incidents	case	0	0	0

Customer Privacy Complaints

Classification	Unit	2018	2019	2020
Complaints received from outside parties	case	-	-	0
Complaints from regulatory bodies	case	-	-	0

Purchase of Suppliers' Products

Classification	Unit	2018	2019	2020
Product purchases from SMEs	KRW 100 million	3,229	3,522	2,692
Ratio of SME product purchases	%	34.5	32.0	35.5

Support for Suppliers' Competitiveness Enhancement

Classification	Unit	2018	2019	2020
Joint R&D projects	cases	17	20	25
	participating companies	No.	16	20
	R&D budget	KRW 100 million	12	15
Training of SME suppliers' employees	technical/research personnel training	person	83	52
	job training	person	35	11
	online education	person	151	155
	Total	person	269	218

Customer Satisfaction

Classification	Unit	2018	2019	2020
Public-service customer satisfaction index (PCSI)	point	93.5	93.8	89.5

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.

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 to prevent corruption and business risks.

Classification	Unit	2018	2019	2020
Violations of the anti-corruption rule	case	2	0	0
	person	2	0	0

Anti-corruption Education

Classification	Unit	2018	2019	2020
Completion of ethics education	person	3,324	3,514	3,927
Completion of online Code of Conduct education	person	7,242	7,662	8,003

Education on Human Rights Policies and Procedures

Classification	Unit	2018	2019	2020
Employee education on human rights (executives and staff members)	person	2,104	3,880	3,985
Hours of employee education on the company's human rights policies and procedures	hour	1	1	1
Proportion of employees educated on the company's human rights policies and procedures	%	95	99	97

Social Contribution Activities

Classification	Unit	2018	2019	2020
Cash contribution	KRW 1 million			17,401
employee volunteering during paid working hours	hour			1,175
Management overheads	KRW 1 million			623

* Type of Philanthropic Activities : Charitable Donations : 10%, Community Investments : 61%, Commercial Initiatives : 29%

Job Creation through Social Contribution Programs (2020)

Classification	Project Cost (KRW 1 million)	Job creation (persons)	Notes
Energy welfare (Onnuri Heat Efficiency Improvement Program)	2,706	25	Includes indirect job creations
Construction Academy (Homeless empowerment program)	107	18	Direct job creations
Relief Factory	10	3	Direct job creations
Toy Library, Multicultural Family Support Program, Senior Academy)	366	4	Direct job creations
Subtotal	3,189	50	

Contributions

Classification	Unit	2018	2019	2020
Total donations (industry associations and tax-exempt organizations)	KRW 1 million	4,889	3,879	3,060

* No contributions to lobbying, interest representation or political activities

Top five source of contributions

Classification	Unit	2018	2019	2020
Korea Energy Economics Institute	KRW 1 million	1,000	1,000	1,000
Korea Energy Agency	KRW 1 million	800	600	600
Foundation for Cooperation of Large Enterprises and SMEs in Agriculture and Fishery	KRW 1 million	476	310	919
Kyungpook National University	KRW 1 million	-	-	130
Keimyung University	KRW 1 million	-	100	100

* 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 /6.8.5/7.8	8	
	102-2	Activities, brands, products, and services		8	
	102-3	Location of headquarters		8	
	102-4	Location of operations		8-9, 28-29	
	102-5	Ownership and legal form		8, 58-59	
	102-6	Markets served		8-9, 28-29	
	102-7	Scale of the organization		8	
	102-8	Information on employees and other workers		8, 75	
	102-9	Supply chain		41, 77	
	102-10	Significant changes to the organization and its supply chain		-	None
	102-11	Precautionary Principle or approach		32, 39, 67-68	
	102-12	External initiatives		82-85	
	102-13	Membership of associations		86	
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, 60-61	
	102-17	Mechanisms for advice and concerns about ethics		60-61	
Governance	102-18	Governance structure	6.2/7.4.3/7.7.5	58-59	
Stakeholder Engagement	102-40	List of stakeholder groups	5.3	67-68	
	102-41	Collective bargaining agreements		76	
	102-42	Identifying and selecting stakeholders		67-68	
	102-43	Approach to stakeholder engagement		67-68	
	102-44	Key topics and concerns raised		69-70	Refer to "Consolidated Subsidiaries" in the 2020 Business Report
Report Method	102-45	Entities included in the consolidated financial statement	5.2 / 7.3.2-7.3.4	-	
	102-46	Defining report content and topic Boundaries		69-70	
	102-47	List of material topics		69-70	
	102-48	Restatements of information	7.5.3/ 7.6.2	-	See footnotes for detailed data changes
	102-49	Changes in reporting		70	
	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	
	102-55	GRI Content Index		79-81	
102-56	External assurance		86-87		

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	20, 30, 40, 50	
	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	73	
	201-2	Risks and opportunities posed by climate change that have the potential to generate substantive changes in operations, revenue, or expenditure,		21~23, 27, 31~32	
Indirect Economic Impacts	201-3	Defined benefit plan obligations and other retirement plans		75	
	203-1	Infrastructure investments and services supported	6.3.9/6.8.1/6.8.2/ 6.8.7/6.8.9	21~27, 16~17	
Procurement Practices	203-2	Significant indirect economic impacts		48~49	
Anti-corruption	204-1	Proportion of spending on local suppliers	6.4.3/ 6.6.6/ 6.8.1/ 6.8.2/ 6.8.7	77	
Anti-competitive Behavior	205-1	Operations assessed for risks related to corruption	6.6.1~6.6.3	60~62	
	205-2	Communication and training about anti-corruption policies and procedures		60~61, 78	
	205-3	Confirmed incidents of corruption and actions taken		61, 78	
Economic Performance	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	62	

GRI – 300: Environmental

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Energy	302-1	Energy consumption within the organization	6.5.4/6.5.5	74	
	302-4	Reduction of energy consumption		31~32, 74	
Water	303-3	Water recycled and reused	6.5.4	74	
Biodiversity	304-2	Significant impacts of activities, products, and services on biodiversity	6.5.6	34~35	
	304-3	Habitats protected or restored		34~35	
Emissions	305-1	Direct (Scope 1) GHG emissions	6.5.5	31, 74	
	305-2	Energy indirect (Scope 2) GHG emissions		31, 74	
	305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	6.5.3	33, 74	
Waste	306-2	Waste by type and disposal method		33, 74	
	306-3	Significant spills		33	
Environmental Compliance	307-1	Non-compliance with environmental laws and regulations		75	

GRI – 400: Social

Topic	Disclosure	Indicators	ISO 26000	Page	Remarks
Occupational Health and Safety	403-1	Workers representation in formal joint management-worker health and safety committees	6.4.6	37~38, 77	
Training and Education	404-1	Average hours of training per year per employee	6.4.7/6.8.5	76	
	404-3	Percentage of employees receiving regular performance and career development reviews		76	
Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	6.2.3/6.3.7/6.3.10/ 6.4.3	52, 58~59, 75	
Non-discrimination	406-1	Incidents of discrimination and corrective actions taken	6.3.6/6.3.7/6.3.10/ 6.4.3	52	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	67	
Local Communities	413-1	Operations with local community engagement, impact assessment, and development programs	6.3.9/6.5.1~6.5.3/	16~17, 45~48	
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	79	
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	57	

Task Force on Climate-related Financial Disclosures (TCFD)

KOGAS recognizes the magnitude of the climate crisis and has been trying to contribute to realizing carbon neutrality by reducing carbon and greenhouse gas (GHG) emissions and transitioning to low-carbon energy sources. TCFD (Task Force on Climate-related Financial Disclosures) was created in 2015 under the leadership of the Financial Stability Board (FSB), which is the consultative group of the G20 finance ministers and central bank governors, to develop climate-related financial risk disclosures. This international information disclosure framework recommends climate-related financial disclosures in four areas: governance, strategy, risk management, and metrics and targets. KOGAS seeks to transparently disclose its efforts in mitigating climate change, in accordance with the TCFD guidelines.

TCFD Recommendations		KOGAS Information Disclosure Status	Page
Governance : The role of the board of directors and management concerning climate-related risks and opportunities			
Governance	Describe the organization's governance around climate-related risks and opportunities.	KOGAS operates the "Climate Change Energy Committee" for climate-related decision-making (including financial risk management such as carbon credit purchase, etc.). The committee's members include the vice president and key department executives. This decision-making body plays a central role in establishing climate change strategies, including climate response policies, GHG emissions target, and climate-related financial decision-making.	31
	Describe management's role in assessing and managing climate-related risks and opportunities.		31
Strategy: The impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning			
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	In the short term, there exists the risk of having to purchase additional carbon credits, aside from those allocated by the government, for KOGAS to comply with the cap-and-trade system mandate, following the government's cut in credit allocations. As we invest heavily in the energy sector in response to climate change, we identify the entry into new future businesses as a key opportunity. In the medium and long term, we can secure the engine for new growth by shifting to environment-friendly energy through hydrogen industry infrastructure establishment, etc.	21~23, 27, 31~32
	Describe the impact of climate-related risks and opportunities on the organization's business, strategy, and financial planning.	Climate-related risks and opportunities have major impacts on KOGAS' financial planning, including strategy establishment, business area expansion, and new investments. Climate change risk impacts our overall business, such as business site operation and management, investment in equipment, and technology development related to the adjustment to climate change and climate change mitigation. We identify risks posed by 6 climate change influence factors, including heat waves, cold waves, and heavy rain, on our facilities and stable gas supply, review their status and assess the impacts, and conduct comprehensive analyses. On the climate-related opportunity side, we are expanding our business by building hydrogen vehicle charging stations, importing and producing hydrogen, and investing in businesses that use green energy such as LNG cold energy.	
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	We put together lists of risks pertaining to each of the 6 climate change influence factors that impact gas facilities, which are heat wave, cold wave, heavy rain, heavy snow, strong winds, and sea level rise. To reduce the impact of climate change, we conduct climate change impact assessments, strengthen our competency in preparation of climate change, and established a system for damage prevention against climate change. Moreover, KOGAS is contributing to climate change mitigation with our 2030 GHG reduction roadmap.	31~32

TCFD Recommendations		KOGAS Information Disclosure Status	Page
Risk Management: How the organization identifies, assesses, and manages climate-related risks			
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	We identify potential climate-related risks and opportunities, analyze and categorize the causes of climate-related risks, and assess climate-related risks with consideration to the possibility of incidents caused by climate change and their impacts.	31
	Describe the organization's processes for managing climate-related risks.	KOGAS named GHG, fine dust, and climate/environment change risks as the key future risks. Accordingly, we are identifying the impact of business on climate change risks and managing climate-related risks through mitigation activities such as leading the hydrogen economy.	31
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	At KOGAS, the team in charge of climate risk management carries out management tasks with support from the general risk team. The general risk management team establishes the risk management system and monitors the hands-on team's risk management work.	31
Metrics and Targets: The status of climate-related risks and opportunities metrics and reduction targets in place			
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	KOGAS manages various indicators such as the amount of GHG emissions, expenses related to low-carbon alternatives, and the amount of water used, including sea water used for LNG vaporization.	31~32
	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 greenhouse gas (GHG) emissions and the related risks.	SCOPE1: 206,510 tCO ₂ e SCOPE2: 388,752 tCO ₂ e SCOPE3: 101,084,478 tCO ₂ e*	31, 74
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	KOGAS established the "Hydrogen Business Strategy" and "KOGAS Vision 2030" in 2019 and 2021, respectively. Through them, we are actively taking part in all business processes of the hydrogen industry such as hydrogen production and supply and technology development. Through such efforts, we established goals to drive the revitalization of the hydrogen economy as a public organization and have been promoting them. KOGAS also established the "2030 Greenhouse Gas Reduction Roadmap" to respond to the climate crisis and reduce carbon emissions. The goal is to reduce GHG emissions by 24.8% by 2030 compared to the 2017 level. To meet this goal, we are working on 4 strategic tasks, including the implementation of high-efficiency equipment, operation method improvement, and expanding the use of renewable energy. In 2021, KOGAS will establish its own roadmap for "2045 KOGAS Carbon Neutrality" and accelerate the business structure change to an environment-friendly one focused on climate change response.	21~23, 31~32

* Use of Sold Products, Purchased Goods and Services (upstream), Investments

Global initiatives

UN SGDs

The Sustainable Development Goals (SDGs) of the United Nations are the world's share 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>NO POVERTY</p> <ul style="list-style-type: none"> - Deferral of city gas bill payments for socially vulnerable groups hit by COVID-19 - 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 		<p>ZERO HUNGER</p> <ul style="list-style-type: none"> - Energy kits including bottled water and ice boxes for compact room residents - Priority support for marginalized and socially vulnerable groups through the employee donation fund - Efforts to end hunger at home and abroad through continued support for Korea Food for the Hungry International (KFHI), Korean Red Cross, etc. 		<p>GOOD HEALTH AND WELL-BEING</p> <ul style="list-style-type: none"> - COVID-19 masks and emergency every day necessities support - Children: Support for welfare improvement in local child centers, support for children with severe disabilities and the Visiting R-BANK initiative, and support for children with critical medical conditions - Adolescents: Scholarships for high school and college students - Youth & Middle-aged: Heat efficiency improvement project, start-up conferences, support for social enterprises, Construction Academy, etc. - Seniors: Senior Academy, distribution of silver carts
	<p>QUALITY EDUCATION</p> <ul style="list-style-type: none"> - Free construction skills training for the homeless and compact rooms to support their employment - Childcare and education support for children of single-parents - Education support for unmarried, single mothers - Scholarships for low-income families, Toy Library 		<p>GENDER EQUALITY</p> <ul style="list-style-type: none"> - Support women-led companies in bidding and contract participation - Provide jobs to women with career discontinuity and unmarried single mothers who must both work and take care of their children (exclusively in charge of toy libraries) - Family-friendly company certification 		<p>CLEAN WATER AND SANITATION</p> <ul style="list-style-type: none"> - Promotion of environmental improvement activities to enhance water quality - Environmental preservation efforts such as stream cleaning activities - Support for residential sanitation improvement for socially vulnerable groups
	<p>AFFORDABLE AND CLEAN ENERGY</p> <ul style="list-style-type: none"> - Promotion of universal energy welfare through gas supply to remote mountain/island communities - Realization of the renewable energy expansion policy (building and operation of hydrogen stations) - Hydrogen vehicle support for social welfare facilities - Heat efficiency improvement projects for socially vulnerable groups, including the installation of air conditioners/heaters, LED light replacements; seasonal support for compact room residents 		<p>DECENT WORK AND ECONOMIC GROWTH</p> <ul style="list-style-type: none"> - [Socially vulnerable groups] Construction Academy, heat efficiency improvement project; hiring of a social welfare worker in charge of socially vulnerable people - [Social economy] Support for social enterprises and sales channel explorations - [Win-win coexistence with communities] K&R&D campus building, etc. - [SME cooperation] Technology development cooperation; business fund support 		<p>INDUSTRY, INNOVATION, AND INFRASTRUCTURE</p> <ul style="list-style-type: none"> - Support for installing city gas pipelines around the country (4,945km), 77 storage tanks, and other national infrastructure including the 5 production bases - Promotion of sustainable industrial development through social investment for the spread of decentralized power, such as fuel cell installation
	<p>REDUCED INEQUALITIES</p> <ul style="list-style-type: none"> - Scholarships for high-achieving students of socially vulnerable families; Energy kits and residential environment improvements for socially vulnerable groups with limited energy services in the summer season; heating cost support 		<p>SUSTAINABLE CITIES AND COMMUNITIES</p> <ul style="list-style-type: none"> - [Local development] Construction of Green Energy Campus for the revitalization of Daegu Innovation City - Sponsor Local Innovation Forums; Relief Factory; etc. - [Improvement of settlement conditions] Toy Library, heat efficiency improvement project, opening soccer fields, tennis courts, and foot volleyball courts for local residents, etc. 		<p>RESPONSIBLE CONSUMPTION AND PRODUCTION</p> <ul style="list-style-type: none"> - Support of sustainable consumption through new technology development such as smart gas meters - Improvement of efficiency and safety through smart production bases- Stable supply of natural gas and efficient facility operation through production and supply infrastructure expansions
	<p>CLIMATE ACTION</p> <ul style="list-style-type: none"> - Greenhouse gas reduction through hydrogen energy foundation establishment - Increased energy efficiency through eco-friendly facilities and process improvement - Efforts to create demand for natural gas, which is a clean fossil fuel, is considered a measure of preventing climate change and emergency action taken for that effort 		<p>LIFE BELOW WATER</p> <ul style="list-style-type: none"> - Temperature and emissions velocity control when discharging cold drainage water to seawaters and discharge to sea far from shore; introduction of seawater pipe coating and painting technique to prevent habitation of marine life in the pipes - Improvement of marine environment using LNG bunkering - Establishment of a marine pollution network; monitoring of environmental impact assessment recommendation executions 		<p>LIFE ON LAND</p> <ul style="list-style-type: none"> - Construction of clean supply control stations 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, which is a clean fossil fuel
	<p>PEACE, JUSTICE, AND STRONG INSTITUTIONS</p> <ul style="list-style-type: none"> - Revitalize the local economy, support liquidity of SMEs, and support livelihood of socially vulnerable groups with the KOGAS Win-Win Package for Overcoming COVID-19 - Hold social contribution project contests to provide opportunities for people to apply their ideas to business projects 		<p>PARTNERSHIPS FOR THE GOALS</p> <ul style="list-style-type: none"> - Efforts to strengthen partnerships with developing countries through KOGAS' overseas projects - Securing a driving force for sustainable management through the operation of the Social Value Committee for win-win cooperation - Strengthen partnerships through operations of 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	63~65
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	
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.	51~52, 63~65
Principle 5 Businesses must ensure the effective abolition of child labour.	
Principle 6 Businesses must eliminate discrimination in respect of employment and occupation.	
Environment	
Principle 7 Businesses should support a precautionary approach to environmental challenges	30~35
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	
Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery.	60~62

Assurance statement on the sustainability report for Korea Gas Corporation

Dear Stakeholders of Korea Gas Corporation

KFQ has been requested by Korea Gas Corporation to conduct an independent assurance on the 2021 Sustainability Report for Korea Gas Corporation (further 'the Report'). KFQ has responsibility to provide an opinion of independent assurance in accordance with scope of assurance, based on standard, methodology and limitations stated in this Assurance Statement.

KFQ was not involved in the process of preparing the Report and the information and presentation of data within the Report is the responsibility of Korea Gas Corporation.

Standard and Scope of Assurance

The assurance was planned and carried out in accordance with following criteria based on international standard, AA1000AS v3, AA1000APS(2018) and GRI standards :

- Compliance with AA1000AS
 - Application of Type 1 (Adherence to Principles of Inclusivity, Materiality, Responsiveness and Impact) with Moderate Level
- Compliance with GRI standards according to the criteria of "Core Option"
 - GRI Standard reporting principles
 - GRI Universal Standards
 - Topic Specific Standards
 - Management Approach for Topic-specific Standard: 103-1, 103-2, 103-3
 - Indirect Economic Impacts: 203-1, 203-2
 - Anti-Corruption: 205-1, 205-2, 205-3
 - Energy: 302-1, 302-4
 - Biodiversity: 304-2, 304-3
 - Waste: 306-2, 306-3
 - Occupational Health and Safety: 403-1
 - Diversity and Equal opportunity: 405-1
 - Human Rights Assessment: 412-2
 - Public Policy: 416-2
 - Economic Performance: 201-1, 201-2, 201-3
 - Procurement Practice: 204-1
 - Anti-Competitive Behavior: 206-1
 - Water and Effluents: 303-3
 - Emissions: 305-1, 305-2, 305-7
 - Environmental Compliance: 307-1
 - Training and Education: 404-1, 404-3
 - Non-Discrimination: 406-1
 - Local Communities: 413-1
 - Customer Privacy: 418-1

Methodology

In order to assess credibility of sustainability performance of the Report, we reviewed the process and system for preparation of the Report, as well as available data and information. Non-financial information was reviewed based on internal data of Korea Gas Corporation, such as latest sustainability report, disclosed Business Report and compared with information from media and internet. Financial information was investigated whether data in the Report are correctly reported from Financial Statements which is disclosed as public information through All Public Information In-One(<http://alio.go.kr>), a national disclosure system for management information of public institutions. The assurance was solely assessed on document review and on-site visit was not conducted during this assessment. Validity of report descriptions and processes for materiality assessment, identifying issues considering stakeholders, data collection and management, and the Report preparation are assessed. It was confirmed that the findings from above steps such as error, inappropriate information and ambiguous expressions are properly complemented by Korea Gas Corporation.

Competency and independence

The assurance team was organized in accordance with KFQ's internal regulations. KFQ has no conflict of interest which could threaten the independence and impartiality of verification, other than providing third-party audit services in the Korea Gas Corporation.

Limitations

The completeness and responsiveness of sustainability performance in the Report has inherent limitations due to its nature and the methodology used to determine, calculate and estimate its performance. In accordance with the terms of the contract, assessment is conducted based on provided data and information without verification for original data of specified performance information which is out of assurance scope.

Findings and Conclusions

As a result of the above assessment, we confirm that the content of this report fulfills the requirements of the 'Core option' of GRI Standards and secured reasonable basis to assurance level of Type 1 in accordance with AA1000AS v3. Within the scope of the assurance activities above, we could not find further significant error or inappropriate information from the final Report against the following principles:

• Inclusivity

Whether Korea Gas Corporation is actively identifying stakeholders and enabling their participation in establishing an organization's material sustainability topics, and the developing strategic countermeasures.

- Korea Gas corporation is collecting opinions from various stakeholders including the central and local government, nation, client company, cooperative companies, local communities, employees and labor union through communication channels such as Hydrogen Economy Committee, Working-level Consultative Body, Gas Supply Review Committee, Labor-management Council. Omission of major stakeholders was not found.

• Materiality

Whether each topic is considered in overall sustainability management activities by identifying and prioritizing the most relevant sustainability topics in consideration of impact on the organization and stakeholders.

- Korea Gas Corporation conducted a materiality assessment in terms of stakeholders' interest and business relevance. They identified important issues, derived priorities, and reported sustainable management activities and performance without omission of major issues.

• Responsiveness

Whether Korea Gas Corporation has established a communication process with stakeholders to respond to the needs, interests, and expectations of stakeholders that affect sustainability performance.

- Korea Gas Corporation has been reporting activities and performance that addresses needs and concerns of stakeholders which were identified from materiality assessment process and responds to their opinion by taking into consideration for its overall management.

• Impact

Whether Korea Gas Corporation has considered sufficient aspects of the impact of material topics based on its understanding of related stakeholders' concerns.

- KFQ confirms that Korea Gas Corporation is identifying and monitoring for impact of material topics of stakeholders such as services and research activities and reporting them to the extent possible.

Recommendation for improvement

KFQ recommends following developmental approaches in order to systematize sustainability management in the future and to disclose results of the report effectively.

- We hope its proactive efforts to be publicly disclosed that for considering ESG factors for investment decisions and performances when reviewing the risks of overseas business. The action will allow stakeholders to understand Korea Gas Corporation's efforts for social responsibility.
- As a public institution that drives the domestic energy industry, we recommend continuing to disclose the performance of low carbon eco-friendly energy projects, including the hydrogen sector. The action will allow stakeholders to fully understand Korea Gas Corporation's efforts about climate change.

July, 2021
Seoul, Korea
Ji Young Song, CEO

Prizes and Awards/Memberships

Prizes and Awards

Name of Award	Host	Year
Contribution in Greenhouse Gas Reduction	Minister of Education	2020
Realization of Social Value through Social Contribution Activities and Win-Win Cooperation	Minister of Trade, Industry and Energy	2020
Sustainable Development through Mutual Growth	Korea Commission for Corporate Partnership Chairman	2020
Hydrogen Economy Revitalization Contribution Award	Minister of Trade, Industry and Energy	2020
Contribution in Local Development (local talent hiring, etc.)	Minister of Land, Infrastructure and Transport	2020
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

Memberships

Name of Association	Joining Year
Korea Gas Union	1985
WEC Korean Member Committee	1985
GIGNL (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
Korea Emissions Market Association	2018
Korea Emissions Market Association	2021
Korea Society of Energy and Climate Change	2021
K-CCUS	2021

SUSTAINABILITY REPORT 2021

BETTER ENERGY
BETTER WORLD

Representative	Hee-Bong Chae
Publisher	Korea Gas Corporation
address	120 Cheomdan-ro, Dong-gu, Daegu, Korea (41062)
Tel	+82-53-670-0114
Website	www.kogas.or.kr



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