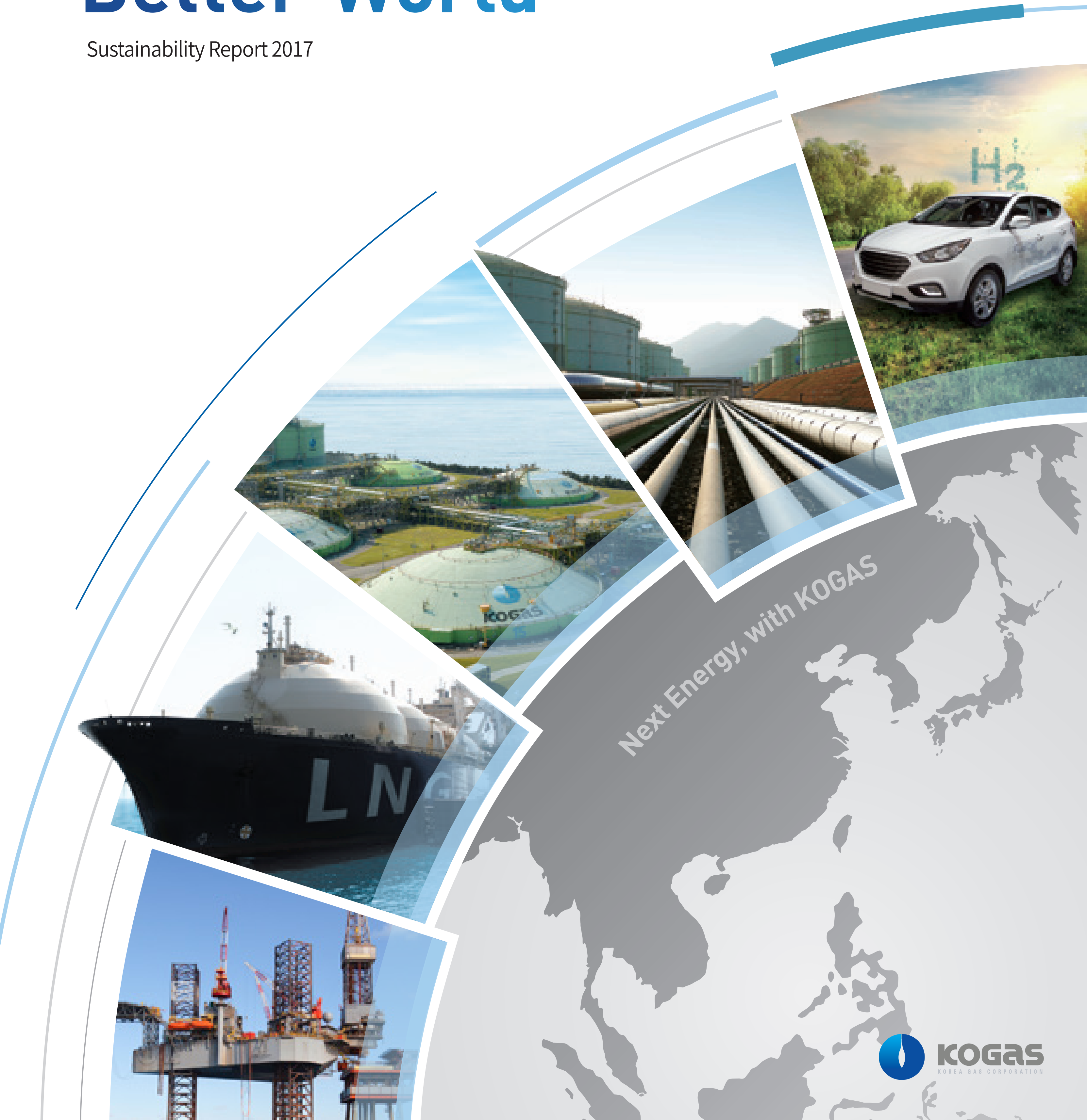
Better Energy
Better World

Sustainability Report 2017



Better Energy
Better World

KOGAS
Sustainability Report 2017

About this Report

KOGAS pursues to position itself as an energy corporation that grows along with stakeholders through corporate management activities to fulfil social responsibilities as a corporate citizen. Such management activities of sustainability management and the corresponding performance are transparently disclosed through yearly publication of the report. This report is KOGAS' 10th Sustainability Report.

Reporting Scope and Period

This report was written based on sustainability performance data from January to December 2016. Data of the first half of 2017 on some quantitative performance considered to be of significance for disclosure is included in the report. Some quantitative performance of the past three years since 2013 has been disclosed to identify the trends, and there was no critical change in the corporate scale, corporate governance, or the ownership structure during the reporting period. The scope of this report encompasses KOGAS' headquarters, regional business locations, and R&D centers. Performance and information for overseas business were also included, if necessary.

Changes from the Previous Year

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

Writing and Assurance Standards for the Report

This report was written in accordance with the Core option of the international standard of GRI (Global Reporting Initiative) G4. To secure credibility and quality, independent third-party assurance was conducted and the result is contained in the Appendix.

Additional Information of the Report

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

Website	http://www.kogas.or.kr
Address	120, Cheomdan-ro, Dong-gu, Daegu, Korea (41062)
Department	Future Strategy Team
E-mail	jinah@kogas.or.kr
Tel	+82-53-670-0208
Fax	+82-53-670-0249

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CEO Message

KOGAS will create a better energy world through sustainability management.

Dear distinguished stakeholders,

I would like to express my heart-felt gratitude to you for showing your generous interest and support for KOGAS at all times. As a result of our endeavors to promote energy welfare for the past 33 years, we have positioned ourselves as an eco-friendly energy corporation for the public by installing pipeline infrastructure network of 4,572㎞ and 69 storage tanks of 10.66 millionkℓ, achieving the natural gas distribution rate of 90.8% to local governments nationwide. We also conduct 24 gas and crude oil projects in 13 countries worldwide. Such efforts enable us to acquire overseas resources, contribute to stable supply and demand of energy and create added values with higher technological values. As such, we raise our prestige as a global energy corporation.

And yet, stagnant demand, higher volatility, and accelerated competitions at home and abroad as the domestic natural gas industry enters a maturity stage requires us to transform our fundamentals. We are committed, internally, to rising higher again as a trusted corporation by stakeholders by establishing a culture of ethics and integrity and reshuffling our corporate culture. To this end, respect for human rights is reflected in our corporate management to befit the global standard based on the Charter on Human Rights Respect we have formulated.

We diversify partnership models with suppliers by jointly advancing into overseas projects without being confined to the scope of the existing gas business in Korea. Our cooperation with the shipbuilding industry for a long period of time, in particular, has contributed to the development of the Korean shipbuilding industry driven by the spill-over effects of related industries, ranging from LNG carriers to FLNGs to LNG bunkering business. At the same time, we strive to reduce sustainability risks in the supply chain with diverse suppliers by formulating and operating the Code of Conduct for Suppliers.

Seeking to take the initiative in fulfilling corporate social responsibilities, we provide natural gas infrastructure in a broader scale in islands and mountain areas with little access to energy including Jeongseon-gun, Goseong-gun and Jeju Island. We also keep our eyes on projects that improve the quality of life for local residents in countries with the presence of KOGAS: providing a playground for children in Uzbekistan and sponsoring the construction of a technical training class for youths in Mozambique.

We will take the lead in achieving growth in the gas industry in the future and creating new values. Specifically, we will expand our roles in the new era of the eco-friendly hydrogen-powered transport fuel and establish a fuel cell-based distributed power network in order to address environmental problems such as micro dust under the new climate scheme of Post 2020. We will also launch new energy projects in a self-driven manner including LNG bunkering and LNG cold energy business to respond to stronger regulations in the maritime environment.

Distinguished stakeholders,

Driven by our cherished mission of ‘Creating a Better World through Better Energy’, we will do our utmost to make the next 100 years for a world with new, excellent and genuine future energy’ under the new vision of ‘Next Energy, with KOGAS’.

Thank you.

July, 2017

Seung-Hoon Lee, CEO and President of KOGAS

KOGAS Business

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

Import Volume for 2016
31,847
thousand tons

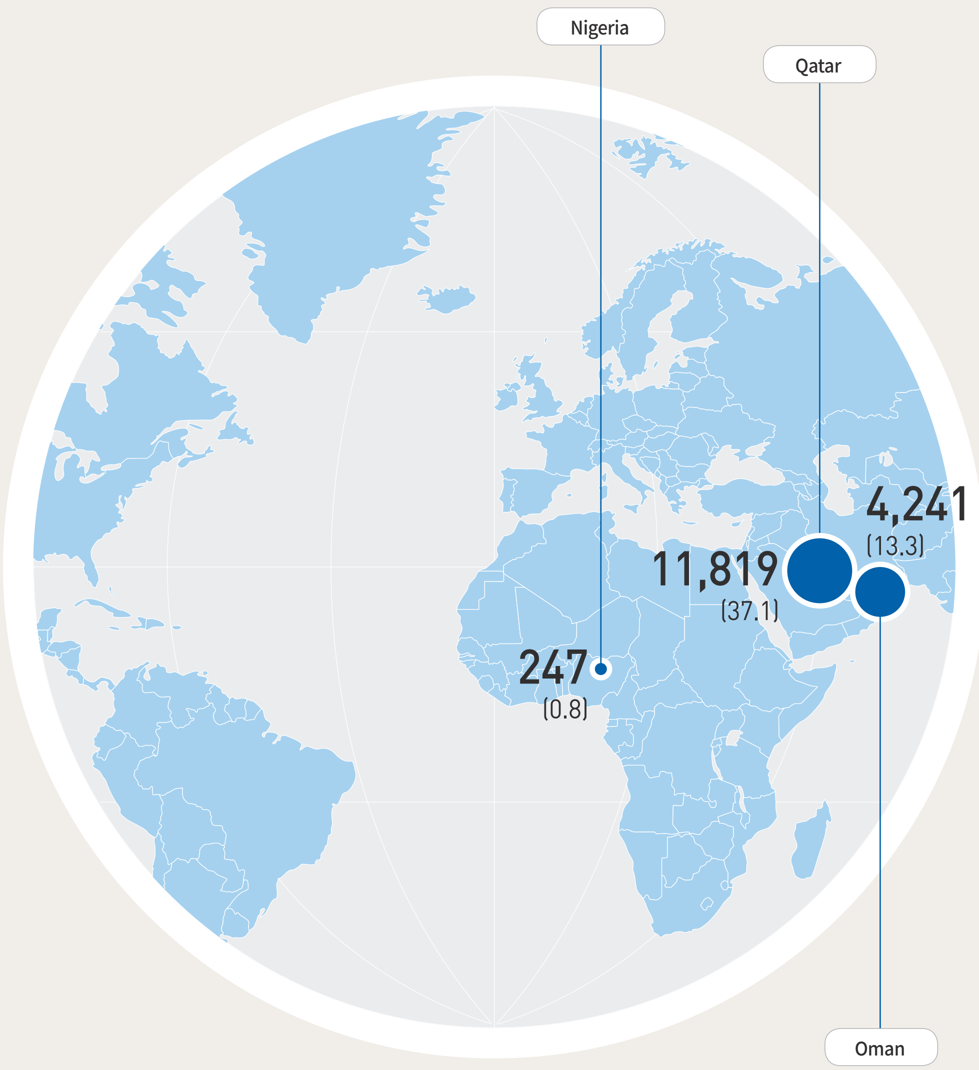
Supply and Demand Management for Natural Gases

LNG Import and Transportation

The amount of our LNG import has increased on a yearly basis up to 31,847,000 tons in 2016 since we imported LNG from Indonesia for the first time in Korea in October 1986. Given the nature of LNG being imported under a long-term contract of over 20 years, we conduct accurate demand prediction by using scientific models for statistical analysis. In order to secure stability in supply by acquiring the volume on time in line with increases in the domestic demand, KOGAS is seeking to diversify exporters in Brunei, Qatar, and Oman besides Indonesia and Malaysia.

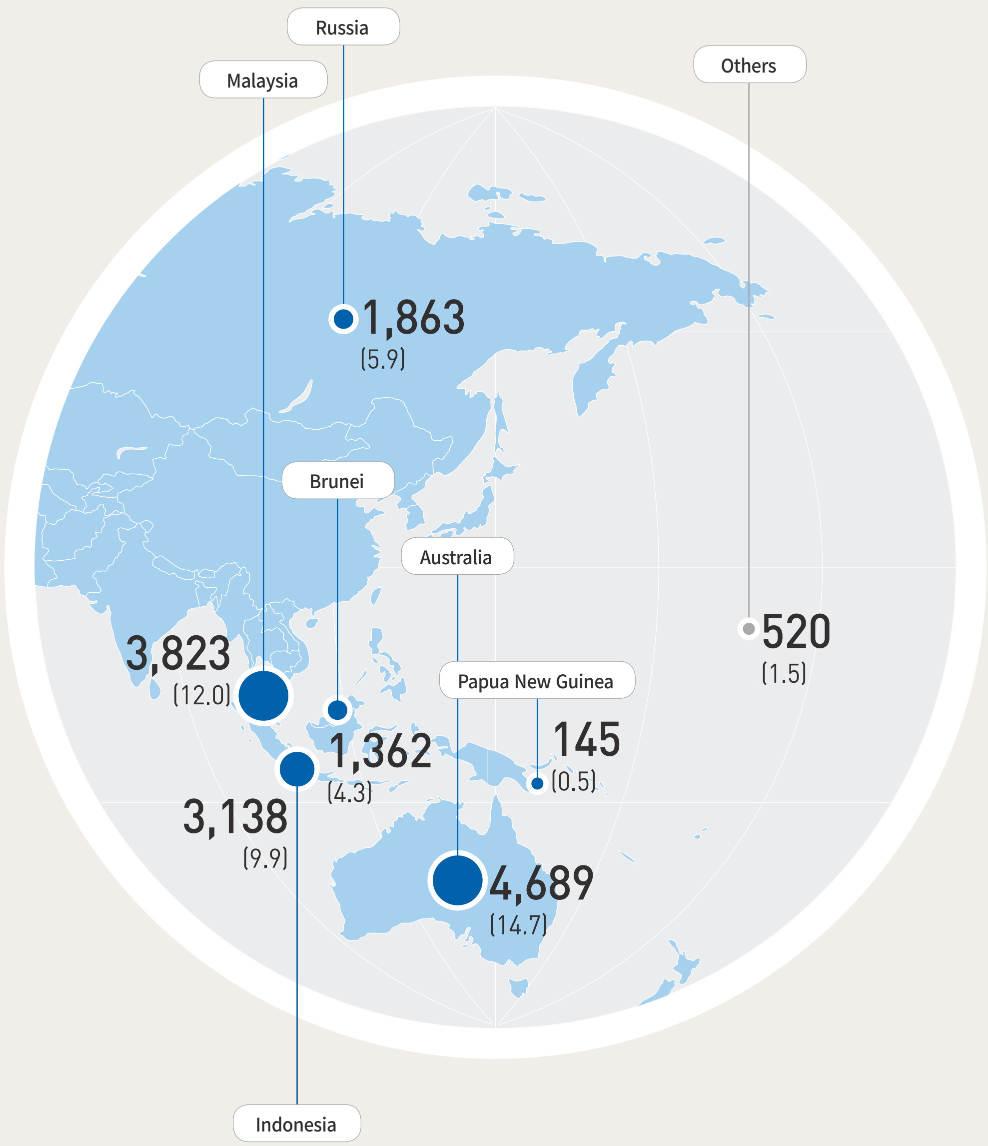
LNG
LNG Import Volume

● Amount of import (1,000 tons)/ data in the bracket: portion (%) (as of December 31, 2016)



Since LNG carriers are required to transport a large amount of LNG which is compressed and liquefied at -162°C, the manufacturing process is extremely challenging and requires sophisticated shipping technologies. In order to foster the domestic shipbuilding and shipping industries, we have proceeded with a business policy on flag-registered LNG carriers, and utilized flag-registered carriers for LNG transport since 1994. KOGAS placed orders for 21 flag-registered carriers up to date, and LNG flag-registered carriers built by five shipping companies have transported LNG to Korea from six countries – Indonesia, Malaysia, Qatar, Oman, Yemen and Russia (Sakhalin).

Korean Flag-registered LNG Carrier
21 in operation,
6 carriers under construction



Total
31,847
(100%)

※ Other countries for import: Algeria, Peru, Equatorial Guinea, U.K. Singapore, Norway and India

LNG Storage Capacity
10.66 million kℓ

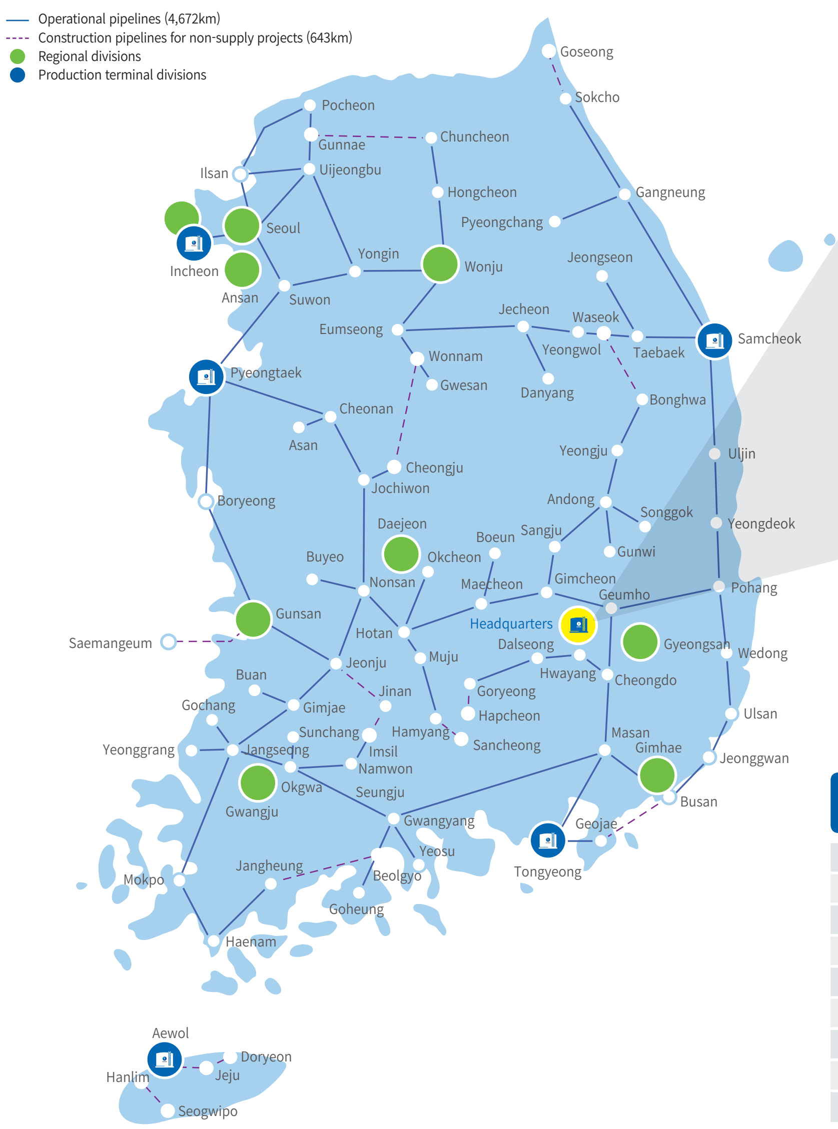
Total Extension of Pipeline Network
4,672km

Production and Supply of LNG

LNG imported through LNG carriers from natural gas producing countries from all over the world is unloaded in terminal divisions, stored in storage tanks, gasified again, and delivered to the nationwide pipeline network. We run four terminal divisions of Pyeongtaek, Incheon, Tongyeong and Samcheok, and have a total of 69 storage ranks of 10.66 millionkℓ – the world's largest storage facility capacity for a single corporation.

Regional divisions that are supplied with natural gases gasified from each terminal division securely supply natural gases, which go through each governor station (4 ~ 0.85MPa) up to pipelines of power plants and general city gas producers. Since our first natural gas supply from Pyeongtaek Power Plant in 1986, we have supplied natural gases to 48 power plants and 32 city gas producers nationwide as of 2016 through the nationwide pipeline network stretching up to 4,672km, and the city gas distribution rate of KOGAS (supply rate of local governments) stands at 90.8%.

Current Status of KOGAS' Terminal Divisions and Pipeline Network (as of January 2017)



Headquarters (Daegu)

Current Status of Management Sites in 9 District Divisions and Major Pipeline Supply

Seoul District Division	38 management sites	412.132km
Incheon District Division	18 management sites	269.570km
Gyeonggi District Division	45 management sites	526.470km
Gangwon District Division	64 management sites	637.847km
Chungcheong District Division	34 management sites	463.679km
Jeonbuk District Division	28 management sites	433.659km
Gwangju Jeonnam District Division	47 management sites	575.248km
Daegu Gyeongbuk District Division	67 management sites	786.994km
Busan Gyeongnam District Division	42 management sites	566.501km

Construction of Terminal Divisions and the Supply Chain

We have carried on construction business to expand terminal divisions and the supply chain so that benefits for the public could increase through stable gas supply over the long haul. Along with the extension of production facilities at Incheon and Samcheok Terminal Divisions, a terminal division is under construction at Aewol Port in Jeju. A construction project for natural gas supply facilities began in Jeju in June 2016. We will strive for balanced regional development and energy welfare by continuously constructing pipeline networks and distributing natural gases to areas neglected in the supply of natural gases.

LNG Sales Volume in 2016
32,773
thousand tons

Sales Business

The sales volume of natural gases has increased about 24 times for 30 years since their first supply in 1987(based on the maximum amount of sales, 2013) as people's awareness of clean energies has expanded. Natural gases taking up 10.0% of the entire domestic energy consumption are sold in various sectors for household, industrial and power generation usages. The sales volume of LNG in 2016 stood at 17,384,000 tons for city gas producers, and 15,389,000 tons for power generation companies, totaling 32,773,000 tons.

Incheon Terminal Division	Operating Status	Construction Status
	• The world's largest delivery capacity as a single terminal division • Storage tanks: 100,000kℓ capacity×10 units, 140,000kℓ capacity×2 units, 200,000kℓ capacity×8 units • Port facilities: 1 berth of 75,000 ton capacity, 1 berth of 127,000 ton capacity • Gasification and delivery capacity: 5,070 tons/hour	• 1st gasification facilities in Phase 3: combustion-type 120 tons/hour×6 units (~ May 2018) • 2nd storage tanks in Phase 3: above ground-type 200,000kℓ tank×3 units (~ July 2020) • 3rd gasification facilities in Phase 3: combustion-type 120 tons/hour×3 units (~ June 2018)

Pyeongtaek Terminal Division	Operating Status	Construction Status
	• The world's largest storage capacity as a single terminal division • Storage tanks: 100,000kℓ capacity×10 units, 140,000kℓ capacity×4 units, 200,000kℓ capacity×9 units • Port facilities: 1 berth of 75,000 ton capacity, 1 berth of 127,000 ton capacity • Gasification and delivery capacity: 4,636 tons/hour	-

Tongyeong Terminal Division	Operating Status	Construction Status
	• Storage tanks: 140,000kℓ capacity×13 units, 200,000kℓ capacity×4 units • Port facilities: 1 berth of 75,000 ton capacity, 1 berth of 127,000 ton capacity • Gasification and delivery capacity: 3,030 tons/hour	-

Samcheok Terminal Division	Operating Status	Construction Status
	• Storage tanks: 200,000kℓ capacity×9 units • Port facilities: 1 berth of 127,000 ton capacity • Gasification and delivery capacity: 1,320 tons/hour	• Storage tanks: Above ground-type 270,000kℓ tank×3 units (~ June 2017)

Jeju Aewol Division	Operating Status	Construction Status
	-	• Storage tanks: Above ground-type 45,000kℓ tank×2 units • Gasification and delivery capacity: air-type 30 tons/hour×4 units, combustion-type 30 tons/hour×2 units

Overseas Business

At a time when the overseas dependence of domestic energies stands at 96%, KOGAS carries out overseas resources development business to secure stable supply and demand of natural gases. We have steadily tapped into not only upstream business including exploration and development of natural gases and crude oil but also LNG liquefaction, operation of overseas LNG terminals, construction and operation of overseas city gas pipelines and distillation and infrastructure business. This shows how we have taken an active part in the entire business scope.

KOGAS in the World

KOGAS' overseas projects **24**

(as of 2016-end)

Exploration of resources	Development and production of resources	LNG projects	Infrastructure projects
3	9	8	4

Exploration Projects

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

Resources Development and Production Projects

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

LNG projects

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

Overseas Infrastructure Project

- Manzanillo LNG Terminal Project, Mexico
- Maputo Pipeline Project, Mozambique
- CNG Gas Station Project, Uzbekistan
- CNG Cylinder Project, Uzbekistan

Research and Development

KOGAS continuously strives to raise technological competitiveness in energy, and apply the technologies that are fostered to each industrial site. KOGAS Research Institute conducts comprehensive research on future energies: upstream to perform exploration, development and production of natural gases; distillation to research contain system for LNG carriers, storage tanks and liquefaction; downstream in charge of stable supply of natural gases; and future energies including new and renewable energies and alternative energies.

Key Research Areas

Exploration and Development of Natural Gases
- E&P of oil & gasfields
- CBM
- Shale/Tight gas
- GM/Polar resources

Liquefaction and Transport of Natural Gases
- Design of storage tanks
- Containment system (KC-1)
- Liquefaction plant and liquefaction process

Supply of Natural Gases
- Intelligent Pigs
- Gas quality and metering
- Risk and safety diagnosis
- Methodology and pipeline soundness

Clean Energies
- Hydrogen fuel cell
- Natural gas-powered vehicles
- LNG bunkering
- Synthetic natural gas
- DME
- GTL

2025 Future Solution Portfolio

Current Key Technologies
- Design of LNG storage tanks and terminals
- Design of liquefaction plants
- Safety analysis and risks assessment of gas facilities

Key Next-Generation Technologies
- Shale gas production technologies
- Pipeline gas importation technologies
- Technologies to create a demand in new natural gases
- Establishment of manufacturing/ supply-based hydrogen infrastructure
- Alternative natural gas technologies

Promising Technologies for the Future
- Designing of gas field production systems
- Technologies for evaluation of oil/gas fields and production promotion
- Smart Gas Grid

Current Status of R&D Investment

Unit: KRW 100 million

2008	2009	2010	2011	2012	2013	2014	2015	2016
320	347	383	436	453	443	468	425	719

Current Status of IPRs and Technology Transfers

Unit: number of cases

Industrial property rights		2008	2009	2010	2011	2012	2013	2014	2015	2016
Patents	Patent application	32	46	24	40	30	27	35	50	35
	Registration	21	23	22	28	28	48	31	13	46
Program		21	3	5	8	2	7	10	6	0
Technology transfer		-	3	-	-	2	4	2	2	2

KOGAS at a Glance

We have contributed to enhancing benefits for people's livelihood and realizing welfare in energy by supplying natural gases securely and stably to the public in pursuit of 'Better Energy, Better Tomorrow'. Driven by endless changes and innovation for the past 30 years, KOGAS has positioned itself as Korea's representative energy corporation equipped with the world's largest LNG storage facilities, having established pipeline networks for natural gas supply in Korea. We broaden our horizons of energy beyond Korea through exploration and development of oil/gas fields, LNG terminals and pipeline network business.

As of December 31, 2016

LNG import volume

31.847 million tons

Amount of LNG sales

32.773 million tons

Current status of overseas projects

24 projects in 13 countries

Total extension of the main pipeline

4,672 km

KOGAS
KOREA GAS CORPORATION

Storage facilities

69 units, 10.66 million kℓ

Nationwide city gas distribution rate *

90.8%

Number of Employees

3,626

R&D investment

KRW 71.9 billion

* Based onsupply rate of local governments

KOGAS Profile

Credit Ratings

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

Company Outline

KOGAS is Korea's representative energy corporation established to enhance benefits for people's livelihood and realize energy welfare for them through safe and stable supply of natural gases.

As of December 2016

Company Name	Korea Gas Corporation (KOGAS)	Type of Corporate Body	Corporation
CEO	Seung-Hoon Lee	Sales	KRW 21.1081 trillion
Establishment Date	August 18, 1983	Net Income	KRW △673.6 billion
Foundation for Establishment	Korea Gas Corporation Act (No. 3639, enacted in December 1983)	Earnings per Share	KRW -7,740 (for common stock) KRW -7,740 (diluted earnings per share)
Location	120, Cheomdan-ro, Dong-gu, Daegu, Korea	Number of Employees	3,626

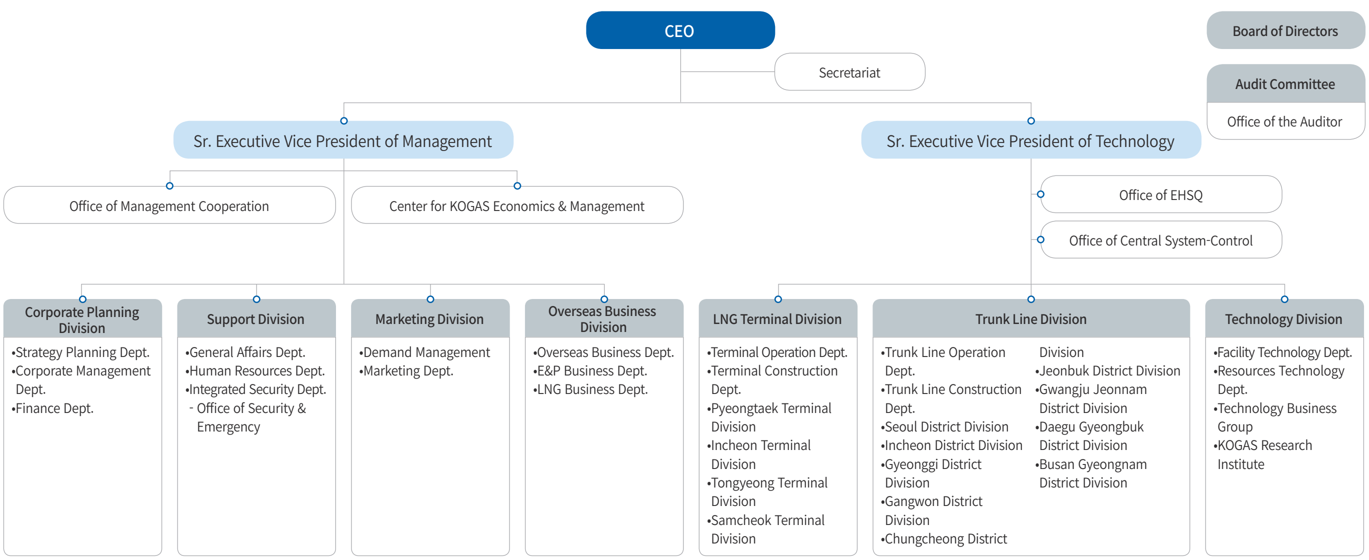
※ Financial items are based on the Consolidated Financial Statements under K-IFRS.

Key Business Areas

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

Organizational Composition

KOGAS has seven divisions: Corporate Planning Division, Support Division, Marketing Division and Overseas Business Division under the Vice President of Management; and LNG Terminal Division, Trunk Line Division and Technology Division under the Vice President of Technology. Under the divisions are 24 units (headquarters, departments, and teams) and 13 divisions (terminal divisions and district divisions).



KOGAS History

1980's

Base building

Aug. 1983 Establishment of KOGAS
Oct. 1986 First import of LNG
Nov. 1986 Commencement of natural gas distribution to power plant operations (Pyeongtaek)
Feb. 1987 Commencement of city gas supply to the Seoul metropolitan area
Apr. 1987 Completion of terminal and distribution facilities at Pyeongtaek

1990's

Expanding Growth

May 1990 Establishment of the R&D Center
Jul. 1993 Commencement of city gas supply to the mid region (Daejeon, Cheonan, Cheongju)
Jun. 1994 Commission of the first LNG national flag carrier
Nov. 1995 Commencement of natural gas supply to the Yeongnam and Honam area
Dec. 1996 Commencement of natural gas supply to the Busan area
Jan. 1997 Establishment of KOLNG
Oct. 1997 Commencement of operations of the Incheon terminal
Oct. 1999 Commencement of natural gas supply to the Seohae area
Dec. 1999 Listed on the Korea Stock Exchange
Dec. 1999 Commencement of natural gas supply to the Southern area

2000's

Becoming a World Class

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

2010's

Better Energy, Better World

Jan. 2010 Incheon LNG Terminal surpassed the 100 million tons mark in accumulated production of natural gas
Jan. 2010 Landed the development and production rights for the oil and gas fields in Zubair and Badra, Iraq
Oct. 2010 Gained access to the Akkas and Mansuriya Gas Fields in Iraq
Mar. 2011 Named as the World's 4th Most Admired Energy Company by Fortune
Jan. 2013 Agreement signed for the E&P project on three blocks in Cyprus
Sep. 2013 Additional Discovery of a Gas Well in Area 4 of Mozambique, Secured 87 Tcf in Total
Sep. 2013 Being incorporated into the DJSI Asia Pacific Level and ranking first in the gas sector
Dec. 2013 Completion of a nationwide extensive natural gas distribution project, a total of 4,065 km of a pipeline network
Feb. 2014 Being selected as the institution of excellence for seven consecutive times in the Customer Satisfaction Evaluation for Public Organizations (Ministry of Strategy and Finance)
Mar. 2014 Hosted the Gastech 2014 at Kintex
Oct. 2014 Won the bid to host the 2021 World Gas Conference in Daegu
Oct. 2014 Relocation of Headquarters to Daegu from Seong Nam
Oct. 2015 Commencement of operations in GLNG, Australia
Jan. 2016 Declares 2025 Vision ('NEXT Energy, with KOGAS')
Jan. 2016 Consecutively incorporated into DJSI Asia Pacific Level 4
Oct. 2016 Awarded with the Prime Ministerial Award on the World Standards Day 2016
Oct. 2016 921 cases of in-house standardization and patent applications (630 cases)
Oct. 2016 Organizing Asia Pacific Gas Conference (APGC) 2016 in Daegu

Vision & Strategy

KOGAS 2025

In order for KOGAS to become a public corporation with clean energy contributing to livelihood of the public through save and stable supply of natural gases, KOGAS established and announced ‘KOGAS 2025’, a new mid-and long-term management plan in January 2016. KOGAS 2025 consists of three strategy directions and nine strategy tasks based on the slogan for the vision, ‘NEXT Energy, with KOGAS’ meaning that KOGAS will be with public for a new, outstanding and reliable future energy world. We will make ‘Better Energy, Better World’ under KOGAS 2025.

KOGAS 2025

Management Motto	Better Energy, Better Tomorrow		
Core Value	Trust in People; Responsibility for the Society	Change to the Future	Challenge to the World
Management Measures	Focus on communication	Substantiation	Pursuit of innovation
Points of Pursuit	A sense of public duty to serve the public, growth potentials as a global company, efficiency in internal management		
Vision Slogan	NEXT Energy, with KOGAS		
Strategy Directions	Establishing Reliable Status of Public Enterprise (Trust)	Securing Competitiveness in the Gas Industry (Neo)	Setting a Performance Oriented Management System (EXcellent)
Strategy Tasks	1. Reinforce social responsibility 2. Operate facilities stably and safely 3. Create customer value	4. Perform successful international business 5. Grow as a Global Provider 6. Create new demand	7. Improve stability of the financial structure 8. Raise the technological value 9. Establish a vibrant organizational culture
Strategy Goals	Improving the Consumer Confidence Index	Achieving Goals about New Growth Engines	Fortify the Organizational Competency Index
	•Achieving the first rank in Customer Confidence Index - Ranked first in customer satisfaction - Safety culture index ‘World Class’ - Ranked first in mutual growth - Ranked first in the degree of integrity - Ranked first in information security	•Gaining 100% rate in acquiring competencies for minefield management technologies •Continuously pursuing package-type (terminal division + pipeline) business •Generating hydrogen-based demand •Intensifying low-carbon management including LNG bunkering •New marketing supply of 8million tons •Revenue of KRW 47 trillion	•Debt ratio below 200% •Net income of KRW 1.5 trillion •Setup of technical standards for overseas and new business •Organizational Effectiveness Index of 100%

Vision Slogan

NEXT Energy, with KOGAS

KOGAS will be with the public
For a new, outstanding and genuine future energy world!

N — Neo
Securing new growth engines to be newly pursued

EX — Excellent
Strengthening technological competencies and establishing a lively corporate culture that generates performance

T — Trust
Providing benefits to the public and growing into a reliable company with integrity

with KOGAS
Ensuring shared growth along with stakeholders through creation of social value

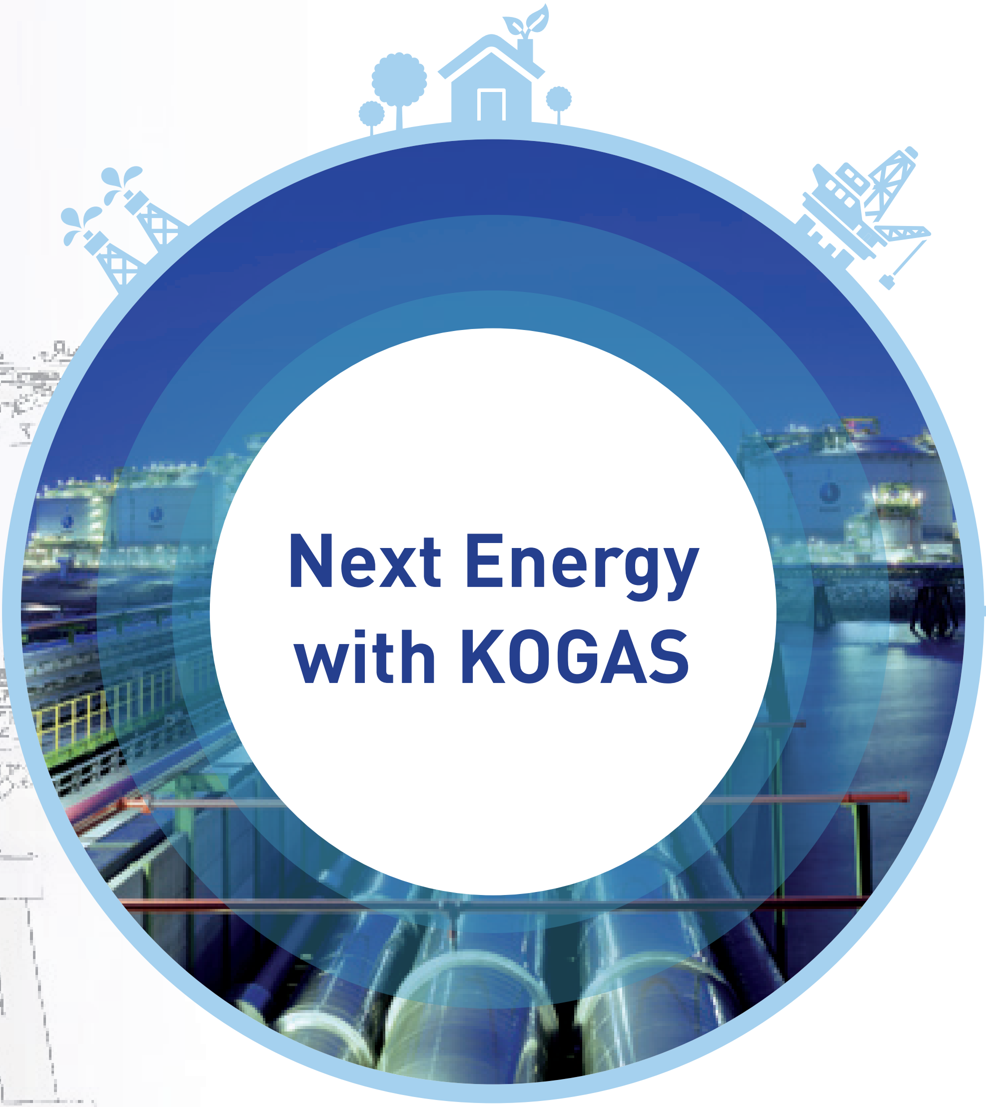
Sustainability Management Strategies

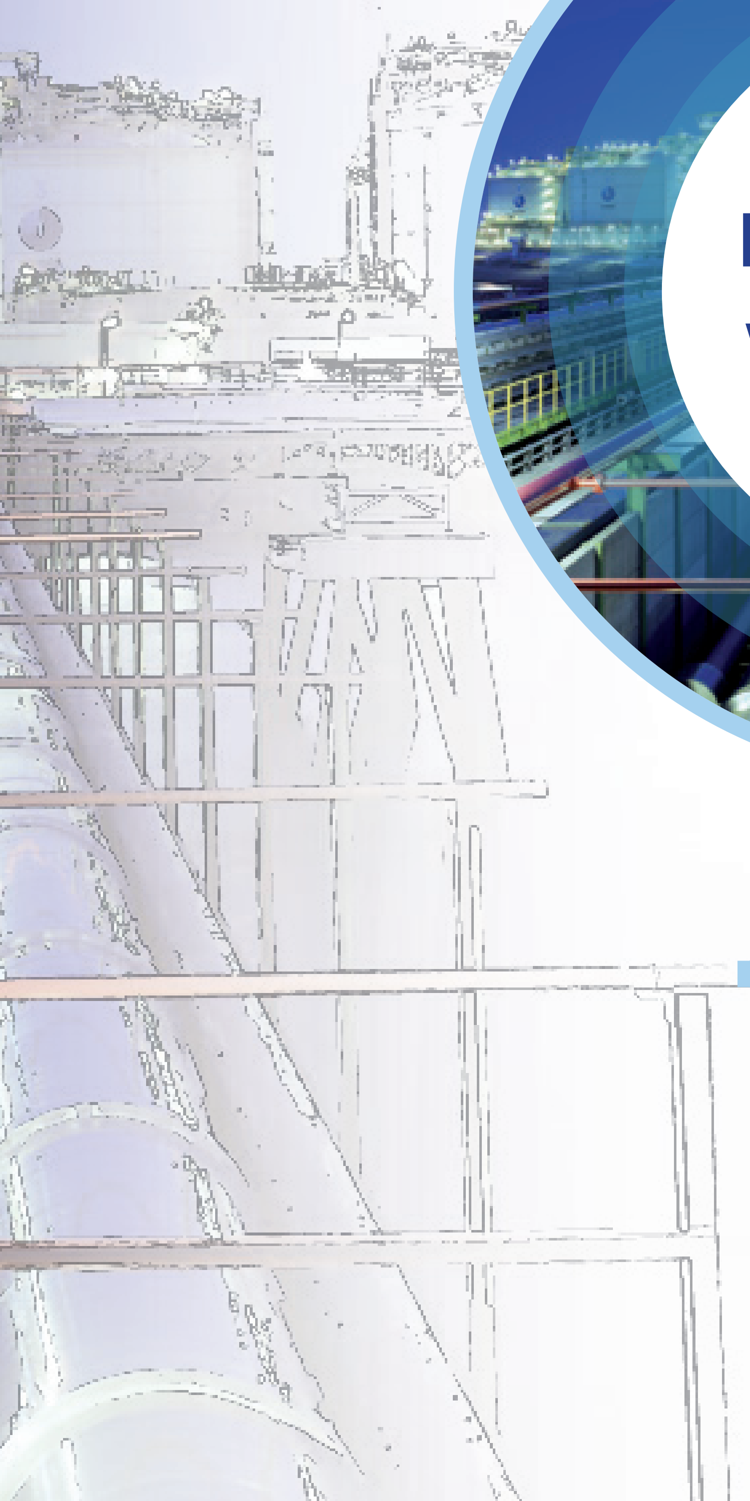
KOGAS is responsible for minimizing the impact of global climate change and ecological footprint in supplying energy safely and seamlessly as Korea's largest supplier of natural gases. We respect and listen to our stakeholders throughout the world, including the public, community, government, customers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

System for Sustainability Strategies

Vision	Global KOGAS - with People, with the Planet			
Mission	Sustainability Excellence: DJSI World Level			
	Governance	Economy	Environment	Society
Strategic Directions	Securing leadership for sustainable management by strengthening the foundation for management	Carrying out sustainable business by supplying energy in a stable manner	Minimizing environmental impacts by adopting leading environmental management	Creating a corporate culture that prioritizes people
Core Issues	•Strengthening the efficiency of the Board of Directors and accountability in sustainability •Intensifying independent risk management •Establish an integrated form of stakeholder management •Intensifying the analyzing and sharing system for issues related to stakeholders	•Expanding the rate of independent development of energies •Developing a new demand and business for gas •Strengthening the demand management for stable supply •Intensifying the development of alternative energies •Establishing an anti-monopolistic prevention system	•Intensifying policies and systems for environmental management •Boosting reliability in internal and external environmental policies •Strengthening the system for response to climate change	•Strengthening the operating system for ethical management •Advancing human rights and labor practices •Strengthening the performance-based compensation system •Enhancing the safety and health system •Upgrading the win-win cooperation infrastructure •Reinforcing social contribution strategies and performance management •Strengthening the customer management System
Major Tasks	•Management of the Board of Directors - Increase the independence and efficiency of the BOD - Raise the BOD's accountability for sustainability management •Risk Management - Systematizing corporation-wide risk management - Devising measures for prior identification of risks •Stakeholder Management - Manage stakeholders' issues on an integrated basis - Communicate issues internally and externally - Establish an integrated form of stakeholder management	•Expansion of Energy Assets and the Independent Development Rate - Identify supply restraints and set up peak oil strategies - Expand investments in overseas E&P •Demand Management - Raise efficiency on the demand side - Set up plans to cooperate with industries •Developing New Business - Operate LNG facilities and develop transport businesses - Reinforce business networks - Create a hydrogen-based demand	•Intensifying policies and systems for environmental management - Redefining the procedure and guideline for environmental management - Establishing policies and strategies for biodiversity •Boosting reliability in internal and external environmental policies - Improving the system for managing environmental pollutants - Continuously disclosing information on the amount of emission for environmental pollutants - Increasing transparency in cost for environmental activities •Strengthening the system for response to climate change - Putting in place a low-carbon management system - Contributing to the national GHG reduction target - Continuously exploring GHG reduction business	•Ethical Management - Upgrade ethical management policies - Raise management transparency •Talent Management - Revamp human rights and labor practices - Strengthen performance-based remuneration systems - Develop global talent •Managing safety and health - Managing sites free of accident/disaster - Continuously maintaining the healthcare management system - Preventing industrial accidents for suppliers/supporting their safety management activities •Win-win Cooperation - Support SME's sustainability management - Initiating competency build-up for SMEs •Management for Customer Satisfaction - Analyze VOC and customer feedback - Heighten privacy protections for customers •Social Contribution - Improve the management of social contribution activities - Implement strategic social contribution programs

Next Energy with KOGAS





N	eo	New Future Energy World - Management of Sustainable Energy Business
EX	cellent	Excellent Future Energy World - Excellent People, Vibrant Organizations
T	rust	Trust True Energy World for the Future - Stable Supply, Safe Sites

NEXT Energy with KOGAS

New Future Energy World

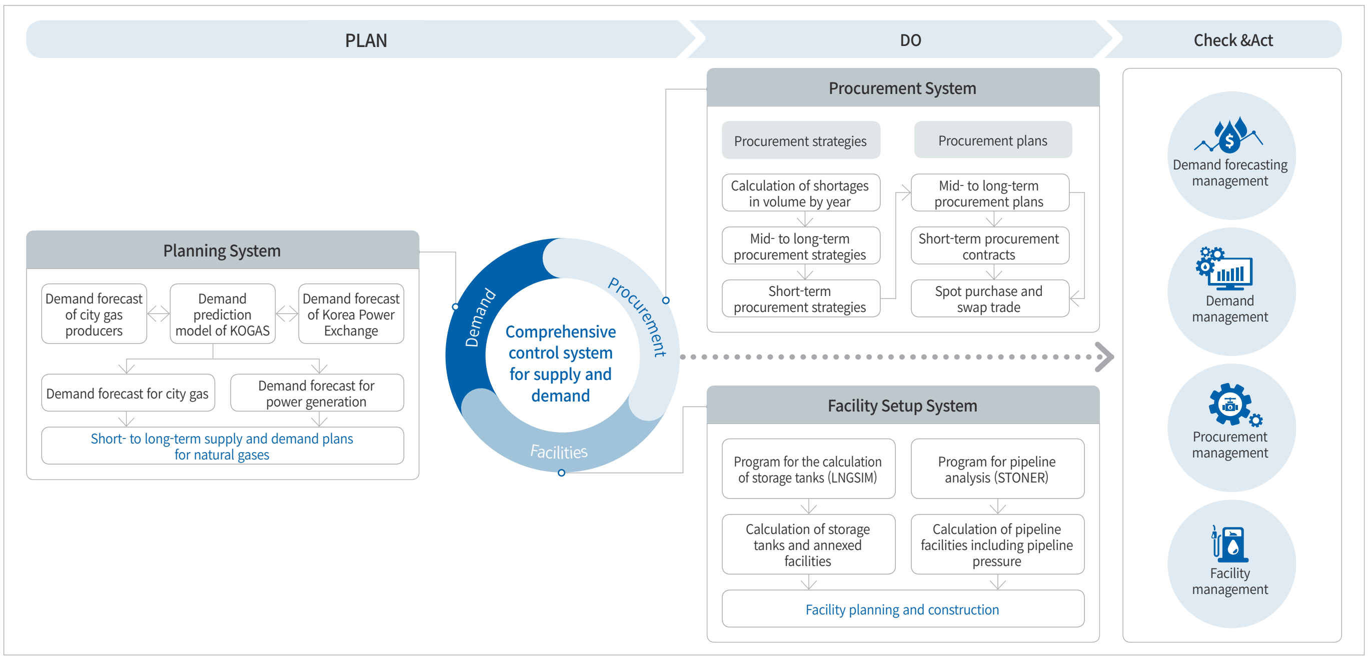
Management of Sustainable Energy Business

Business of Natural Gas Procurement and Sales

Supply and Demand Management System for Natural Gases

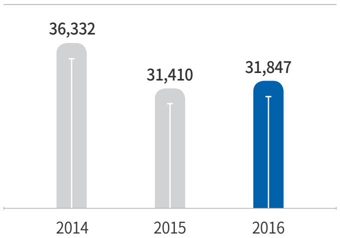
The development and production of natural gases require a period of 5 to 10 years, and generate investment costs of over USD 10 billion. They are covered by a long-term contract of over 20 years under the pre-sales and post-production scheme. They cannot be stored for long, and their transportation vessels and storage facilities are limited, so making elastic responses to demand is challenging. KOGAS is striving to stably respond to uncertainties in demand by recognizing the importance of supply and demand management, and establishing a corresponding management system, thus intensifying the responsive capabilities to fluctuation in supply and demand. The Ministry of Trade, Industry and Energy established the Gas Supply and Demand Plan for over 10 years according to Article 18.2 of the Urban Gas Business Act and publicizes it every two years. Long-term supply and demand plans for natural gases classify them into some for city gas and others for power generation, thereby raising accuracy in predictability in consideration of the economic growth rate, population growth rate, the industrial structure and basic plans for the supply and demand of electricity, etc. Driven by management experiences and competencies, KOGAS suggests development strategies in the natural gas industry by dynamically spearheading the long-term natural gas supply and demand plan, that is, a long-term national energy policy. We analyze the supply and demand records on a daily basis, predict demands for each scenario on a monthly basis, and forecast the supply and demand accordingly. The purpose is to manage the integrated supply and demand management system for timely identification of the rapidly changing supply and demand for stable management on both sides. Monitoring results on factors for changes in the demand including temperature, GDP, and electricity usage are reflected in the demand forecast. We have also adopted and operate a big data statistical system for scientific demand prediction.

Integrated Supply and Demand Management System for Natural Gases



Current Status of Natural Gas Procurement

Unit: 1,000 tons



Current Status of Natural Gas Sales

Unit: 1,000 tons

Type	City gas							For power gene-ration	Total
	Residential/ Office heating	For general usage	For industrial usage	Heating, Ventilation, Air-Conditioning(HVAC)	For transport	Others	Total of city gas		
2016	7,883	1,539	5,710	554	950	748	17,384	15,389	32,773
2015	7,482	1,478	5,756	478	953	782	16,929	14,527	31,456
2014	7,502	1,484	6,867	472	978	877	18,180	16,993	35,173

Business of Natural Gas Procurement

Management of LNG Supply and Demand

Achieving 'Short-Term Supply and Demand Balance' in Response to a Rapid Rise in Demand

It has been required for KOGAS to devise strategies for stabilizing short-term supply and demand because the demand for LNG used for power generation to cater to the peak power depends upon tapping on the base load (nuclear power, coal). Breakout of unpredictable factors including climate abnormalities and earthquakes are also external influencers. KGOAS responds to the short-term fluctuation in demand by planning for a short-term and winter-time demand volume in April and October, respectively, and figuring out a volume to stabilize supply and demand based on the 'routine forecast of demand' by organizing six meetings by the Supply and Demand Measure Team and two by the Advisory Council.

Ensuring 'Mid-Term Stability in Supply and Demand' through Multifaceted Efforts

Fluctuation in demand has been picking up as the level of demand for electricity is slowing down and base-load power plants are expanded. KOGAS has further sophisticated the mid-term demand prediction, using a predictive model reflecting the recent records in demand and policy variables. We aim to secure stability in supply and demand for the next five years, reviewing the related situations post to the 12th long-term plan for supply and demand and considering market changes. Furthermore, stability in supply and demand has been driven by higher reliability in demand prediction based on multi-level consultations among the government, Korea Power Exchange, KEPCO and power generation companies, etc.

Initiating 'Long-Term Optimization of Supply and Demand' through Stronger Competencies in Proactive Supply and Demand

KOGAS seeks for measures to optimize supply and demand by specifying business strategies for LNG trading because the global LNG market continues to witness an excessive supply of LNG, and the short-term trading volume grows from 19% in 2010 to 27% in 2016. Using a subsidiary in trading can help maintain a supply-demand balance by enabling KOGAS – the parent corporation – to procure LNG through the subsidiary, if necessary, and save procurement cost thanks to optimized transport. That is why KOGAS plans to establish a trading subsidiary in the second half of 2017. Its flexibility in handling volumes and function as a supply-demand buffer is expected to fundamentally ease potential supply-demand imbalances resulting from changes in the domestic demand in the future.

Ensuring Stable Transport of LNG

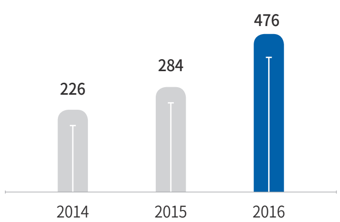
KOGAS induces stability in transport by systematically managing flag-registered LNG carriers. A difference in the amount of a fare paid and a normal fare upon operating flag-registered carriers might lead to a dispute on the fare with the shipping company thereof. KOGAS minimizes possibilities of such disputes by managing the error rate in the transport fare by minimizing it. In addition, we maintain safe performance of carriers by conducting on-dock repair 10 times due to higher possibilities of safety accidents upon operating obsolete flag-registered carriers. KOGAS' error rate in transport fare in 2016 improved by 0.3%p to 0.3% compared to the previous year, and achieved 'zero' dispute on fares and 255 accident-free ship operations.

Conducting Sales Management Business

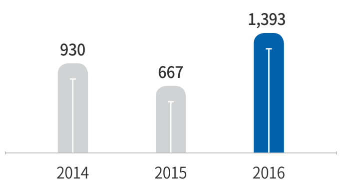
As the roles of natural gases increase to improve the level of micro dust and achieve GHG reduction goals along with the needs for them, KOGAS achieves management goals by disseminating and selling natural gases to cater to national energy policies. We facilitate the sales of natural gases for cooling as a way to ease the power peak in summer time. We have established long-term strategies for cooling to come up with effective measures to boost sales, and expanded institutional support including payment of allowances for gas cooling and stringent measures for the obligatory ration for gas cooling in public institutions, etc. As a consequence, the sales volume for natural gases for cooling reached 260,000 tons, up 18% from the previous year, contributing to the growth of 2% in the power reserve rate during the peak time. Meanwhile, we seek for and initiate ways to expand the sales of compressed natural gas (CNG) for transport as a countermeasure against micro dust. Ways to increase the CNG sales are: payment of subsidies for CNG, expansion of CNG-powered wide-area express buses, pilot business of CNG-powered chartered bus and expansion of recharging stations for long-distance vehicles, etc. We have devised a scheme to obligate the usage of CNG to new routes of metropolitan wide-area buses while securing applicable laws, based on which we plan to raise the future sales of CNG-powered vehicles.

Overseas Business

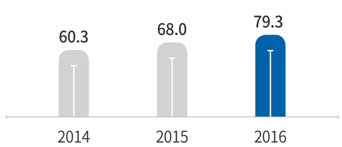
Annual Production Volume
Unit: 10,000 tons



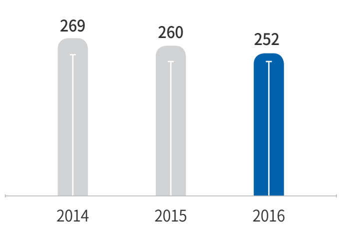
LNG Development and Procurement Volume
Unit: 1,000 tons



Technological Self-sufficiency
Unit: %



Amount of Resources Secured
Unit: million tons



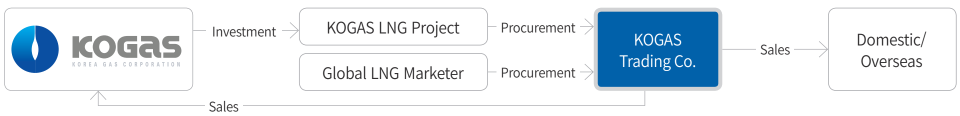
E&P Business

KOGAS has continuously initiated business on overseas resources development to induce stability in supply and demand in domestic natural gases and intensify energy security. We have raised efficiency in business operation by raising profitability through efficient business management and systematically respond to the business environment which is worsened by uncertainties.
The development and production business of oil & gas fields in Zubair, Iraq is to provide technical services and acquire crude oil. Increases in the capacity of crude oil treatment facilities led to a higher production of crude oil, resulting in the net income of KRW 98 billion, up 16% from the previous year. Recovery rate compared to the accumulated investment cost reached 96%. The business reduced the number of days for drilling by modifying the design for production wells, and increased the amount of crude oil by securing the facility capacity of the maximum product target with the extension of crude oil facilities. Meanwhile, the development and production business of gas fields A-1/A-3 achieved the sales rate of 115%, which is much higher than the initially planned sales volume through stable sales management despite concerns over shrinkage in demand due to the recent economic slowdown.

LNG Business

KOGAS' overseas LNG business has grown to the extent of driving the entire business of exclusive development and operation in 2016 after starting off in the form of equity investment in 1996. We have established the management right-driven strategies for LNG business execution, aiming to initiate the production of commercial operation in 2025 in order to prepare for shortage of volume due to the closing of the overseas business contract and tap on to opportunities in new markets including the U.S. and Iran. This business model is expected to bring about stability in supply and demand, and also in price through sufficient supply of volumes in demand in Korea, generating profits through sales in the global market.

LNG Trading Business Model



Natural Gas Infrastructure Business

The natural gas infrastructure market encompassing the business of the Floating Storage and Regasification Unit (FSRU) and business aligned with LNG supply, and is expected to grow up to approximately KRW 150 trillion for the next decade. KOGAS launched the 'Overseas Advancement Council for Natural Gas Infrastructure Business' – a private-institutional-public body – in order to establish a close cooperation system with EPC companies and financial institutions in the hopes of expanding overseas business in response to such market changes. We cooperate with domestic companies on joint business development to advance into the global market together. We also cooperate on calculation of investment cost, feasibility study, sharing of package projects, site inspection and technical review on six projects in Indonesia, India, Morocco, South Africa and Bangladesh.

Acquisition of Business Competencies

KOGAS prevents illegitimate investment and strengthens the management of investment performance by continuously improving the system to proceed with overseas projects. Tasks for improvement were identified to sophisticated the system, and expertise and transparency in making decisions were raised by obligating the third-party feasibility study and developing a checklist for risk analysis. We also established a cross-department cooperation system for efficient management of business, and train specialized personnel required for business development and management led by KOGAS.
The year-on-year level of technical competencies went up by 11.3% thanks to intensification of core technologies for E&P needed for exclusively managing mine fields in 2020. We plan to focus our management resources on especially core business in running overseas business, and steadily bring up technological prowess for resources development – an area where there is a big gap between KOGAS and major global energy companies. In addition, we will dramatically raise efficiency in investment, considering the nature of resources development business including high cost and high risks.

Launch of the Promotion Team for Hydrogen Convergence Alliance

As the domestic gas market has entered a mature stage, the distribution rate of natural gases has become stagnant, and the increase rate of the demand is gradually dropping. Against this backdrop, KOGAS is seeking for various measures for demand development in order to secure new growth engines. As the hydrogen automobile market is forecast to expand especially driven by intensified environmental regulations and countermeasures against micro dust after the Paris Agreement was signed in 2012, we are to create a new demand by leading the era of hydrogen usage for transport. As such, we launched the 'Promotion Team for Hydrogen Convergence Alliance' as a part of our efforts to disseminate natural gas reformation*-based hydrogen vehicles.

In August, 2016, we launched the 'Hydrogen Convergence Alliance' as a private-public council with the participation of three government institutions, three local governments and 16 enterprises/academic institutions. They have explored policy tasks including the privately-led dissemination of hydrogen-powered vehicles and facilitation of recharging infrastructure setup. In February 2017, the 'Promotion Team for Hydrogen Convergence Alliance' came into being as an official standing body, which is expected to specifically implement policy tasks, while seamlessly supporting activities of the 'Hydrogen Convergence Alliance'. The 'Promotion Team for Hydrogen Convergence Alliance' plans to establish a roadmap for each step to spread the hydrogen energy within this year, while supporting to improve policies and systems to foster related industries. Other activities planned include the expansion of hydrogen-powered vehicles and installation and management of hydrogen recharging stations.

* reformation: conversion of a natural gas into hydrogen

Background

Strategy Tasks: To create new sources of demand by preparing for the era of hydrogen-driven economy

Needs
- Requiring to expand new sources of demand for natural gases
- Strengthening environmental regulations including the Paris Agreement
- Expanding the number of recharging stations for hydrogen-powered vehicles as a countermeasure against micro dust
- Preparing for the era of hydrogen-driven economy with future growth engines

Composition and Roles of the 'Promotion Team for Hydrogen Convergence Alliance'

Policy Planning Support Division	Foundation Support Division	Technological Development Support Division	International Cooperation Support Division
Supporting policies to facilitate the spread of hydrogen-powered electric vehicles and hydrogen recharging stations, and foster industries related to sustainable hydrogen energy	Supporting the management of supply and demand of hydrogen needed for hydrogen-powered electric vehicles as well as smooth dissemination of such vehicles and hydrogen recharging stations	Supporting hydrogen-powered electric vehicles, hydrogen recharging stations, hydrogen technologies and pricing	Engaging in promotion of safety for the public, and supporting technical standards, international cooperation and industries associated with the hydrogen energy

Export Contract for LNG Fuel for LNG Bunkering Ships

The International Maritime Organizations (IMO)'s regulations on the emission of sulfur oxides for ships has been made more stringent from 3.5% by 0.5% by 2020 to be applicable to all oceans, which spotlights attention to LNG as a new fuel for ships which can replace the existing fuel for ships. Accordingly, the global demand for LNG bunkering is expected to increase up to 3 million tons in 2020 and 22 million tons by 2030. We pave the way to establish related systems and infrastructure so that we could create a new demand for natural gases through the development of LNG bunkering business.

KOGAS laid the foundation for installing gas storage facilities within ports by improving related laws and regulations including the Port Act, and the enforcement rules of the Urban Gas Business Act. We strive to facilitate LNG bunkering by establishing the basic facility for ship bunkering in Tongyoneg LNG Terminal and installing the LNG bunkering function on one carrier for Jeju from September 2019.

In addition, we have strengthened business activities for LNG-powered ships for major ship owners to facilitate the dissemination of LNG fuel-powered ships, and also strive to exchange information and conduct joint business with advanced companies abroad. Plans are underway to continuously establish infrastructure to make preemptive responses to LNG bunkering business by devising related laws on ship-to-ship bunkering in the future.

NEXT Energy with KOGAS

Excellent Future Energy World

Excellent People, Vibrant Organizations

Talent Management

Principles in Talent Management

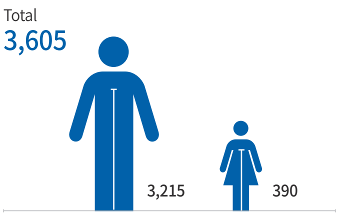
Ideal Talents

KOGAS has re-defined desirable talents to achieve its vision together as follows: ‘talents with integrity in pursuit of principles and honesty’, ‘trusted talents who practice consideration and cooperation’, ‘talents with a challenging spirit for changes that can lead organizational growth’ and ‘creative global talents that can open up the future.’ These have become the criteria for recruitment, personnel management, evaluation and talent development at KOGAS.

Ideal Talents

Status of Employees* (by gender)

Unit: Number of employees



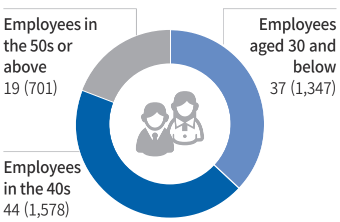
* Regular employees, as of 2016-end

Respect for Human Rights

Having joining the UN Global Compact in 2007, KOGAS has thoroughly fulfilled 10 principles for four items – human rights, labor, environment and anti-corruption. In 2015, we had diagnosis on 38 specific items in 10 areas after conducting the ‘self-inspection on human rights management’ in accordance with the guideline of the National Human Rights Commission. Overall results have been ‘favorable’ and ‘satisfactory’, but areas of comparative weakness were institutionally complemented. In February 2016, we launched a department solely in charge of human rights management which oversees policies and performance indicators of human rights management, and performance and activities of human rights management. In 2017, we formulated ‘KOGAS Charter on the Human Rights Management’ and the CEO has officially declared it, expressing strong commitment for human rights management. The charter consists of the following 10 major provisions: support for international human rights policies and international human rights norms; prohibition of discrimination based on race, religion or disability, etc.; guarantee of the freedom of association and collective bargaining; prohibition of forced labor; prohibition of forced labor; creation of a safe and hygiene working environment; win-win development with suppliers and protection of human rights for their suppliers; protection of human rights of local residents; environmental protection and protection of human rights for consumers. After formulating and declaring the ‘Charter on Human Rights Management’. KOGAS implemented a ‘pledge to comply with the human rights charter for all employees’ to form consensus on human rights management of employees and create a culture of respecting human rights in April, 2017. We also conducted proactive internal and external promotional activities on our website, internal portal, email and SNS and through newspaper coverage. We plan to proceed with formulation of a guideline on the human rights management while developing assessment on impact of human rights to practice human rights management in a more systematic manner. Our efforts to rescue victims of human rights violation will be boosted through efforts to prevent human rights violation in advance and the scheme to handle grievances.

Status of Employees* (by age bracket)

Unit: % (number of employees)

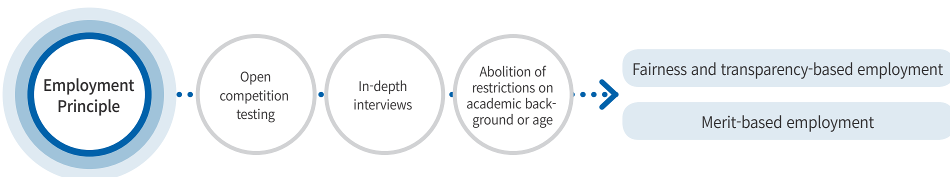


* Total employees as of 2016-end

Talent Recruitment

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

Employment Principle



Strengthening Talent Competencies

Human Resources Development Strategies

KOGAS established and operates a competency-based talent development system aligned with its vision and strategic directions to select and develop top talents with expertise in the gas industry. We continue to implement training courses by realigning a system to develop human resources embodying Vision 2025 and compatibility, and exploring the needs for competency development of the organization and its members.

Human Resources Development System

Talents with integrity in pursuit of principles and honesty	Trusted talents who practice consideration and cooperation	New Ideal Talents	Talents with a challenging spirit for changes that can lead organizational growth	Creative global talents that can open up the future

Three Strategy Directions for HRD

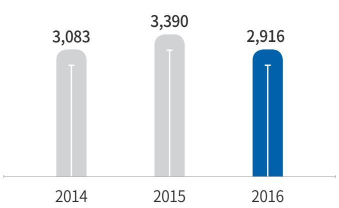
Forming a desirable corporate culture to form consensus on core values	Strengthening specialized competencies to strengthen competitiveness in the gas industry	Intensifying performance management in developing human resources to raise the executing capabilities for strategies

10 Strategy Tasks for HRD

• Embodying KOGAS-style core values • Facilitating policy-type training to contribute to the nation • Spreading the practice of a corporate culture focusing on innovation and collaboration • Strengthening the basic training for sustainable growth	• Expanding the development of core talents to bring up competitiveness in the gas industry • Sophisticating the convergence-driven global talent development system • Upgrading site-oriented HRD based on job competencies	• Intensifying mid-and long-term strategy execution capability through systematic planning on HRD • Establishing a corporation-wide integrated talent development infrastructure • Strengthening performance management for developing talents

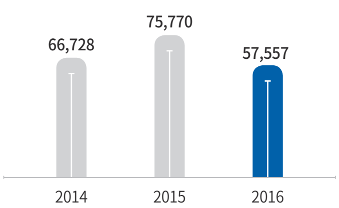
Per-capita Average Training Budget

Unit: KRW 1,000



Number of Trainees

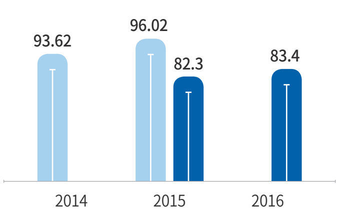
Unit: Number of employees



Satisfaction level for training*

Unit: number of points

Before the change After the change



* The survey on the satisfaction level for training up until 2015 targeted individual training courses, but for post-2015 evaluation, the survey has newly calculated on results by adopting an evaluation procedure and measurement techniques on the entire education and training content and its management.

Fostering Female Leaders and Specialists

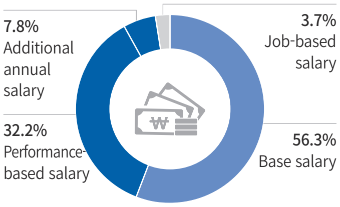
KOGAS is making multifaceted efforts to foster female talents. Such programs as the female talent development course and the long-term commissioned training course were designed to foster female employees as female leaders and specialists. We have paved the way for female employees to be advanced to high-ranking positions by promoting managerial positions for women and expanding the positions in major departments. Female judges have been mandatorily allocated to strike a balance in making judgment for the promotion review of positions in Grade 3 or above to expand and foster female managers. In 2016, we generated the first female employee to be promoted to the position of Grade 1, and expanded the appointment of female managers to key positions in essential business, including the head of the Facility Technology Department and the director of the Maritime Base Business Team.

Talent Development Programs

KOGAS has established a balanced talent development roadmap touching upon organizational competencies (core values and leadership) and personal competencies (job competencies and global competencies) in each stage from joining KOGAS until leaving it in order to foster competent talents. The dual track for career development has been established and is up and running – KOGAS-led and self-led tracks – including a specialist track and a manager track. In the area of boosting organizational competencies, we created and operate the following directions and action strategies for education and training: building up a corporate culture by internalizing core values; raising leadership competencies of executives through continuous support for management activities and fostering competent specialized personnel to take the initiative in realizing KOGAS' vision; improving the system for evaluation of actions for HRD programs based on performance; and running programs to boost public benefits. We have also adopted the self-led learning system whereby employees can design and implement training they want to intensify individual competencies, supporting to practice continued self-development. In particular, we run the Global Leader Training Course to continuously foster personnel to lead overseas business.
Meanwhile, KOGAS implements an in-house program to validate qualifications to technically systematize the management and remuneration areas for safe and stable supply and also to devise a system to objectively validate job competency. A total of 743 employees acquired certifications as facility operation specialists, facility maintenance and machinery specialists and facility maintenance and E&I specialists from 2010 to 2016, for which the government approval has been made for the internal qualification validation system.

Fair Evaluation and Remuneration

KOGAS’ Performance-Based Salary



KOGAS conducts fair and transparent efficiency rating based on employees’ performance and capabilities, and the results are reflected in personnel appointment and remuneration. All employees excluding executives are, in principle, subject to goal-based performance evaluation. All employees set goals for their achievement and competencies at the beginning of a year, and have them approved by their manager. They are subject to year-end performance evaluations based on their individual yearly performance. For high achievers, incentives are provided to enhance their organizational immersion by differentially paying the bonus and the base salary and by giving benefits in a review to select employees to be dispatched outside. For low achievers, meanwhile, we seek higher performance by supporting competency development through training or job rotation. Furthermore, chief officers (excluding executives), intermediary managers and candidates to be promoted among the manager level among team members are subject to multi-dimensional evaluation. Results of the evaluation are finally assessed in ranking based on comparative analysis among employees in the same rank that are subject to evaluation.
Meanwhile, KOGAS induces long-term performance generation by aligning evaluation results with remuneration. All wage items are broken down into basic, job, and performance-based under the pay-for-performance scheme, except for statutory benefits (paid leave). Accordingly, the base salary taking up 56.3% of the entire salaries are divided into five grades depending on competency evaluation for a differential increase. Differential payment is made so that the maximum and the minimum amounts could differ by over two times by converting 32.2% of the entire salary into a performance-based one.

Work-Life Balance

Ministry of Gender Equality and Family

Certification as an Excellent Institution with Family-Friendly Programs
(first certified in 2015)

Flexible Working Hours

We run the flexible working hour system to make the forms of working more flexible to create a working environment with a work-life balance. We gather opinions of employees through a satisfaction level survey and a survey on the demand for the convertible part-time system and improve the operation system in order to facilitate the usage of employees’ flexible working hour system. We have broadened the options through various schemes including alternative work scheduling, compressed working and smart working. In 2016, working types of the working-hour selection scheme were added to enable the operation of the flexible working hour system which transcends stereotyped working time and space.

Performance of the Flexible Working Hour System

Unit: number of people

Type		2014	2015	2016
Part-time work system		28	48	61
Flexible work system	Flex-time work, etc.	914	1,107	961
	Alternative work schedule	-	747	1,389
	Compressed working	-	-	1
Remote work system	Smart working	-	-	3
Total		942	1,902	2,415

Maternal Protection and Family-Friendly Management

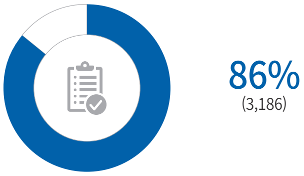
We create an environment for maternal protection for female employees during their pregnancy based on their needs. Their working hours are shortened, their job can be changed, and in-house married couples are appointed in workplaces in the same area. Moreover, the duration of maternity leave has been expanded for three years to prevent career interruption of women due to childbirth or childcare. The maternity leave after childbirth is 120 days for women with multifetal pregnancy. The number of working hours on weekdays was shrunk from 15 to 30 hours a week during pregnancy and childcare to guarantee a work-life balance as much as possible. Upon returning to work after using the childcare leave, their preference for job positions is fully embraced so that their existing job career can continue. We boost female employees’ job satisfaction and immersion by managing nursing rooms and in-house childcare centers in five sites and guaranteeing lactation hours during work. Meanwhile, we create a corporate culture that strongly recommends and is thoughtful of male employees when they are to take a child leave by guaranteeing the prior replacement with alternative personnel, thereby easing the burden for them to use the leave.

Corporate Culture

Advancement Strategies for Labor-Management Relations

Forming advanced labor-management relations of win-win cooperation is critical to continuously generate a favorable management performance. Aiming to establish desirable labor-management relations, pending agenda in the relations have been analyzed and labor-management relations strategies have been realigned based on internal diagnosis. Moreover, four strategy directions and eight strategy tasks were established based on the strategy goal of 'building cooperative labor-management relations based on principles and trust'. We form a desirable labor-management culture and establish a vibrant corporate culture in pursuit of joint future values of the labor and the management driven by such strategies.

Number of employees joining the labor union



Advancement Strategies for Labor-Management Relations

Vision	Next Energy, with KOGAS			
Core Values	Trust	Responsibility	Change	Challenge
	Trusted KOGAS		Vibrant corporate culture	
Strategy Goal	Building cooperative labor-management relations based on principles and trust			
Four Strategy Directions	Developing and practicing advancement strategies for labor-management relations	Expanding labor-management cooperation activities for trust recovery	Strengthening management competencies for facilitating communication	Rationally improving collective agreements
Eight Strategy Tasks	① Developing and practicing labor-management strategies ② Managing labor-management relations focusing on each site	③ Labor-management activities for recovery of public trust ④ Innovation of a corporate culture with vibrancy	⑤ Intensification of communication and harmony ⑥ Buildup of competencies for crisis response and management	⑦ Raising effectiveness in collective bargaining ⑧ Rationally improving collective agreements

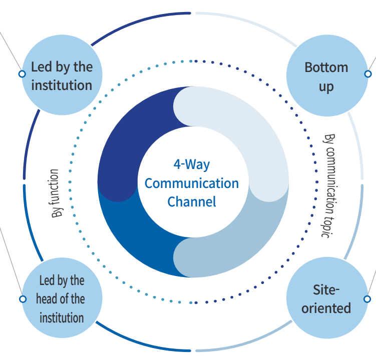
Strengthening Communication Between the Labor and the Management

Approximately 86% of all employees at KOGAS have joined the labor union, maintaining a high rate of unionists. This is why communication between the labor and the management is somewhat challenging although communication among unionists is easy. Not only that, workers in gas facilities in sporadic remote places nationwide might find it challenging to engage in communication, which requires smooth and diverse communication channels due to the diversity in interests among work forms, between headquarters and sites, and among job categories. Having identified such a communication environment and nature of the labor-management communication, we have established and efficiently utilized the '4-Way Communication Channel' through role-sharing by the subject of communication (led by the institution/the head of the institution), and function (bottom-up/site-oriented), thereby facilitating labor-management communication. In 2016, we formed a strong consensus between the labor and the management on conflicts within the organization thanks to facilitated corporation-wide communication including imbalances in promotion, wage gaps and labor-management conflicts as well as management agenda. We share the process of making improvement and rationally solve problems throughout the course.

4-Way Communication Channel

Communication channel	Key topics
① Collective Bargaining	Negotiating on the performance-based annual salary system and revision of the wage system & wage increase rate, etc. (15 times)
② Labor-Management Council	Agreeing on forming a task force to improve wage gaps among different work forms (29 times)

Communication channel	Key topics
③ 'Talk Talk' Meeting	Organizing luncheon meetings on pending management agenda for unionists at the headquarters (45 times)
④ Dialogue Time with the CEO	Explaining management agenda for employees on sites and listening to their suggestions (7 times)



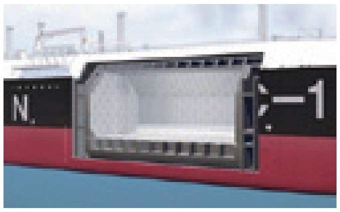
Communication channel	Key topics
⑤ La Plaza	Using KOGAS' first anonymous online communication and discussion channel (94 times)
⑥ 'Blind' of the Public Institution	Engaging in honest feedback and discussions on KOGAS' corporate culture and vision (55 times)

Communication channel	Key topics
⑦ Seminar on the Performance-Based Pay	Explaining the government's guideline on the performance-based system and that of KOGAS (draft) (management executives, 14 times)
⑧ Seminar on Management Agenda	Explaining management agenda and discussing the seamless operation of facilities (head of sites, 65 times)

Specialized Research-Based Technological Innovation

KOGAS Research Institute

The KOGAS Research Institute continues to conduct research to develop clean energies and future energy resources to create basic, yet core technologies and new growth engines in the entire process in the gas industry – exploration and development of natural gases, LNG transport and storage, and supply of natural gases. As of 2017, about 100 researchers are passionately involved in research and technological development to lead future gas technologies with investment of approximately KRW 110 billion in a total of 82 projects. We will further strive to undertake R&D to foster the domestic gas industry and develop future energy industries.



KC-1

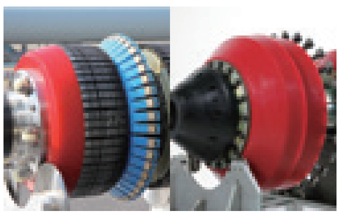
Korean-style LNG Cargo Containment System KC-1

The Korean-style LNG Cargo Containment System KC-1 started as a national research project to ease the dependency on overseas technologies and loyalty burden in 2004. We proprietarily developed the LNG Cargo Containment System KC-1 with domestic technologies after a decade of joint research with Korea's three shipbuilding companies (Daewoo Shipbuilding & Marine Engineering, Samsung Heavy Industries, and Hyundai Heavy Industries). Two out of six flag-registered LNG carriers adopted in Sabine Pass of the U.S. are expected to be equipped with LNG Cargo Containment System KC-1 to be delivered in September 2017. This is expected to bring about the royalty replacement effect of KRW 250 billion and the production inducement effect of over KRW 1.1 trillion. Furthermore, we are working on installing LNG Cargo Containment System KC-1 is to small LNG carriers in Aewol Terminal Division in Jeju.

270,000kℓ LNG Storage Tank

LNG Storage Tank with the World's Largest Capacity

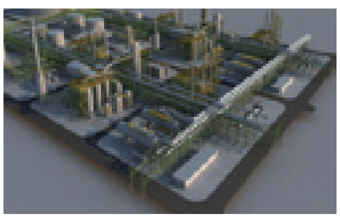
Amid increases in the natural gas import volume and demand, scale-up of LNG storage tanks to store natural gases has been emphasized as a core technology in the LNG industry. KOGAS developed a next-generation ultra-large LNG storage tank by fully leveraging LNG storage tank localization technologies and construction know-how gained through the existing R&D efforts. The storage tank touts a ultra-large capacity of 270,000kℓ. Comprehensive review took place on the tank on the thickness of the steel sheet that can be constructed, the occurrence rate of evaporation gas in the storage tank, and seismic load-driven design possibilities. In particular, the seismic scale in the design was upgraded from 6.5 to 7.0 to enable an optimized design that is safe and economical. The safety of the ultra-large LNG storage tank was verified by an external verifier. The technology developed was successfully applied to the Samcheok Terminal Division (LNG (Incheon, Samcheok, Tongyeong, and Pyeongtaek) Terminal Divisions). KOGAS was also engaged in the SLNG extension project in Singapore, successfully concluding a turnkey contract with the 270,000 kℓ storage tank technology.



Intelligent Pig

Smart Pipeline Management – Intelligent Pigs

The pipeline facility can be used semi-permanently, but continuous management is needed to prevent gas leakage including pipeline cracking. Intelligent Pigs are the cutting-edge pipeline management technology which accurately diagnoses the status of pipelines by penetrating inside the pipeline where gas flows. The pigs are applied with latest technologies including the data storage system, monitoring system, wireless reception/transmission system, and inertial measurement unit. It does not merely remove impurities within the pipeline, but detects abnormalities by identifying the pipeline thickness based on the measurement of magnetic flux changes. Accurate positioning is identified by being equipped with the inertial measurement unit, and the pipeline can be numerically mapped. As of June 2017, Intelligent Pigs are testing 2,391km-long pipelines for 46 sections, contributing to stable supply of pipelines for natural gas supply, and we are carrying out robotic development projects for 16-inch pipeline inspection.



Korean-style Liquefaction Process

Korea Single Mixed Refrigerant (KSMR) Technology

KOGAS developed Korea Single Mixed Refrigerant (KSMR) – an exclusive liquefaction process for natural gases – by intensively focusing on core technologies in the business of natural gas liquefaction plants as KOGAS' strategic core business. This technology is competitive in aspects of process simplification, easiness of operation and efficiency in production compared to the existing commercialization process in other countries. A verification test is to be conducted in the first half of 2017 as a test bed has been currently set up. We also plan on 'development of small-scale liquefaction plant process technologies' in tandem with recent diversification of global demands for gas.

Management Innovation – Driver of Sustainable Growth

BP (Best Practice) Contest

KOGAS organizes the annual BP Contest to select best practices and share them among business sites, contributing to higher management efficiency. In addition, we continue to foster corporate competencies through on-site innovation activities engaging working-level employees, and induce the interest of employees by using the brand of 'Best & First (BnF)'.

BEST & FIRST(BnF)

Achieving innovation earlier than others to be top-notch

Activities of 'First'

Discovering excellent tasks and ideas in and outside KOGAS and achieving sophistication of knowledge management

(Internal) Community of Practice – CoP

KOGAS creates excellent collective knowledge through activities of CoP (Community of Practice), a voluntary learning community and shares the performance through a knowledge management system, thus seeking higher efficiency in work, stronger productivity, and higher technological competitiveness. In 2016, we intensified strategy-based CoP activities to concentrate our competency on core tasks aligned with management strategies.

(External) KOGAS' Open Innovation Contest

KOGAS has organized 'Open Innovation Contest' to sophisticate knowledge management since 2016. We have strived to explore new business and technologies and improve irrational systems by acquiring technologies and ideas externally beyond our boundary. We have awarded prizes to excellent projects following the first stage of document screening and the second stage of presentation evaluation in future energy business and eco-friendly green business under the title of 'Contest on Ideas for New Energy Business'.

Activities of 'Best'

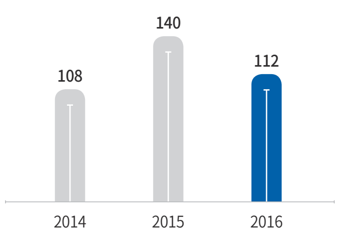
Spreading and sharing best practices derived from 'First' activities throughout the corporation

BP Contest

KOGAS shares performance in excellent knowledge management activities aligned with its vision and strategies at the end of each year, and organizes a contest to discover best practices. By doing do, we are spreading motivation among members on management performance with encouragement and rewards for strong performance. We review if award-winning best practices are applicable to similar sites after the contest so that it does not remain a one-time event, and apply them throughout the corporation.

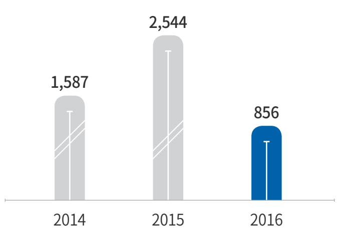
Excellent CoP

Unit: number of cases



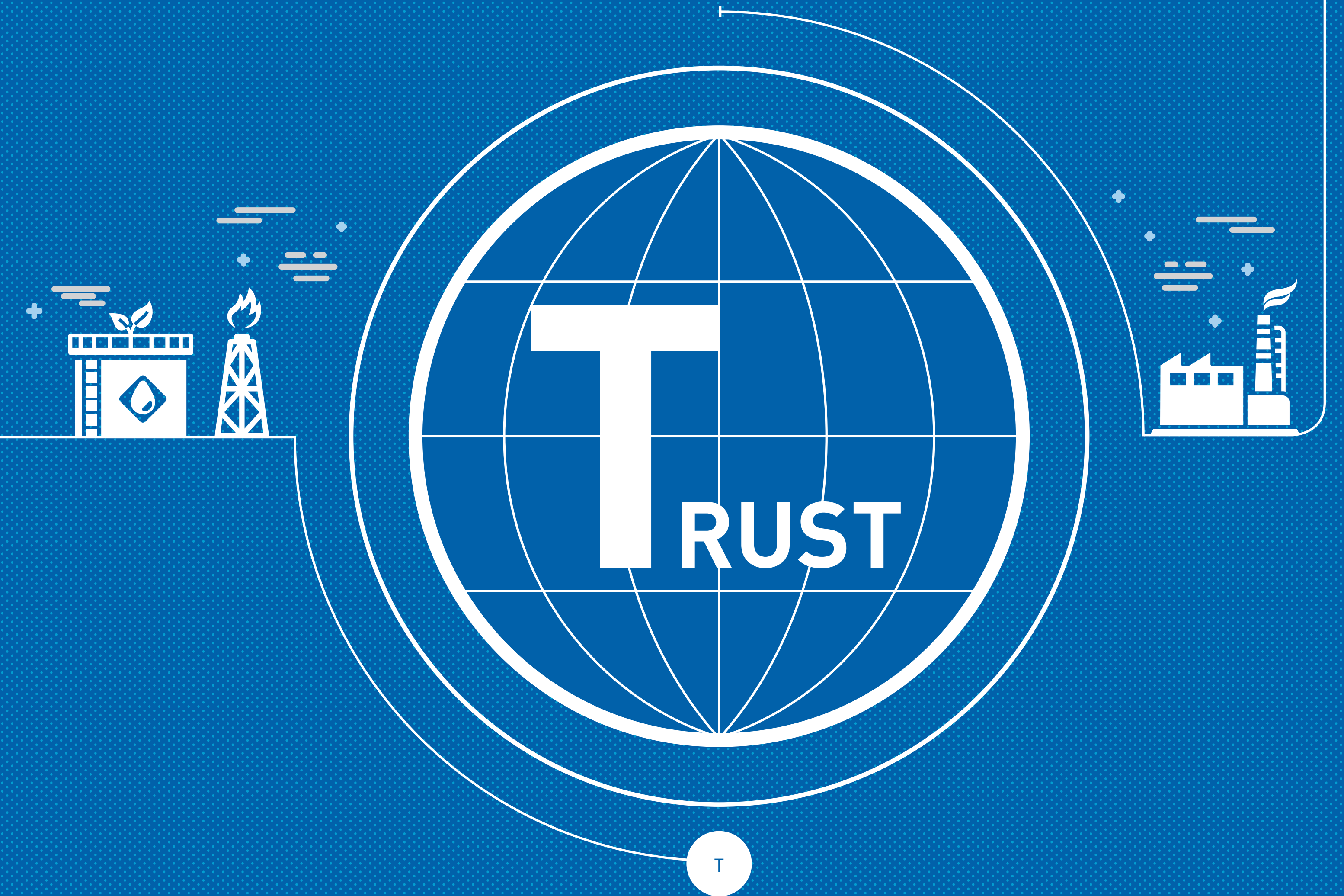
Financial Effects of Innovation Activities

Unit: KRW 100 million



NEXT Energy with KOGAS

True Energy World for the Future

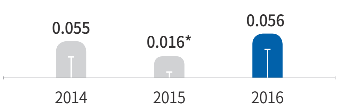


Stable Supply, Safe Sites

Production and Supply of Natural Gases

Natural Gas Loss Ratio

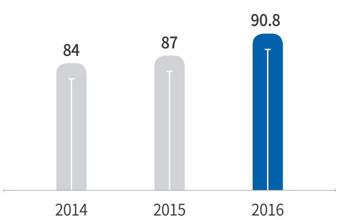
Unit: %



* Data for 2015 have been modified based on the findings of the accounting verification in 2017.

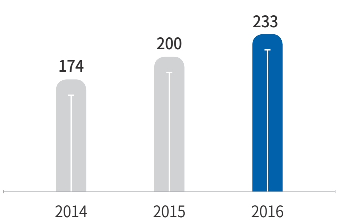
Natural Gas Distribution Rate to Local Governments

Unit: %



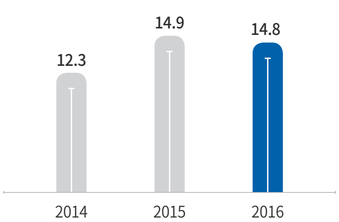
Completion Records of Supply Pipelines

Unit: km



Storage Ratio

Unit: %



World-Class Management of the Loss Ratio of Natural Gases

The natural gas loss ratio, that is, the ratio of the actual supply volume to the total amount of procurement is directly linked to KOGAS' revenues. Thus, KOGAS strives to ease the burden of natural gas fees for the public by minimizing the loss ratio and strengthening the revenue base. We have installed 16 metering stations by continuously adopting ultrasound metering stations which excel in accuracy, maintenance and operability compared to their counterparts. We have increased the level of expertise in the metering area by implementing calibration through authorized test institutions for the existing 3,451 metering stations and launching the Metering Management Team, and also run an exclusive business unit for efficient management. In 2016, the loss ratio for natural gases in 2016 stood at 0.056%, which was slightly up from the previous year, but the level has been continuously higher than that of overseas LNG terminal divisions of the identical level*.

* Company S in Italy with 0.045%> KOGAS 0.056%> Company E in the U.S. with 0.5%> Company D in the U.K. with 1.05%> Company N in Australia with 3.50%

Timely Expansion of the Production Facility Infrastructure

Facilities need to be expanded in a timely manner for a stable supply of natural gases. KOGAS is making preemptive responses by planning for mid- to long-term facility construction. Under a plan to increase the storage ratio by 20% by 2029, KOGAS completed the phase 1 construction project for the Samcheok LNG Terminal Division and started the send-out, opening up the era of production from four terminal divisions along with the ones in Pyeongtaek, Incheon and Tongyeong. Construction is underway for the LNG terminal division at Aewol Port in Jeju under the construction project for facilities to supply natural gases to Jeju. Accordingly, construction of Aewol Terminal Division is to be completed in August 2019 whereby the 20-inch main pipelines which are 81.9km long and eight supply management stations are to be constructed. Once completed, it is expected to supply natural gases of 150,000 tons per year throughout Jeju. Once convenient and economical natural gases are supplied in Jeju, it will contribute to higher convenience and benefits for local residents and self-sufficiency in electric energy supply within Jeju. Meanwhile, construction work for the main natural gas pipeline of 176km and 21 supply management stations was completed in June 2016. As such, we have successfully completed the 'project to set up a meshed network in the northern part of the metropolitan area' for stable supply of natural gases to LNG combined power plants and combined heat and power plants, while further disseminating natural gases in the northern part of the metropolitan area. We currently run the natural gas supply pipelines which are 4,672km long in total and 383 supply management stations, supplying gases to 208 local governments, and the national natural gas distribution rate is 90.8%.

Stable Gas Supply

KOGAS strives to ensure that no supply disruptions or power system failures occur by securely and stably operating facilities. In 2016, we removed factors of anxiety in supply by tightly preventing supply suspension as our clients continued to work on maintaining an appropriate level of supply pressure. We allocated highly skilled personnel and competent ones in major management stations first as a part of our efforts to prevent human errors. We also conducted periodic OJT training focused on cases of accidents and practice drills against simulated accidents once a quarter. We have also complemented the operational and work procedures, renewing the operation guideline in consideration of operating conditions in each management office, and strengthened the approval system in prior control stations upon operating valves in management stations. Furthermore, we have improved our supply and control systems: 'reinforcing the voice notification on key alerts in control facilities and operating the system in alignment', 'expanding the indication for the installment specification for the operating screen in management stations' and 'completing the voice notification function upon operating on-site valves and operating it routinely'.

Disruption in the Supply of Natural Gases and System Trouble

Unit: number of cases

	2014	2015	2016
Gas Supply Disruption*	0	0	1
System Trouble**	0	0	0

* Gas supply disruption: cases when there is a failure of gas supply to parties specified on the supply protocol and contracts

** System Trouble: cases when there is a gas supply of over one hour while not satisfying the needs on the demand side including the volume and pressure as a result of facility breakdown and accidents

Safety Management

EHSQ Management Measures

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

Safety Management Strategies

EHSQ Management System

Natural gases supplied by KOGAS might be safer than other sources of fuel, but due to the possibility of large-scale accidents caused by them, safety definitely tops any agenda. KOGAS has taken an active stance even more to establish the Environment, Health Safety & Quality Management System (EHSQMS), an integrated management system for health and environmental issues. For the EHSQ management system, we have acquired certifications of ISO 9001, ISO 14001, OHSAS 18001 and ISO 29001. The system has been designed and operated to be suited to domestic and international standards, which serve as the backbone to minimize on-site risks and raise productivity. We strive to achieve goals by sharing action plans throughout the corporation in order to advance the EHSQ management system and raise the level of safety culture.

Safety Management Strategies

Vision	Creating an Advanced Safety Culture Based on Autonomous Safety		
Directions	Raising awareness about safety	Strengthening consensus	Enhancing executing capabilities
	• Sharing the commitment of the CEO • Strengthening labor-management cooperation • Ensuring the management to lead by example	• Conducting voluntary safety activities • Developing a safety culture • Strengthening internal communication	• Compensating performance on safety • Intensifying the weight in evaluation • Strengthening internal competency
On-site Activities	Settling a site-oriented autonomous safety culture		

Ensuring voluntary engagement	Forging labor-management cooperation	Ensuring managers to lead	Continuing to carry on	Achieving on-site customization

Roadmap for Safety Management

2021 Attainment Goals	Safety Culture Index	KOGAS disaster rate	Disaster rate of partner companies	Number of facility accident cases
	Grade 8.1/Grade 10 as the full score	To reduce the disaster rate below one third of the average in the industry of electricity, gas, and water supply	To reduce the disaster rate below one third of the average disaster rate of public corporations	Zero

Safety Management of Sites

KOGAS has conducted site-oriented safety management activities to prevent industrial accidents on sites. In 2016, we reshuffled our organization and launched a separated exclusive unit for safety management to raise expertise of industrial safety and health activities. The amount of budget for expanding investment in safety increased with the injection of KRW 3335.3 billion in 2016, contributing to improved safety management. Meanwhile, as some of the issues have been continuously pointed out including incompetent safety management for small-and medium-scale construction sites and accidents involving suppliers, we added a special contractual condition upon signing a contract to impose safety management charges on sites lacking in safety activities. In addition, we have strengthened safety management activities by expanding the amount of constructions from over KRW 30 billion to over KRW 5 billion where the institution to exclude the industrial safety and health management cost from the bid price rate. In 2016, we achieved two consecutive years of zero accidents, and achieving the performance of being selected as a competent client in preventing construction accidents released by Korea Occupational Health & Safety Agency. The accident rate of our suppliers is at one third of the average rate of suppliers of corporate clients.

Disaster Management Evaluation*

* Evaluation of disaster management on the infrastructure system organized by the Ministry of Public Safety and Security
** Evaluation in 2015 was waived thanks to the evaluation result (excellence) in 2014

Advancing the Disaster Management System

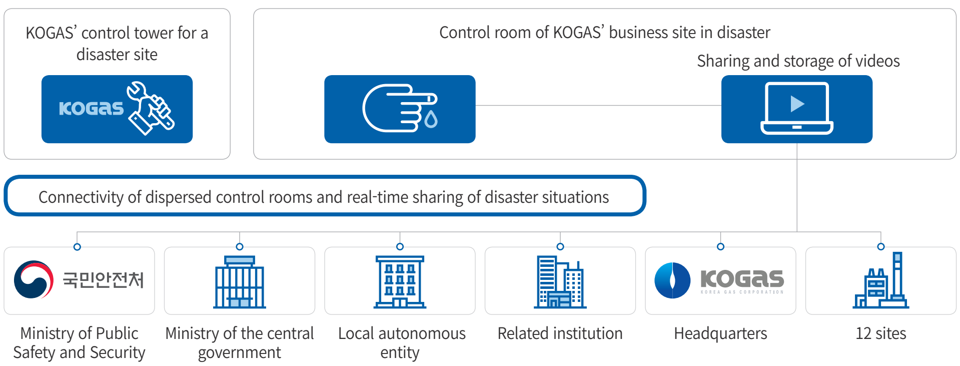
Disaster Prevention Activities

KOGAS performs activities to manage disaster prevention against natural disasters including typhoons, earthquakes and tsunami and emergencies including terrorism and fires outbreaks. Yearly strategies for disaster prevention are devised and implemented, while the action manual for sites is formulated and revised for us to come with response strategies for each stage of an earthquake and standards for facility operation. In addition, we have raised the level of interest among all employees by running an exclusive unit for disaster-related operations, and implements the preventive inspection which has been reinforced. The CEO implemented site safety inspection himself for vulnerable regions and facilities against disasters. Meetings to confirm on crises against natural disasters were organized under the moderation of the vice president of technology. In addition, we removed 356 risks by performing disaster preventive activities for 66 times through the national safety diagnosis and safety inspection during a vulnerable period, etc.

Competency Buildup for Disaster Response

KOGAS has put in place a systematic response scheme against disasters to protect the lives and properties of the nation and minimize damage when disasters are expected or take place. We improved the system in 2016 for such competencies for disaster response to be intensified. The system was realigned into the 'ICT Disaster Response System' by utilizing video conferences on individual PCs of public officials and 'Nara-e-um' service enabling online collaboration which was set up by the Ministry of Government Administration and Home Affairs. The system enables information sharing and joint crisis evaluation meetings on topical disaster situations among KOGAS in Daegu, Central Disaster and Safety Headquarters in Seoul, the Ministry of Trade, Industry and Energy in Sejong and local governments overseeing disaster sites when disasters occur. They produced a log-in manual to enable cross-institutional collaboration when disasters break out, and checked out its functions jointly with local governments over once a quarter. In addition, we improved the operating equipment at the Disaster and Emergency Operations Center so that the system could work better to enable real-time transmission of video information. The system was even applied to 'Safe Korea anti-Disaster Drill', a disaster response drill, led by the Ministry of Public Safety and Security whereby real-time videos are shared among multiple parties with such related institutions as fire stations. Such efforts enhanced capabilities to counter disasters so that the government-level roles as a control tower could be executed even when large-scale disasters occur.

System for Sharing Real-Time Disaster Situations



Performance of Optimized Operation of the Disaster Response System

Due to the outbreak of an earthquake of 5.8 Richter intensity in Gyeongju in September 2016, KOGAS was required to conduct evaluation on anti-seismic performance and reinforcement of KOGAS' earthquake-related facilities suited to natural gas facilities. As such, we completely revised the action manual for sites, separately managing the standards for crisis alerts and gas supply suspension, thereby preventing supply suspension induced by malfunction in measuring the seismic acceleration. Moreover, we conducted routine performance test on the pre-installed seismic detection facilities, and completely replaced obsolete and inappropriate instruments. Furthermore, the seismic performance evaluation was implemented in 11 stations in 3 areas to 72 in 4, respectively. Meanwhile, Daegu Gyeongbuk Regional Division overseeing the earthquake center of Gyeongju identified safety of underground buried pipelines, checking out soundness of 140km-long pipelines.

Raising Employees' Awareness of Health and Safety

Employee Health Management

KOGAS has established and operates a health management system for industrial health management and prevention of occupational diseases by preventing health risks in the middle of work on sites and offices, creating a pleasant working environment and systematically managing employees' health. Moreover, we run an in-house healthcare room to manage employees' occupational diseases at all times. When we see employees with detected diseases based on results of the annual health check-up, we intensively manage them by signing an agreement with a medical clinic in their region.

We formed a committee for not only managing employees' physical health but also solving and supporting psychological grievances. The committee is in operation to improve the psychological health of employees through periodic psychological tests. In addition, the Industrial Safety and Health Committee has been set up and operated to review and decide on key matters on industry safety and health including securing a safe workplace and ensuring safety and health of employees. We organize sports and mountain climbing events to improve employees' health and boost their collaborating spirit. We also try to boost individual health improving activities by operating such welfare facilities as a fitness center and a table tennis room and organizing health-related clubs. Furthermore, we ensure that our sites are free from smoking through continued efforts to wage an anti-smoking campaign throughout the corporation.

Safety Training for Employees

We conduct training to improve employees' awareness of safety for all our employees in order to strengthen the level of a safety culture throughout the corporation, and job function-specific training to foster safety specialists. In 2016, as we provided training on safety and health, 181 employees completed statutory training and 34 completed specialized training. We opened 14 courses in the in-house safety training sessions, and 788 employees completed them. For executives, we run a safety leadership enhancement program, while for team directors and above, we reflect the weight associated with disasters by revising it upwards in our internal performance assessment. We fulfil our social responsibilities for safety against disasters through diverse training sessions: 'Safe Korea anti-Disaster Drill' led by the Ministry of Public Safety and Security, joint anti-disaster drills among related institutions, monthly inspection of the video conference system in the Disaster Control Room, and video conferencing via the communication network for national mapping.

EHSQ Training System

Next Energy, with KOGAS

Establishing a Safety Culture, Fostering Specialized EHSQ Personnel

Establishing a system for enhancing the safety culture level
- Early adaptation and electrification
- Specialized competency buildup
- EHSQ leadership competency build-up

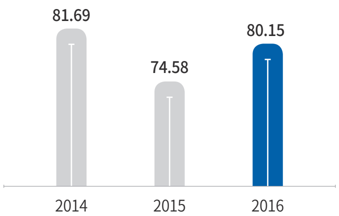
Setting up a training system by job function
- EHSQ personnel development
- EHSQ site personnel development
- EHSQ specialized personnel development

Type	Goal	Objective	Target	Curriculum	
Establishing a system to improve the safety culture level	Early adaptation and electrification	• Learning the culture of KOGAS and EHSQ culture	Employees having worked for KOGAS for two years or less Grade 6 or below	• EHSQ training in recruiting new employees • Training EHSQ legal training	• Regular safety and health training • Disaster response(risk management) training • Cyber safety training • 365-Day Safety Campaign • Gas fire drills
	Specialized competency buildup	• Raising awareness about being involved in safety • Strengthening specialized competency based on the EHSQ culture in each field	Employees having worked for KOGAS for 3~10 years Grade 5~3	• EHSQ legal management training • EHSQ training by job function	
	EHSQ leadership competency buildup	• Enhancing the safety awareness among the management	Employees having worked for KOGAS for 11 years or more Grade 2 or higher	• Safety Leadership Program (SLT) • Safety and health manager training • Supervisor training	

Information Security

Evaluation of Information Security Management

Unit: number of points



Setup of the Latest Information Protection System

OTP* certification system
- ID/PW(Stage 1)+OTP(Stage 2)

▼ Reinforced certification of portal users

e-mail information protection system
- Defense against APT* attack
- Encryption of information

▼ Blocking 60,000 cases of intelligent threats

USB security system
- Management of USB usage history
- Possible control of CDs and mobile phones

▼ Control of carrying out of all types of mobile devices

* OTP: One Time Password
* APT: Advanced Persistent Threat

Establishing and Operating Information Security Management

Selection of Key Tasks for Information Security

Cyber infringement against public institutions has been recently expanded and security technologies have been reinforced driven by acceleration in the IT environment. In addition, policy, technical and managerial protection measures for the security environment of KOGAS have been required to be stronger due to limitation on unnecessary collection of personal information and more stringent laws and regulations on management activities. As such, KOGAS acquired the ISO 27001 certification, and selected three core tasks for information security to manage them in multi-dimensional manner: acquiring a strategic response system for evaluation of external institutions, operating an in-house control center and establishing a collaborative system, and setting up a system for integrated management of corporation-wide documents and content.

Acquisition of the International Certification of the Information Protection Management System (ISO 27001)

KOGAS has acquired the certification of ISO 27001 – the certification on the international standard for information protection – in order to proactively take part in protection activities for national infrastructure against cyber threats, while initiating security reinforcement by promptly embracing the rapidly changing information security policies. Having complemented the existing weakness in incompetent comprehensive standards on the security control, we applied 114 standards in 14 areas of ISO to the corporation-wide business network and key operations (manufacturing, sales, etc.), thereby systematically managing potential security threats. We have standardized 10 operational standards and procedures including a procedure of personal information infringement, and complemented technical weaknesses including firewalls 100%.
Not only that, we improved the level of security by securing a routine surveillance system for on-site information security to ensure preemptive security management. Having removed vulnerabilities in personal information online and offline and reinforced the level of security, we achieved zero case of personal information leakage.

Roadmap for the Information Protection Management System

Strengthening the system to inspect information security through the information protection prescribed in ISO 27001

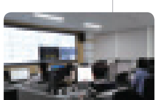
Periodic inspection and classification of threats ⇨ Extraction of prioritized tasks for improvement ⇨ Systematic measures

Setting up a system to block the mobile Internet	Setting up the Disaster Recovery Backup Center	Expanding the application of Digital Rights Management (DRM)
Completely blocking abnormal mobile accesses	Ensuring perfect restoration upon the destruction of the main IT center	Blocking the external leakage of internal information

Setup and Operation of the Cyber Control Center

KOGAS established the 24/7 Cyber Control Center, which can block cyber threats through emergency actions and fast initial measures when security accidents occur by comprehensively monitoring from infrastructure associated with people's entry, video footage, firefighting and electricity. Meanwhile, latest information protection systems are applied to OTP certification, e-mail information protection system and USB security system to remove security threats, thereby blocking 60,000 cases of risks.

KOGAS' Comprehensive Cyber Defense System



Setup of the Cyber Control Center (operating 24/7)

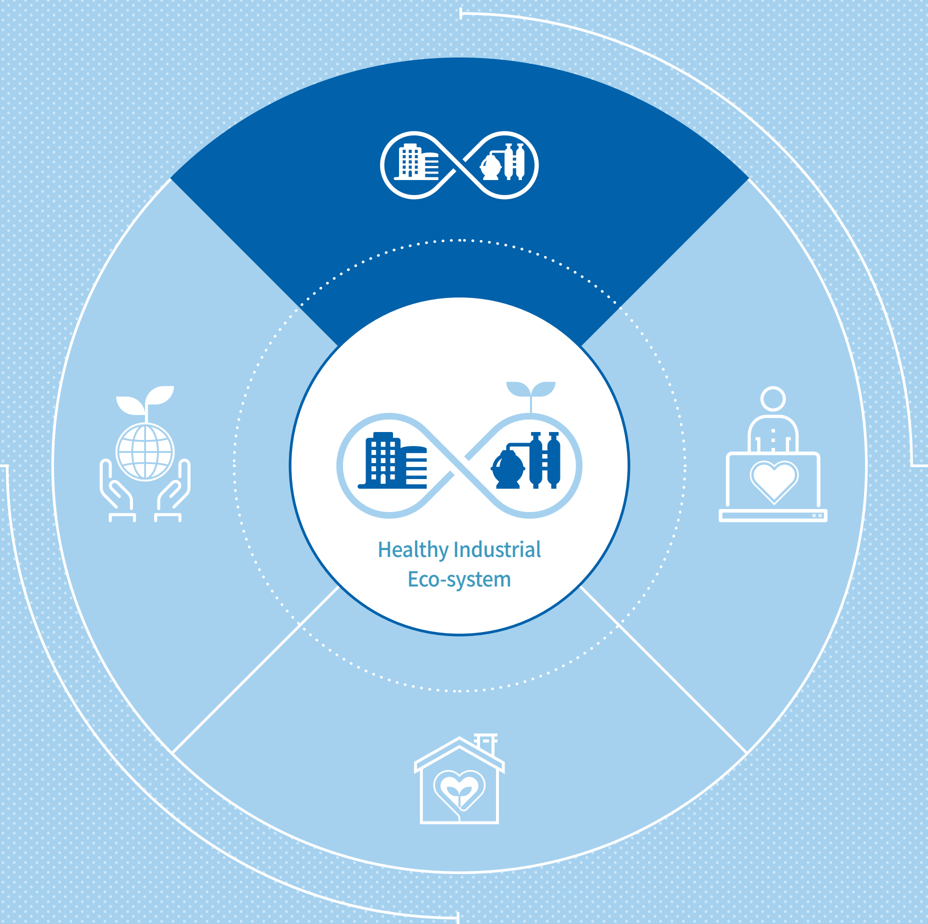
Setup of the Cyber Control Center		▶ Implementation of internal comprehensive control
Setup of infrastructure	Entry, video footage, firefighting and electricity	Operation of cyber security control
Network deployment	Setup of Security control network	
Setup of control system	Set up of the integrated monitoring system	

Shared Value with KOGAS

Healthy Industrial Eco-system

MANAGEMENT APPROACH

KOGAS believes that creating a sound corporate ecological environment for the natural gas industry is an obligation of a public corporation to keep in mind for the sake of the nation and the public, and puts a high priority on the relevant issues. We maintain a fair partnership with small-and medium-sized suppliers and extend support for their growth to ensure win-win cooperation and shared growth. We contribute to higher productivity in the natural gas industry by sharing our technical prowess and know-how, and secure growth engines for Korea as well as the gas industry by expanding the procurement of products from SMEs.



●
We cooperate with SMEs to explore their new business channels at home and abroad.

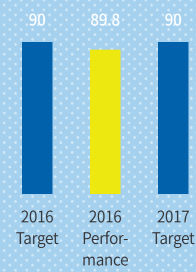
●●
We extend support to strengthen SMEs' R&D competencies.

●●●
We disseminate a performance sharing system to settle a culture of fair performance distribution.

KEY PERFORMANCE & NEXT GOAL

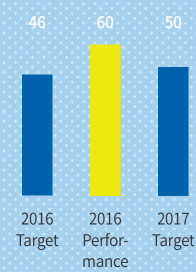
Satisfaction Level in Shared Growth Projects

Unit: points



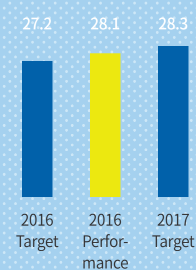
Number of companies participating in the channel support project

Unit: number of companies



Records on procurement of SME products

Unit: %



Shared Growth

Strategies for Win-Win Cooperation for Shared Growth

System for Initiating Shared Growth

KOGAS suggests a double gear growth model to create synergies by fostering the industry throughout the entire industrial eco-system for natural gases and jointly developing technical packages of private companies. We carry out activities of win-win cooperation with two axes – securing growth engines in SMEs and turning SMEs into global giants – accordingly, and pour in all-out efforts to spread the culture of shared growth.

Mid- to Long-Term Shared Growth Roadmap

~2017	Short Term
• Recognition as an institution of excellence in the shared growth evaluation • Successful completion of the initial operation of the gas project-type export strategy system (GASPO) • Localization of equipment and materials and completion of a roadmap for technological development	

2018~2021	Mid Term
• No.1 in rank as a public corporation specializing in energy • Expansion of the operation of Gas Industry ExPOrt Platform (GASPO) • Localization of equipment and materials and initiation of Phase 1 of technological development - Execution of tasks which can be internally initiated	

2022~2025	Long Term
• Entry into the rank of world-class shared growth • Aligned operation of GASPO and the localization system • Localization of equipment and materials and initiation of Phase 2 of technological development - Execution of tasks requiring collaboration with the government, etc.	

System for Initiating Shared Growth

Vision	KOGAS, a Platform for Glocal Natural Gases with SMEs			
Model for Growth	Model for Double Gear Growth			
Double Gear Targets	1st Gear: Securing growth engines (securing growth engines of SMEs)		2nd Gear: Developing global giants (helping to turn SMEs into hidden champions)	
Four Strategies	Strengthening technological competitiveness	Intensifying corporate productivity	Reinforcing efforts to discover new channels	Creating a culture for shared growth
12 Strategic Tasks	Facilitating the R&D mentoring system Developing jointly aligned technologies expanding infrastructure Expanding projects for cooperation in technological development	Supporting productivity enhancement Supporting liquidity for SMEs Strengthening competencies of SMEs	Jointly discovering overseas channels Jointly advancing into overseas projects of KOGAS Supporting the discovery of markets for domestic demand	Facilitating the performance sharing system Expanding projects for local win-win benefits Facilitating the Shared Growth Council

Organization in Charge

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

Organization in Charge of Shared Growth

Organization in Charge of Shared Growth Tasks

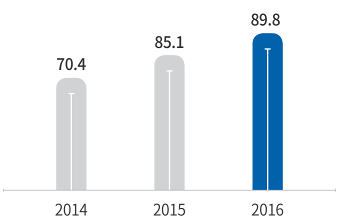
- CEO
  - Planning management: **Strategy Planning Department** – KOGAS' overall business analysis and policy planning, etc. including shared growth tasks
  - Execution control: **Top management/Executives**
  - **Audit Team** – Internal control of appropriateness of initiating operations including prevention of unfair transactions
  - **Shared Growth Team (supervision/in charge)**
    - Initiation of supervision of operations
    - Setting and management of key performance indicators (KPIs) in subordinate supporting units
    - Internal evaluation and reward on performance of shared growth
  - Support: **Corporate Culture Team** – Formation of a culture of sound shared growth including improvement in the hierarchical culture with SMEs
  - **Material Contracting Team** – Improvement in the system for deregulation and procurement of SME products
  - **Divisions Nationwide** – Procurement of SME products, development of small-amount technologies, and receipt and management of complaints
  - **Construction Department** – Procurement of materials for construction associated with equipment construction, and exploration of tasks for technological development
  - **KOGAS Research Institute** – Mentoring of technological development for SMEs, technical problem-solving and support for joint usage of research equipment and materials
  - **Overseas Business Department** – Joint entry into overseas projects with SMEs
  - **E&P Business Department** – Joint entry into overseas projects with SMEs
  - **Facility Operation Department** – Procurement of SME products involved in facility operation, and exploration of technological development tasks

Related councils

- **Shared Growth Management Council**
  - Key role: consultation on key policies for shared growth
  - Frequency of meetings: whenever needed
- **Working-Level Council for Shared Growth**
  - Key role: consultation on measures to implement policies for shared growth
  - Frequency of meetings: quarterly
- **Public Procurement Manager Council**
  - Key role: consultation on the expansion of procurement of SME products on site
  - Frequency of meetings: semiannually
- **Council for Shared Growth on Site**
  - Key role: discussion on measures to cooperate with SMEs on site
  - Frequency of meetings: whenever needed

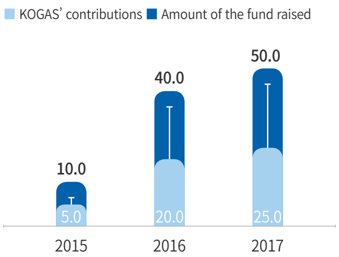
Satisfaction Level in Shared Growth Projects

Unit: points



Amount of the Shared Growth Fund Raised

Unit: KRW billion

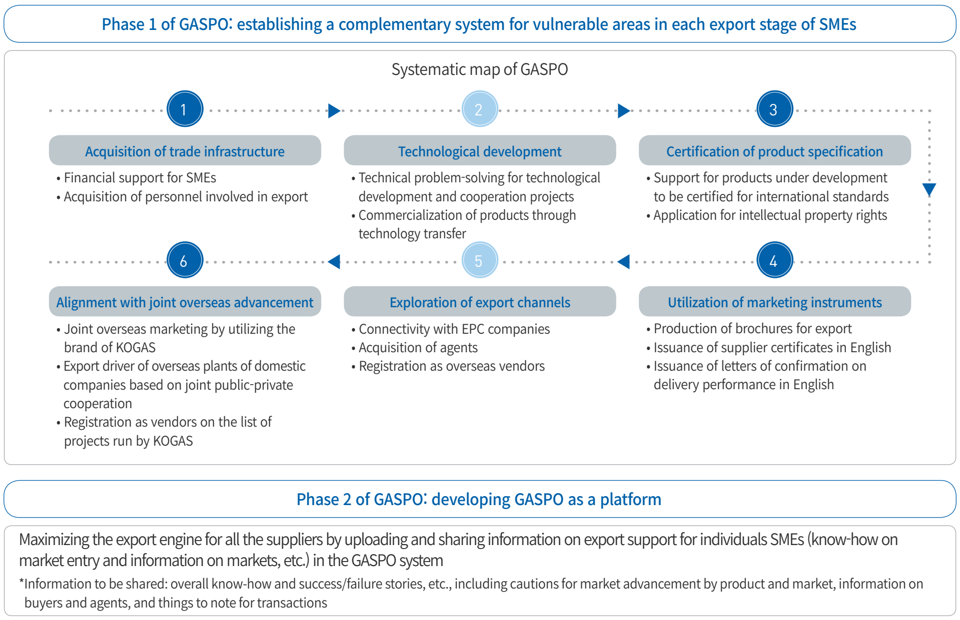


Strengthening Sales Channels

Establishing 'KOGAS Export Platform' to Explore Overseas Sales Channels for SMEs

Export of SME products requires an organically connected process in action, which covers acquisition of trade infrastructure, ownership of technological prowess, certification of product specifications, acquisition of marketing instruments and exploration of export channels. Even a single problem within the process might, in fact, block the path for export. Against this backdrop, KOGAS established the Gas Industry ExPOrt Platform (GASPO), a platform for systematic export support. It aims to support small-and medium-sized suppliers to develop their competency in each export stage and improve their capability for exclusively strengthening areas lacking in export potentials, in consideration of the nature of KOGAS and government policies. GASPO is a platform which has integrated and complemented the existing sporadic schemes for export support into a single system. We ensure to diagnose and resolve points of possible export blockage by setting up and implementing GASPO, and activate and operate the function of each core stage.

GASPO system



Overseas Promotional Activities by Utilizing the Brand of KOGAS

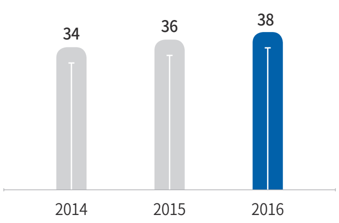
KOGAS supports overseas marketing for SMEs by utilizing its brand and recognition. We have set up booths to promote small-and medium-sized suppliers to promote them with the brand of KOGAS up front in a large-scale international gas industry conference and exhibition, and produced and distributed a joint brochure to introduce their products and corporate profiles. This type of support was effective in forming trust among visitors of KOGAS' booth toward small-and medium-sized suppliers as customers and partners of KOGAS, whose qualification requires stringent technical standards and conditions. We also ran KOGAS Shared Growth Pavilion of 25 booths in not only domestic exhibitions including 'GAS KOREA' and 'Environment & Energy Tech' but also Abu Dhabi International Petroleum Exhibition & Conference where export consultations worth USD 46 million were carried out, thereby contributing to exploration of sales channels for SMEs.

Support for Exploration of the Domestic Market

KOGAS explores new markets by forming a model for shared growth in acquiring sales channels for SMEs based on private-public cooperation. We carried out the 'project to convert LNG engine for ships' under a joint initiative among KOGAS, Busan Metropolitan Government and SMEs whereby (two) public ships held by Busan Metropolitan Government were converted into LNG ships on a pilot scale, and an agreement on joint implementation was signed to expand the conversion up to 28 ships. As such, we proceeded with cooperation projects which are expected to improve the marine atmospheric environment, and bring about an increase of KRW 6 billion in annual sales volume for SMEs.

Strengthening Technological Competitiveness

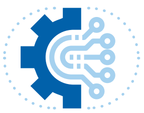
Contracts on technology transfer (accumulated)
Unit: number of cases



R&D Mentoring System

KOGAS strives to address the challenge confronted by SMEs due to a shortage of researchers through several programs to intensify the technological competitiveness of SMEs in the natural gas industry: 'technological mentoring system' and 'one-point solution for bottleneck techniques' by leveraging the resources of research workforce at the Resources Technology Research Center, LNG Technology Research Center, New Energy Technology Research Center and Research Center for Technical Support. In 2016, we provided five cases of technological mentoring including the 'development of super-high-efficiency stainless-type heat recovery mechanism for gas-powered equipment' and five cases of one-point solutions for bottleneck techniques related to localization of gas flow meters.
Meanwhile, we completed 38 cases of technology transfer up until 2016 through the 'development of SME products through the transfer of retained technology and related projects' to transfer natural gas-related IPRs held by KOGAS to SMEs. We performed nine cases of test projects in 2016 in KOGAS' natural gas facilities including LNG terminal divisions and pipelines under the 'project to provide a test bed for products developed by SMEs which utilize natural gas facilities'.

Amount of reduction in procurement cost by utilizing products of successful technological development



KRW 1.28 billion

Amount of reduction in procurement coast by utilizing localized components

KRW 1.46 billion

Technological Development Cooperation Projects

KOGAS develops technologies aligned with new growth projects including LNG bunkering and fuel cell projects, and localizes major equipment and materials for gas facilities in partnering with SMEs on technological development. We extend technological development cost and experiences with site operation to small-and medium-sized suppliers, which, in turn, secure technological competitiveness by developing key components for gas facilities with their own technological prowess. The technologies and products that are developed are procured by KOGAS to guarantee revenues for SMEs, which could pave the way for KOGAS to stably supply natural gases by reducing the procurement cost of foreign products and improving the facility performance. In 2016, we sponsored technological development cost worth KRW 1.1 billion for 19 tasks, through which, cost reduction and import substitution effects worth KRW 2.7 billion were generated.

Strengthening Corporate Productivity

Expanding Programs of Win-Win Benefits for SMEs

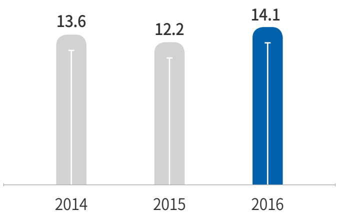
KOGAS has implemented the project of 'Small and Medium Business Corporation Plan' along with SMEs, aiming to help them lay the foundation for inducement of long-term retention of core personnel and for the influx of competent talents. The project is intended to provide performance pay – the joint fund accumulated by an employer and an employee - to mid-term core personnel after their five continuous years of service. KOGAS plans to extend KRW 198 million for the next five years by selecting 33 core personnel in about 10 companies.
We also run the 'Shared Growth Fund' worth KRW 50 billion as a project to support SMEs' fund liquidity. It is to provide a low-interest fund to SMEs by forming a loan fund via one-on-one matching with the Industrial Bank of Korea based on KOGAS' non-interest deposits. We secured a fund worth KRW 50 billion from the deposits of KRW 5 billion in 2015 and KRW 20 billion in 2016, and executed loans of KRW 47.1 billion to 168 SMEs. Furthermore, we perform projects of win-win cooperation by establishing the fair trade order through the introduction and setup of the 'Win-Win Payment System', and support SMEs' liquidity through early conversion of suppliers' sales proceeds into cash and risk prevention of serial bankruptcies.

Training for Competency Buildup for Employees of Small-and Medium-Sized Suppliers

Having recognized a lack of opportunities in training for small-and medium-sized suppliers due to a challenging management environment and a lack of supporting schemes, KOGAS provides diverse training and consulting programs to foster their practical competencies on production sites and their capabilities for job functions. We have opened our internal employee training programs for those of small-and medium-sized suppliers to take, and enable them to develop their understanding of natural gases and practical capabilities through site visits of production and supply facilities in the natural gas industry. Furthermore, cyber training sessions are provided to upgrade their employees' job functions and language proficiency so that they competencies could be strengthened by completing courses on business, professional job functions and foreign languages.

Spreading the Culture of Shared Growth

Dissemination Level of the Performance Sharing System*

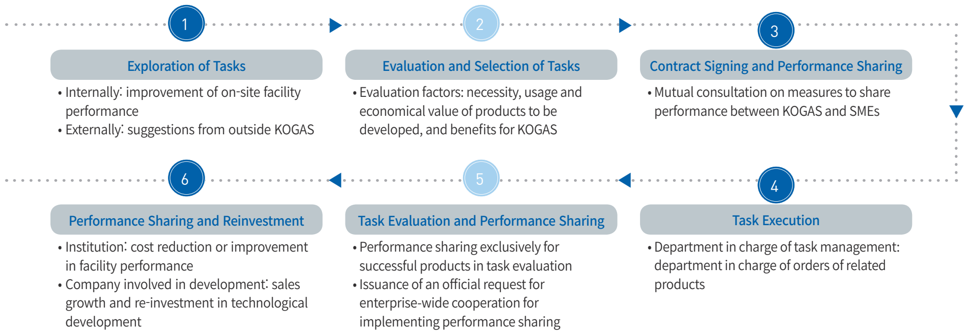


*Dissemination Level of the Performance Sharing System: the number of registered tasks in the year of evaluation X 0.3 + the number of identified tasks up to the year of evaluation X 0.7

Spreading the Performance Sharing System

KOGAS implements the performance sharing system to select tasks catering to joint needs of small-and medium-sized suppliers and KOGAS, extend economic and technical support and share the performance. Both entities gain win-win benefits and achieve goals of shared growth as the system spreads a culture of fair performance distribution and provides opportunities ranging from product development and opening of sales channels. We raise efficiency of the system by periodically measuring and evaluating the process of implementing projects for technological development cooperation and competency buildup of SMEs. Meanwhile, we have expanded the topic of tasks to the 'area of utilizing natural gases' and launched a system for small-scale technological development, recognizing internal and external environmental changes: reduction in the number of registered tasks due to a lack of consensus for the need for shared growth with SMEs and reduction in the demand for gas; and lower sales of SMEs due to shrinkage in investment in new facilities amid slowdown in overseas development. As a consequence, we discovered five tasks in the area of natural gas utilization and seven tasks in small-scale technological development in 2016.

Process of KOGAS' Performance Sharing System

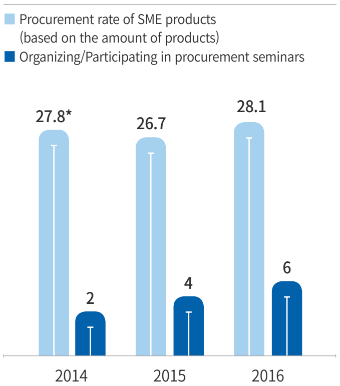


Expanding Local Win-Win Projects

KOGAS provides consulting for productivity innovation and wages an industrial innovation movement to support production facilities and technological development of SMEs and small-and medium-sized suppliers (including secondary and tertiary ones) in Daegu where KOGAS headquarters is located. We have made achievements for nine companies from November 2015 in the following areas: improving the working environment, preventing safety accidents, acquiring systematic development methodologies and competencies for developing manuals, and consulting on and supporting the basis for standardizing the product development stages and quality assurance system. By doing so, we improved the defect rate associated with outsourcing in SMEs and reducing their production cost.

Procurement of SME Products

Unit: %, number of cases



* Since 27.3% disclosed in the 2016 Sustainability Report is wrong, it is to be corrected as 27.8%.

Listening to Bottlenecks of SMEs and Improving Systems

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

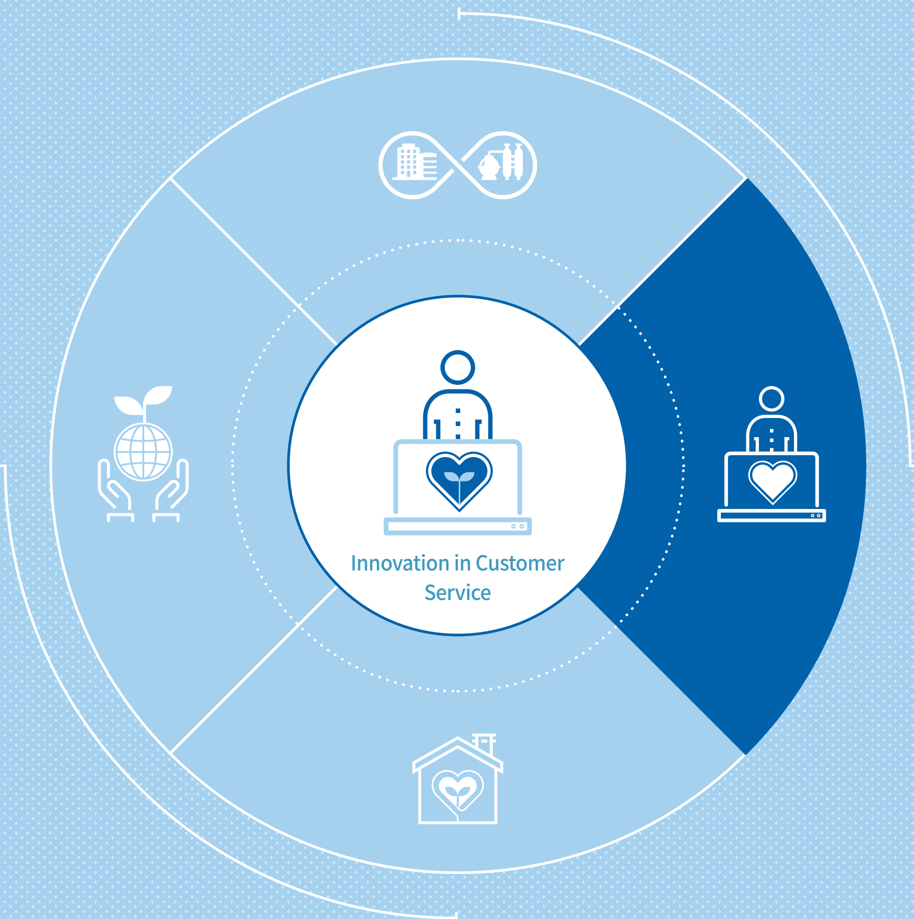
Expanding the Procurement of SME Products

KOGAS conducts training for employees in charge of the public procurement system to spread procurement of SME products, and ensures opportunities to promote their products and meet one another in procurement seminars of public corporations and SMEs. The SME product procurement rate in 2016 reached 28.1%, and the number of times KOGAS organized and participated in procurement seminars was six, which has been gradually rising.

Innovation in Customer Service

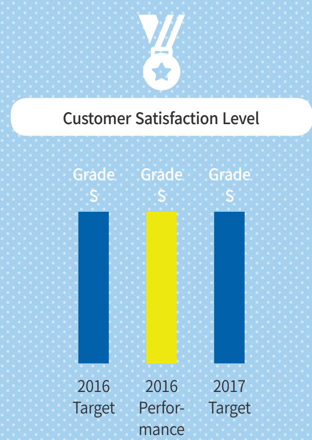
MANAGEMENT APPROACH

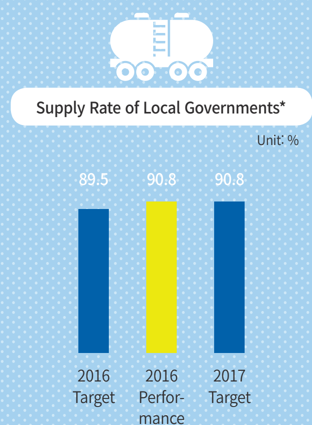
KOGAS defines customers as targets of direct and indirect services in the distribution process of natural gases. Customers are categorized into three groups: first, the general public as end-users of natural gases indirectly provided by KOGAS; second, city gas producers delivering natural gases from KOGAS to consumers; and third, large-volume consumers directly provided with services by KOGAS. We run a network for customer satisfaction management to provide products and services that satisfy customers, identify customer needs through close communication, and reflect them in management activities.



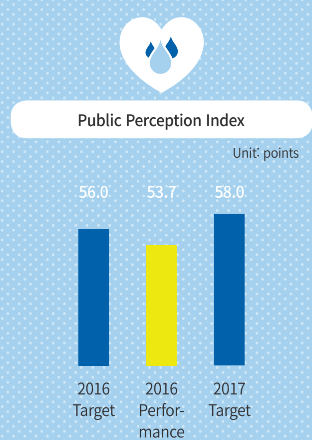
- We provide services for the public to perceive the benefits through innovation in public services.
- We implement user-oriented management activities for improvement in public benefits.
- We establish a system for communication and collaboration for win-win growth with customers.

KEY PERFORMANCE & NEXT GOAL





* Supply rate of local governments = number of supply of local governments ÷ total number of local governments



Public Satisfaction Management

Innovation in Public Perception-Driven Service

Strategies for Innovation in Public Perception-Driven Service

KOGAS is a public corporation established to enhance the livelihood and public welfare of citizens by securely and stably supplying natural gases. KOGAS defines customers as all targets of direct and indirect services ranging from city gas producers to the public. We make diverse efforts to satisfy customers by identifying customer needs and reflecting them in management activities.

System for Innovation in Public Perception-Driven Service

Innovation Objective	Raising the quality of public service and happiness of the public driven by autonomous innovation		
Innovation Directions	Raising benefits for the public	Improving public-oriented services	Easing the burden of the public
Innovation Tasks	Establishing a system or communication and collaboration Intensifying activities for information sharing Raising efficiency in collaboration-based investment	Improving systems to be rational Proactively opening facilities Reforming irrational regulations	Reducing the gas cost Lowering the cost for gas supply infrastructure

Roadmap for Innovation in Public Perception-Driven Service

Level 1	Level 2	Level 3
Period of another jump-up: 2015~2016	Expansionary period: 2017~2021	Settlement period: 2022~2025
• Laying the foundation for collaboration and win-win growth • Intensifying activities for autonomous innovation	• Intensifying site-driven innovation activities • Strengthening the efforts to share innovation activities	• Establishing an enterprise-wide culture of innovation • Realizing a corporate culture in pursuit of innovation

Customer Satisfaction Level

2014	2015	2016
Grade A	Grade A	Grade S

Customer Communication

KOGAS enhances its corporate image and perception by expanding the channels to communicate with the public. We run a promotional pavilion, and promote key achievements through media on shared growth, higher public benefits and expansion of energy welfare. In addition, various types of content are available on our website and SNS to expand the customer relationship network.

We run the enterprise-wide 'network to initiate customer satisfaction management' to identify customer needs. KOGAS' on-site service organizations led by excusive departments by customer type handle job functions for customer satisfaction management. CS leaders have been selected by customer type and contact point, thereby enhancing our capability to execute tasks for customer satisfaction. In addition, the CS Initiation Committee is periodically up and running on site with the participation of customer members to listen to the voices of customers and improve customer services. We also operate 'KOGAS CS SCHOOL', a win-win cooperation and competency buildup programs for wholesalers and retailers. We also conduct demand forecasting training for personnel in charge of volume partially committed for the city gas so that KOGAS and customers could exchange demand forecasting data, paving the way for higher accuracy in demand forecasting.

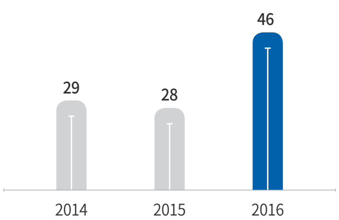
KOGAS conducts on-site seminars to address inevitable problems that occur at sites in advance, thus listening to the voices of customers and finding solutions with customers. KOGAS is equipped with face-to-face communication channels for key customers including city gas producers, power generators, and direct suppliers. Programs we run include a joint workshop with customers, the Demand Development Council, a seminar on tariff schemes, a seminar for customers, tech information exchange meetings, Demand Development Workshops, and On-site Business Day. Customer VOC is monitored in real time through online customer support systems including the customer support system, the customer center on the website, and BIZ portal. Such efforts served as the basis to collect actual customer feedback. We strive to fully reflect the rational demands derived from the process in improvement tasks.

Performance in Activities for Innovation in Public Services

Improvement in Public Benefits by Establishing a System for Communication and Collaboration

KOGAS is leading changes of happiness for the public by engaging in user-oriented customized services. We have set up oceanographic big data in collaboration with the National Fisheries Research and Development Institute for long-term and continuous management of oceanographic information because of diverse types of complaints continuously raised on the cooled water discharge due to the operation of LNG bases, and the occurrence of damage done to nearby local fishermen, especially from the red tide resulting from global warming, etc. The system was disclosed through the web service with the real-time reflection of the materials through five buoys observed by KOGAS and the oceanographic observation data of the National Fisheries Research and Development Institute. Furthermore, information on fish farms is provided in real time to nearby local fishermen by providing the function of the red tide alert system.

Number of cases registered to apply for incentives for facilities for the underprivileged
Unit: number of cases



Promotional stickers for the project to support gas cooling

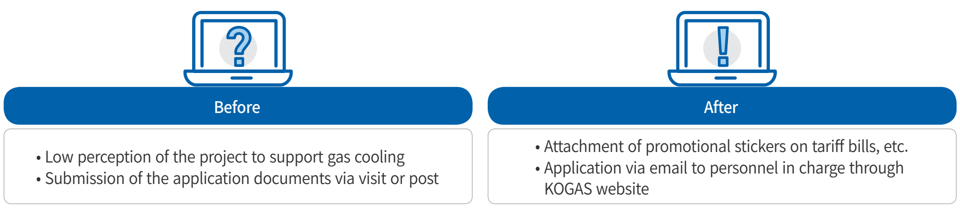
Improving Public-Oriented Services by Enhancing Public Perception-Driven Systems

Upgrading Services through System Setup and Improvement

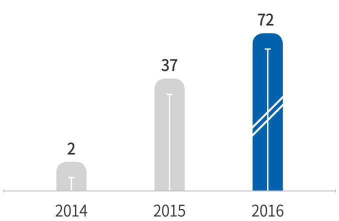
The Gas tariff Reduction Management System (GRMS) whose service is provided by KOGAS is s system for the public eligible for gas tariff reduction to conveniently apply for the benefits and for personnel in charge of city gas production to manage it with convenience. The method of applying for city gas tariff reductions and the qualification renewal was improved and simplified in alignment with the government's administrative network for the underprivileged. The number of households that received the benefits of gas tariff reduction in 2016 increased by 12% to 1,039,000.

Meanwhile, we initiated the simplification of the application procedure for the project to support gas cooling. The existing five-step application procedure was streamlined to a three-step one to be performed on KOGAS website, thereby improving the procedure to be simpler. As a result of recipient-friendly promotional activities, the number of applications for incentives for facilities for the underprivileged reached 46 in 2016.

Efforts to Expand Recipients in the Project for Gas Cooling



Conversion of fuel into LNG for yard tractors (accumulated)
Unit: number of units



Converting Fuel into LNG for Yard Tractors

KOGAS has continued to convert the fuel into LNG for yard tractors - container carriers in operation in ports – by signing an agreement with the Ministry of Oceans and Fisheries and Busan Port Authority. The fuel cost burden has been eased (approximately KRW 13 million/unit) by saving approximately 38% compared to diesel fuel through the supply of LNG to yard tractors. Moreover, the working environment was improved for port workers who used to suffer from the exhaust emission, while GHG from ports was dramatically lowered.

Lowering the Public Burden Driven by Efforts to Reduce City Gas Tariff

We ease the public burden and enhance energy welfare by efficiently running our projects. We reduce the public burden through timely reflection of tariff reduction factors, and share the pain with them by applying tariff discounts to the public hit hard by natural disasters including an earthquake or a typhoon. In particular, when petitioners eligible as a multi-child (three or more) family apply for birth registration, the process is handled at a city community center in an integrated manner so that recipients can receive tariff reduction benefits without undergoing an extra application process.

Responsibilities to Local Community

MANAGEMENT APPROACH

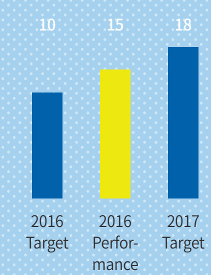
KOGAS considers that it is a responsibility as a public corporation to achieve win-win cooperation with the local community, gaining its support and trust, while extending sufficient support by communicating proactively with community and identifying mutual needs, perceiving that it is the starting point of value sharing. In addition, we have implemented social contribution activities which pursue creation of both corporate values and community values, transcending social contribution activities in a philanthropic one-way support.

- We proceed with social contribution activities which create shared value.
- We embody 'Onnuri' – KOGAS-style social contribution brand.
- We take the lead in facilitating the local economy.

KEY PERFORMANCE & NEXT GOAL

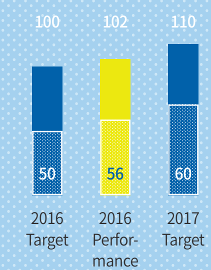
Expansion of the Portion of Investment in Demand Generation

Unit: %



Heat Efficiency Improvement Project

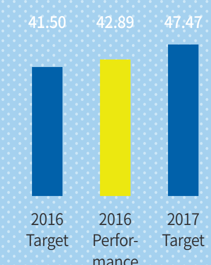
Unit: Number of facilities* / Number of households**



* Social welfare facilities,
** The socially underprivileged

Social contribution mileage*

Unit: point/number of people



* A system to manage employees' performance in volunteering and donation of money, etc. by quantifying it

Social Contribution Activities of KOGAS

Social Contribution Activities by Creating Sharing Value

KOGAS defines social contribution activities as those to realize the human dignity and improve the quality of life. We are committed to playing full responsibilities as a corporate citizen by engaging in our inherent management activities which contribute to the livelihood of the public and returning corporate profits to the society. As such, we strive to realize energy welfare and spread the culture of sharing through 'Onnuri' – KOGAS-style social contribution brand. In 2016, in particular, we established a strategy system for KSV-type social contribution activities*, which pursues the generation of both corporate values including economic benefits and social values.

* KSV-style social contribution activities: KOGAS-style social contribution activities for creating shared value (CSV)

KSV-style Social Contribution Strategies

Vision	Achieving Global KOGAS as Customers' Companion			
Strategic Goals	Initiating Global Social Contribution Activities			
Brand Name	Onnuri ('Make the whole world a Heart-warming Place for People to Live in')			
Goals of Social Contribution Activities	Realizing social responsibilities by strengthening KSV-style social contribution activities			
Directions for Implementation in 2016	Early discovery of KSV-style tasks + Substantiation of existing social contribution activities			
Strategy Tasks	Onnuri Love Project for energy welfare	Onnuri Harmony Project for win-win cooperation with community	Onnuri Hope Project for global cooperation	Onnuri One Heart Project for a culture of voluntary sharing
Implementation tasks	KSV-style tasks			
	Projects to generate a demand for the installation of fuel cells in social welfare facilities	Generation of jobs with a self-sufficiency program for the elderly	Support for a technical training school in Mozambique	-
	Key Explanation			
	Implementation of Onnuri Heat Efficiency Improvement Project Support for city gas tariff for the underprivileged in terms of energy	Implementation of social contribution activities tailored for Daegu (sponsorship of local events, a toy library project, a project to support residential stability, support for severely ill pediatric patients suffering from rare or incurable diseases and specialized contribution projects for the elderly, etc.)	• Medical and scholarship programs • A campaign to protect cultural heritage sites • Blue Sky Project (an air environment improvement movement) • Sponsorship of sports and academic fields	Management of Onnuri Volunteer Groups Implementing 'Volunteer 5up' campaign: KOGAS-style sharing campaign to raise the social contribution mileage (summing of time-specific donations) by 5% a year compared to the previous year

Social contribution project cost in Daegu

KRW 3.1 billion in 2016
KRW 3.6 billion in 2017

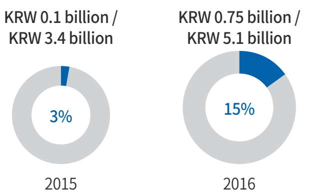
Connectivity of UN SDGs and KOGAS' Social Contribution Activities

Four priorities related to group-level strategies among UN SDGs and connectivity with project drivers

1 NO POVERTY	Eradicating all types of poverty in all places	Efficiently implementing domestic and overseas projects by raising the brand value	7 AFFORDABLE AND CLEAN ENERGY	Sustainable modern energies which are cheap and reliable for all	· Efficient implementation of domestic and international projects by raising the brand value · Increase in the amount of natural gas usage through projects which generate a demand
3 GOOD HEALTH AND WELL-BEING	Guaranteeing a healthy life and improving welfare for people of all ages	Efficiently implementing domestic and overseas projects by boosting the brand value	10 REDUCED INEQUALITIES	Easing intra-national and cross-national inequality	Efficient implementation of domestic and international projects by raising the brand value

Performance of KSV-style Social Contribution Activities

Expansion of the Portion of Investment in Demand Generation



Expanding Demand-Generating Social Contribution Projects

KOGAS performs various demand-generating social contribution projects for the underprivileged and social welfare organizations in alignment with the nature of its business. We implemented a 'pilot project to install fuel cells*' to contribute to energy welfare of social welfare facilities in Daegu and disseminate new and renewable energies. We extended KRW 300 million to Daegubeol Welfare Center and Jisan Social Welfare Center, completing the installation of fuel cells of 5kW. The facilities are expected to generate cost reduction of 10~15% in electric bills and hot water supply fees by installing fuel cells as high-efficiency eco-friendly energy devices. Furthermore, we continue to implement KCSV-style social contribution projects which pursue two objectives of generation of a demand for natural gases and realization of energy welfare, including installation of Gas Engine Heat Pump (GHP) and laundry driers in social welfare facilities and support for installation of inlet pipelines for areas where city gas was not supplied.

* Fuel cells: high-efficiency eco-friendly new and renewable energy sources with comprehensive efficiency of over 82% and CO_2 reduction effect of 40% compared to thermal power generation as a system to generate heat and electricity, using the chemical reaction of hydrogen and oxygen extracted from the city gas


Fuel cells for Jisan Welfare Center

Creation of 'Beautiful Jobs' through the Architecture Academy

KOGAS created jobs for the homeless under Onnuri Heat Efficiency Improvement Project in collaboration with Daegu Social Welfare Council and the Cell Town* Counseling Center. KOGAS and the Cell Town Counseling Center established a curriculum and selected target recipients. Six homeless people were recruited in Onnuri Heat Efficiency Improvement Project of KOGAS after conducting training at the Architecture Academy at Daegu Social Welfare Council. The project is significant in that it supported financial self-sufficiency through exclusive technical training programs instead of simply extending financial support to the homeless.

*Cell town: a small room of 3.3 square meter leased on a monthly rent without a deposit


Architecture Academy

Launch of Mozambique Technical Training Class

Having signed an MOU with the Mozambican government in Africa on cooperation in resources development, KOGAS has installed a plant for developing gas oil fields and conducted a gas pipeline construction work. Although the project required a large-scale skilled workforce, there was a lack of skilled personnel due to the absence of technical college or professional workforce in Mozambique. As such, KOGAS opened a technical training class in a middle and high school in Maputo to satisfy the demand of the Mozambican government for support – Korea's partner country in terms resources – and acquire necessary personnel on site. Courses in the class cover theories and practices on pipelines and welding. The training is expected to foster Mozambican students as specialized workforce, thus contributing to creation of jobs for youths and higher income in Mozambique, and also serve as a pipeline to acquire personnel, being capable of continuously fostering customized technical workforce for KOGAS.


Mozambique Technical School

Exploration and Performance of Tasks for KSV-style Social Contribution Activities

Type	Records	Performance in creating shared value	
		Value of contribution to KOGAS management	Social value
Onnuri Love	• Installing fuel cells of 5kW in (two) social welfare facilities	• Generating a demand for natural gases and promoting the fuel cell project	• Reducing the fuel cost for welfare facilities • Improving the noise and air quality
	• Installing Gas Engine Heat Pump (GHP)	• Generating a demand for gas for cooling and promoting gas cooling effect	• Improving welfare in vulnerable facilities • Contributing to easing the power peak in summer
	• Installing city gas-based laundry dryers in (30) social welfare facilities	• Generating a demand for natural gases and expanding the dissemination of gas-powered devices	• Improving welfare of the underprivileged • Contributing to shared growth by disseminating SME products
Onnuri Harmony	• Conducting training for acquiring technician certificates in construction for self-sufficiency of the homeless (20 people) → six of them landed on a job	• Utilizing the homeless as technical workforce in social contribution activities	• Creating jobs for the homeless
Onnuri Hope	• Supporting Mozambique Technical Training School - Constructing a technical training facility for 200 trainees per year	• Forging friendly ties with resource-rich countries, and laying the foundation for success of the Mozambican project	• Supporting technological development in least developed countries • Paving the way for joint entry of domestic enterprises into overseas market
	• Supporting talents majoring in gas engineering at Hoseo University (10 students per year)	• Establishing a pool of talents involved in the gas business and utilizing the workforce required by KOGAS	• Setting up the basis for industry-academic cooperation • Creating jobs in the gas industry

Performance of Onnuri Social Contribution Activities

Onnuri Love Project

Heat Efficiency Improvement Project

Under the 'Onnuri Love Project', heating efficiency is improved through floor heating in low income households and social welfare facilities, heat insulation in walls and replacement of windows and flooring or wallpaper, while supporting the installation of inlet pipelines for city gas. In 2016, the project was implemented with the total budget of KRW 1.9 billion for 45 low-income households and 101 social welfare facilities. The budget was also utilized to support the cost of installing LNG inlet pipelines in 14 low-income households and 22 welfare facilities in vulnerable residential districts.

Gas Tariff Reduction Project

We carry out a project to support heating fees for our neighbors struggling from a shortage of heating fees in order to improve the quality of life and achieve energy welfare for the underprivileged. In 2016, the number of those that are eligible for gas tariff reduction increased as expanded the number of eligible beneficiaries, thus providing gas tariff benefits of KRW 71.9 billion to 1,039,00 underprivileged households and KRW 5 billion to social welfare facilities. We strive to reach out to more neighbors by paying the outstanding amount for city gas tariff for the underprivileged in winter, and providing a month-long tariff discount for victims of the earthquake and typhoon in the summer of 2016 in Gyeongju, Ulsan, Yangsan and Busan.

Onnuri Harmony Project

The Onnuri Harmony Project is a community-centered social contribution activity to revitalize the local economy and establish trust with local community residents. We extend financial support to local governments around natural gas terminal divisions in accordance with internal regulations. We have continuously scaled up the implementation of social contribution activities tailored for Daegu where our headquarters is located. KOGAS organized the Park Concert twice by holding the inauguration ceremony of Daegu Mecenat Council with commitment to foster Daegu as a premium city of culture and art in 2016. By organizing the Park Concert every year, and fostering it as a cultural content representing not only Daegu but also Korea, KOGAS seeks to contribute to turning Daegu into a globally-renowned city of culture. In addition, we run various social contribution programs for the underprivileged including support for underprivileged children to enjoy cultural performances, a project to improve study rooms for juveniles and Haengbok Dungji ('happiness nest'), a project for housing stability. We also do our best in follow-up care of Onnuri Children's Toy Library formed by KOGAS.

Onnuri Hope Project

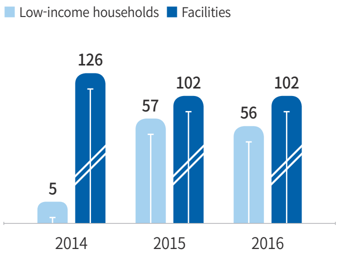
The Onnuri Hope Project is a social contribution activity aimed to foster future generations. Along with the medical outreach program including a medical support project for severely ill pediatric patients, a project to sponsor aid tools for disabled children, and a project to support operation fees for heart disease pediatric patients in developing countries. We strive to fulfil our social responsibilities as a global energy corporation by continuously exploring contribution projects for local residents to beef up their competency for self-sufficiency instead of merely giving unidirectional benefits, as in the case of Mozambique Technical Training Class, a benchmarking model as a KSV-style social contribution activity. Furthermore, a project to improve the atmospheric environment for a sustainable society is underway along with a project to protect cultural properties. KOGAS also makes unwavering investment in promoting sports and culture.

Onnuri One Heart Project

KOGAS has conducted voluntary social contribution activities by running the Onnuri Volunteer Groups launched in April 1999. The Onnuri Volunteer Groups of KOGAS consists of eight teams in the head office and 17 branches of business divisions. (as of January 2017). They spread the consensus of a culture of sharing through various types of volunteering activities: voluntary charity work aligned with local welfare facilities, sharing of briquettes with those in need jointly by the labor and the management, family volunteering on weekends and joint volunteering activities among public corporations. We also run the 'Onnuri Fund' to support the underprivileged with the fund raised among employees. Meanwhile, we conduct the 'Volunteer 5 up Campaign' every year so that employees could be encouraged to raise their social contribution mileage points by over 5% year on year. In 2016, per-capita social contribution mileage points recorded 42.9 points, up 7.5% from the previous year.

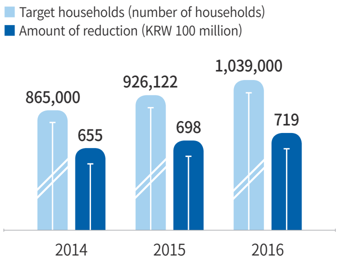
Heat Efficiency Improvement Project

Unit: number of households/facilities

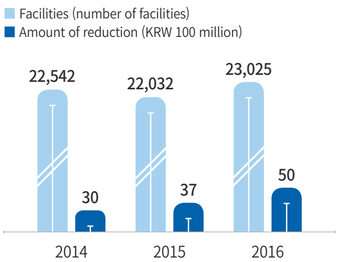


Gas Tariff Reduction Project

The socially underprivileged

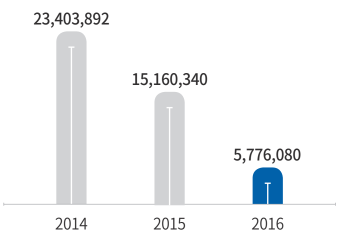


Social Welfare



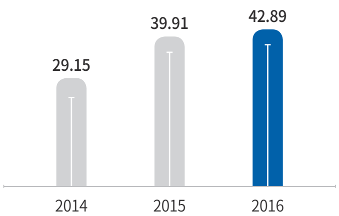
Amount of Settlement for Postponement of Supply Suspension

Unit: KRW



Mileage Points for Social Contribution Activities*

Unit: point/person



* A system to manage employees' performance in volunteering and donation of money, etc. by quantifying it

January

We gave a cake made by our new employee to Daegu Child Welfare Center with whom we forged sisterhood ties. Moreover, winners of highest excellence at the ‘Open Competition for Vision 2025 Slogan’ donated a part of their prizes money to give out bikes to children at the center.

March

Children from Shinsaeongwon, a social welfare institution, visited ‘Chungyeong, Energy Gallery’, KOGAS’ promotional pavilion of natural gases. The children visited 13 exhibition halls and 5 experience zones, and learned with a great fun using games and puzzles at ‘Energy Lab’ – an energy science class for children – ranging from production to transportation, supply and utilization.

April

We took part in the 2016 Daegu International Marathon held at Gukchaebosang Memorial Park. The event was participated by 78 of KOGAS employees and their family members. KOGAS sponsored Daegu Sports Council with KRW 30 million for successful hosting of the marathon.

The Domestic Legal Affairs Team of KOGAS provided free consulting services to the elderly at Daegu Donggu Senior Citizens Welfare Institute on the Law Day of April 25. They consulted on legal affairs ranging from inheritance and land property rights to trivial fights in a daily life, providing professional advice and comforting their mind.

Milestones of Social Contribution

December

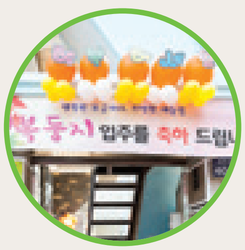
We offered scholarships worth KRW 320 million by organizing an awarding ceremony for giving out ‘2016 KOGAS Onnuri Scholarship Certificate’ at the main building of the headquarters of Korea Student Aid Foundation in Daegu. We also donated a total of KRW 100 million in the fund for the underprivileged raised by employees in MBC’s ‘Hope 2017 Sharing Campaign’ at the end and beginning of year at the main building of MBC.

November

KOGAS employees also took part in volunteering to deliver briquettes for the underprivileged at Ongijonggi Village in Dong-gu, Daegu. About 80 employees gave out a total of 50,000 pieces of briquettes including 3,000 pieces they delivered in person.

October

The moving-in ceremony for 10 households in the ‘Haengbok Dungji Residential Stability Didimdol Project’ was held in Sincheon-dong, Daegu. The project is to rent out discarded or empty houses in a city after repairing them free of charge to the underprivileged to ease the burden of paying monthly rents for the low-income class and provide opportunities of self-sufficiency. KOGAS participated in the efforts to improve the residential environment for the low-income class and contribute to raising the quality of their life.

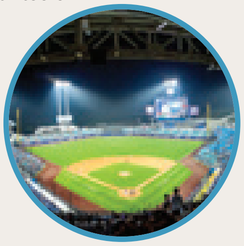


We donated Onnuri Gift Certificates (gift vouchers for traditional markets) worth KRW 70 million with the largest national holiday of Chuseok – Korean Thanksgiving – just around the corner to Daegu Social Welfare Council. This is to donate the points generated by using our corporate cards last year by converting them into gift vouchers, which were given out to about 80 institutions including elderly welfare centers and welfare facilities for the disabled in Daegu.

Activities in Daegu in 2016

May

We organized 'KOGAS DAY' by inviting 2,000 underprivileged children and 1,000 family members of KOGAS employees by making the opening of Daegu Samsung Lions Park. The event where children and adolescents from 90 social welfare facilities in Daegu were invited organized diverse side events for the audience. The participants not only watched a match but also participated in the quiz event via the large screen during the match and ran a photo zone for visitors together with university student volunteers.



Community Chest of Daegu donated a fund of KRW 3 billion for social contribution activities. KOGAS is expanding the scale of financial support for Daegu every year. In 2016, in particular, a total of nine new projects were added on the list of social contribution activities in Daegu: organizing the 'Park Concert' to support cultural performances, installing laundry dryers in social welfare facilities, supporting heating cost for the underprivileged and repair of briquette-powered boilers, and support education of multi-cultural families.

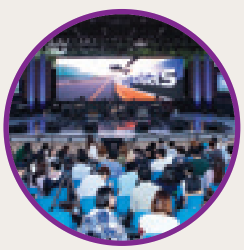
We organized the '1st Park Concert for Daegu Citizens' at Kolon Field Concert Hall located in Duryu Park in Daegu. The Park Concert jointly planed in partnership with Daegu Metropolitan Government and Daegu Foundation for Culture was held as a festival to reunite Daegu citizens. The event was organized along with the launching ceremony of Daegu Mecenat Council intended to foster Daegu as a prestigious city of culture and art as well as to contribute to the development of culture and art.

June

New employees of KOGAS walked on Dulle-gil Trail in front of Apsan Mountain in Namgu, Daegu along with 50 adolescents at Daegu Child Welfare Center. The wrote their dreams them down on balloons, floated them in the air, reaffirmed their will to achieve them and cheered up one another to do so.

September

We held the 2nd Park Concert at Kolon Field Concert Hall located in Duryu Park, Daegu. The hall accommodating about 20,000 Daegu citizens presented performances of local culture and art organizations including samulnori (a Korean traditional percussion performing troupe), ballet and musicals and a concert of pop singers, presenting the audience with diverse cultural stages.



August

We donated 200 blood donation cards for blood transfusion for pediatric patients with leukemia at Kyungpook National University Children's Hospital. The cards were significant in that the donation was made by employees through the blood drive jointly with Daegu-Gyeongbuk Blood Center.

July

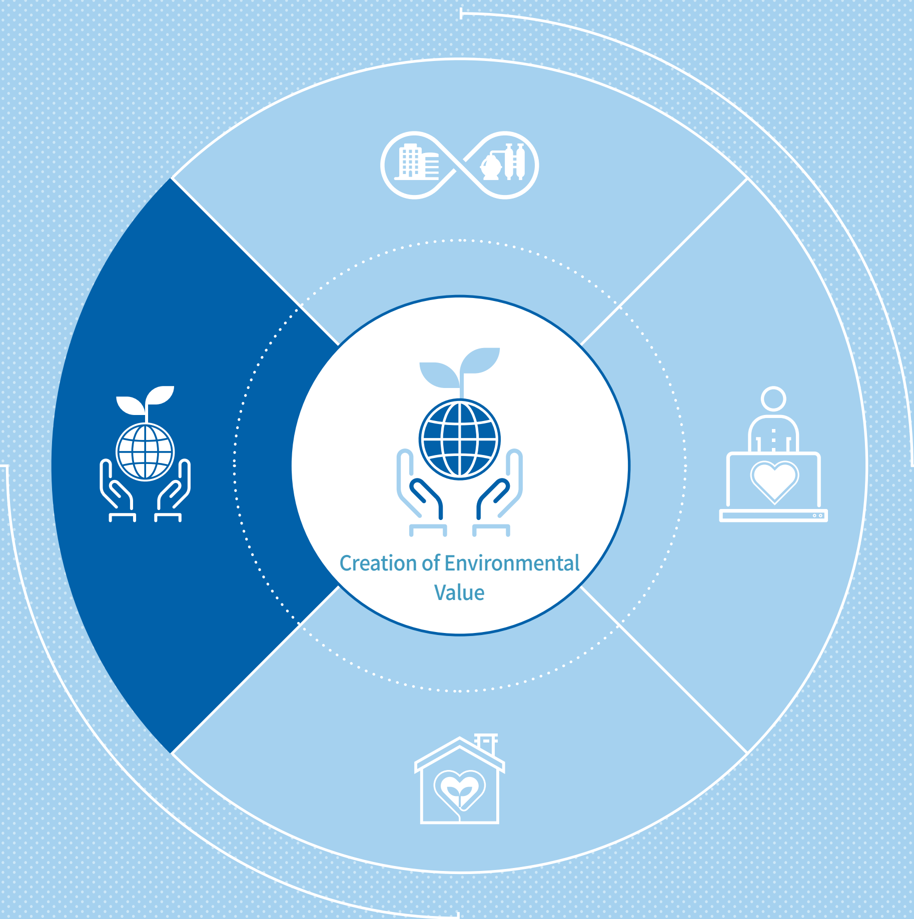
We also took part in volunteering to give out free meals at Ansim Community Welfare Center, targeting low-income senior citizens in Dong-gu, Daegu. The event was organized to prevent malnutrition of the elderly in exhaustion from scorching heat in summer. Employees of KOGAS reached out to 80 senior citizens in serving their meals and having a friendly conversation with them.

KOGAS' new employees of the 38th year visited the toy library in Daegu Seongseo Welfare Center, engaging in volunteering by making dolls with local children. KOGAS supports the setup and operation of Onnuri Toy Library in welfare centers in Daegu.

Creation of Environmental Value

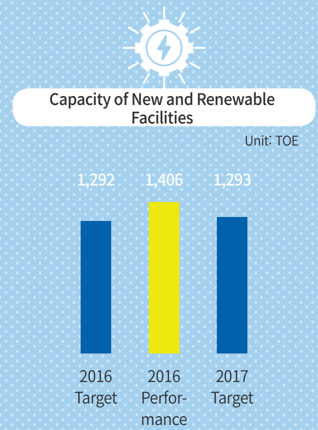
MANAGEMENT APPROACH

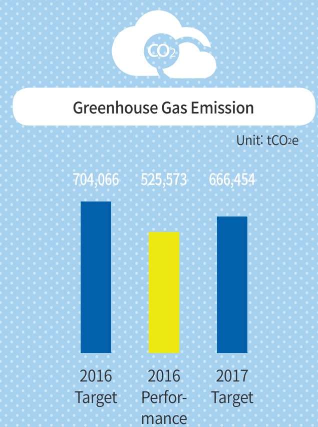
Natural gases are spotlighted as eco-friendly fuels which generate almost zero pollutant upon incinerating sulfur, nitrogen and dust are removed in the process of liquefaction. They are grabbing the attention as a critical means to respond to climate change due to little GHG emissions. KOGAS has established an eco-friendly management system by identifying environmental risks and opportunities at the same time, while preemptively responding to climate change.

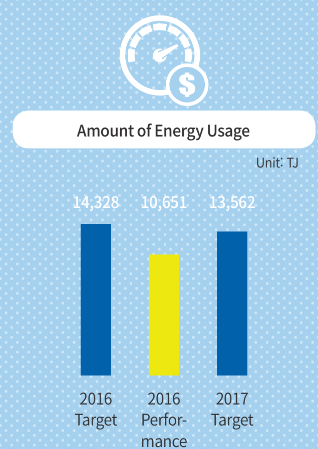


• We proceed with enterprise-wide activities to reduce greenhouse gas.	•• We acquire and retain the environmental management system (ISO 14001).	••• We continue to adopt new and renewable energy facilities.

KEY PERFORMANCE & NEXT GOAL





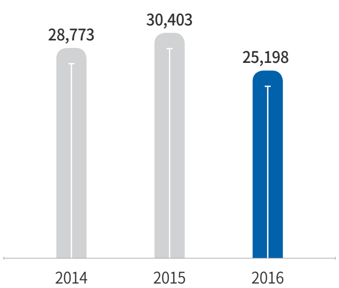


Environmental Management

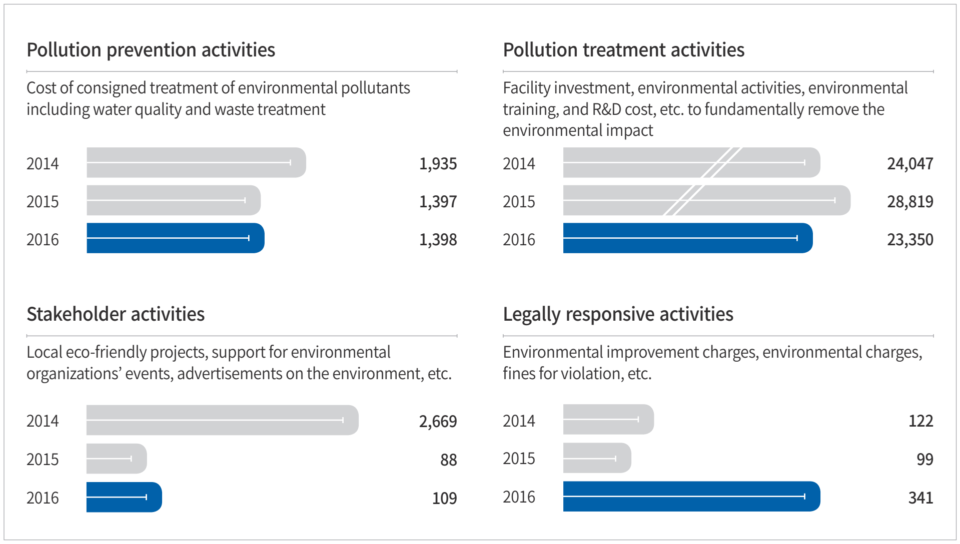
Environmental Management System

Environmental management at KOGAS is not a management activity simply to minimize the environmental burden. It is managed based on the Environment, Health, Safety & Quality Management System (EHSQMS), an exclusive management system of KOGAS. Having declared environmental management in 1997, KOGAS has strived for environmental management activities, including acquisition of ISO 14001 and designation as a green enterprise. KOGAS sets more stringent levels than the statutory ones for emitting pollutant substances into the air and water, etc. on production sites, and dynamically manages them. Environmental load data generated on sites is managed on a monthly basis, which is registered in the Environmental Information Disclosure System and disclosed to the public. Moreover, we voluntarily evaluate environmental feasibility by avoiding passive actions to simply comply with statutory responsibilities and regulations, and take actions for improvement plans to be taken. Business sites in the metropolitan area were designated as green enterprises and are managed accordingly. As such, we strive to establish an autonomous environmental management system on sites.

Environmental Activity Cost per Year
Unit: KRW million



Environmental Activity Cost
Unit: KRW million



Efforts to Minimize the Environmental Burden

Air Pollution Management

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

Water Pollution Management

The Pyeongtaek, Incheon and Samcheok Terminal Divisions located on the coastal line discharge the domestic sewage into a river or sea in a concentration level below the statutory level after purifying it at sewage treatment facilities. The Pyeongtaek, Incheon and Samcheok Terminal Divisions located on the coastal line discharge the domestic sewage into a river or sea after purifying it at sewage treatment facilities. The household sewage of the Tongyeong Terminal Division and production management offices of regional divisions is channeled into terminal treatment plants for treatment. Moreover, the production process of natural gases requires a miniscule amount of water, making such a small impact on the water environment. LNG terminal divisions are managed below the statutory level of concentration for water pollutants as they are equipped with oil treatment facilities. Moreover, the seawater entering into an open rack vaporizer (ORV) in the LNG gasification process is discharged into the coast without any environmental impact after being used for heat exchange.

Management of Hazardous Chemicals

Major hazardous chemicals used on sites include sodium hydroxide (NaOH) and hydrogen chloride (HCl). They are used to adjust the level of pH within water tanks of the Submerged Combustion Vaporizer (SMV) which serve as LNG gasification facilities. Such substances, in particular, are used in a lower level of concentration, which are not classified as hazardous ones, causing no harm to the body and the environment. Hazardous chemicals used are managed according to legitimate procedures without leakage.

Waste Management

We stringently apply the treatment standards above the statutory levels prescribed in related laws on the waste generated from sites in the middle of production and supply process and construction works. Data on waste is recorded in the IT system for internal environmental management on a monthly basis, and is reflected in the next year’s plan to lower the amount of waste generated. We proactively take part in the government policy on control and recycling of waste, and continuously reduce the amount of waste discharge by transparently managing the entire process from discharge to delivery and final treatment. We ensure that waste treatment companies are periodically guided and inspected so that waste generated from sites could be appropriately treated. Waste being generated in all sites of KOGAS registered in Allbaro system (http://www.allbaro.or.kr) in real time whenever it is discharged, delivered and treated, and it is disclosed through the environmental information disclosure system once a year.

Protection of Bio-Diversity

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

Prevention of Marine Pollution

KOGAS has established a system to promptly and efficiently respond to sites of accident by devising a ‘manual on on-site actions’ to respond to marine disasters. In addition, we are fully equipped with more disaster reduction supplies than statutorily required along with continued training against potential accidents, thereby minimizing secondary environmental damage resulting from accidents.

Low Carbon Management

Low Carbon Management Strategies

KOGAS set a vision of becoming ‘a sustainable future energy company’, striving to establish its goals, that is, cost-effective GHG reduction and to become a leading company in responding to climate change. KOGAS’ low carbon management strategies are decided and executed through the two-step deliberation process. The Climate Change/Energy Working-Level Committee consisting of heads of working-level departments in charge deliberate on pending issues on low carbon management. Then, the Climate Chante Energy Committee as the decision-making body comprised of executives devises final strategies and decide on critical matters on climate change response.

Low Carbon Management Strategies

Vision	Sustainable Future Energy Company	
Major Goals	Cost-effective GHG reduction	A leading company in climate change response
Core Tasks	Response to the Emissions Trading	Climate Change Response
(six tasks in two areas)	• Establishing a system to respond to the emissions trading scheme • Developing personnel for the emissions trading scheme • Initiating projects to reduce GHGs	• Responding through new and renewable energies • Managing energy efficiently • Raising awareness about and promoting climate change

Efforts to Climate Change Response

Current Status of Installing New and Renewable Energies

	Capacity	Sites (number of sites)
Photovoltaic	1,562.5 kW	63
Solar energy	613.0 m^2	6
Geothermal energy (cooling)	1,424.6 kW	2
Geothermal energy (heating)	1,458.9 kW	3
Wind power	15.7 kW	5
Fuel cells	301.0 kW	2

Response to the Emissions Trading Scheme

In the emissions trading scheme, the government enables emissions activities of establishments emitting GHGs within an allowed scope by allocating emissions rights on a yearly basis, and evaluates their actual GHG emissions so that the emission right for an unused quota or a shortage is allowed to be traded between establishments. In 2015, KOGAS was designated as an eligible target company to fall under the emissions trading scheme. KOGAS was allocated with the emission right from the government for the primary planning period from 2015 to 2017. We do the best to reduce the GHG emissions to effectively respond to the scheme by exploring reduction projects, improving facilities and proceeding with reduction project at home and abroad. The surplus emission credits among the government’s emission allowance in 2016 is carried over and managed accordingly as the credits for the implementation period of 2017.

Incentives for Management of GHG Emissions

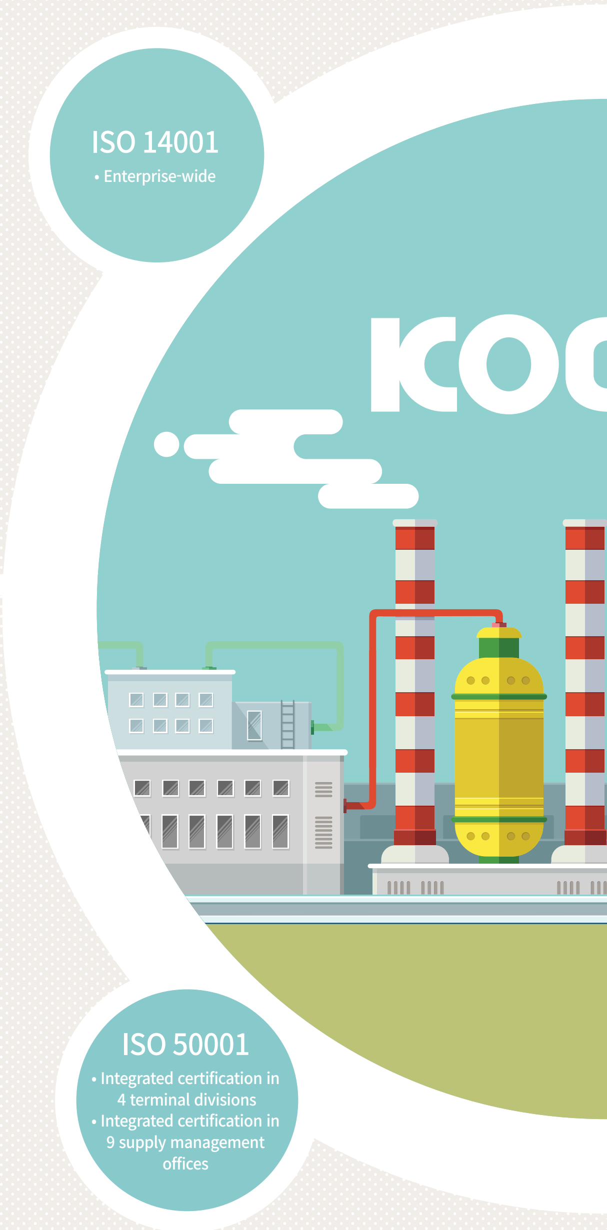
We conduct semi-annual monitoring on goal achievement by setting internal targets for GHG emission by business site. Excellent business sites that have strived to and achieved strong results to achieve GHG reduction goals and raise awareness about energy usage are selected to give them rewards and compensation. Key items for evaluation include performance records compared to targets, basic unit management of energy and records of exploring GHG reduction projects. Additional points are imposed on business sites that have maintained the energy management system (ISO 50001) and set up the real-time energy monitoring system. In 2016, rewards were offered to five business sites (two prizes for each of highest excellence and excellence prizes and one encouragement prize) out of 13 in total in 2016.

New and Renewable Energy Project

We foster low carbon energy projects to respond to the government’s low carbon growth policy and acquire new growth engines. We reduce the usage of GHG and energy by leveraging five types of new and renewable energy facilities: photovoltaic, solar energy, geothermal energy, wind power and fuel cells. We internally produce and use a certain percentage of in-house electricity by introducing various new and renewable energy facilities to the headquarters building, 13 business sites and facilities of gas supply. We could produce the electricity of 5,572MWh and heat of 636GJ, using facilities for new and renewable energies in 2016, thereby reducing GHG emission of 2,636tCO_2e.

Environmental Management of KOGAS

INPUT



Amount of energy usage*

Unit: TJ

	2014	2015	2016
Total amount of energy usage	11,760	10,189	10,651
Direct energies	4,629	2,965	3,248
Indirect energies	7,131	7,224	7,414

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

Amount of water usage*

Unit: m^3

	2014	2015	2016
Total amount of water usage	2,054,523,871	2,079,743,858	2,016,499,069
Seawater	1,576,236,007	1,581,500,930	1,571,859,597
Water service	469,209,947	491,108,395	436,181,693
Others	9,077,917	7,134,533	8,457,779

* There is a difference in number with the one disclosed in the existing report because of a change in the amount of total water usage due to increases in the facilities using ground water as new management sites are constructed, and also an error in the unit of amount of other water usage.

Environmental investment

Unit: KRW million

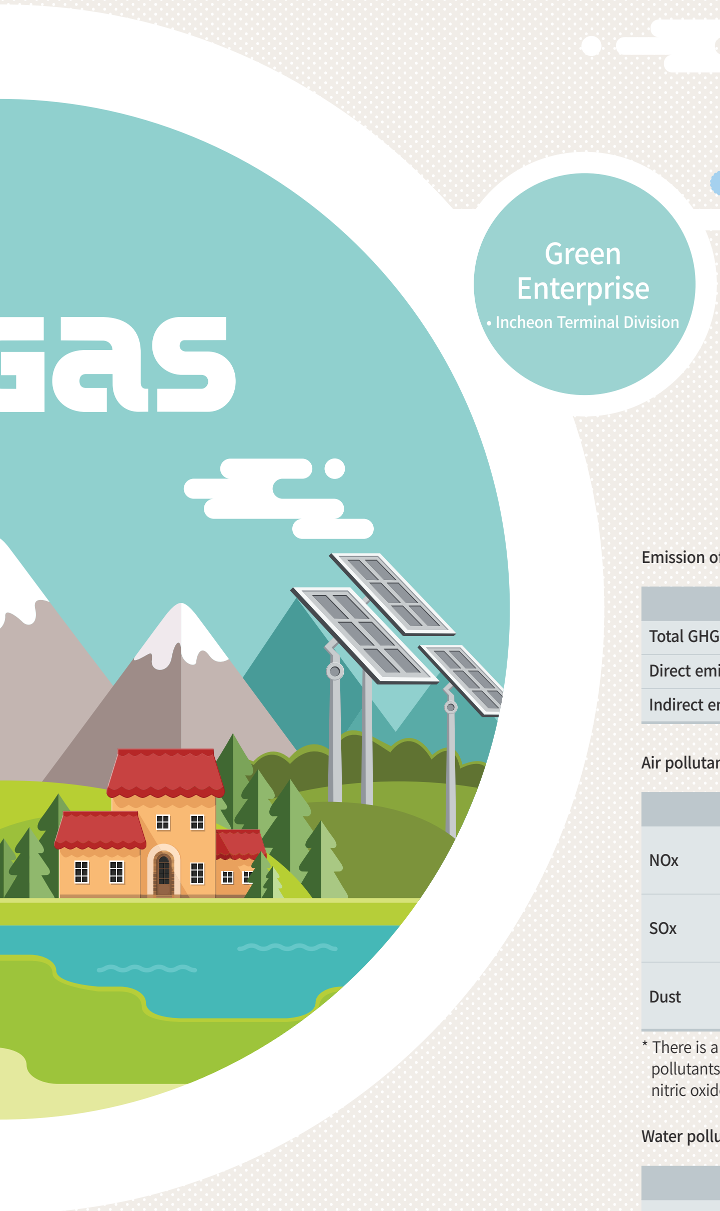
	2014	2015	2016
Amount of environmental investment	28,773	30,403	25,198
Eco-friendly procurement	17,352	11,561	5,865

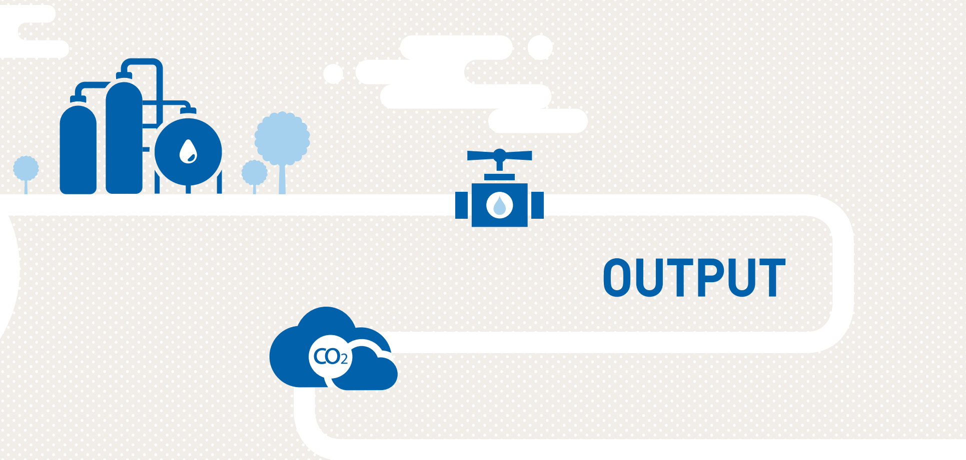
Usage of hazardous chemicals*

Unit: kg

	2014	2015	2016
Amount of usage	186,022	333,427	142,358
Basic unit (kg/1,000 tons)	5.29	10.6	4.34

* There is a difference in number with the one disclosed in the existing report because of a change in the amount of hazardous chemicals due to addition of substances categorized as hazardous chemicals among the ones used on business sites amid the amendment of the Chemicals Control Act.





Emission of GHG

Unit: tCO_2e

	2014	2015	2016
Total GHG emission	592,506	502,988	525,573
Direct emission	246,750	150,711	166,283
Indirect emission	345,756	352,277	359,290

Air pollutants*

Unit: kg

		2014	2015	2016
NOx	Amount of emission	369,863	256,230	278,257
	Basic unit (kg/1,000 tons)	11.28	8.15	8.49
SOx	Amount of emission	1,070	689	749
	Basic unit (kg/1,000 tons)	0.03	0.02	0.02
Dust	Amount of emission	3,322	2,191	2,398
	Basic unit (kg/1,000 tons)	0.09	0.07	0.07

* There is a difference in number with the one disclosed in the existing report because of changes in the amount of emission of air pollutants as some facilities on sites are categorized as air pollutant emitting facilities, and the total load management including nitric oxides' is applied to sites.

Water pollutants*

Unit: kg

		2014	2015	2016
BOD	Amount of emission	99.9	125.3	124.2
	Basic unit (kg/1,000 tons)	0.0028	0.004	0.004
COD	Amount of emission	58.6	71.8	48.6
	Basic unit (kg/1,000 tons)	0.0017	0.0023	0.002
SS	Amount of emission	156.9	236.3	139.5
	Basic unit (kg/1,000 tons)	0.0045	0.0075	0.0043

* There is a difference in number with the one disclosed in the existing report because of changes in the amount of emissions for BOD, COD and SS due to modifications in the quantifiable data for wastewater and amount of effluent treatment in the management system.

Discharge of waste*

Unit: tons

		2014	2015	2016
General		832	967	3,300
Designated		248	429	198
Construction		485,406	411,583	290,394
Total	Amount of emission	486,486	412,979	293,892
	Basic unit (tons/1,000 tons)	13.83	13.13	8.97

* There is a difference in number with the one disclosed in the existing report because of changes in the amount of waste discharge because the amount of waste discharge on business sites was re-calculated (changes in the guideline on operational maintenance and management of waste discharged from construction works).

KOGAS Sustainability Management

Corporate Governance

Composition and Management of the Board of Directors

Composition of the Board of Directors (BOD)

KOGAS' BOD is the top decision-making body in charge of overseeing decisions made regarding major strategies and policies and the management agenda, and supporting management. It is operated pursuant to the Act on the Management of Public Institutions and the Articles of Incorporation. The BOD consists of 11 members including the CEO: four executive directors and seven non-executive directors. A non-executive director is appointed as the chairman of the BOD to ensure independence. The BOD is striving to enhance stakeholders' rights by establishing a desirable corporate governance structure for keeping the top management in check with a high portion of non-executive directors compared to executive ones.

Management of the BOD

The BOD is organized once a month in principle, and can be organized with the sole authority of the chairperson or the demand of over one third of registered directors. In order to fairly manage the BOD, the agenda is decided with the approval of a majority of registered directors. It is provided that directors with a special interest with regards to decision-making at the BOD are restricted from exercising the decision-making right on the agenda so that decisions can be made transparently. The results of BOD meetings are disclosed on the KOGAS website and the management information disclosure system for public institutions (www.alio.go.kr, Alio), except for special matters including confidentiality in management.

Independence of the BOD

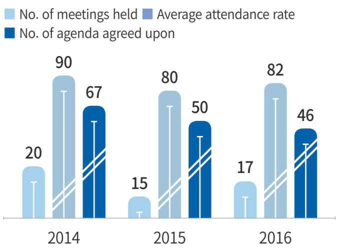
Executive directors at KOGAS are appointed as those who fulfill qualifications pursuant to the Act on the Management of Public Institutions, the Articles of Incorporation and operating regulations of the Executive Recommendation Committee. Independence is secured by disqualifying those who are in a critical transactional relationship with KOGAS employees and KOGAS for the past two years, or those who have worked in a competitor of KOGAS. Inspection standards are devised by the Executive Recommendation Committee consisting of three non-executive directors and two outside members upon appointing executive directors. There is an identification procedure on their relationships with the company as candidates to make sure the procedure is systematic and fair. Non-executive directors are required to have expertise and experiences in different fields including economics, management, law or related technologies, or knowledge and experiences related to KOGAS' operations covering energy including gas.

Diversity of the BOD

KOGAS imposes no particular restriction in recruitment to secure diversity of members in the BOD. The BOD door is always open to candidates regardless of gender, religion, race or nationality as long as they are qualified and capable. In particular, upon recruiting them through public opening and recommendation to secure female directors in the diversity aspect, we have continuously requested for recommendation of female candidates upon making a request for it to the Ministry of Personnel Management (database on national talents), and yet, there has been no female applicant so far. The BOD of KOGAS consists of male directors 100%.

BOD Activities

Unit: times/%/agendas

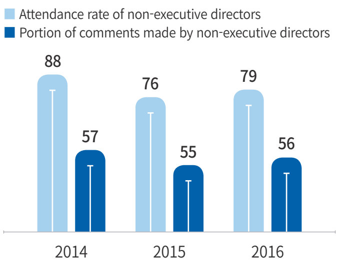


Non-executive Directors' Participation in Management

Unit: number of cases

Performance of Non-executive Directors

Unit: %



Composition of the BOD

As of May-end, 2017

Type	Name	Position
Executive Director	Seung Hoon Lee	Executive Director, CEO
	Sang Hoon Lee	Chief Auditor Executive
	Wan Gi Ahn	Executive Director, Vice President of Management
	Young Du Kim	Executive Director, Vice President of Technology

Type	Name	Position
Non-executive Director	Sun Woo Lee	Lead Non-executive Director (Chairman of the BOD), Professor of Public Administration, Korea National Open University
	Kwang Sik Choi	Director, Chairman of SL Innovations Co., Ltd.
	Man Kyo Chang	Director, Auditor at the Korean Construction Guarantee Cooperative
	Won Tak Lee	Director, President of Daewon University
	Jong Rae Kim	Director, Visiting Professor of Business Administration and Management, Chungnam National University
	Jun Hyung Lee	Director, Chairman of GoodNET Corp.
	Yang Hoon Son	Director, Professor in the Department of Business Administration at the University of Incheon

Operation of Subcommittees

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

Operation of Subcommittees

As of May-end, 2017

Type	Composition	Members	Key Roles
Audit Committee	One executive director, two non-executive directors	Non-executive directors: Kwang Sik Choi, Jun Hyung Lee Executive director: Sang Hoon Lee	• Reporting to the BOD on directors' act of violating laws and the Articles of Incorporation • Matters entrusted by the BOD, and those determined to fall under the responsibilities of the Audit Committee according to laws and the Articles of Incorporation, etc.
Sustainability Management Committee	Two or more directors	Non-executive directors: Man Kyo Chang, Sun Woo Lee Executive director: Wan Gi Ahn	• Mid- to long-term management plans, major investment projects • Budgetary and operational plans, management evaluation, promotional projects, etc. • Safety and environmental projects and operational plans • Ethical management and social contribution activities, etc.
Overseas Project Committee	Two or more directors	Non-executive directors: Jong Rae Kim, Yang Hoon Son	• Overseas resource exploration and development/production • Review or counseling on overseas plant projects and other overseas projects

Evaluation of the BOD

KOGAS continuously manages activities and performance of directors including the BOD attendance rate, suggestion for corporate management and portion of comments made. In addition, KOGAS seeks the development of the BOD through objective evaluation following the BOD management evaluation and individual director evaluation. The remuneration for executives is composed of basic salary, incentives, and severance pay. The yearly basic salary is decided in the BOD meetings within the scope of salary limits, which is approved in a shareholders' meeting. The president receives incentives depending on the result of assessment of management performances after signing a management contract to achieve the corporate philosophy and vision with the chief of the relevant institution. The assessment is based on performance indicators on financial performance of management activities and external perception, and environmental and social indicators. Executive directors receive incentives after making a contract for performance with the president.

Amount of Remuneration Paid in 2016

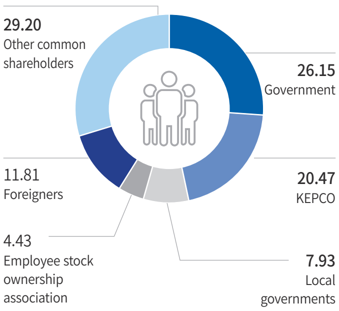
Unit: KRW 1,000

	Number of People	Total amount of Remuneration	Amount of Average Remuneration per Individual	Note
Registered executive directors	3	340,139	113,380	-
Outside executive directors	7	-	-	KRW 2.5 million per month for monthly salary
Auditors	1	104,658	104,658	-

Composition of Shareholders

Unit: %

As of December 31, 2016



Composition of Shareholders

KOGAS was listed on the Korea Exchange on December 15, 1999. The amount of KOGAS' legal capital stands at KRW 1 trillion. Shareholders of KOGAS are comprised of public shareholders and ordinary shareholders. Public shareholders, namely the government, KEPCO, and local governments, hold approximately 54.60% of total shares. The majority shareholder is the Korean government which holds 26.15% of total shares. There has been no change regarding the majority shareholder for the past three years.

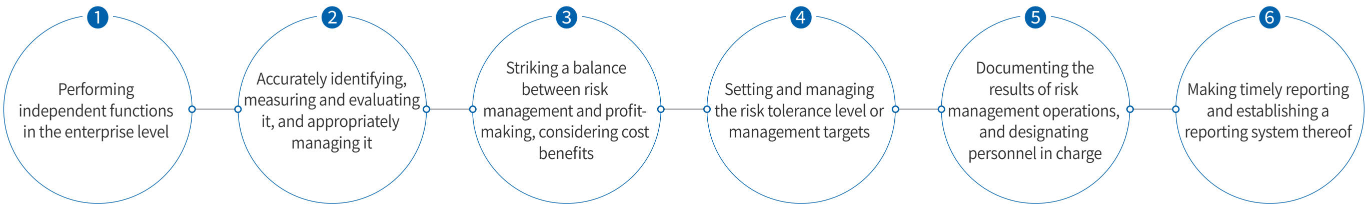
Risk Management

Risk Management System

Risk Management Strategy

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

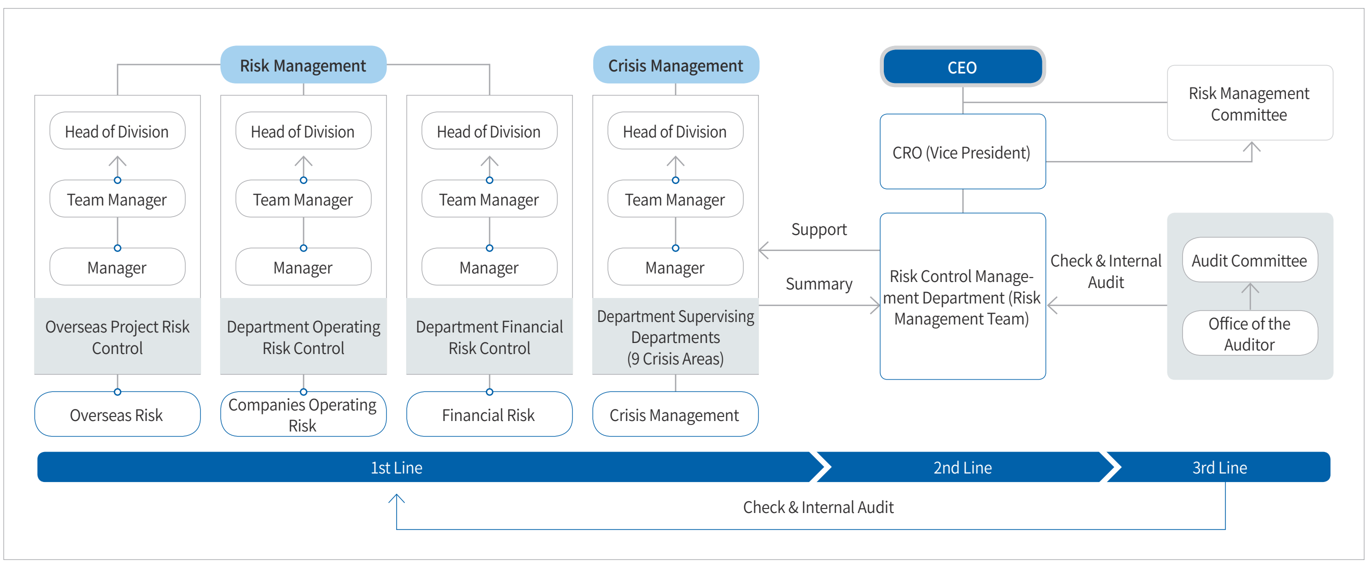
Principles of Risk Management



Risk Management Organization

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

Risk Management Organization



Investment Risk Committee (2016)

No.	Date	Target business
1	May 30	CGR, Canada
2	June 16	Uzunkui, Uzbekistan
3	August 29	Cylinder, Uzbekistan
4	September 12	Coral FLNG, Mozambique
5	September 12	LNG Canada
6	September 20	Badra, Iraq

Risk Monitoring and Reporting System

KOGAS monitors the current status of risk management on a quarterly basis, providing feedback to departments in charge so that they can make timely and effective responses by monitoring the response performance upon the issuance of risk alerts. For the reporting system, the departments in charge report results of each of their risk management activities to the supervising departments, which collect them and report to the CRO on the current status of enterprise-wide risk management. Lastly, the CRO reports to the Risk Management Committee. In 2016, we launched the ‘Investment Risk Committee’ to identify possible risks in new and modified projects, and established a system to devise measures. The Investment Risk Committee as an independent unit from business departments deliberates on risks in five areas – nation, economic feasibility, legal affairs, technology and operation. The committee members that are examiners consist of six internal and external specialists, which are selected from a predetermined pool of examiners. Deliberation results of the Investment Risk Committee are provided as important reference materials for business evaluation.

Risk Management Activities

Spread the Culture of Risk Management

Training

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

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

Evaluation and Remuneration

Overseas subsidiaries are evaluated once a year to improve the level of risk management and management operations in overseas business. Risk profiles of each project and performance level of the self-checklist are evaluated on a quarterly basis. Adequacy of establishing and implementing plans to manage core risks are qualitatively evaluated. Evaluation of subsidiaries which used to be confined to that of heads of overseas subsidiaries has been expanded to cover their members, starting from 2016. Risk management performance of subsidiaries is measured, and performance pay of their members is differentially paid based on the evaluation results.

Risk Management of Overseas Projects

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

Introduction of the Investment Management System

KOGAS has adopted the ‘Investment Management System’ enterprise-wide since 2016 for higher efficiency in risk management and risk management aligned with strategies. The system enables perusing and analyzing the current status and risks of all overseas projects underway. The current status of overseas investment projects and business-specific risks can be shared enterprise-wide through the system. We are also equipped with a system to establish strategies in consideration of related risks upon setting long-term strategies.

Checklist on Risks

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

Ethical and Integrity Management

System for Ethical and Integrity Management

System for Ethical and Integrity Management Strategies

KOGAS suggests four strategy directions and relevant tasks for action to realize ‘Clean KOGAS’ under the vision of ‘realizing clean and transparent global principle-based management’. We ensure such commitments for ethics and integrity to be internalized by all employees, and reflecting them throughout corporate management. We will secure trust from the public by eradicating irregularities and corruption through innovative ethical activities.

System for Ethical and Integrity Management Strategies(2016)

Ethical Vision	Realization of Clean and Transparent Global Management with Integrity			
Ethical Goals	Clean KOGAS Fulfilling Social Responsibilities with Ethical Management			
Goal for 2016	Establishing new ethical management to realize ‘Clean KOGAS’			
Strategy Directions	Substantiating ethical management systems and regulations	Establishing an engagement-based ethical management system	Raising ethical awareness to practice ethical management	Expanding consensus on ethical management
Strategy Tasks	• Revising the code of action for employees • Handling reporting on unfair solicitation and graft • Eradicating gifting practices	• Launching a corporation-wide portal on ethical management • Operating the integrity and ethics mileage point system • Establishing a reporting system on a case of delivering a lecture outside KOGAS, etc.	• Performing customized ethical training • Striving to eradicate a culture of gap-eul (the order of power of position) • Organizing voluntary mock trials on ethics led by employees	• Further promoting best practices on ethical management internally and externally • Facilitating the corruption reporting system • Diagnosing and evaluating the level of ethical awareness
Implementation and Review System	Planning	Implementation of Tasks	Monitoring	Feedback
	• Basic plans on ethical management • Plans to implement policies for integrity and innovation	• Internalizing institutions and regulations • Establishing the ethical management system • Training on and practicing ethical management	**External** • Evaluating integrity by the Anti-Corruption & Civil Rights Commission • Evaluating anti-corruption policies **Internal** • Making diagnosis on the level of ethical management	• Spreading consensus and promoting best practices • Establishing annual plans for the next year and reflecting improvements

Regulations on Ethical Practice for Employees

Code of Ethics	Our Promise 30	Code of Actions of KOGAS’ Employees	Integrity Rules for Executives
A standard of values and actions for employees to practice transparent principle-based management required of a clean energy corporation	A specific code of actions for employees to abide by in engaging in cooperation of work with colleagues and related departments and relationships with stakeholders, etc.	A standard of actions for employees to abide by to form a corporate culture of anti-corruption and integrity	A standard of conduct for executives to create a corporate culture of integrity

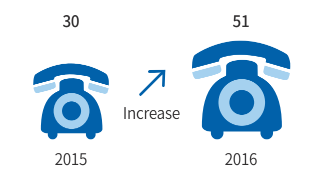
Organization in Charge

KOGAS strengthened the organization in charge and allocated five personnel in charge in January 2016 to secure engines to drive ethical management. The organization in charge of ethical management oversees formulating and revising the code of ethics and establishing and operating a program for actions, and periodically evaluates and monitors ethical management to measure its implementation and the improvement level. Moreover, we also develop training sessions and materials on ethics, and provide ethical counseling for ethical decision-making and conflict resolution.

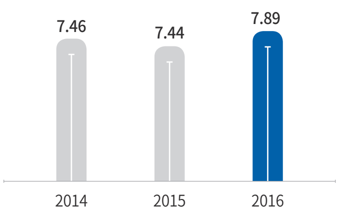
KOGAS' reporting system

Internal	Cheongumgo, anonymous bulletin board, integrity auditors, Integrity Ombudsman, KOGAS Whistle
External	KOGAS Whistle, National Ombudsman, Red Whistle

Number of cases reported

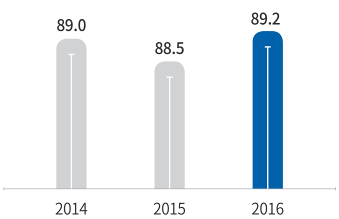


Comprehensive Level of the Anti-corruption & Civil Rights Commission



Anti-Corruption Initiative Assessment

Self-diagnosis of Ethical Levels

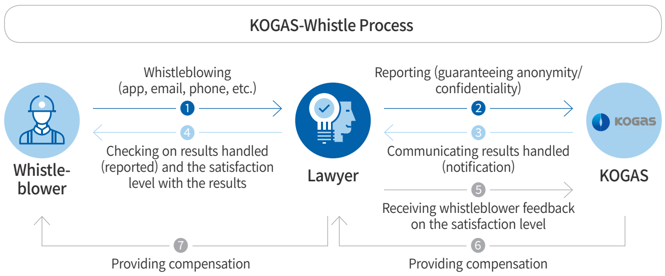


Formation of a Culture of Ethics and Integrity

Facilitating the Whistleblowing System

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

KOGAS-Whistle



Roles of the Lawyer(s)

- Counseling for whistleblowers, and registering and communicating on cases of whistleblowing and reporting (special watch dog)
- Guaranteeing and protecting anonymity and confidentiality of whistleblowers
- Attending as a committee member when the HR Committee holds a meeting on a relevant case

Revising the Code of Conduct and Intensifying its Standard

'KOGAS' Code of Conduct for Employees' formulated in 2005 is stringently managed as a standard of forming a corporate landscape with integrity and ethical awareness and actions for employees to abide by. To this end, a higher level of standard than the disciplinary standard for public officials is imposed on employees of KOGAS on corruption and bribery, discrimination, practices of anti-monopoly/competition, money laundering and internal trading, and the whistleblowing system. In particular, in 2016, the code of conduct was revised for the ninth time to respond to changes in the social and ethical environment. Under the vision, standards were intensified on stricter provisions on anti-bribery, limitations on exchanges of financial allowances, e.g. delivery of external lectures and launch of officials in charge of anti-solicitation. As such, we strived to ensure fair performance of job functions and spread of a culture of integrity.

Training Program on Ethics and Integrity

We run training programs on ethics and integrity that are customized for each rank in order to raise the level of ethical awareness. In addition, we do the utmost to internalize a culture of ethics and integrity through cyber training sessions on such themes as shared growth with suppliers and win-win cooperation.

Rank-Specific Training Programs on Ethics and Integrity

Target audience	Training methodology	Topics
High-ranking executives	Group training	• Training on integrity for high-ranking executives by inviting outside experts (twice) - Training on how to become ethical leaders and practice integrity, and also on the Act on the Prohibition of Illegal Solicitation
Managers in charge of ethics and integrity	Group training	• Training on ethics and integrity for employees in the Office of the Auditor • Organizing the Integrity Auditor Workshop, training on the Act on the Prohibition of Solicitation, and discovering best practices (40 trainees)
Integrity Training by Lifecycle	Group training	• Conducting training in each career stage, e.g. new/transfer/promotion/rank-specific training
All employees	Group training	• Itinerant training on integrity for sites nationwide ⇒ intensifying training on customer-oriented integrity policies

Improvement of the Integrity Ombudsman System

KOGAS runs the Integrity Ombudsman, an anti-corruption civilian watchdog. Having revised the operating guideline in 2016 to intensify effectiveness of the system, we have expanded its members up to seven in each working-level field (contracting, safety, accounting and construction, etc.) from the existing three-person scheme. In addition, we listen to diverse suggestions from working-level specialists and reflect them to KOGAS' integrity management by easing the qualifications of eligibility to include members of civic and social organizations and to fit the level of ombudsman systems of other public institutions.

Stakeholder Engagement

Definition of and Communication with Stakeholders

KOGAS identifies new opportunities and risks by gathering economic, environmental and social needs and opinions of stakeholders of KOGAS, and effectively reflect them to corporate management activities by initiating innovation in service.
Our stakeholders are defined as individuals or organizations subject to a critical impact of KOGAS' activities

Self-leading Customers

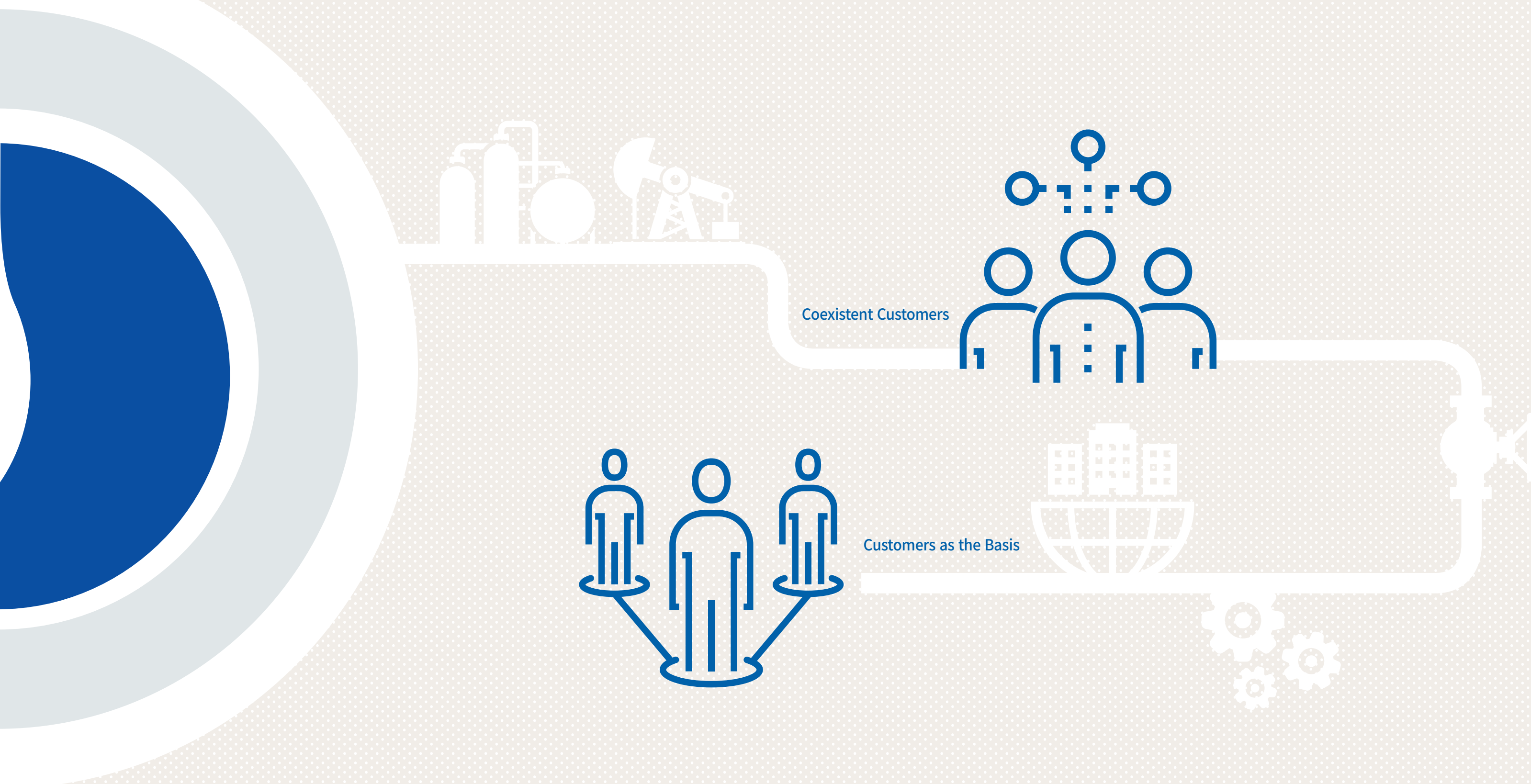
Definition	Stakeholder group	Areas of Interest	Communication Channels	Purpose of Communication	Key communication efforts and performance
Providing benefits to the public and driving growth in the gas industry	Employees	Self-esteem, organizational vision	• Expanded executives' meetings, Management Committee • Dialogue with the CEO • Labor-Management Council	• Seeking to achieve purposes of establishment for KOGAS • Sharing mid- to long-term strategies, and internalizing core values	• Spending a time of communication between the CEO and employees (7 times) • Strengthening labor-management communication, e.g. organizing a joint labor-management workshop • Implementing four joint Onnuri programs for the labor and the management, e.g. a self-sufficiency program for the homeless • Practicing social contribution activities
	Labor Union	Working environment, welfare			

Cooperative Customers

Definition	Stakeholder group	Areas of Interest	Communication Channels	Purpose of Communication	Key communication efforts and performance
Engaging in policy coordination for service for the public	Public	Energy fees, energy welfare	• Negotiation on tasks on the agenda • Support for inter-parliamentary affairs including National Assembly inspection of the government offices • Reporting of mid- to long-term management strategies, etc.	• Spearheading to acquire consistency among policies in the gas industry and management vision of KOGAS • Improvement in the quality of public services	• Establishing a real-time disaster response system with 26 local government by promoting and sharing 'Nara-e-eum' • Raising convenience for eligible applicants by improving application system for gas tariff reduction
	Government	Functions for public interest and policy compatibility			
	National Assembly				

and services, and categorized based on a system of classification focused on competition and collaboration to raise benefits for the public.

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



Coexistent Customers

Definition	Stakeholder group	Areas of Interest	Communication Channels	Purpose of Communication	Key communication efforts and performance
Contributing to higher benefits through the gas supply and forming a relationship to share partnership-based growth	City Gas Producers	Generating demand	• On-site seminars, business presentation • Seminars for improving customer satisfaction • Publishing the Sustainability Report	• Pursuing values of horizontal shared growth • Sharing and executing development strategies for the gas industry	• Making timely supply of city gas to Jeongseon-gun Country in Gangwon Province by supporting the retail pipeline investment cost of city gas companies by 50% (KRW 2.9 billion), etc. • Opening outdoor sports facilities at the main building of the headquarters to residents in adjacent areas • Implementing 'Onnuri Heat Efficiency Improvement Project' (50% of the business volume in Daegu Gyeongnam)
	Importers	Cooperating in business			
	Community	Facilitating the local economy			

Customers as the Basis

Definition	Stakeholder group	Areas of Interest	Communication Channels	Purpose of Communication	Key communication efforts and performance
Supporting and providing the basis for generating performance for the growth of the gas industry	Investment Companies	Facilitating projects	• Meeting on cooperation for resources development • LNG Buyer Council • Shared Growth Committee	• Establishing trust-based partnerships • Sharing business information in a timely Manner	• The CEO meeting with government officials in countries with KOGAS' presence (nine times in total including a meeting with the Minister of Petroleum in Iran)
	Countries to which KOGAS has Expanded	Generating national wealth			• Signing new agreements for six projects on cooperative tasks for technological development of SMEs • Mentoring on technological development for SMEs and expanding support for certification • Supporting SMEs to take part in overseas fairs for SMEs
	Suppliers	Achieving growth in a symbiotic relationship			

Materiality Test

Selection of and Reporting Process for Material Issues

KOGAS periodically listens to stakeholders' feedback on sustainability activities and identifies issues to be responded to by prioritizing them. For issues of materiality to be dealt with by KOGAS, goals and strategies are set and executed along with performance monitoring. Such issues are transparently disclosed in the Sustainability Report on an annual basis.

Selection of and Reporting Process for Material Issues

STEP1	STEP2	STEP3
Identification of Sustainability Issues	Prioritization of Material Issues	Selection of Final Issues and Validity Assurance
Finding out 30 issues by utilizing various issue collecting mechanisms, including internal data review, media research, benchmarking and review of international standards to identify issues on sustainability management	Prioritizing a pool of issues discovered based on their impact on stakeholder evaluation and decision-making and the economic/environment/social impact of the organization	Preparing for a process for review and information collection of the material issues selected in order to report the performance of sustainability management in a reasonable and balanced manner
Sustainability	Materiality	Completeness

Stakeholder Inclusiveness

STEP 1 Identification of Sustainability Issues

In order to figure out the economic, environmental, and social impacts of all activities and services, we conducted media analysis, benchmarking of related institutions and the industry KOGAS is engaged in, and review of international reviews and stakeholder surveys, organization of T/F workshops and analysis of internal data, etc. from January to the end of December, 2016.

Media Research
Analyzing news articles on KOGAS' management and activities exposed in the media coverage from January to the end of December, 2016

Benchmarking Analysis
Analyzing best practices and key trends based on reports of the industry at home and abroad and related institutions

Review of International Standards on Sustainability Management
Finding out key issues in international standards related to sustainability management including GRI G4, DJSI and ISO 26000

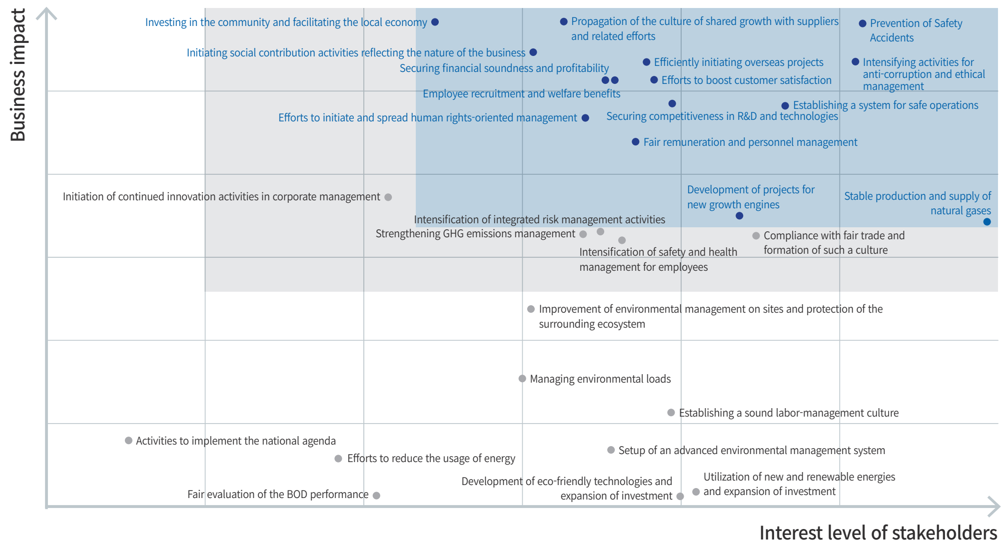
Stakeholder Surveys
Conducting a five-day survey from April 24 to 28, 2017, to determine materials issues for stakeholders

T/F Workshop
Organizing a workshop to help those involved in report writing and managers covering related issues, and openly discuss sustainability management

Review of Internal Data
Identifying major economic, environmental and social issues by analyzing the management evaluation reports, mid-and long-term management strategies, management disclosure and various internal reporting data

STEP2 Prioritization of Material Issues

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



STEP 3 Selection of Final Issues and Validity Assurance

We have finalized the content to be reported by defining the level of boundary and scope for material aspects to be included in the report based on internal review. In addition, we conducted validity check to make rational and balanced expression of sustainability management performance which includes both positive and negative impacts of KOGAS.

	Material Issues	GRI G4 Aspects	Aspect Boundaries		Page
			Internal	External	
1	Prevention of Safety Accidents	Industrial safety and health	KOGAS and employees	Government	34-36
2	Intensifying activities for anti-corruption and ethical management	Anti-corruption		Government	66-67
3	Propagation of the culture of shared growth with suppliers and related efforts	Evaluation of the impact of suppliers on the society		Suppliers, Global stakeholders	40-44
4	Investing in the community and facilitating the local economy	Local communities		Local communities	48-53
5	Efficiently initiating overseas projects	-		Government, Suppliers, Shareholders/ Investors, Global stakeholders	10-11, 23
6	Initiating social contribution activities reflecting the nature of the business	Local communities		Local communities, NGOs	48-53
7	Efforts to boost customer satisfaction	Product and service labeling		Customers	45-47
8	Establishing a system for safe operations	Industrial safety and health		Government	34-36
9	Employee recruitment and welfare benefits	Employment, training and education		-	26-29
10	Securing financial soundness and profitability	Economic effects		Government, Shareholders/Investors	21-24, 33
11	Securing competitiveness in R&D and technologies	-		Government, Shareholders/Investors	30-31
12	Efforts to initiate and spread human rights-oriented management	Diversity and equality in opportunities		-	26-28, 80-81
13	Stable production and supply of natural gases	-		Government, Suppliers, Shareholders/ Investors, Global stakeholders, Citizens	33
14	Fair remuneration and personnel management	-		-	26-28
15	Development of projects for new growth engines			Government, Shareholders/Investors	24

APPENDIX

Performance Summary

Economic Performance

Major Economic Performance (consolidated financial sheets)

Type	Unit	2014	2015	2016
Revenues	KRW 100 million	372,849	260,527	211,081
Operating income	KRW 100 million	10,719	10,078	9,176
Net income (loss)	KRW 100 million	4,472	3,192	-6,736

Major Financial Indicators (consolidated financial sheets)

Type		Unit	2014	2015	2016
Growth potentials	Increase rate in revenues	%	-2.0	-30.1	-19.0
	Increase rate in net income	%	Conversion into a surplus	-28.6	-311.0
Profitability	Return on Assets (ROA)	%	0.99	0.72	-1.64
	Return on Equity (ROE)	%	4.79	3.23	-6.97
Stability	Current ratio	%	139.84	174.81	153.77
	Debt ratio	%	380.98	321.45	325.38
	Capital ratio	%	20.79	23.73	23.51
Productivity	Productivity of capital	%	6.18	6.39	5.18

Summary for Consolidated Financial Statement (consolidated financial sheets)

Type		Unit	2014	2015	2016
Assets	Current assets	KRW 100 million	137,913	100,146	85,439
	Non-current assets	KRW 100 million	329,807	323,707	313,840
	Total assets	KRW 100 million	467,720	423,853	399,278
Liabilities	Current liabilities	KRW 100 million	98,621	57,287	55,563
	Non-current liabilities	KRW 100 million	271,855	265,997	249,851
	Total liabilities	KRW 100 million	370,476	323,284	305,413
Shareholders' equity	Paid-in capital(A)	KRW 100 million	4,616	4,616	4,616
	Others(B)	KRW 100 million	92,628	95,954	88,122
	Equity attributable to shareholders of the corporation (subtotal)(A+B)	KRW 100 million	97,244	100,569	92,737
	Non-controlling interests	KRW 100 million	0.0045	0.0015	1,127
	Total shareholders' equity	KRW 100 million	97,244	100,569	93,865

R&D

Type	Unit	2014	2015	2016
R&D investment expenses	KRW 100 million	468	425	719
Technological patents (accumulated)	Number of cases	294	307	347

Generation and Distribution of Economic Value

Stakeholders	Calculation Criteria	Unit	2014	2015	2016
Suppliers	Expenses for purchasing goods from SMEs	KRW 100 million	5,306	3,569	2,983
Employees	Employee wages and welfare benefits	KRW 100 million	2,909	3,164	3,480
Government	Corporate tax + Taxes & dues	KRW 100 million	0	298	3,542
Community	Donations and social contribution activity expenses	KRW 100 million	264	207	183
Customers	Revenues	KRW 100 million	372,849	260,527	211,081
Creditors	Interest	KRW 100 million	8,430	7,764	8,408

Environmental Performance

Greenhouse Gas Emissions

Type	Unit	2014	2015	2016
Total GHG emissions	tCO_2e	592,506	502,988	525,573
Direct emissions	tCO_2e	246,750	150,711	166,283
Indirect emissions	tCO_2e	345,756	352,277	359,290

Amount of Energy Usage

Type	Unit	2014	2015	2016
Total amount of energy usage*	TJ	11,760	10,189	10,651
Direct energies	TJ	4,629	2,965	3,248
Indirect energies	TJ	7,131	7,224	7,414

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

Amount of Water Usage*

Type	Unit	2014	2015	2016
Total amount of water usage	m^3	2,054,523,871	2,079,743,858	2,016,499,069
Seawater	m^3	1,576,236,007	1,581,500,930	1,571,859,597
Water service	m^3	469,209,947	491,108,395	436,181,693
Others	m^3	9,077,917	7,134,533	8,457,779

* Data in this report might be different from those in the previous one because of changes in the amount of the entire water usage due to increases in facilities using groundwater as management stations were newly built, and also because of errors in the unit for the amount of other types of water used.

Emission of Environmental Pollutants

구분			단위	2014	2015	2016
Sales volume of natural gases			1,000 tons	35,173	31,456	32,773
Air pollution*	NOx	Amount of emissions	kg	369,863	256,230	278,257
		Basic unit	kg/1,000 tons	11.28	8.15	8.49
	SOx	Amount of emissions	kg	1,070	689	749
		Basic unit	kg/1,000 tons	0.03	0.02	0.02
	Dust	Amount of emissions	kg	3,322	2,191	2,363
		Basic unit	kg/1,000 tons	0.09	0.07	0.07
Water pollution**	BOD	Amount of emissions	kg	99.9	125.3	124.2
		Basic unit	kg/1,000 tons	0.0028	0.004	0.004
	COD	Amount of emissions	kg	58.6	71.8	48.6
		Basic unit	kg/1,000 tons	0.0017	0.0023	0.002
	SS	Amount of emissions	kg	156.9	236.3	139.5
		Basic unit	kg/1,000 tons	0.0045	0.0075	0.0043
Waste***	General		1,000 tons	832	967	3,300
	Designated		tons	248	429	198
	Construction		tons	485,406	411,583	290,394
	Total	Amount of emissions	tons	486,486	412,979	293,892
		Basic unit	tons/1,000 tons	13.83	13.13	8.97

* Data in this report might be different from those in the previous one because some of the facilities on sites are classified as facilities emitting air pollutants, and the amount of emission of air pollutants is changed due to the application of the Total Maximum Daily Load (TMDL) including nitric oxides to sites.
** Data in this report might be different from those in the previous one because of changes in the amount of emission for BOD, COD and SS due to modification in the quantified data on the amount of wastewater and effluent treatment in the management system.
*** Data in this report might be different from those in the previous one because of changes in the amount of waste discharge as the amount of waste on industrial sites was recalculated (modification in the guideline for managing routine maintenance and waste generated from construction works).

Amount of Hazardous Chemicals Used*

구분	단위	2014	2015	2016
Sales volume of natural gases	1,000 tons	35,173	31,456	32,773
Amount of use	kg	186,022	333,427	142,358
Basic unit	kg/1,000 tons	5.29	10.60	4.34

* Data in this report might be different from those in the previous one because of changes in the amount of hazardous chemicals used due to the addition of such chemicals among the ones used on sites following the amendment of the Toxic Chemicals Control Act.

Risks and Opportunities of Climate Change

There has been a greater interest in measures for climate change because of the continuous increase in the carbon emissions – the cause for global warming – and from the onset of the Paris Agreement. In Korea, directions to convert into fuels for power generation (including coal) are positively reviewed, and roles of the natural gas (LNG) – a low-carbon emitting fuel – is expected to play intensified roles as an intermediary fuel, which might be an opportunity for KOGAS. Furthermore, KOGAS' initiation to diversify its business into new and renewable energy sectors including hydrogen energy and LNG bunkering business is expected to significantly contribute to higher revenues and KOGAS' financial structure.
Meanwhile, KOGAS is aware of the necessity of CDM business, while exploring business for reduction in emission. Some of the business cover a need to procure emission credits as the amount of allocation by the government is reduced by phase (including the amount of paid allocation), and also improving facilities to control procurement cost. We currently conduct quantitative and qualitative analyses on risks, while identifying physical factors of climate change (heat waves, torrential rain, cold waves, heavy snow and gale, etc.), and plan to establish adaptation measures to climate change on earth.
Seeking to proactively respond to climate change risks, KOGAS runs the Climate Change/Energy Committee and the Working-Level Committee for devising plans for climate change response and energy management, etc. We also respond to climate change throughout the corporation by devising indicators to evaluate the compliance of the allocated amount of GHG emission in each terminal division and regional division and their efforts to save energy.

Violation of environmental laws and regulations

Type	Unit	2014	2015	2016
Violation of statutory obligations/regulations	Amount of penalty	0	0	0
Number of times	KRW	0	0	0

Social Performance

Performance in the BOD Operation

Type	Unit	2014	2015	2016
Number of times BOD meetings have been held	Number of times	20	15	17
Agenda agreed upon	Number of agenda	67	50	46
Pre-deliberation rate*	%	80	81	95
Revised agreed-upon agenda	Number of agenda (%)	1(1)	2(4)	1(2)
Reported agenda	Number of agenda	27	28	29
BOD attendance rate	%	90	80	82
Attendance rate of non-executive directors	%	88	79	79
Portion of speeches/motions delivered by non-executive directors	%	57	55	56

* In 2016, the scheme for calculating the preliminary review was changed into 'the number of agenda explained at the preliminary council/the number of agenda presented to the Board of Directors) (before the change: the number of times the preliminary council was organized/the number of times the Board of Directors was organized).

Status of Employees

Type		Unit	2014	2015	2016
Total employees		Number of employees	3,483	3,497	3,626
Employment type	Regular (Including executive director)	Number of employees	3,453	3,460	3,605
	Non-regular	Number of employees	30	37	21
Distribution of employees by age bracket	Below the 30s	Number of employees	1,234	1,205	1,347
	In the 40s	Number of employees	1,626	1,603	1,578
	Above the 50s	Number of employees	593	652	701
Women employees	Women employees	Number of employees (%)	346(10.0)	350(10.1)	390(10.8)
	Women managers	Number of employees (%)	5(0.14)	5(0.14)	37(1.03)
Distribution of personnel based on social equity	The disabled	Number of employees	100	108	131
	High school graduates	Number of employees	558.5	547.5	497
	People of national merit	Number of employees	318	331	356
	Local talents	Number of employees	1,616	1,640	1,749
New recruits based on social-equity	The disabled	Number of employees	10	15	8
	Women employees	Number of employees	22	13	52
	High school graduates	Number of employees	41.5	29	69
	People of national merit	Number of employees	20	18	26
	Local talents	Number of employees	82	65	27.5

※ The data were produced based on the All Public Information In-One.

Status of Training for Employees

Type	Unit	2014	2015	2016
Investment expenses for education and training	KRW million	8,726	9,371	8,364
Education hours per person	Number of hours	116	135	102
Education training expenses per person	KRW 1,000	2,505	2,654	2,382

Employees' Rate of Return to Work After a Childcare Leave

Type	Unit	2014	2015	2016
Childcare applicants	Number of employees	21	23	46
Men employees applying for a childcare leave	Number of employees	4	2	2
Post-childcare leave return rate	%	87	100	92

Employees' Performance Evaluation

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

Type	Unit	2014	2015	2016
Rate of application of performance evaluation	%	96.9	96.2	96.5

Employees' Retirement Management

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

Type		Unit	2014	2015	2016
Retirement pension	Amount of assets under management	KRW 100 million	1,241	1,664	2,566
	Number of subscribers	Number of employees	3,486	3,518	3,640
Retired employees	Retirement age	Number of employees	13	21	0
	Voluntary retirement	Number of employees	7	8	10

Status of the Labor Union Subscription

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

Type	Unit	2014	2015	2016
Number of labor unionists	Number of employees	3,012	3,017	3,186
Labor union subscription rate	%	88	86	86

Occupational Health and Safety

The rate of workers represented by the Joint Labor-Management Health and Safety Committee (total number as of 2016-end: 3,468, number of employees on sites: 2,524). Topics for consultation include establishing preventive plans against industrial accidents, and matters on safety/healthcare measures following the adoption of hazardous/risky machinery and equipment. We perform a health checkup once a year for employees to prevent occupational diseases, along with a once-a-year special health check-up for employees in work shift and private police guards.

Injury rate (2016)*	Rate of taking number of leaves (2016)*	Rate of absenteeism (2016)	Number of occupational deaths (2016)
0.029%	23.07%	0%	0명
1 case of fracture due to falling off	Sick leave of 90 days	-	-

* Rate of the injured out of 100
** Average working hours of 40 per individual/week X 52 weeks

Status of Suppliers

Type	Unit	2014	2015	2016
Number of major partner companies	Number of companies	72	82	84

Procurement Contracts with SMEs

Type	Unit	2014	2015	2016
Purchases of SME products	KRW 100 million	5,306	3,569	2,983
Ratio of purchases of SME products	%	27.8*	26.7	28.1

* 27.3% disclosed in the 2016 Sustainability Report a typo, which is to be corrected as 27.8%.

Support for SMEs' Competitiveness

Type		Unit	2014	2015	2016
Joint R&D	Number of cases	Cases	27	27	19
	Participating companies	Number of companies	27	27	19
	R&D budget	KRW 100 million	26.8	22.2	10.0
Training for employees in small-and medium-sized suppliers	Training for technical/research personnel	Number of employees	19	70	-
	On-the-job training	Number of employees	2	8	-
	Online training	Number of employees	13	28	37
	Subtotal	Number of employees	34	106	37

Customer Satisfaction

Type	Unit	2014	2015	2016
Public-service Customer Satisfaction Index (PCSI)	Grade (points)	A(97.2)	A(93.7)	S(94.9)

Product and Service Information and Labeling

KOGAS supplies natural gases as products, and disclose the Material Safety Data Sheet (MSDS) to customers and on our website, which explains hazardousness, risks, emergency tips and handling procedures on the materials supplied. These are supplied pursuant to Article 41 of the Industrial Safety and Health Act, Article 37.2 of its Enforcement Decree and Article 92.2~10 of its Enforcement Rule. KOGAS has not violated related rules and regulations in 2016.

Cases of Anti-Corruption and Violation

We periodically monitor all site sand all business activities by establishing an internal constraining system. In addition, we operate the internal whistleblowing (reporting) system, and prevent corruption and management risks through advisory and supervisory activities including the Integrity Ombudsman and integrity auditors. The routine inspection system is operated as follows for preventing and strengthening the control of cases of key corruption and management risks.

Risks of budget waste		Moral hazard risks		Risks of collective selfishness		Risks of incompetent control		Key management agenda
82 risks	+	9 risks	+	19 risks	+	60 risks	+	Risks of false reporting, etc.
Auditing system	+	Routine monitoring	+	Comprehensive & special auditing	+	Daily auditing	+	Prior review of agenda

Type	Unit	2014	2015	2016
Cases of violating anti-corruption laws	Number of cases (number of people)	3(3)	1(1)	1(22)*

* For the internal case of unfair conduct found out in 2016, we intensified punitive measures, the internal control system and policies on ethics (refer to p.66~67 for details).

Employee Training on Human Rights Policies and Procedures

Type	Unit	2014	2015	2016
Completion of ethical training	Number of employees	2,963	1,624	3,144
Completion of online training on the code of conduct	Number of employees	3,281	3,237	5,980

Social Contribution Activities

Type	Unit	2014	2015	2016
Total volunteering hours	Number of times	45,878	74,593	34,711
Volunteering hours per person	Number of times	13.3	21.2	9.4
Discounts for gas fees	KRW 100 million	685	735	768

Creating jobs through social contribution projects (2016)

Type	Business cost (yearly)	Number of jobs	Note
Onnuri Heat Efficiency Improvement Project (energy welfare)	KRW 1.97 billion	29 employees	Application of the labor inducement coefficient* (construction business)
Self-sufficiency Program for the Homeless	KRW 50 million	6 employees	Actual number of people employed
Operation of social contribution buses	KRW 90 million	1 employee	1 bus driver
New operation of the Toy Library (2 launched in 2016)	KRW 120 million	2 employees	1 social worker/toy library
Happy Nest Project, setup of study rooms, Love Fence Project	KRW 220 million	3 employees	Application of the labor inducement coefficient* (construction business)
Daegu Social Welfare Council	KRW 80 million	3 employees	New employment
Subtotal	KRW 2.53 billion	44 employees	

* Labor inducement coefficient in construction business (Korea Employment Information Service): 14.6 employees/KRW 1 billion

Amount of contribution

Type	Unit	2014	2015	2016
Total amount of contribution	KRW	4,117,124,650	5,107,753,500	4,452,000,260

Top five sources of contributions* (2016)

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

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

Prizes and Awards/Memberships

Awards and Certifications

Title of awards	Organized by	Year
Ministerial Award of Trade, Industry and Energy of Korea CSR Film Festival	Ministry of Trade, Industry and Energy	2016
Designation as an excellent customer in the prevention of construction accidents	Korea Occupational Safety and Health Agency	2016
Highest rank in the disaster management evaluation in the national infrastructure system	Ministry of Public Safety and Security	2016
1st Rank in the Best Companies to Work	GWP KOREA	2016
Certification as an excellent company in Standard Service Quality	Ministry of Trade, Industry and Energy	2016
Ministerial Award of Trade, Industry and Energy in the Energy Voucher Business	Ministry of Trade, Industry and Energy	2016
Prime Ministerial Commendation commemorating the 2016 World Standards Day	-	2016
Prime Ministerial Award in Korea Safety Award	Ministry of the Interior	2016
Integrated ISO certifications (ISO 8001, ISO 14001, ISO 29001, OHSAS 18001)	KOGAS, British Standards Institution (BSI)	2016
Acquisition of the highest level (excellence) in the Evaluation of Customer Satisfaction Level of Public Corporations (for nine consecutive years)	Ministry of Strategy and Finance	2015
Designation as an excellent institution in security equipment for major national facilities – Tongyeong Terminal Division	National Intelligence Service	2015
Korea Energy Environment Award – Chungcheong District Division	Ministry of Environment	2015
Collective Ministerial Commendation of Trade, Industry and Energy in energy saving and efficiency improvement – Gyeonggi District Division	Ministry of Trade, Industry and Energy	2015
Award for Men of Merit for Sharing in 2015 by Gyeonggi Province – Gyeonggi District Division	Gyeonggi Provincial Government	2015
Korean National Sharing Award (Minister of Health and Welfare) – Jeonbuk District Division	Ministry of Health and Welfare	2015
2015 Korea Energy Environment Award – Chungcheong District Division	Ministry of Environment	2015
Designation as an excellent institution in integrated defense for major national facilities (prime ministerial award) – Incheon Terminal Division	Ministry of National Defense	2015
Designation as an excellent institution in joint evaluation of disaster management in the national infrastructure system	Ministry of Public Safety and Security	2015
Grand Prize in the 2014 Technology Development Award (Administrator Prize of the Small and Medium Business Administration)	Small and Medium Business Administration	2014
Award for Men of Merit in Social Welfare by Gyeonggi Province – Gyeonggi District Division	Gyeonggi Provincial Government	2014
1st Rank in the energy sector in Korea's Most Admired Companies for seven consecutive years	Korea management Association	2014
Platinum Award in the annual sector category of the 2012/13 VISION AWARDS	LACP	2014

Memberships

- IUCN
- UN Universal Declaration of Human Right
- UN Global Compact
- Institute for Global Economics
- Energy & Mineral Resources Development Association of Korea
- Green Company Council
- Korea Environmental Preservation Association
- Ethical Management SM Forum
- Korea Gas Union Corp.
- Korea National Committee of WEC

Human Rights Management at KOGAS

Principle of Human Rights Management

KOGAS formulated and declared the 'Charter on Human Rights Management' in April 2017 to establish a system for human rights management fulfilling international standards and raise reliability in the domestic and international markets, thereby contributing to sustainability management. We implemented internal and external promotions proactively on the 'Charter on Human Rights Management' to spread consensus among all employees and create a culture for human rights, which have been shared on KOGAS' official website and the in-house portal, via email for all employees and SNS (Facebook) and on newspaper. In addition, all employees signed the 'Pledge to Comply with the Charter on Human Rights Management'. We have established diverse communication channels, endeavored to prevent violation of human rights, diversified the grievance handling system and continuously conducted due diligence in order to put them into action throughout the corporation. Furthermore, KOGAS joined the UN Global Compact in 2007, an international agreement prescribing global corporate social responsibilities. We announced that we will sincerely implement the ten principles in four areas as human, rights, labor standards, environment, and anti-corruption. We express our endorsement for the Universal Declaration of Human Rights through the Sustainability Report on a yearly basis.

Identification of Risks for Human Rights

KOGAS evaluated 38 items in 10 areas according to the checklist of human rights management: setup of the human rights management system; non-discrimination in employment; guarantee of freedom of association and collective bargaining; prohibition of forced labor; prohibition of child labor; guarantee of industrial safety; responsible management of the supply chain; human rights protection of local residents; guarantee of the environmental right; and human rights protection of consumers. The results were overall favorable and satisfying. The results of identification are disclosed through the corporate-wide notices and posting of the e-bulletin board, etc. and information on classes neglected by KOGAS, areas to be improved and potential risks, etc.

Plans and Measures to Ease Human Rights Risks

Strengthening Management of the Area of 'Responsible Supply Chain Management'

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

Complementing the Area of 'Establishing a Human Rights Management System'

Seeking to improve the area of 'establishing a human rights management system', we took actions for improvement and complementation: institutionalizing human rights management, periodically disclosing results, launching a department in charge of human rights management (Innovative Culture Team), and declaring policies on human rights management, etc.

Strengthening EHSQ Management

Upon proceeding with business, KOGAS' EHSQ management regulations mandates safety and environmental evaluation to minimize damage when accidents occur by preventing casualties and property loss and taking preventive measures against accidents. In addition, EHSQ regulations are prescribed for suppliers to abide by mandatorily to ensure actions for guaranteeing a compliant labor environment and business ethics on sites.

Rate of identifying human rights risks in KOGAS' management activities and rate of taking actions

Total rate of evaluation for the past three years	Rate of risks being identified among those that have been evaluated	Rate of application of complementary/improvement measures among those where risks are identified	Standard of calculating the reporting rate
100%	26%	100%	Number of employees (100%)

KOGAS' Charter of Human Rights Management

KOGAS' Charter of Human Rights Management

We strive to achieve our mission for enhancing benefits for people's livelihood and realizing welfare in energy by supplying natural gases securely and stably to the public in pursuit of 'Better Energy, Better Tomorrow'. We pursue 'implementation of a non-discriminating fair society' and 'human rights management that puts people on the top priority'.

To this end, we declare the 'KOGAS' Charter on Human Rights Management' and pledge to take actions as a standard for taking proper actions and making proper value-based decisions for employees in order to enhance respect for humans and raise values in all our management activities.

We respect and support international standards and norms which support such values as human rights, labor, environment and anti-corruption.
We do not discriminate all stakeholders including employees for reasons of race, religion, disability, gender, place of birth or political opinions, etc.
We guarantee freedom of association and collective bargaining to protect the rights of employees.
We disallow any forms of forced labor and child labor.
We enhance industrial safety and health by creating a safe and hygienic working environment.
We strive for win-win development with suppliers, and support and cooperate with them for them to practice human rights management.
We respect and protect human rights of local residents in areas where we do business.
We protect the environment and strive to prevent environmental damage.
We strive to ensure that our business execution does not hamper the public safety, and protect personal information collected for business purposes.

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

Employees of KOGAS

Supply Chain Management

Code of Conduct for Suppliers

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

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

100%
(2018)

Suppliers of KOGAS

KOGAS' suppliers are classified into two types: construction work and major equipment and materials*. The category of construction work is participated by 129 companies engaged in the construction of production and supply facilities and maintenance work, and that of major equipment and materials is with 60 companies that are registered to supply components that are essential to produce and supply natural gases. Key suppliers among them are three large-scale construction companies (construction work) worth over KRW 5 billion and 39 companies (major equipment and materials) that have signed contracts with KOGAS in 2016 among those registered as major equipment and materials companies.

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

Status of KOGAS' suppliers in 2016

Primary suppliers	Key primary suppliers	Total procurement cost of primary suppliers	Procurement ratio of core primary suppliers out of the total procurement cost of primary suppliers
168 companies	42 companies	KRW 152,224,777,319	42.16%

Strategies for Supply Chain Management

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

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

Strategies for Supply Chain Management

Quality	Technological capability	Continuity	Delivery	Transparency in selection
Mandatory clarification of acquisition of ISO 9001, KOSHA 18001 certification	Clarification of technological capability including designing and manufacturing by clarifying the records of goods supply	Clarification of management crises (merger, integration, etc.)	Clarification of actual manufacturing capability, etc. through due diligence	Acquisition of adequate quality by implementing competitive bidding

Key ESG Targets

ISO 9001 Certification	KOSHA 18001 Certification
Acquisition of manufacturing capability for major equipment and materials for suppliers, and adequate quality by setting up a quality control system	Imposition of credits on KOSHA 18001 certified companies to bolster safety and health activities of suppliers so that industrial accidents on construction sites could be reduced

Management of Risks in the Supply Chain

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

	Construction Work	Major Equipment and Materials
Identification of Risks	**1. An official process to identify potential risks when bidders participate in a bidding for construction work** - Applicable standards: Specific Standard [Guideline] for Qualification Inspection for Construction Work - Content: Identifying risks in areas of personal position (accident rate, legal violations in safety and environment and certification on safety, etc.) while conducting qualification/prequalification inspection for construction projects above a predetermined threshold **2. Method of identification** Direct evaluation at KOGAS based on applicable materials in each area predetermined by government agencies and subordinate institutions (accident rate, etc.) **3. Alignment with strategies for managing the supply chain** The probability of industrial accidents is very high, given the nature of sites for construction work. Therefore, companies with high potential risks are eliminated by identifying suppliers' safety and health management state.	**1. An official process to identify potential risks of companies registered for major equipment and materials** - Applicable standards: [EHSQI-06401 Guideline on Registration and Management of Manufacturers of Major Equipment and Materials] 8. Monitoring and Measurement - Content: Companies registered for major equipment and materials may be requested to undergo inspection and submit related documents. When issues which are critical to management occur or reasons to restrict qualifications for participating in bidding take place, special inspection might be conducted, or bidders may be required to submit documents. **2. Method of identification** For document evaluation and due diligence on sites, sanctions are implemented, e.g. bidders' qualification for registration being terminated by identifying falsification of documents submitted, suspension of production and severe defects in materials. Such findings are reported to the top management internally, e.g. decisions made at the Working Level Committee and the Plenary Committee, and are notified to relevant companies. **3. Alignment with strategies for managing the supply chain** - (Evaluation of applicant companies for new registration) Site reviews for companies are conducted to decide on their registration, including technological ability, management status and pilot product test. Potential sustainability risks are periodically evaluated and managed to prevent safety risks in advance, and then suppliers are added accordingly. As such, supply chain risks are managed and implemented for effective management. - (Evaluation of pre-registered companies) The valid period for registration is renewed and managed through reevaluation of technological ability, management status and constraints, etc.
Scope and Objectives of Evaluation	Evaluation of personal position on the intensity of sustainability risks in construction work is subject to items for review, and for the bidders with such high risks, the risks are defined as high sustainability risks. 1. Integrity as construction companies: penalties 2. Construction accidents and administrative sanctions - Accident rate, track records of violating the purpose of using the industrial safety and health management cost, track records of violating the duty to report on occurrence of industrial accidents, track records on punishment pursuant to environmental laws and regulations, acquisition of KOSHA 18001 certification	The intensity of sustainability risks on major equipment and materials is an essential factor. Acquisition of ISO 9001 certification is identified and soundness and technical ability (designing/manufacturing ability, and remedy defects, etc.) of the quality management system is referred to for evaluation.
Methods of Risk Management	We evaluate sustainability risks of suppliers by biannually measuring penalties for large construction works of KRW 5 billion or higher. The penalties are measured through evaluation on industrial accidents of suppliers, safety and health management methods and track records, and the results are reflected in follow-up construction contracts.	For companies registered for major equipment and materials, we organize the Working Level and Plenary Committees for evaluating major equipment and materials to impose corporate sanctions. Once sanctions are determined, they are notified to companies, requesting them to making improvement and reflecting the integrity in maintenance for follow-up evaluation onto evaluation of personal position. Quality inspection is performed for initial order volume after sanctions were imposed, if necessary.

Third Party's Assurance Statement

Introduction

Korea Gas Corporation ("KOGAS") commissioned DNV GL Business Assurance Korea Ltd. ("DNV GL"), part of DNV GL Group, to undertake independent assurance of the Sustainability Report 2017 (the "Report"). KOGAS have sole responsibility for the preparation of the Report. The responsibility of DNV GL in performing the assurance work is to the management of KOGAS in accordance with the terms of reference. DNV GL's assurance engagements are based on the assumption that the data and information provided by the client to us as part of our review have been provided in good faith.

Scope of assurance

The scope of assurance included a review of sustainability activities and performance data over the reporting period 1st January to 31st December 2016. This included:

- Evaluation of the Report on the adherence to the principles for defining the sustainability report content in the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines 4.0
- Evaluation of the process for determining material aspects for reporting and the management approach to material issues and the process for generating, gathering and managing the quantitative and qualitative data in the Report.
- Review of the performance data and information in 2016 against the information disclosed in the Stateowned/State-controlled organization information disclosure system (www.alio.go.kr), the evaluation report for state-owned/state-controlled organization, internal documents and records in the Report.

Basis of our opinion

We performed our work using DNV GL's assurance methodology VeriSustain™*, which is based on our professional experience, international assurance best practice including International Standard on Assurance Engagements 3000 (ISAE 3000). We applied the limited level of assurance. The audit was carried out in May and June 2017. The site visits were made to KOGAS headquarters in Daegu, Korea. We undertook the following activities as part of the assurance process:

- challenged the sustainability-related statements and claims made in the Report and assessed the robustness of the underlying data management system, information flow and controls;
- interviewed representatives from the various departments;
- conducted document reviews, data sampling and interrogation of supporting databases and associated reporting system and associated reporting systems as they relate to selected content and performance data;
- reviewed the materiality assessment report.

Limitations

The engagement excludes the sustainability management, performance and reporting practices of KOGAS' associated companies, subsidiaries, suppliers, contractors and any third-parties mentioned in the Report. DNV GL did not interview external stakeholders as part of this Assurance Engagement. Economic performance based on the financial data is cross-checked with internal documents, the audited consolidated financial statements and the announcement disclosed at the website of Korea Financial Supervisory Service (http://dart.fss.or.kr) as well as the State-owned/State-controlled organization information disclosure system (www.alio.go.kr) and KOGAS' website (www.kogas.or.kr). These documents, financial statements and the announcements are not included in this Assurance Engagement. Limited depth of evidence gathering including inquiry and analytical procedures and limited sampling at lower levels in the organization were applied. The baseline data for Environmental and Social performance are not verified, while the aggregated data at the corporate level are used for the verification. DNV GL expressly disclaims any liability or co-responsibility for any decision a person or an entity may make based on this Assurance Statement.

Conclusion

On the basis of the work undertaken, nothing comes to our attention to suggest that the Report does not properly describe the adherence to the Principles for defining report content in GRI G4. The verification team has observed that there is general awareness of sustainability context across all different levels of the organization. Further opinions with regards to the adherence to the following Principles are made below;

* The VeriSustain protocol is available upon request at DNV GL website. (www.dnvgl.com)

Stakeholder Inclusiveness

KOGAS has identified internal and external stakeholder groups such as Employees, Trade union, The public, Government, National assembly, City Producers, Natuaral gas importers, , Local communities, Subsidiaries, Countries where KOGAS has business and Suppliers. KOGAS engages with the stakeholders at the company and business unit levels through various channels. The examples of approaches to engagement with selected stakeholders are described in the Report.

Sustainability Context

KOGAS has stated in the Report the '2025 Vision' and strategy for sustainability management. The goal of social contribution sector has been linked to the UN SDGs (Sustainable Development Goals), and key issues and action plans are developed to achieve the sustainability management strategy based on the 4 strategic directions of governance, economy, environment and society aspects. KOGAS addresses how material issues are managed and what was achieved in 2016, which would help the stakeholder understand the management approaches to the material aspects.

Materiality

KOGAS has conducted the materiality assessment to prepare the Report. 30 issue pools were formed and internal and external stakeholders were surveyed to rate the issues. 15 material issues are prioritized accordingly. KOGAS considers the consistent way of selecting material issues so that the decision made by the management and daily operation are fully aligned with strategic sustainability management. The verification team has reviewed the materiality assessment process and nothing comes to our attention that would cause us to believe that material issues identified from the assessment are not reported.

Completeness

The Report has covered the sustainability performances of KOGAS and management approach to material issues for the reporting period. The reporting boundary has been set to include domestic operations such as headquarters, LNG terminals and Trunk lines and research institute. Some performance information from overseas activities are included. Nothing comes to our attention to believe that the Report does not cover material issues derived from materiality assessment.

Report quality: Accuracy and Reliability

We found a limited number of non-material errors and these were corrected prior to inclusion in the Report. The data presented in the report were gathered from the teams responsible for data control in KOGAS. The verification team interviewed the Person-in-charge, reviewed the process of gathering and processing data and information, and the supporting documents and records. The depth of data verification is limited to the aggregated data. Based on sampling verification and other reported information and available evidence, nothing comes to our attention that would cause us to believe that the data and information presented in the Report have any intentional error or material misstatement.

Competence and Independence

DNV GL Business Assurance is part of DNV GL Group and a global provider of certification, verification, assessment and training services, helping customers to build sustainable business performance. Our environmental and social assurance specialists are present in over 100 countries. The assurance work was performed by independent team which meets DNV GL's competence requirements. DNV GL was not involved in the preparation of any statements or data included in the Report except for this Assurance Statement. The verification team has complied with DNV GL's Code of Conduct.

June 2017
Seoul, Korea

In Kyoon Ahn Country Representative

DNV GL Business Assurance Korea Ltd.

DNV·GL

GRI Content Index

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G4-2	Provide a description of key impacts, risks, and opportunities.	●	4-5, 64-65
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G4-5	Report the location of the organization's headquarters.	●	14
G4-6	Report the number of countries where the organization operates, and names of countries where either the organization has significant operations or that are specifically relevant to the sustainability topics covered in the report.	●	10-11, 14
G4-7	Report the nature of ownership and legal form.	●	14, 63
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G4-11	Report the percentage of total employees covered by collective bargaining agreements.	●	29
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G4-13	Report any significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain.	●	No significant changes occurred during the reporting period
G4-14	Report whether and how the precautionary approach or principle is addressed by the organization.	●	34-37, 54-59, 64-65
G4-15	List externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses.	●	88-90
G4-16	List memberships of associations and national or international advocacy organizations in which the organization.	●	79
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G4-26	Report the organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken specifically as part of the report preparation process.	●	68-69
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G4-29	Date of most recent previous report (if any).	●	2
G4-30	Reporting cycle.	●	2
G4-31	Provide the contact point for questions regarding the report or its contents.	●	2
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Sustainability Initiative

ISO 26000

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

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UN SDGs (Sustainable Development Goals, SDGs)

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

UN SDGs		KOGAS' Strategies for Social Contribution				Alignment
		Love	Hope	Har-mony	One Heart	
1	Eradicating all forms of poverty everywhere	○	○	○		Contributing to easing economic impoverishment and poverty through various forms of social contribution activities, including providing city gas tariff for the underprivileged at home and abroad, extending medical fees, operating welfare facilities, providing economic support for families in crisis and supporting the underprivileged with stable housing
2	Eradicating poverty, and promoting food security and sustainable agriculture		○	○		Striving to eradicate poverty at home and abroad through continued support for Food for the Hungry International, Friend Asia and the Korean Red Cross
3	Guaranteeing a healthy life and promoting welfare for people of all ages	○	○	○		Implementing comprehensive and systematic health and welfare projects for various classes of people by age – children, adolescents and the elderly – and by non-age – the homeless and residents of shanty towns, etc. (guaranteeing healthy life for the underprivileged and contributing to welfare improvement by providing medical cost for severely ill pediatric patients in underprivileged households, giving assistance to rehabilitation equipment for disabled adolescents, supporting the elderly by installing gas timer cocks, and running job placement programs for self-sufficiency and rehabilitation of the homeless and residents in shanty towns)
4	Providing comprehensive high-quality education and life-long learning opportunities	○	○	○		Continuously providing opportunities for high-quality comprehensive education and life-long learning through support for high-quality educational environment by providing scholarships to children and adolescents in low-income households at home and abroad, improving the educational environment, and constructing the Toy Library and children's playground; and also through operation of training programs on construction skills for fundamental self-sufficiency and rehabilitation of the homeless and residents in shanty towns so that they could be self-sufficient without financial support
5	Achieving gender equality and empowering the rights of all women and girls	○	○	○		Carrying out activities as a part of KOGAS' interest in gender equality by sponsoring facilities and households with single mothers (supporting their living environment through wall covering and replacement of flooring, providing emergency living expenses for families in crisis to empower women's rights, giving out sanitary products to underprivileged women and providing medical cost to severely ill women
6	Ensuring availability of water and sanitation and managing it sustainably		○	○	○	Continuously performing environmental preservation activities including cleaning up rivers by running Onnuri Volunteer Groups, and supporting the project to improve a residential environment by improving the hygiene state of the underprivileged
7	Providing modern types of energy which are cheap, reliable and sustainable for all	○				Conducting business to stably and continuously provide cheap, clean and natural gases by supporting energy cost reduction for the underprivileged, e.g. installation of fuel cells and gas-powered HVAC units in welfare facilities to save cooling and heating cost, and implementing gas tariff reduction policies for the underprivileged
8	Guaranteeing sustainable economic growth and high-quality jobs and employment	○		○		Performing business to generate demands to increase the usage of natural gases as clean, economical and safe energy sources, and contributing to job creation and promotion of employment through the Architecture Academy (programs on construction skills and job placement) for the homeless and residents in shanty towns
9	Establishing social infrastructure and promoting sustainable industrialization	○				Contributing to sustainable industrial development through social investment to spread distributed electricity by supporting to install inlet pipelines for city gas and fuel cells
10	Easing inequality within and across countries	○	○	○		Continuously performing activities to ease cross-national inequality through medical support and improvement of the educational environment for developing countries, and continuing to strive for easing non-equality in Korea through various projects: academic sponsorship of the underprivileged, invitation to cultural and art shows and support for housing stability and heating cost
11	Creating safe and resilient sustainable cities and settlements	○	○	○	○	Contributing to creation of safe and resilient cities by continuously and diversely engaging in projects: expansion of fuel cells as a distributed electricity form for clean, safe and sustainable cities, formation of settlements by ensuring an equal society through support for the absolute poor, Blue Sky Project to improve the atmospheric environment, Cultural Property Jikimi (protection) Project, and volunteering of employees for environmental clean-up.
12	Guaranteeing sustainable consumption and production patterns	○		○		Contributing to stable supply and demand of natural gases and the virtuous structure for domestic demands by enabling stable operation of facilities for storing natural gases by supporting to install inlet pipelines for city gas, reducing gas tariff, and managing conflicts within a region
13	Preventing impact on climate change and taking immediate actions	○				Social contribution projects for generating demands for natural gases as clean fossil fuels are categorized as efforts for preventing the impact of climate change and taking immediate actions
14	Having capabilities to preserve and use ocean, sea and oceanic resources sustainably	○		○	○	Engaging in environmental clean-up activities by employees working in terminal divisions adjacent to sea by contributing to preservation of oceanic resources through projects to generate demand for natural gases – a clean form of fossil fuels, minimizing the damage of the oceanic environment near natural gas bases, and providing support for damage recovery when accidents happen based on internal regulations
15	Preserving the inland eco-system and forests, preventing desertification and maintaining bio-diversity	○	○	○	○	Minimizing the environmental damage on areas near natural gas bases, and providing support for damage recovery when accidents happen. Engaging in environmental clean-up activities including Blue Sky Project and Cultural Property Jikimi (protection) Project, and improving the environment through projects to increase demand for natural gases – a clean form of fossil fuels
16	Promoting a peaceful and inclusive society and establishing effective and accountable systems accessible for all		○	○	○	Contributing to promoting a peaceful and inclusive society by raising awareness on social responsibilities by facilitating an inclusive society through support to open the Rights Experiencing Center to empower human rights of adolescents and social contribution projects in multiple areas for the underprivileged, running the mileage point system on social contribution for employees and facilitating the employee donation scheme
17	Strengthening instruments to achieve the above objectives and facilitating global partnerships among companies, the National Assembly and countries		○	○	○	Strengthening responsibilities by reflecting the mileage point system on social contribution for employees to the internal job assessment, supporting areas near terminal divisions of natural gases by cooperating with local governments and continuously striving to strengthen partnerships with domestic and international institutions and the government by improving the educational environment and supporting medical cost in developing countries aligned with overseas business

Signatory to and Commitment to Support the UNGC

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

Principle			Page
Human Rights	Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights; and	26-28, 80-81
	Principle 2	Make sure that they are not complicit in human right abuses.	
Labor	Principle 3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	26-29, 80-81
	Principle 4	The elimination of all forms of forced and compulsory labor;	
	Principle 5	The effective abolition of child labor; and	
	Principle 6	The elimination of discrimination in respect of employment and occupation	
Environment	Principle 7	Businesses should support a precautionary approach to environmental challenges;	54-59
	Principle 8	Undertake initiatives to promote greater environmental responsibility;	
	Principle 9	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	66-67

Subsidiaries and Invested Companies

1. Subsidiaries

Type	Company Name
1	Korea Gas Technology Corporation Co., Ltd.
2	KOGAMEX Investment Manzanillo B.V.
3	KOMEX-GAS, S. de R.L. de C.V.
4	KOGAS Iraq B.V.
5	KOGAS Badra B.V.
6	KOGAS Akkas B.V.
7	KOGAS Mansuriya B.V.
8	KOGAS Canada Ltd.
9	KOGAS Canada LNG Ltd.
10	KOGAS Australia Pty. Ltd.
11	KOGAS Prelude Pty. Ltd.
12	KG Timor Leste Ltd.
13	KG Krueng Mane Ltd.
14	KG Mozambique Ltd.
15	KOGAS Mozambique, Lda
16	KOGAS Cyprus Ltd.
17	KC LNG Tech Co., Ltd.
18	KOGAS-SEAGP COMPANY Ltd.

2. Affiliate

Type	Company Name
1	Korea Ras Laffan LNG Ltd.
2	Korea LNG Ltd.
3	Hyundai Yemen LNG Company
4	Korea LNG Trading Co., Ltd.
5	Kor-Uz Gas Chemical Investment Ltd.
6	South-East Asia Gas PipelineCompany Limited
7	Sulawesi LNG Development Limited
8	TOMORI E&P Limited
9	AMEC Partners Korea LTD

3. Joint Ventures

Type	Company Name
1	Kor-Uz Cylinder Investment Co., Ltd.
2	Korea-Uz CNG Investment Co., Ltd.
3	TERMINAL KMS de GNL, S. De R.L.De C.V.
4	GLNG Operations Pty. Ltd.
5	GLNG Property Pty. Ltd.
6	CORDOVA GAS RESOURCES LTD.*
7	ENH - KOGAS, SA.
8	LNG Canada Development Inc.
9	Manzanillo Gas Tech, S. de R.L. deC.V.

*Disposed in 2016

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