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KNOC Sustainability Report 2020

Creating Value Beyond Energy

KNOC Sustainability Report 2020



KOREA NATIONAL OIL CORPORATION

About this Report

KNOC is engaged in a number of areas of the oil industry, including oil exploration, development, production, and stockpiling to achieve a stable supply of oil at the national level, while at the same time is striving to fulfill its social responsibilities and spread social value as a public corporation. Most recently published report is the 2014 Sustainability Report, and this is the 5th report. KNOC aims to share our efforts to realize social values and our achievements in this area with our various stakeholders, through the biennial publication of Sustainability Report.

Reporting Standard

This report conforms to the Core Options of the Global Reporting Initiative (GRI) Standards and reflects the international standards for social responsibility, ISO 26000 and the UN SDGs (Sustainable Development Goals). The reporting standards and definitions of financial information in this report are based on K-IFRS, the Korean version of International Financial Reporting Standards.

Reporting Period and Boundaries

The report covers the major social activities and outcomes at KNOC's domestic and overseas business sites for the period from January 1 to December 31, 2019. It also includes data up to the first half of 2020 for important qualitative metrics, and data for the last three years to show trends for some quantitative metrics.

Report Verification

To ensure reliability, the reported activities and performances have been verified by Lloyd's Register, an independent professional organization, and the results can be checked in the statement of verification (p.84~85).

Report Information

This report has been published in Korean and English and can be downloaded from the KNOC website (www.knoc.co.kr).

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CEO Message



"Dear Stakeholders,
Thank you for your interest and support for Korea National Oil Corporation."

KNOC is a government-owned oil company that specializes in oil exploration, production, stockpiling, and distribution with an aim to provide oil to the people of Korea steadily and thereby contribute to the national economy. In the event where unprecedented crises give rise to structural imbalance between supply and demand, resulting in the volatile oil price, KNOC has been making its own contribution to efforts to deal with the crises. In light of this, KNOC and its employees have declared 2019, as the first year of emergency management, to gain the people's trust.

Ensuring energy security and contributing to the national economy through stable oil supply

In particular, KNOC has achieved an operating profit of approximately KRW 500 billion in the E&P(Exploration & Production) sector despite the plunge in oil prices. In the E&P business, KNOC has started oil production from the Haliba oil field in the UAE, and secured the successful recovery of a KRW 1.4 trillion investment from the Kurdistan Regional Government of Iraq. KNOC also succeeded in attracting investors for the Northeast Asian Energy Hub project, putting the stockpile business on track. Also from oil trading business, KNOC has realized a record high profit of KRW 200 billion.
In addition, KNOC is accelerating the development of new and renewable energies as well as reducing carbon emissions, in line with the government's Green New Deal policy and the global economic transition to low-carbon energy. While promoting new energy convergence projects including natural gas development, the CCS(Carbon Capture & Storage) project, and hydrogen production based on domestic continental shelf exploration, KNOC plans to expand into a global energy company that leads the low-carbon economy as well as promotes eco-friendly energy by setting up a floating offshore wind farm around the sea near the Donghae gas field where production ends.

Promoting sustainable and safe working environment

KNOC has maintained a zero-accident workplace for 19 consecutive years based on strict safety controls and ensured public safety with facilities that are fully equipped for explosion, fire, and drone attacks. In addition, KNOC has met the target in terms of reducing GHG emissions (113%) in 2019 by running the GHG Reduction and Energy Saving Committee and managing GHG and energy targets in the public sector, and is taking the lead in responding to climate change by expanding solar power generation facilities at its stockpiling sites.

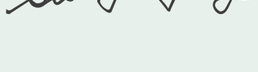
Striving to become a public corporation that partners, local communities, and even the general public agree that it realizes social values

KNOC is making a wide range of efforts to create an ecosystem for shared growth and a culture of fair trade in the domestic oil industry. Likewise, being the first among public companies in Ulsan to hire disabled athletes, KNOC has provided the athletes a safe and sound environment so that they could entirely focus on their practices. With a hope of becoming closer to the public and being trusted by society, KNOC has made efforts to support the medical workers who are helping Korea overcome COVID-19, the small business owners suffering from economic difficulties, and students from low-income households.

Broadening out spectrum from oil business, KNOC aims to contribute to the promotion of people's happiness by living up to the expectations of the various stakeholders. I ask for your continued support and encouragement so that KNOC, which has grown with people's trust and love, can further create value by becoming a global oil company.

Thank you.

September 2020
Su Yeong Yang, President & CEO of Korea National Oil Corporation



KNOC Profile

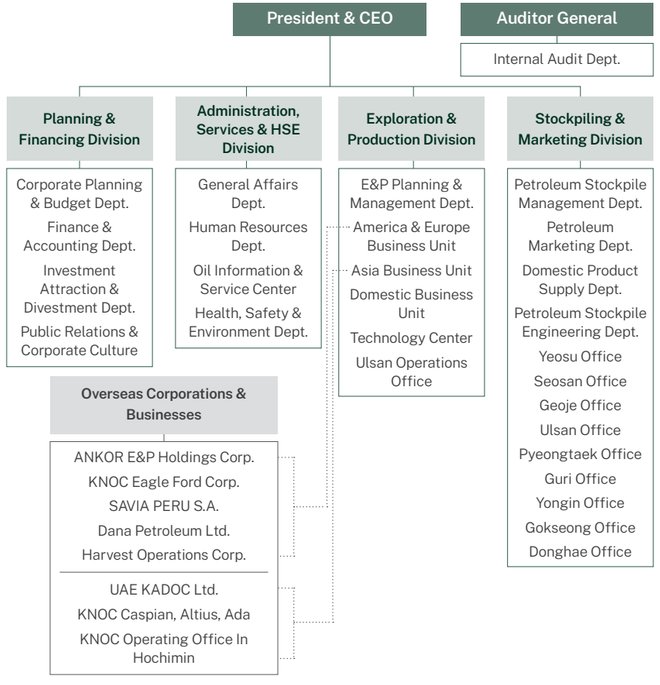
The only government-owned oil company in Korea, KNOC was established on March 3, 1979 under the Korea National Oil Corporation Act to stabilize domestic oil supply and prices in preparation for the oil crisis. We promote projects related to domestic and overseas oil development, stockpiling, improvement of oil distribution, and provision of oil information so that people can use energy securely.

Corporation Overview

As of the end of December 2019

Company name Korea National Oil Corporation	**Form of enterprise** Government-owned enterprise	**President** Yang Su Yeong
Date of establishment March 3, 1979	**Capital** KRW 10,515,106 million	**Shareholder** Korean government (100%)
Number of employees 1,372	**Location** 305, Jongga-ro, Jung-gu, Ulsan	

Organization Chart



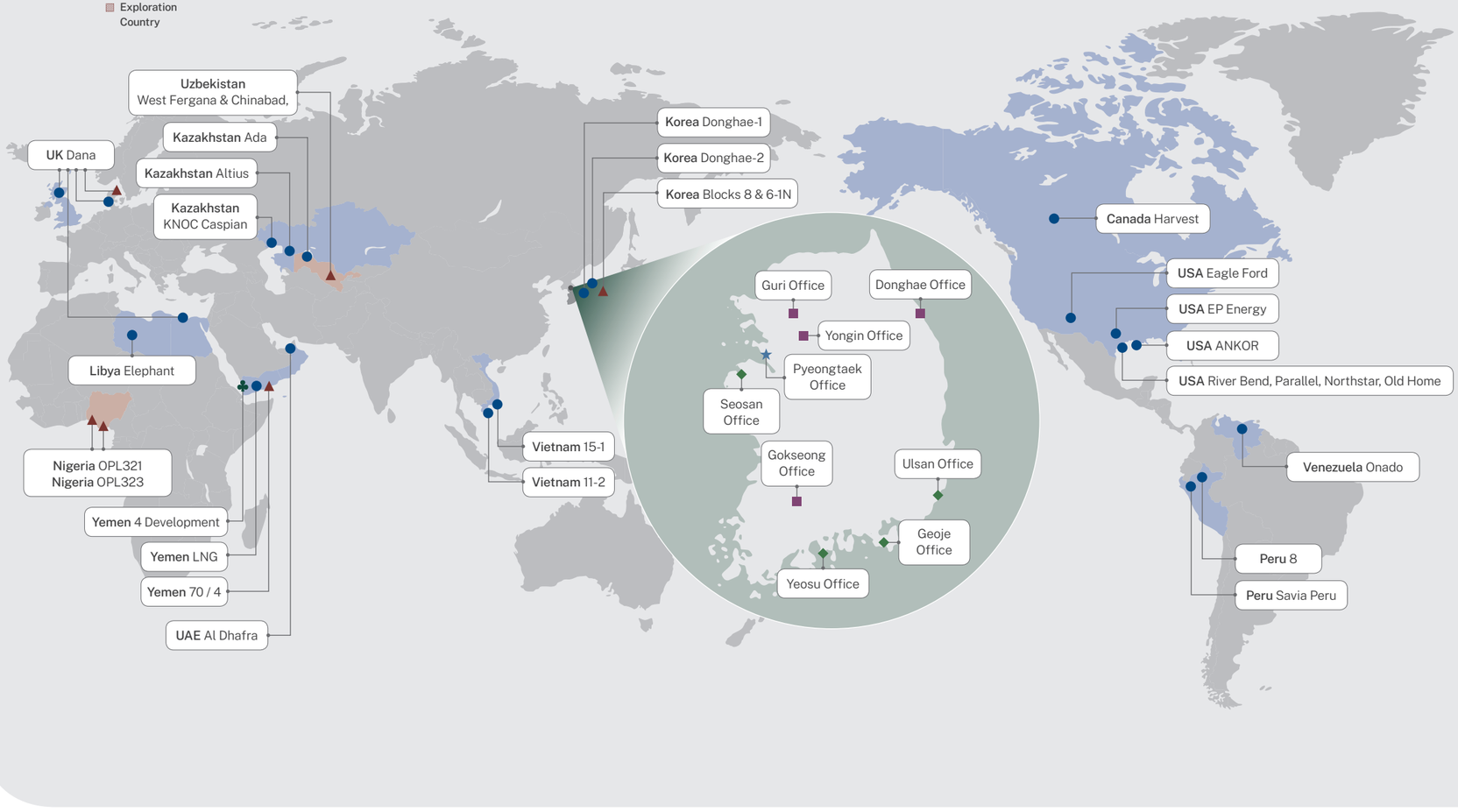
KNOC E&P and Stockpiling Business Status

E&P			Stockpiling
Production	Development	Exploration	Stockpiling
22	1	6	9

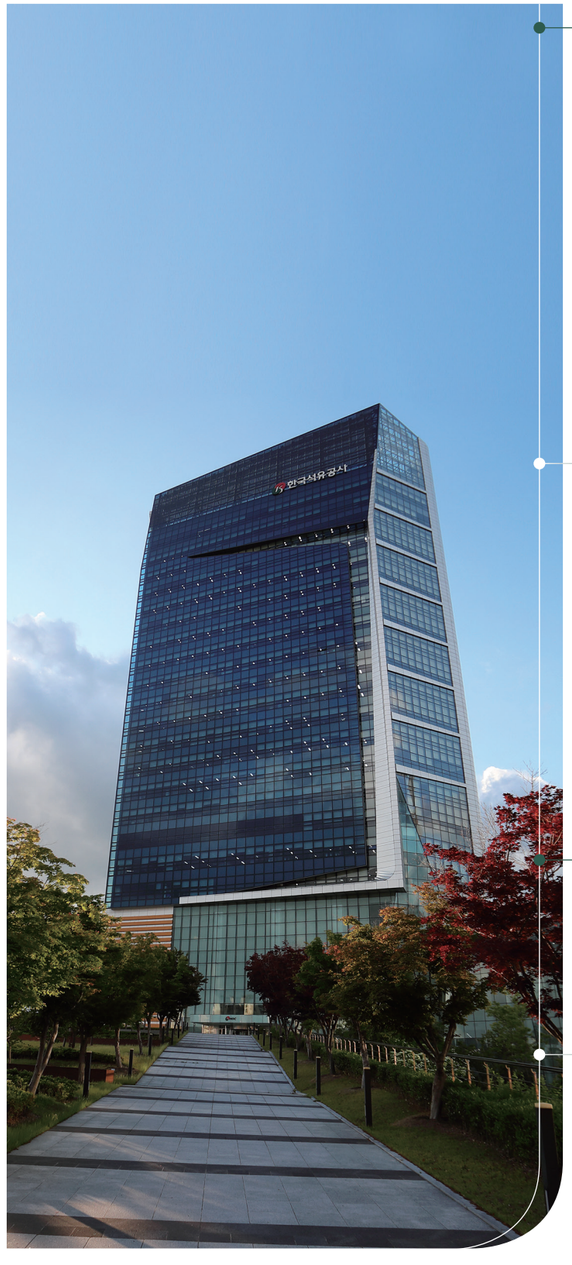
● Production ♣ Development ▲ Exploration
Producing Country, Development Country, Exploration Country
◆ Crude Oil Base ■ Product Base ★ LPG Base

Daily Production	Reserves	Stockpiling
185.9 Mboed	1,237MMboe	96,460 Mbbl

(As of the end of December 2019)



History



2010 - 2019

Jul.	2019	Began Production in Haliba field in the UAE
Sep.	2018	Began Production in Canada's Black Gold
Oct.	2016	Began gas production in Donghae-2, Korea's East Sea
Nov.	2014	Moved HQ to Ulsan
Feb.	2014	Launched joint venture, Korea Energy Terminal, for the Northeast Asia Oil Hub Project
Jun.	2013	Announced the vision of NE Asia Oil Hub and completed storage facility in Yeosu
Mar.	2012	Signed an agreement for the three exploration projects in the UAE
Dec.	2011	Opened the first economical gas station
Mar.	2011	Acquired Altius in Kazakhstan
Jan.	2011	Acquired Dana in UK

2000-2009

Dec.	2009	Acquired Harvest Energy in Canada (currently Harvest Operations Corp.)
		Acquired Sumbe in Kazakhstan (currently KNOC Caspian LLP)
Feb.	2009	Acquired Peru Petro-Tech (currently Savia Peru)
May.	2008	Established ANKOR Energy in the USA
Apr.	2008	Launched Opinet (oil price information service)
Dec.	2006	Began gas production in Block 11-2, Vietnam
Feb.	2005	Opened Seosan Office
Jul.	2004	Began gas production in Donghae-1, Korea's East Sea
Oct.	2003	Began oil production in Block 15-1, Vietnam
Jun.	2000	Opened Donghae Office

1990-1999

May.	1999	Opened Gokseong Office
Jan.	1999	Launched Petronet (petroleum information service)
Oct.	1998	Opened Yeosu Office
Oct.	1997	Opened Yongin Office

1979-1989

Jul.	1989	Opened Pyeongtaek Office
Dec.	1987	Discovered Korea's first natural gas on the continental shelf
Jan.	1985	Opened Geoje Office
Jul.	1981	Opened Guri Office & Ulsan Office
Mar.	1979	KNOC was Established

Long-Term Strategy to 2030

As a government-owned oil company, KNOC is proactively responding to the changing business environment to secure the people's right to energy. We will grow into an E&P-based global energy company by achieving our newly established core values and strategies.

Mission

Contributing to the National Economy by Stabilizing Oil Supply

Vision

Creating Value Beyond Energy

Slogan

Today's Challenge, Tomorrow's Innovation, Everyone's KNOC

Core values

- Passion & Challenge
- Innovation & Growth
- Safety & Trust

Management policy

- Future
- Internal stability
- Responsibility

Strategic directions / tasks

Securing the financial soundness of key businesses

- Improve productivity and economic feasibility of major business
- Improve the management efficiency of overseas subsidiaries
- Prepare the foundation for future investments with systemic debt management

Enhancing the security of oil supply and national safety

- Increase potential oil supply
- Create a safety & environmental management and respond to disasters proactively
- Strengthen the security protection system

Realizing people-oriented social values

- Promote people's trust and benefits
- Create fair jobs and happy workplaces
- Maximize win-win value by reinforcing shared growth

Pursuing innovation future growth

- Promote innovative new energy businesses
- Streamline the management support system
- Strengthen the smart management process

KNOC's Business Overview

Oil is vital to the everyday life of the people and business activities. KNOC is making every effort to ensure energy security in Korea.







Oil E&P business

29 projects in 16 countries

KNOC is actively engaged in oil development projects all over the world to ensure a stable supply of oil. Currently, KNOC is participating in 29 promising oil development projects in 16 countries (including 3 in Korea), producing about 186 thousand barrels of oil equivalent per day on average with about 1.24 billion barrels of oil equivalent of reserves.

Overseas oil field development	Domestic continental shelf development
Commercial production at Haliba oil field (first case of successful exploration, development, and production in the UAE and direct introduction of crude oil into Korea, June 2019)	Securing new exploration rights for Block 8 and the northern area of Block 6-1 located in the deep-sea area of the East Sea(April 2019)

Oil stockpiling

146-million-barrel stockpiling capacity & 96.5 million barrel oil reserves

KNOC operates 9 stockpiling bases nationwide, securing an oil reserve of 96.5 million barrels in stockpile facilities with a capacity of 146 million barrels (10.3 million barrels under construction of underground oil storage in Ulsan). This reserve is equivalent to 89 days of net imports based on data from the IEA(International Energy Agency). In addition, KNOC is striving to improve its crisis response capabilities by efficiently operating oil reserves and stockpiling facilities, and to develop Korea as an oil logistics hub in Northeast Asia.

Oil trading	International joint stockpiling	Leasing of oil reserves and facilities to domestic refiners
• Participating in the trading of crude oil, oil products, and LPG, utilizing the price volatility in the international oil market • Using profits as a resource for oil reserve growth	• Leasing the available space in stockpile facilities to NOC's and oil traders and storing customer's crude oil/product • Increasing the oil reserve level • Generating storage revenue • Emergency purchase option in case of supply shortage	• Providing timely support to private companies including domestic refiners with oil reserves and stockpile facilities, to prevent from imbalances in domestic oil supply and demand

Improvement in distribution structure

1,194 economical gas stations nationwide (about 10.2% of national gas stations)
1.24 billion annual Opinet users

KNOC supplies high-quality oil products to 1,194 economical gas stations nationwide at reasonable prices. As KNOC's supply price for economical gas stations has become the standard price for oil transactions, it is contributing to creating a transparent oil trading environment and improving the oil distribution structure. KNOC also operates Opinet, a real-time domestic gas price information service used by an average of 339 thousand people a day. Users can conveniently access the price information from about 12,000 gas stations and about 2,000 LPG charging stations nationwide through various media, including the Opinet website, their smartphones, and even car navigators.

Economical gas station operation
Increase purchase volume and reduce gas purchase unit price and distribution costs through joint purchase.

Petroleum information service
Providing an information service that helps users find cheap gas stations, report illegal acts, and locate quality certified gas stations.

New energy business

Entering the green energy business

KNOC is promoting the green energy complex business such as floating offshore wind power to actively respond to the government's "Renewable Energy 3020 Implementation Plan" to increase the share of renewable energy to 20% of total energy by 2030. KNOC will develop into a comprehensive energy company leading the reduction of greenhouse gases, by continuously discovering engine for future growth.

Floating offshore wind power generation	Clean hydrogen convergence	Carbon capture and storage (CCS)
• Utilizing the shutdown Donghae gas field • Leading the revitalization of shipbuilding and offshore plant projects by creating floating offshore wind farms	• Manufacturing hydrogen using natural gas on the domestic continental shelf, which has a lower production cost than imported natural gas.	• Promoting geological storage of carbon dioxide to contribute to GHG reduction

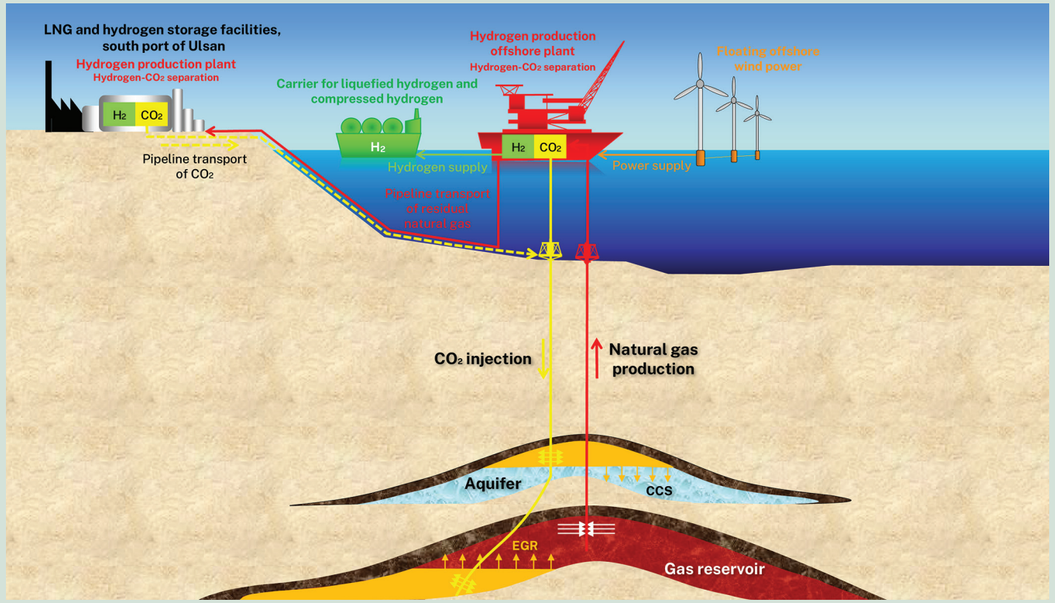
Post Corona, Post KNOC

Low-carbon energy society

Oil prices turned negative for the first time in history, as oil-producing countries sought their own direction in the midst of COVID-19, and the oil market has been facing numerous difficulties as energy transition accelerates at the global level. Reduction of GHG emissions is mandated by the Paris Climate Agreement[1], and developed countries, including Europe and Korea, announced the "Green New Deal," an eco-friendly energy policy, as a key measure to revive their economies from the COVID-19 pandemic. While responding to the government's low-carbon energy transition policy, KNOC is trying to secure new growth engines to produce eco-friendly new and renewable energy. To this end, it has built a facility to store hydrogen and LNG in the southern port of Ulsan, making it an outpost for Northeast Asian oil hubs to revitalize the trading business, and also preparing to diversify its business into a new and renewable energy business linked to the existing oil and gas business while reducing carbon emissions, by constructing a green energy complex business model consisting of Domestic natural gas-Hydrogen production-CCS[2]-Floating offshore wind power. KNOC will not get lost in the oil industry crisis caused by the COVID-19 pandemic, but ensure profitability and public interest at the same time by running the existing business and the new and renewable energy business in a balanced manner, and lead the low-carbon energy industry.

1) Paris Climate Agreement: 195 member countries unanimously agreed to make joint efforts to achieve Net Zero carbon emissions by 2050.
2) CCS(Carbon Capture and Storage): CO_2 capture and storage technology

Green Energy Complex Business Model (domestic natural gas-hydrogen production-CCS-floating offshore wind power)



Management innovation for post-corona response

KNOC launched the "Labor-Management Joint TF for Post Corona Response" to establish a future strategy in line with the government's basic plan for resource development. To gather the company's capabilities, the president and the union head served as joint TF chairpersons, and the heads of business divisions and departments and the full-time union officers participated as members. The management of KNOC and the labor union agreed to work together to overcome the crisis of the sharp oil price decline caused by the COVID-19 pandemic, and established future growth strategies in response to environmental changes. KNOC also held a post-corona innovative idea presentation to respond to changes in the energy supply and demand and prepare a strategy for future survival and growth in the post-corona era. All heads of divisions and departments, including the president, participated in the presentation, discussing various ideas for the future growth of KNOC, such as promoting a new business in line with the government's basic resource development plan, improving the financial structure, and establishing a cooperation model for private resource development. With the participation of all employees and solid cooperation between labor and management, KNOC is redefining its role in the post-corona era and establishing core strategies for future survival and growth.



Labor-Management Joint TF for Post Corona Response launched



Post-Corona Innovative Idea Presentation held

Overcoming COVID-19 with the People

KNOC is working with the Korean people, sharing and helping the community to overcome the difficulties related to the prolonged COVID-19 pandemic. We purchase local products and provide financial support for economical gas stations in order to revitalize local economies, and give donations and agricultural products to the vulnerable, including low-income families and multicultural families. With the goal of participating in efforts to overcome COVID-19, KNOC will take the lead in preventing the spread of COVID-19 and supporting those affected.

Adding warmth
- Donated KRW 200 million to the vulnerable in Daegu and Ulsan.
- Provided goods such as agricultural product gift sets worth KRW 1.5 million to low-income families and multicultural families.

Reducing grief
- Extended the repayment period and reduced interest for economical gas stations suffering from financial problems.
- Executives and department heads, including the president, returned part of their salaries.

Multiplying happiness
- Purchased local products to revitalize the local economy.
- Launched the "One Table One Flower" purchase campaign for local flower farmers.

Sharing love
- About 200 employees participated in group blood donation campaigns.
- Provided 900 lunchboxes to medical staff at the screening clinic in Jung-gu, Ulsan.

Happy energy for Nation, KNOC

14 Governance

16 Risk Management

18 Ethical Management

20 Stakeholder Engagement and Materiality Assessment

Governance

Composition and role of the Board of Directors

The board of directors of KNOC consists of 4 executive directors including the president and 5 non-executive directors. Non-executive directors include university professors, lawyers, and financial experts whom together enhance the expertise of the board of directors, and one of these non-executive directors serves as the chairman securing the independence of the board of directors.

Composition of the Board of Directors (as of June 30, 2020)

Position		Name	Gender	Career	Term of office
Executive members	President	Yang Soo-young	Male	Former Non-executive Officer at POSCO Daewoo	2018.03.22 ~ 2021.03.21
	Auditor general	Yoon Eui-sik	Male	Former Manager, Section 4 of the Public Institutions Audit Bureau at the Board of Audit and Inspection	2018.12.24 ~ 2020.12.23
	Planning & Financing Division Head	Koh Gyu-jeong	Male	Former Head of Performance Improvement Promotion Division	2020.06.26 ~ 2021.06.25
	Exploration & Production Division Head	Baek Oh-gyu	Male	Former CEO of Savia Peru S.A.	2019.08.27 ~ 2021.08.26
Non-executive members		Lee Jang-hee	Male	Professor, Business School of Chungbuk National University	2018.05.23 ~ 2020.05.22
		Kim Taek-hwan	Male	Member of the Seoul Jungnang Office, the National Unification Advisory Council under President	2018.07.16 ~ 2021.07.15
		Jeong Ho-seong	Male	Representative Lawyer of Law Firm Jain	2018.07.16 ~ 2021.07.15
		Kim Yeong-gwa	Male	Former Asian Industry Cooperation Ambassador at the Ministry of Foreign Affairs	2020.05.07 ~ 2022.05.06

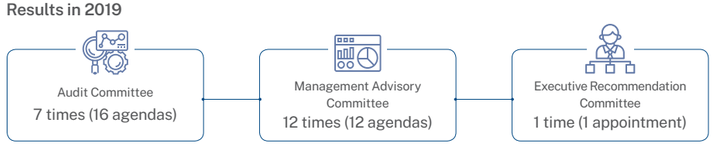
* One non-executive member vacant, scheduled to be recruited through the Executive Recommendation Committee in the second half of 2020

Subcommittees and professional committees

KNOC operates three subcommittees - the Audit Committee, the Management Advisory Committee, and the Executive Recommendation Committee-to help the board of directors make decisions efficiently. The Executive Recommendation Committee publicly recruits candidates for executives to enhance the transparency of the procedure; in 2019 it appointed a member of the Executive Recommendation Committee from the labor industry to increase the diversity of the board of directors.

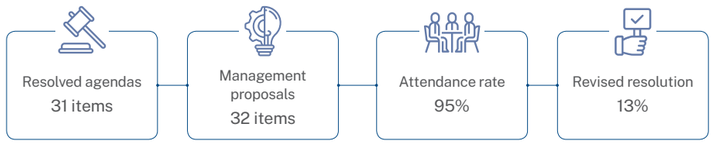
Committees	Members	Holding time	Duties
Audit Committee	Auditor general, two non-executive directors	Quarterly and as needed	Monitoring including accounting audit
Management Advisory Committee	All board members	Monthly	Sharing and discussion of major management issues
Executive Recommendation Committee	Non-executive directors, external members	When necessary to appoint an executive	Screening and recommendation of executive candidates

Results in 2019



Proactive performance management by the board of directors

KNOC has developed performance indicators for non-executive directors to encourage non-executive directors to participate in management. By checking the performance of non-executive directors based on four indicators - the number of agendas, the number of proposals, the attendance rate, and the revised resolution - and providing feedback on unsatisfactory matters, KNOC helps management and non-executive directors build consensus on management issues.



On-site communication

KNOC makes use of internal and external communication channels to share its core values and expand the role of the board of directors. Externally, it participates in the Regional Innovation Council and the Public Institution Leaders' Council of Innovation City to communicate with external stakeholders such as local communities and partners, and internally, the CEO and directors visit business sites such as the Donghae Platform and the construction site for Ulsan stockpile base to strengthen internal communication activities.



Visit to the Construction Site of Ulsan Storage site



CEO and Directors visiting Donghae Platform

Decision-making in consideration of sustainability

The board of directors of KNOC conducts discussions for decision-making on management issues including issues for sustainability. In 2019, it proposed agendas for human rights management, safety management, mid-term management goals and operation plans, and decided to enact the human rights charter and establish and improve the basic safety plan.

Date	Sustainability issues	Details
Jan. 25, 2019	Enactment of the Human Rights Management Charter	Discussion on the current status of human rights management, the standards for establishing the human rights management charter and its contents
Jun. 27, 2019	Establishment of 2019 basic safety plan	Discussion on the safety management promotion plan, the grounds and purpose of establishment, etc.
Oct. 25, 2019	Mid-to long-term management goals from 2020 to 2024	Analysis of management performance and future business environment, and establishment of mid-to long-term management goal systems and detailed implementation plans
Nov. 29, 2019	Contribution to the organizing committee of 2021 WGC(World Gas Congress)	Necessity and expected effects of donation and support, donation and support plans, future plans
Jan. 31, 2020	2020 basic safety plan	Safety management based on "KNOC integrated safety management system" to ensure the safety of citizens and workers

Risk Management

Basic principles of risk management
(Established in 2006)

1. Risks must be identified, measured, evaluated, and appropriately managed according to reasonable standards.
2. Risks must be properly diversified to prevent risk concentration in specific sectors.
3. The level of risk management must be set and managed to be consistent with business goals and strategies so that for-profit operations are not contracted due to excessive control.

Risk management system

KNOC effectively manages risks by categorizing oil price, Foreign exchange, and liquidity risks into financial risks, and corruption, disaster and environmental risks into non-financial risks.

Financial risk management

Oil price risk

KNOC hedges* against the risk of oil price volatility for a portion of the sales volume to minimize the risk of loss. The head office establishes a company-wide hedging policy, and the subsidiaries execute oil price hedging based on the policy. The Oil Price Hedging Committee flexibly adjusts the hedging method and volume according to the characteristics of each subsidiary. In the case of Harvest and Savia Peru, whose liquidity risks are anticipated in 2019, the company has increased the hedging ratio from 37% to 50%, flexibly responding to the crisis.

* Hedge: the investment strategy to offset the risk of fluctuations in oil prices or exchange rates by fixing it at the time of the contract.

Foreign exchange risk

Foreign exchange risk refers to the risk of changes in the value of foreign currency denominated assets or liabilities in accounting that may arise from changes in exchange rates. In managing the foreign exchange risk (including KRW) excluding the functional currency (USD), KNOC uses the VaR method* only for transactions to reduce the risk of volatility in the value of foreign currency denominated assets and liabilities, or to fix profits/costs at the originally planned level. The financial department runs the Foreign Exchange and Interest Rate Risk Committee, which can give advice on important practical matters related to foreign exchange risks.

* VaR(Value at Risk) method: Calculating the maximum potential loss that may occur over a certain period using a 95% confidence level under normal market conditions

Liquidity risk

KNOC measures company-wide liquidity by establishing fund management and raising plans, and manages cash flow by self-raising or borrowing necessary funds to cope with liquidity risks. It also conducts preliminary reviews on important matters related to new and existing businesses in accordance with relevant regulations to eliminate uncertainty and improve the rationality of decision-making. In accordance with the Korea National Oil Corporation Act and company regulations, investments in E&P projects with KNOC's burden of KRW 50 billion or more are deliberated by the Evaluation Committee, and other major matters by the Investment Review Committee. Non-E&P projects or other matters that require management reviews, such as major changes in new and existing businesses, are ultimately determined by the Management Committee or the Board of Directors after deliberation by the Risk Management Committee.

Evaluation Committee,
Investment Review Committee

10 times each

Major business committees

Division	Oil development business		Other business(non-oil development business)
	Evaluation Committee	Investment Review Committee	Risk Management Committee
Composition	7 members including the chairperson	5 members including the chairperson	7 members including the chairperson
Management agendas	1. Statutory scale* - Promoting new projects - Business change - Asset trading - Acquiring or selling shares	1. Other than statutory scale 2. Investment in exploration, development, and production(more than KRW 20 billion) 3. Lending to subsidiaries	1. New business 2. Acquisition, sale, or change of shares in existing business and business withdrawal 3. Important matters related to liquidity risk

* New business, business change: Total project cost of KRW 100 billion or more with KNOC's burden of KRW 50 billion or more / Others: Total project cost of KRW 50 billion or more

Non-financial risk management

Corruption risk

KNOC conducted a survey on the perception of corruption and vulnerable areas to select areas for intensive corruption management, and identified improvement tasks. According to the 2019 analysis, corruption had the most significant impact on investment decisions, and the HR sector was most vulnerable to corruption risk. KNOC has set investment and HR-related sectors as areas requiring intensive management, and conducted internal and external expert pre-investment deliberation, building transparency of the recruitment process, and open recruitment system for overseas employees. In addition, KNOC is blocking corrupt practices through integrity activities such as conducting Improper Solicitation and Graft Act education and strengthening promotion of reporting channels. As a result of these efforts, the audit satisfaction score in 2019 increased by 3.19 points compared to the previous year, and corruption and ethical crimes did not occur.

Disaster risk

KNOC has established a disaster management system consisting of prevention, response, settlement, and recovery steps to protect national infrastructure and people against disaster risks. It has improved periodically the disaster and crisis response manual to minimize damage and respond quickly to disasters, and reinforced safety measures to protect facilities from explosions, fires and drones, which are major hazards at the storage site. KNOC has also provided on-site risk assessment and professional training opportunities for systematic response to disasters. In addition, KNOC participated in a total of 127 joint training sessions with related organizations such as the National Fire Agency, the Coast Guard, and the Forest Service, and established a close cooperation system with the related organizations, such as signing a disaster safety management agreement with the army. KNOC is constantly striving to improve disaster response and prevention capabilities.

Environmental risk

KNOC recognizes possible environmental risks and opportunities in overall business activities, and is proactively carrying out response activities. In accordance with the government's reinforced environmental regulations, it has set up its GHG reduction targets, and has established and implemented measures to adapt to climate change. It reinforced the standards for preventing oil fires and explosions to prevent safety accidents, and strengthened management of asbestos buildings to reduce the risk of asbestos for employees and workers. It has also reinforced gasoline tank management standards and implemented PM(particulate matter) reduction measures. As an environmental issue related to the local community, it has identified and managed the possibility of odor generation due to diversification of stockpiling oil types as a risk factor.

Ethical Management

Establishment of KNOC ethical management system

Vision	KNOC's Ethical Scent, Clean Energy of a Happy World		
Strategies	Advanced company-wide ethical management system	Ethics education to incorporate a sense of integrity and ethics	Systematic management by measuring ethical management
Tasks	**System reorganization** · Expand the size of the dedicated organization. · Expand ethical leader system (ethics & human rights managers) overseas. · Amend the Code of Conduct for "prevention of power abuse".	**Prevention of power abuse** · Establish grounds for the prevention of power abuse. · Strengthen subcontract management. · Run the report & support center. · Measure the power abuse index.	**Prevention of corruption** · Promote the Non-Solicitation Act and the Code of Conduct. · Diversify anti-corruption education. · Operate an electronic pre-reporting system for external activities.

System reorganization

KNOC expanded the department in charge of ethics management and transferred the related tasks that had been performed by each team to the Social Value Promotion Department. The Ethics & human rights manager system, which is in charge of ethical management at the headquarters and domestic offices, was also applied to overseas offices, and thus a total of 43 Ethics & human rights managers were appointed for overseas offices. In the best effort of rework, no unethical behavior was reported from any foreign subsidiaries in 2019.

Organizations dedicated to ethical management



Prevention of power abuse

KNOC has added a "prohibition of power abuse" to its code of conduct, and established a provision to refuse unfair demand or treatment. The company has strengthened the protection of workers by checking the contract conditions of simple service workers at once, revising unfair special agreements, and operating an anonymous channel to report power abuse on the website. As a result of these efforts, KNOC's power abuse index was significantly lower than that of other institutions.

Power abuse index measured

20.8 points

(Other organizations: 35 points on average, the higher, the worse)

Prevention of corruption

KNOC has introduced a range of programs that aim to improve professional ethics, including campaigns and education related to integrity. For example, a monthly pop quiz and knowledge sharing from the consulting program on the Code of Conduct are held to improve the level of understanding of The Improper Solicitation and Graft Act and Code of Conduct among employees. It also provides education in greater depth in order to enhance the risk management (work environment, work load and so on) through a self-evaluation process. Additional contents customized for the Corporation will be made available if necessary. In 2019, KNOC provided visiting integrity training to domestic and overseas business sites, including 20 on-site training sessions and 13 integrity training sessions (by auditor general), and established and operated an electronic pre-reporting system for external activities to prevent possible ethical violations in advance. In particular, as a result of the operation of an electronic pre-reporting system for external activities, KNOC was selected as an excellent case by the ACRC(Anti-Corruption & Civil Rights Commission) and won the Encouragement Award.

Corruption incidents

"Zero"

Best Practices of the Anti-Corruption & Civil Rights Commission

Encouragement Award

Improvement of internal audit system

KNOC, which has a prevention-focused audit system, continuously improves its internal check system. In 2019, the audit system was upgraded, resulting in an audit satisfaction score of 83.65 points; reliability was also improved by introducing a new audit system that reflects the audit trend of the Board of Audit and Inspection.

Advancement of the audit system of internal audit department			Introduction of a new audit system	
Audit capability	Internal	· Strengthened the expertise of auditor general · Introduced associate auditors	Management Recommendation System	· Suggest opinions to induce voluntary improvement within the department
	External	· Appointed a legal advisor in charge of the audit department · Signed an audit business agreement (with KOTRA)	Pre-consulting	· Present prior review opinions to support decision-making of departments
Audit infrastructure		· Established a special audit organization (Special safety inspection team) · Established incentive payment standards for the audit department	Active Administrative Disclaimer	· Relieves employees of responsibility for active business handling
System reorganization		· Reorganized the internal audit process by benchmarking the audit system of the Board of Audit and Inspection	Management communication and cooperation	· Strengthen communication with internal and external stakeholders

Audit satisfaction

83.65 points

Spread of integrity culture

KNOC is focusing on establishing a culture of integrity and improving its system to create a transparent and sound management environment. The company spreads a culture of integrity to employees by providing intensive training on the Improper Solicitation and Graft Act and Code of Conduct, holding an ethical idea contest, and promoting reporting channels, especially in preparation for the holiday season. The company identifies areas vulnerable to corruption in the process of pursuing business at home and abroad, and continuously improves the system to fundamentally block financial leaks. In order to enhance social value, it identifies the types of social responsibility violations that can occur within the company, and conducts audit activities for irregularities in employment, unfair trade, violations of gender equality, and violations of safety laws. In 2019, it conducted four audits for social responsibility violations and five occasional on-site inspections for safety accidents. As a result, KNOC achieved zero employment corruption and zero workplace accidents. As such, KNOC has made continuous efforts to become a public company with integrity, and will continue to fulfill its social role and contribute to improving the fairness of society as a whole.

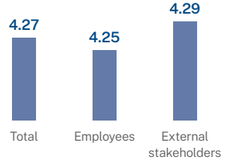
Stakeholder Engagement & Materiality Assessment

Stakeholder Survey

KNOC's stakeholders include the government and related organizations, local governments, citizens, employees, business partners, media and environmental organizations. KNOC will identify specific needs and demands of stakeholders by establishing customized communication channels, and reflect them in management activities.

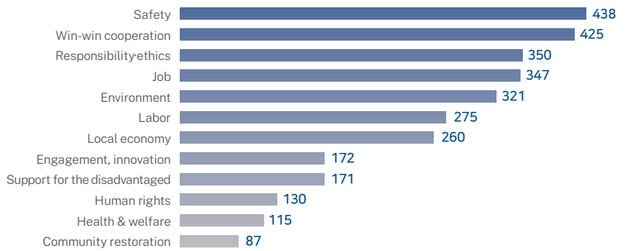
Do you think KNOC is a sustainable organization that fulfills its responsibilities for the environment and society as well as business growth?

(Unit: points/5)



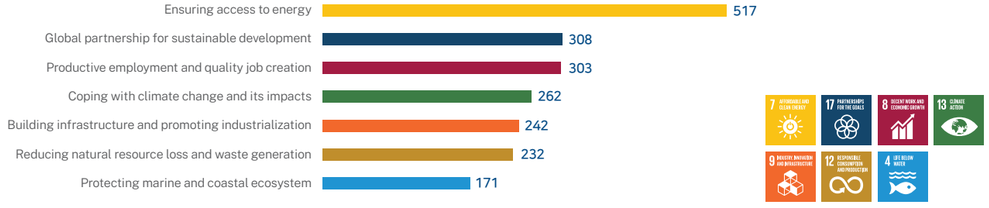
What are the social values that KNOC can effectively create?

(Unit: persons)



What are the UN SDGs that KNOC can effectively create?

(Unit: persons)



Stakeholder communication channels

Stakeholders	Communication channels	Expected effect
Employees, labor union	• Proposal box, electronic reporting system, in-house contest • Internal communication programs, conferences, and labor-management working-level meetings	Principal agents of Social Value, who are encouraged to participate in the social value promotion process
Government, National Assembly, civic groups	• Business consultation with major ministries including the Ministry of Strategy and Finance and the Ministry of Trade, Industry and Energy • Pre-disclosure of information, public data open, management disclosure • Policy-making hearings and councils, seminars for lawmakers, visiting reports	Policy cooperation and information provision to lay the foundation for Social value promotion such as laws and systems
Public, media, and community	• Oil information portal, public offering, referendum, national proposal • Citizen participation group, Innovation and social value council	Demanding, monitoring and evaluating needs to produce outcomes that the people can feel
Customers, Partners, Suppliers	• Online channel with E&P Testbed • Business meetings, CEO-supplier field seminars, workshops	Reinforcing the capacity of the oil industry by creating synergy through collaboration

Materiality Assessment

In May 2020, KNOC conducted a materiality assessment with 680 internal and external stakeholders, and selected material issues to be disclosed in the sustainability report. KNOC's activities and performances were transparently reported, focusing on 18 issues derived from stakeholder surveys, media analysis, and benchmarking in the same industry.

Materiality assessment process

Step 1. Analyze sustainable management environment

- Media analysis
- Benchmarking in the same industry
- Stakeholder survey

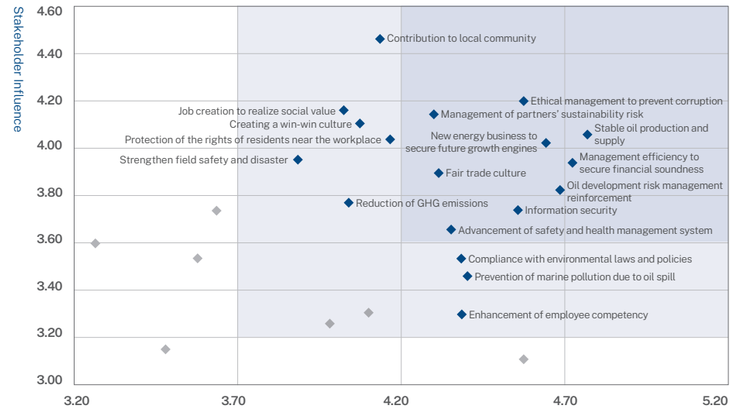
Step 2. Analyze internal and external issues

- Employee survey
- External stakeholder survey

Step 3. Identify material issues

- Organize the table of contents based on the 18 material issues finally selected

Material issues identified



Material issues & Reporting boundaries

No.	Material issues	Inside	Outside			Reporting page
		Employees	Government, National Assembly, civic groups	General public, media, local community	Industry, stakeholders	
1	Stable oil production and supply	V		V	V	32-37p
2	Efforts to Reinforce Ethical Management and Prevent Corruption	V			V	18-19p
3	Management efficiency to secure financial soundness	V			V	35p
4	New energy business to secure future growth engines		V	V		26-31p
5	Contribution to local community		V	V		56-61p
6	Oil development risk management reinforcement	V	V		V	16-17p
7	Management of partners' sustainability risk		V	V	V	44, 54p
8	Fair trade culture		V		V	55p
9	Protection of the rights of residents near the workplace		V	V		45p
10	Personal information security	V			V	46p
11	Job creation to realize social value			V		58-59p
12	Win-win culture for shared growth			V	V	52-54p
13	Advancement of safety and health management system	V			V	44p
14	Compliance with environmental laws and policies		V	V		47-49p
15	Prevention of marine pollution due to oil spill		V	V		48p
16	Strengthen field safety and disaster response	V		V		44-46p
17	Energy saving and GHG emission reduction		V	V		49p
18	Education and training to enhance employee competency	V				64p

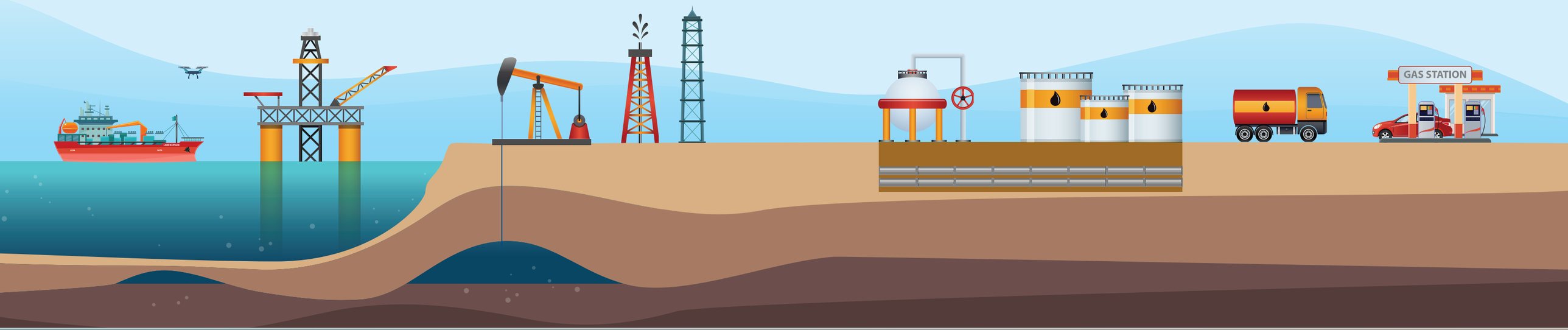
Creating Value Beyond Energy

24 KNOC's Value Creation Process

26 Sustainable Future Growth

32 Stable Production and Supply of Oil

KNOC Value Creation Process



Upstream

New project

Discovering new projects and securing exploration rights in the entire oil development process spanning “exploration-development-production”

Activities

- International bidding, stake participation contract
- Direct negotiation or asset purchase, etc.

Key achievements

- Secured the right to explore the domestic continental shelf
  - -Block 6-1 C&E
  - -Blocks 8 & 6-1N

Exploration

Confirming the potential and reserves of oil for the secured exploration block

Activities

- Surface geological survey, physical exploration
- Exploration drilling and evaluation drilling, etc.

Key achievements

- Exploration drilling
  - -Gas discovery (8.1 MMboe) at Tolmount East for Dana, UK
  - -Secured 6.5 million barrels near Haliba oil field in the UAE

Development

Analyzing the information acquired in the exploration stage and preparing for production

Activities

- Establishing a development plan after oil field evaluation
- Drilling production wells and constructing production facilities

Key achievements

- Additional Development
  - -Expanded development of 15-1 Su Tu Trang gas field in Vietnam (Secured an additional 13.4 million barrels of production)

Production

Predicting oil production and managing production facilities for optimal production

Activities

- Reservoir management
- Production increase, production facility management, etc.

Key achievements

- First Korean company engaged in development and early production in the Haliba oil field (UAE)
  - -Production of 3.5 million barrels and annual sales of USD 180 million expected
- Extended production at Donghae Gas Field
  - -Additional 1.3 million barrels in production and secured additional USD 80 million in operating profit

Downstream

Construction

Building safe and eco-friendly oil storage facilities

Activities

- Construction of stockpiling facilities (aboveground and underground)
- Management of civil complaints regarding construction, etc.

Key achievements

- Underground oil storage in Ulsan
  - -Secured storage capacity of 10.3 million

Stockpiling

Securing strategic oil reserve and operating stockpile facilities to achieve resource security

Activities

- Purchase of strategic reserve oil
- Safety management of storage, etc.

Key achievements

- Secured 96.5 million barrels of government reserves
  - -5th in IEA oil supply capacity

Utilization

Trading crude oil, petroleum products and LPG using price volatility in the international oil market

Activities

- Public use such as lending oil reserves
- Asset utilization business such as trading

Key achievements

- Achieved KRW 202.5 billion, the largest return on the use of stockpiled assets

Distribution

Supplying high-quality petroleum products at reasonable prices and disclosing oil price information, thereby contributing to domestic oil price stabilization

Activities

- Management of economical gas stations
- Supply of petroleum products at low prices, etc.

Key achievements

- 1,194 economical gas stations
- Daily 33.9 million / Annually 124 million users of Opinet

Sustainable Future Growth

KNOC seeks to secure new growth engines by discovering new resource development models. The company has secured an ultra-large oil field with 200 million barrels of reserves (share of KNOC) by participating in the UAE ADNOC Onshore project, and is implementing a low-carbon energy transition by conducting offshore natural gas exploration and floating offshore wind power projects in the East Sea. Furthermore, KNOC is leading the 4th industrial revolution in the domestic oil development industry by applying big data and AI technologies to resource development, developing a DOF(Digital Oil Field), and introducing machine learning to resource development.

Strategies	Major Achievements
Development of New and Renewable Energy	• Promotion of Green Energy Complex Project • Launched the 200MW-class floating offshore wind farm project
Increase in New Business	• Secured the right to explore deep sea area in Korea • Securing 200 million barrels in reserve (share of KNOC) by participating in large global oilfield projects
Development of New Technology	• Constructed KNOC E&P Testbed & Database • Developed the Korean digital oil field (DOF)



Social Values



* Number of jobs to be created up to the construction stage estimated in the preliminary feasibility report

UN SDGs

7 AFFORDABLE AND CLEAN ENERGY

Goal 7

Ensure access to affordable, reliable, sustainable, and modern energy for all.

KNOC news

CEO Roundtable in response to the Energy transition

Following the Paris Climate Agreement, as global investor groups announced the withdrawal and suspension of investment in the oil and gas sector, more and more oil companies are being asked to switch to a low-carbon economy and to disclose their business. KNOC has participated in international oil events such as the CEO Roundtable hosted by ADNOC and the ADIPEC(Abu Dhabi International Petroleum Exhibition and Conference) 2019 to discuss issues facing the oil industry with global oil companies.

At the CEO Roundtable, KNOC discussed how to respond to the energy transition to a low-carbon economy, how to secure new technologies, and how to attract young high-tech talents to secure industrial sustainability. At the ADIPEC 2019, the largest oil & gas event in the Middle East, KNOC discussed how to respond to reinforcing global environmental regulations and how to prepare a digital transformation policy to overcome the crisis, while operating a promotional booth to exchange with the global market.



Development of New and Renewable Energy

Green energy complex business

The Korean government announced the Renewable Energy 3020 Implementation Plan setting a goal to produce 20% of its energy from renewable sources by 2030. KNOC is pursuing a Green Energy Complex project to meet this trend of expanding new and renewable energy. It is expected to contribute to the conversion of low-carbon energy through promoting green energy complex projects, such as floating offshore wind power generation projects by utilizing the experience of oil and gas resources exploration, development and production and the construction and operation of offshore production facilities, which is own-business of KNOC.

Domestic Natural Gas development

KNOC is pursuing exploration of the continental shelf located in the East Sea, and plans to conduct exploration drilling in 2021 to check the productivity of oil and natural gas in deep sea areas. Once the domestic continental shelf exploration is successful, it is possible to supply cheap gas compared to imported natural gas for 10 years in Korea, with the import substitution effect estimated at KRW 35 trillion. KNOC is actively responding to the government's hydrogen economy policy by producing hydrogen using natural gas from the continental shelf.

Wind conditions of the Donghae Gas Field

Annual average wind speed of

8.1m/s

Donghae 1 floating offshore wind farm project

The Donghae Gas Field, which has produced natural gas that can be used by 340,000 households, is expected to cease production in 2022. KNOC is pursuing the Donghae-1 Offshore Wind Power project to produce eco-friendly energy by recycling the gas production platform and contribute to revitalization of power generation related industries such as shipbuilding and equipment manufacturing. KNOC plans to conduct a feasibility study based on the wind condition data* collected up to October 2019, and based on the results, proceed a floating offshore wind farm development by 2022 and start commercial operation in 2026. This project, which was selected as a major project of Ulsan City for the Renewable Energy 3020 Implementation Plan, is expected to produce eco-friendly new and renewable energy and create jobs for about 25,208 people, stimulating the local economy.

* Top 2 rating based on 7 wind conditions of the National Renewable Energy Research Laboratory of USA

Roadmap for 200MW-class floating offshore wind farm project

Project preparation (Oct. 2018 – Dec. 2020)	Project approval (Jan. 2021 – Apr. 2022)	Construction (Jan. 2021 – Dec. 2025)	Production & Operation (Jan. 2026 – Dec. 2045)
· Operate wind condition meter. · Conduct a feasibility study. · Establish a basic plan. · Conduct 3rd party structural verification study for platform jacket	· Apply for power generation business license. · Acquire approval for preliminary feasibility study. · Establish a SPC. · Implement environmental impact assessment · Obtain a license and permission from the government.	· Design, manufacture, transport, installation - Construction takes 5 years. - Encourage domestic companies to participate and activate related industries.	· Start operation. - Long-term power generation (2026) - Hub for the offshore wind power industry

Clean energy convergence

The Korean government has released a roadmap for stimulating the hydrogen economy (Jan. 2019) and the 3rd Basic Energy Plan (Jun. 2019) to establish a hydrogen economy and secure new growth engines. In response to this, KNOC is building a natural gas-hydrogen energy-CCS-EGR convergence model that develops the domestic continental shelf, extracts and sells hydrogen from the natural gas produced in the domestic continental shelf, and uses carbon dioxide, a by-product of the hydrogen extraction process, for CCS* and EGR** to contribute to energy decarbonization and GHG reduction through a clean energy convergence business. KNOC is promoting the Clean Energy Convergence project to contribute to energy decarbonization and GHG reduction.

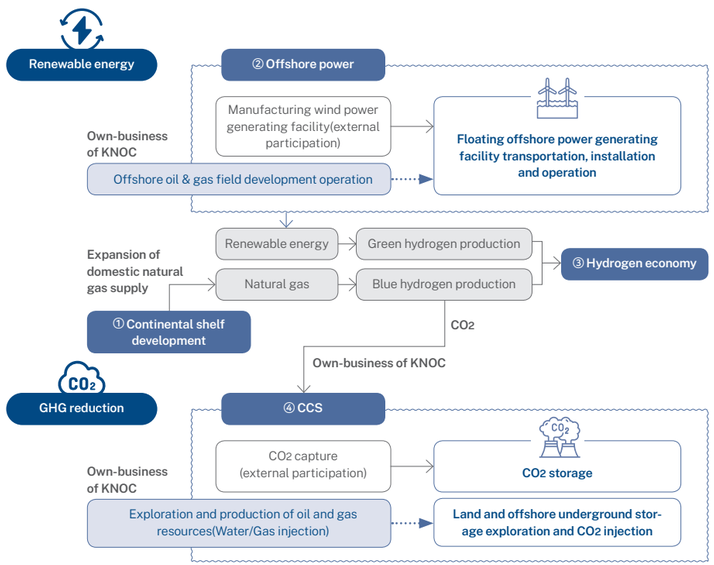
* CCS : Carbon Capture and Storage
** EGR: Enhanced Gas Recovery

Well abandonment services

With the aging of production assets on land and at sea scattered around the world and the increase in end-of-production assets, the asset retirement market is expected to increase to $80~87 billion* by 2027. In order to respond to the aging of assets and increase in assets subject to asset retirement obligation, and to establish a foundation for entering the asset retirement market, KNOC is promoting the AR** business for the aging land assets of Harvest in Canada owned by KNOC. KNOC established an AR Team, a dedicated department to conduct research and benchmarking on the state of the Canadian AR industry, and then analyzes the feasibility to establish a joint venture for the service to attract investment.

* Excerpt from the analysis report for the start of dismantling overseas offshore plants published in December 2018
** AR(Asset Retirement): Abandonment, Reclamation and Remediation

Green energy complex business of KNOC



Increase in New Business

Potential resource(share of KNOC)

14.6 million barrels

Base-centered exploration

In response to the low oil price trend that has continued since 2014, KNOC adopted a production-focused strategy instead of exploration to improve profitability; however, due to the exhaustion of the exploration pool, exploratory drilling has dropped sharply and its production-focused business has reached the limit of growth. As a result of exploring promising structures* around the bases that have been developed and producing oil, the exploration success rate improved and the low-cost short-term development was made possible, resulting in improved profitability. KNOC succeeded in exploratory drilling at Dana's Tolmount East and discovered an additional 47 billion cubic feet of gas (8.1 million barrels equivalent to crude oil), and secured 6.5 million barrels in two promising structures near the Haliba oil field in the UAE.

* Promising structure: Structure confirmed by oil system analysis, such as geological and geophysical evaluation and exploration data analysis, that oil is likely to exist and drilling is possible.

Participation in large global oil fields

ADNOC Onshore, where a number of global oil companies such as ADNOC, Total, and BP participated, manages Abu Dhabi's onshore oil fields. KNOC provided expertise for GS Energy participating in the ADNOC project, and decided to participate in the project in 2017 in consideration of the continuous request for technology from partners (GS Energy, ADNOC) and business conditions. In 2019, after passing the government's preliminary feasibility study, KNOC acquired a super-large oil field with 200 million barrels(based on the share of KNOC) of deposits and increased the amount of crude oil that can be directly introduced in Korea in case of an emergency, strengthening national energy security.

Securing of new exploration blocks

KNOC restores the value chain of "exploration-development-production" by acquiring new exploration blocks, and lays the groundwork for sustainable exploration business.

	Acquired joint exploration rights for deep sea blocks in Korea	Participated in new projects in Kazakhstan
Background	· Good gas sand reservoirs were found from two exploration wells	· Production-focused business structure in Kazakhstan · New exploration opportunities in areas near active blocks
Strategies	· Make the best use of technical and operational knowledge acquiring during previous Concession period · Reduce technical and financial risks by investing with overseas oil companies	· Use of a wealth of geological data in Kazakhstan and operational experience · Collaboration between local offices (discovery of promising business) and headquarters (verification of feasibility) · Independently prepare financial resources by operating in the black in Kazakhstan
Achievement	Blocks 8 & 6-1N · Signed a concession contract and obtained exploration rights with Woodside (Australian company) · Planning for 2021 3D seismic acquisition Block 6-1 C & E · Obtained concession rights (2020) · Preparing for exploration drilling and 3D seismic survey (2021)	Signed a contract to explore Block 10 in Kazakhstan. · Conducted low-cost, high-efficiency exploration in a new block near the ADA block by using existing infrastructure and operating experience · Restored the oil development value chain of exploration-development-production

Development of New Technology

KNOC E&P Testbed & Database

The oil technology development business has a very high entrance level when private corporations try to enter new domestic and global markets, so they need a track record to explain their past performance or achievements on site. KNOC has established a test bed - KNOC E&P Testbed & Database* - to support empirical R&D and private technology development. In 2019, KNOC established a Testbed & Database operation guideline and an operation committee to complete an integrated management system, and set up internal procedures to make its own test bed available for national research projects conducted by external organizations. KNOC will continue to improve the private R&D support system to maximize win-win value and expand the base of domestic oil development.

* KNOC E&P Testbed & Database: KNOC's oil field that has been provided to demonstrate technology developed by private R&D

KNOC E&P Testbed & Database to support private R&D

	Digital Oil Field (DOF*) technology	Paraffin inhibitors for active oil fields	Research on increasing carbonate rock production in the UAE
Period	2017.05 ~ 2020.12	2018.05 ~ 2021.10	2015.12 ~ 2019.11
Sites	Golden Oilfield in Canada	ADA Block in Kazakhstan	Haliba Oilfield in the UAE
Support	· Developed and provided a system demonstration and field data utilization and analysis system for oilfield sites. · DOF demonstration held at the head office and in Canada → Advised on strengthening technology and business feasibility	· Supported KOTRA meeting in Kazakhstan for the use of testbeds. · Arranged a local logistics company for transportation of prototypes.	· Delivered the final outcome and discussed further R&D cooperation. · Supported the application of research results.

* DOF(Digital Oil Field): A system to manage and operate the oil field online in real time

New technology development in connection with the 4th industrial revolution

With the rapid development of new technologies in the era of the 4th industrial revolution, the need to apply new information and communication technologies, such as big data and automated operation of oil and gas field, in the field of oil development is increasing worldwide. KNOC provided the Golden Oilfield of Harvest, a Canadian company, to the private sector as a testbed, and an external organization developed a Digital Oil Field(DOF), an automated system for observation/inspection/prediction of oilfields. It also hosted the first resource development machine learning workshop to share information on applying AI to oil development and the latest AI development trends, and explored mutual development plans between oil development and ICT. In preparation for the AI era, KNOC will secure the latest technologies to streamline operations and lead the introduction of the 4th industrial revolution technology in the domestic oil development industry.

Automated system for oil field observation, inspection, and prediction

Digital Oil Field (DOF)

Stable Production and Supply of Oil

KNOC, the only government-owned oil company in Korea, strives to achieve a stable supply and demand of oil even in difficult external environments such as falling oil prices. The company started production at the UAE's Haliba oil field, which is expected to produce 5.48 million barrels per year, and is improving its financial soundness by applying various payback techniques to its existing assets. The company also normalized the Northeast Asian Energy Hub project, which was delayed due to falling oil prices, and achieved a record-high profit of about KRW 200 billion from the use of stockpiled assets contributing to the stability of the national economy.

Strategies	Major Achievements
Strengthening of Oil Development Competitiveness	• Haliba oil field: Annual production of 5.84 million barrels • Secured an additional 4.6 million barrels of reserves in the Donghae gas field.
Improvement of Financial Soundness	• Recovered USD 1.12 billion in cash • Recovered the entire signature bonus (USD 92 million)
Keeping Oil Reserves Stable	• Secured 96,460 thousand barrels of government reserves (5th in IEA oil supply capacity) • Achieved a profit of KRW 200 billion using the stockpile.



Social Values



UN SDGs

Goal 9

Build resilient infrastructure, and promote inclusive and sustainable industrialization and foster innovation.

KNOC news

Contribution to the national economy by stabilizing oil supply and demand

Korea, which experienced two oil shocks in 1974 and 1979, established KNOC in 1979 to stabilize domestic oil supply, and has been establishing an oil reserve plan since 1980. In addition to the oil reserve plan, KNOC has prepared various measures against potential oil supply crisis.

KNOC operates 9 domestic stockpiling bases to achieve its original goal of "stable oil reserve and strategic stockpiling" and urgently discharges stockpiled oil from each base when there is a disruption in the supply of crude oil. In addition, in case of a crisis, it exercises its preferential purchase rights for oil, which belongs to other oil producing countries, but stored in its stockpiling bases, to secure additional oil. Lastly, in order to introduce crude oil into Korea in case of an emergency, the company designates some of its own overseas blocks to determine the amount of oil that can be introduced in Korea.

For resource security, the Korean government recently announced an oil supply strategy to expand international joint stockpile with oil producing countries and promote oil stockpiling in third countries. KNOC, a public company with a mission to stabilize the "oil supply and demand" of Korea, will do its best to realize resource security.

1st	2nd	3rd	4th
Oil Reserve Plan (Jun. 1980)	**Oil Reserve Plan (Feb. 1990)**	**Oil Reserve Plan (Jul. 1995)**	**Oil Reserve Plan (Nov. 2014)**
43.6 million barrels of stockpiling facility built	51.9 million barrels of stockpiling facility added	146 million barrels of stockpiling facility 141 million barrels of stockpiling target achieved	Proactive response to environmental changes in the international oil market

Strengthening of Oil Development Competitiveness

Haliba oil field
Annual production of
5.84 million barrels
(40,000 barrels per day)



Commercial production ceremony in Haliba oil field

Production cost reduced by
USD 80 million
(Cost per barrel (USD) : 15 → 14.6)

Early production in oil fields

The UAE Korean Consortium composed of KNOC and GS Energy, together with the ADNOC (Abu Dhabi National Oil Company), succeeded in developing an exploratory block in the UAE for the first time as a Korean company, and began commercial production in June, 2019. Due to the delay in delivery of service to complete the oil production facility, the construction was expected to be disrupted. The company, however, succeeded in shortening the construction period by two months by utilizing the existing facilities and taking follow-up measures to stabilize production, proving the company's technological capabilities and laying the foundation for business expansion in the Middle East. The Haliba oil field, which can produce 5.84 million barrels of crude oil per year, is expected to contribute to a stable supply of crude oil in the event of an emergency such as a blockade of strait by introducing all of the produced crude oil directly into Korea.

Increasing asset production

As the production assets mature, the natural decline in production will accelerate. KNOC is increasing production by applying various recovery technologies such as enhanced oil recovery to existing assets that are maturing.

	Donghae Gas Field	Vietnam Block 15-1, Su Tu Nau/Su Tu Vang Oil Fields	Canadian Oil Sand Block
Problems	· As it yields 97% of reserves is, it is being exhausted.	· Reserves are being depleted due to continued production in the main reservoir. · Some reservoirs have been blocked due to increased water production.	· KNOC's first participation in the oil sand project (lack of operating experience) · Early optimization of production facilities
Solutions	· Re-analyze the reservoir model to find additional reserves · Apply incremental hydrocarbon recovery to production wells where production is stopped	· Analyze and apply effective production enhancement methods based on the causes of production decline in each field	· Simulate and monitor optimal production by benchmarking other blocks
Results	· Production reached 2 million barrels. (1.3 million barrels increase compared to the previous plan) · Operating profit reached 62 million dollars. (80 million dollars increase compared to the previous plan)	**Su Tu Nau** · Production increased by 98 thousand barrels. · Sales increased by 6.1 million dollars. **Su Tu Vang** · Production increased by 20 thousand barrels. · Sales increased by 1.2 million dollars.	· Production increase of 150,000 barrels. · $1.43 million of additional revenue

Operating cost reduction

KNOC is reducing operating costs to improve the efficiency of block operation. It expanded in-house maintenance and repairs for aging facilities at Donghae Gas Field, localized replaceable products, and cut unnecessary costs through competitive bidding and system review, resulting in saving KRW 652 million. The company has saved CAD 5 million by optimizing the efficiency of production facilities in the BlackGold block in Canada, and expects to save CAD 29 million over the next 5 years as a result of stopping production in old production wells in Canada after reviewing their economic feasibility. KNOC will maximize operating profits by overcoming the cost reduction limit.

Improvement of Financial Soundness

Continuous improvement of financial structure

KNOC is constantly striving to improve its management efficiency so that it can proactively respond to the business crises caused by low oil prices. The net loss for the year was down 88% compared to the previous year due to efforts to increase profits and reduce costs, such as recovering KRW 1.4 trillion in investment expenses from long-term unsolved projects and achieving a record-high KRW 200 billion by using stockpiled assets. KNOC also established an emergency management plan, a high-intensity financial structure improvement measure, and improved the operating margin for four consecutive years despite falling oil prices. But as oil prices have plummeted due to the recent economic downturn caused by the COVID-19 outbreak, it is operating a post-corona labor-management joint TF to seek survival and future growth, combining all capabilities across the company.

Securing assets by recovering investment cost

Under a contract with the KRG (Kurdistan Regional Government) in 2008, KNOC was guaranteed the right to explore five oil blocks and invested KRW 1.3 trillion by 2018 to complete the construction of SOC(Social Overhead Capital). However, as a result of the exploration, it was predicted that it would be difficult to secure the reserves required to recover the investment; additionally, geopolitical unrest, including relations with the Iraqi central government and Turkey, also rose. Accordingly, KNOC formed an organization dedicated to investment recovery, including experts in negotiation/legal affairs, and the top management directly led the negotiations with KRG's senior officials. As a result of efforts for win-win negotiations, such as providing policy advice and supporting manpower training, KNOC succeeded in landing an agreement to recover the entire investment over 10 years instead of participating in the project, and collected the first round of recovery of $100 million in 2019.

Collecting signature bonus

The Korean consortium, including KNOC, paid signature bonuses to acquire mining rights in two deep-sea blocks in Nigeria in 2005, but the project was invalidated. However, KNOC finally succeeded in recovering the entire signature bonus of $92 million in August 2019 after making various efforts, such as sending a letter in the name of the CEO to the Nigerian presidential office, providing financial support for the local oil ministry, and having in-person interviews with senior Nigerian officials.

Asset rationalization

The prolonged low oil price has formed a buyer's market, and global oil asset trading has contracted. KNOC is actively inducing private companies to participate in stable profit-generating projects, and improving the efficiency of asset management by performing asset rationalization in consideration of profitability, remaining period of mining rights, and business type.

Determined early recovery in cash of all investments
USD 1.12 billion

Signature bonus collected in October 2019
USD 92 million

Keeping Oil Reserves Stable

96,460 thousand barrels secured

(5th in IEA oil supply capacity)

Oil security

Securing and relocating additional oil reserves in a timely manner

KNOC purchased 0.51 million barrels, equivalent to 189% of the crude oil purchase goal, at the price before the increase in oil prices in 2019, saving KRW 600 million of purchase costs, and revised the crisis response manual so that private oil companies, the Ministry of Industry, and KNOC can quickly respond to the oil crisis through close consultations. It also relocated oil and diesel reserves to shorten the delivery period of crude oil by ships by about 20 days and the delivery period of diesel through pipelines by up to 3 days, strengthening practical responses to the supply and demand crisis in the metropolitan area. KNOC is doing its best to actively address environmental changes in oil supply and demand, including changes in the paradigm of the international oil market and fluctuations in oil prices.

Northeast Asian Oil & Gas Hub project

Since 2008, the Korean government has built commercial oil and gas storage facilities in Ulsan and Yeosu that have excellent port facilities to handle 20% of the oil consumption of Korea, China, and Japan, with a view to making the two cities a center for energy logistics in Northeast Asia combining oil logistics, trading and finance. In order to normalize the business that had been delayed for 11 years due to the low profitability of oil storage facilities caused by falling oil prices and the withdrawal of shareholders and investors, KNOC led a public-private cooperation (SK Gas, Ulsan City, and the Korean government) and converted its existing oil-centered businesses to high-value LNG and oil chemistry businesses, attracting customized investors. In November 2019, KNOC signed a joint venture agreement with SK Gas and MOLCT (Singapore) to secure an indirect oil reserve of 10.61 million barrels that can be used for 3.8 days by the entire nation. This agreement is expected to have various ripple effects such as creating jobs for 11,584 people and revitalizing the Ulsan economy.

Underground oil storage site in Ulsan



Underground storage

Compared to the ground tank stockpile, which is vulnerable to external attacks and fires and requires substantial construction and maintenance costs, the underground storage has the advantage of maximizing land use and minimizing damage to nature. Since 2016, KNOC has been replacing old ground tanks with underground storage facilities without financial input, reducing maintenance costs of KRW 2 billion per year, and improving the stability of storage facilities. KNOC can stock 10.3 million barrels at the Ulsan Base, the last domestic underground storage to be completed in 2021, and has proven its competitiveness in the international construction market by localizing core technologies for base construction.

Efficient use of stockpiled assets

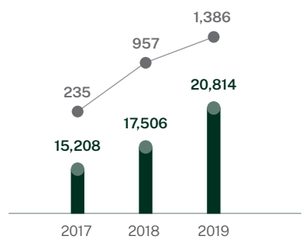
Oil reserve trading

The business using stockpiled assets generates profits by utilizing the difference between the present and future values of oil assets. KNOC has achieved a record-high trading revenue of KRW 138.6 billion in 2019 by making such efforts as assigning analysts from the market information center to business departments, strengthening on-site monitoring through frequent face-to-face contact with customers and delegating negotiation authorities to working-level staff.

Market	Contango (Near month price < Distant month price)	Backwardation (Near month price > Distant month price)
Environment	Advantageous to businesses using tanks	Advantageous to businesses using oil reserves
Solutions	KNOC buys oil at a low price in the international market, stores it in KNOC's tank, and sells it to the international market at a high price.	Customers borrow oil reserves, sell them at a high price in the market, and in the future buy oil at low prices and repay.

Trading profit and volume

(Unit: KRW 100 million, 1,000 barrels)



Leasing storage facilities

In order to overcome the unfavorable conditions for the use of existing stockpiling facilities due to expansion of oil price volatility, KNOC pursued a new business that allows steady use of tanks regardless of market conditions. In 2019, KNOC achieved a total profit of KRW 71.6 billion by making use of storage tanks including income of KRW 49 billion for international joint stockpiling, and will continue to promote customer-friendly business and overcome the unfavorable market conditions for the businesses using tanks.

Projects	Leasing berthing facility and storage tank at the same time	Leasing oil reserve and storage tank simultaneously
Details	KNOC provides its storage tanks and berthing facilities that can accommodate large ships to nearby refineries.	Customers borrow oil reserves, sell them at high prices in the market, and then purchase oil at low prices and repay them.
Outcomes	[KNOC] Receive logistics cost savings and tank rental fee at the same time [Customers] Enhance export competitiveness by saving logistics costs	[KNOC] Maximize utilization of holding assets regardless of market condition [Customers] Release oil when demand for oil increases. Use additional storage facilities
Financial performance	KRW 21.6 billion	KRW 1 billion

Oil supply and demand control tower

KNOC seeks to stabilize domestic oil supply and demand by leasing out stockpiled oil and stockpiling facilities to domestic refineries when needed, regardless of whether the situation is normal or an emergency. In particular, to quickly respond to instabilities in domestic supply and demand, it has improved its internal procedures so that stockpiled oil can be leased out within 1-2 days when requested by a domestic refinery, and in 2019, provided crude oils and major petroleum products (gasoline, kerosene, diesel) covering about 9 days' worth of domestic consumption (6,041 thousand barrels). In addition, when it is difficult to provide direct support to domestic refineries due to the inspection of its own offshore loading and unloading facilities, KNOC, a control tower for stabilizing domestic oil supply and demand, provides alternative means of loading and unloading, such as the facilities of other refiners and its own pipeline.

Social Value,
towards a better future

40 Main Business based Social Value Management and Performance

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50 Enhancing Win-Win value based on Shared Growth

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Main Business based Social Value Management and Performance

Job Creation

Direct and indirect job creation

4,335 jobs

(Target) 3,681 jobs | (Performance) 118%

Transition to full-time positions without conflict

102 people

Severely disabled hired for sports jobs

16 people

First case among the tier 1 government-owned corporations

Ethics and Fairness

Fair recruitment satisfaction

93.72 points

Compared to previous year 5.94 points

Power abuse index

20.8 points

41% lower than the average of other organizations (35 points)

Lowest bid/win ratio adjusted upwards

88.0%

80.5% → 88.0%

Education on human rights

18,325 hours

Win-Win growth

Support for startups to use oil price information

12 companies

669 free API issuances

Supply for KNOC backed Economical gas stations

1.29 billion liters

National benefit of KRW 72.7 billion

Localization of foreign parts and equipment

16 cases

Cooperative profit sharing system

Best practice

Main business-based social value management strategy

Goals

Realization of social value recognized by public

Three major values

- Main business-based
- Region-focused
- Improving the public benefit

Five focus areas

- Job Creation
- Safety and Environment
- Regional Development
- Social Equity
- Ethics and Fairness

Response to COVID-19

Fundraising from employees

KRW 200 million

Lunch boxes delivered to Ulsan Jung-gu Health Center

900 pcs

Pre-payment of annual budget

80%

Regional Development

Donghae 1 floating offshore wind farm project

Total capacity of 200MW

Construction of new energy industry ecosystem

Increase in purchases from local markets

48%

Compared to the previous year

Total cost of oil and LNG storage facility construction

KRW 616 billion

Job creation and promotion of local related industries

Safety Management

Accident-free workplace

19 consecutive years

In domestic workplaces

Evaluation of personal information management

92.3 points

Awarded by the Minister for contribution to information security service

Social Equity

Hiring rate of high school graduates in 2019

33.3%

Exceeded the government guideline of 10%

Disabled employment rate

3.9%

Awarded grand prize in the 2019 Job Creation Exemplary Management Prize of Korea

Percentage of female managers

4.0%

One female board member appointed

Recruitment of local talent

12 people

12 people employed VS only 2 legally required over the last two years

Environmental Preservation

Reduction in VOCs emission

55.5%

Using the optical inspection system of oil storage

Reduction of domestic GHG emissions

113%

Over GHG emission reduction target

Oil Spill

Zero

In the last 3 years at domestic workplaces

Safe and Eco-friendly Workplace

KNOC strives to ensure the safety of all citizens, including employees, workplace workers, and local residents, and is proactively carrying out disaster response measures by upgrading safety management and disaster response systems. In order to minimize the environmental impact, it is carrying out environmental responsibility activities that are subdivided by environmental pollution and business site operation, and is actively responding to climate change through GHG and energy target management in the public sector.

Strategies	Major Achievements
Creation of Safe Workplace	• Achieved zero accidents at domestic workplaces for 19 consecutive years • Reduced accidents by 60% at the underground storage construction site
Realization of Safe Society	• Awarded from the Ministry of Public Administration and Security in the emergency rescue sector • Awarded by the Minister of Trade, Industry and Energy for the contribution to information security service
Management of Environmental Risks	• VOCs reduction by 460 tons per year through the gasoline tank improvement project (~ 2023) • Achieved 113% of 2019 GHG emission reduction target*

* Based on the public sector's GHG and energy target management system



Social Values



UN SDGs

Goal 13

Take urgent action to combat climate change and its impacts.

Goal 8

Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

interview

Leading safety activities, and spreading a national safety culture"



In Korea, which is entering the ranks of advanced countries, safety is regarded as an important factor as well as other management indicators. KNOC, as a national core business operator with a number of overseas business sites, needs to comply with international safety and health standards such as ISO 45001 along with the domestic KOSHA system, and thoroughly implement a disaster management system in preparation for large-scale accidents.

The fact that more than 70% of the workplaces are PSM P-grade and achieved zero accidents for 19 consecutive years shows that KNOC has made efforts for safety even under emergency management situations. The increase in safety staff and safety-related budget also shows KNOC's strong commitment to safety. It is also highly appreciated that KNOC has established an integrated safety management system in cooperation with military units, small and medium-sized enterprises, and local communities, and has spread a safety culture nationwide.

In order to upgrade KNOC's safety capabilities, it is necessary to improve internal safety awareness through safety training. In addition, it seems necessary to establish a policy containing the CEO's commitment to safety and to introduce an IT-based safety management system integrated into the ERP(Enterprise Resource Planning). I hope that KNOC will have the capacity to protect the safety of employees, local communities, and even the people.

Park Ju Chull, Dean of Graduate School of Industry /
Professor of Industrial Management Engineering, University of Ulsan

Creation of Safe Workplace

Domestic workplaces for 19 consecutive years

Zero accidents

Overseas workplaces LTIF performance improved

0.49 → 0.35

(2018) (2019)

At the underground storage construction site

60% reduction in accidents

Reinforced workplace safety management

KNOC operates an Occupational Safety and Health Committee to involve workers in the safety management system. In 2019, it established a joint safety management committee with labor and management from KNOC and partner companies to protect workers and improve the working environment, through approaches such as introducing a work suspension request system and a two-person work system for risky work.

KNOC improved the facility inspection system and ensured the stability of facility operation by conducting a survey/analysis on the actual condition of the underground cavity and facility management of the stockpile base, and then introducing the underground cavity groundwater flow model* and the cavity internal pressure change test. KNOC implemented risk-based on-site safety management by introducing a risk index warning system based on daily work status and risk assessment, reinforcing safety prevention activities. It has also been cultivating excellent safety personnel by increasing safety personnel and reinforcing safety job training. As a result, KNOC has achieved zero accidents for 19 consecutive years in 10 domestic business sites.

* Flow model: Groundwater flow analysis method for monitoring oil leaks

Safe working environment

KNOC holds a near miss accident and risk element monitoring and reporting contest and encourages the voluntary participation of all employees through rewards in order to discover and eliminate various risk factors inherent in the workplace, ensuring a safe workplace and establishing a culture of safety.

In 2019, KNOC intensified its regular preventive safety/environmental management activities to reduce the safety/environmental risks that increase with the aging of production assets and facilities at overseas business sites, and as a result improved LTIF performance without any oil spill accidents. It will continue to strengthen its field-oriented preventive activities to ensure a safe and comfortable workplace.

* LTIF (Lost Time Injury Frequency): Work related the number of lost time injuries incidents per 1 million hours worked

Expanded responsibility for safety of suppliers

In 2019, at the construction site of Ulsan underground storage ordered by KNOC, a worker suffered an ankle fracture due to the breakage of the boom pole of a work vehicle, and another worker suffered a finger amputation due to a finger being caught in a wire rope while moving a heavy object. With a sense of responsibility for the accidents, KNOC is reinforcing safety management at all its business sites to prevent recurrence of accidents. Besides, it introduced a construction site risk observation card system in which workers who discover risk factors at work sites immediately report them, and took 100% appropriate measures for 26 reported problems. In addition, as an ordering organization, KNOC is fulfilling its responsibility for the safety of its suppliers by developing new safety technologies, supporting the use of new products, assessing risks in cooperation with suppliers, and providing additional safety equipment to special workers.

Realization of Safe Society

Advanced disaster response system

Strengthened disaster management capabilities

KNOC established an on-site disaster management system to realize an energy safety society for the nation and the people, while ensuring the continuity of operation of national infrastructure* and minimizing damage to the public. In order to reinforce its disaster prevention capabilities, KNOC improved its disaster response manuals and facilities, increased disaster response personnel by 34%, and conducted a joint safety training with local governments and fire departments. Besides, to secure disaster recovery capabilities, KNOC developed the BCP (Business Continuity Plan) for national infrastructure, maintained regular release conditions of oil reserves, and signed a disaster response safety management agreement with the Army.

* Continuity of Operation: A set of systems for establishing and operating plans to continue essential services during and following an emergency or disaster



Safety drill in Korea

Improved disaster prevention facilities

Disasters occurring at domestic and overseas oil facilities cause anxiety about social safety as well as unstable oil supply. KNOC has ensure the stability of national infrastructure by analyzing and preventing the causes of major disasters in oil facilities.

Due to a reduction in explosive oil vapor

Complaints Reduction

5 cases(2018) → 0 cases(2019)

Category	1. Explosion (oil vapor) -VOCs reduction and treatment	2. Fire -Fire detection / Flame prevention		3. Drone -Drone attack
Risk factors	• A trace amount of explosive oil vapor was discharged from the top of the crude oil tank. • There have been continuous complaints about odor. • Explosive oil vapor needed to be reduced and treated.	**[Fire detection system]** • Functional limitations of existing CCTV • Existence of areas vulnerable to fire and blind spots for fire monitoring	**[Flame prevention system]** • Embers entering through the oil vapor outlet (Cause of fire in Goyang oil storage tank)	• Bombing threat using drone • Drones appeared in Geoje office, etc.
Improvements	• Installation of a device to reduce the scattering of explosive vapors for the first time in Korea • Installation of 5 facilities to collect and incinerate explosive oil vapors for the first time in Korea	• Installation of thermal imaging camera and alarm system for fire detection (Pyeongtaek)	• Installation of flame prevention system at the oil vapor outlet of gasoline tank (Yongin, Gokseong) -74 flame protection nets in 2018 -15 back fire protectors in 2019	• Review of surveillance measures for drone attacks and installation of two cameras for drone detection
Results	• Fewer civil complaints due to a reduction in explosive oil vapor	• Enhanced fire prevention and response capabilities		• Proactive response to external risks



Army unit oil storage tank safety management consulting

Mutual cooperation system with related organizations

Almost all of the disasters that have occurred in recent years are complex disasters that require a joint response by multiple organizations rather than a single response by one organization. For this reason, KNOC is strengthening mutual cooperation for disaster safety by establishing a system of cooperation with related organizations such as oil refineries and fire departments. It conducted safety management consulting for the army unit's oil storage tank and suggested 38 safety management improvements to the army, and supported efforts by refiners to conduct safety inspections on hazardous material storage tanks, while presenting 19 improvements related to tank and fire fighting facilities to refiners. It also conducted 52 joint drills with the fire department to extinguish fires caused by oil leakage in loading arms or oil pipelines, and 15 joint drills with the Korea Forest Service to extinguish forest fires. KNOC will actively share its expertise in the area of safety to contribute to improving the safety management level of organizations that are vulnerable in this area, laying the foundation for a safer society.



Safety check for vulnerable groups

Establishing a culture of safety in local communities

Beyond workplace-oriented safety management, KNOC seeks to discover and manage safety blind spots in local communities, and to eliminate safety insensitivity. KNOC not only raises the safety awareness of local residents through safety inspections and safety training, but also improves the ability to respond to safety accidents, thus promoting a culture of safety and realizing safer communities.

Category	Safety management activities	Expected effect
Safety check	Safety check for vulnerable groups - Conducted safety check of firefighting and electrical facilities in 114 residences, including households of seniors living alone, households with disabilities, senior citizens' halls, and village halls.	Preventing damage to local residents' lives and property through safety check
Providing and sharing safety supplies	Disaster safety supplies for the vulnerable. - Provided safety supplies worth about KRW 40 million, such as gas cut-off, safety first aid kit, fine dust mask, disaster safety kit, fire extinguisher, etc. to low-income vulnerable households	Providing safety products to create a foundation for people's safety
Safety Education (PR/Campaign)	Training to enable people to respond to the safety accidents that can occur in everyday life, and safety promotion and campaigns - A total of 8 safety training sessions covering topics such as how to use fire extinguishers, CPR training, and what to do in an earthquake or fire. (behavior know-how)	Providing participation-oriented safety training to improve the ability of local residents to respond to safety accidents

Awarded by Minister of Trade, Industry & Energy

Contribution to information security service

Information security

The leakage of important information, including personal information of customers and employees, causes enormous costs and losses not only in the organization but also in society. KNOC achieved zero personal information leakage by improving the personal information management system for each life cycle of information (collection-use and provision-storage-destruction), and was awarded the highest rating with 92.93 points in the personal information management evaluation in 2019. It practices information security on a daily basis by upgrading the response and authentication system and conducting cyber simulation training in order to strengthen its ability to respond to cyber threats. As a result of spreading information security awareness across the company by providing customized security training to all employees, KNOC was awarded from the Minister of Trade, Industry and Energy for information security service.

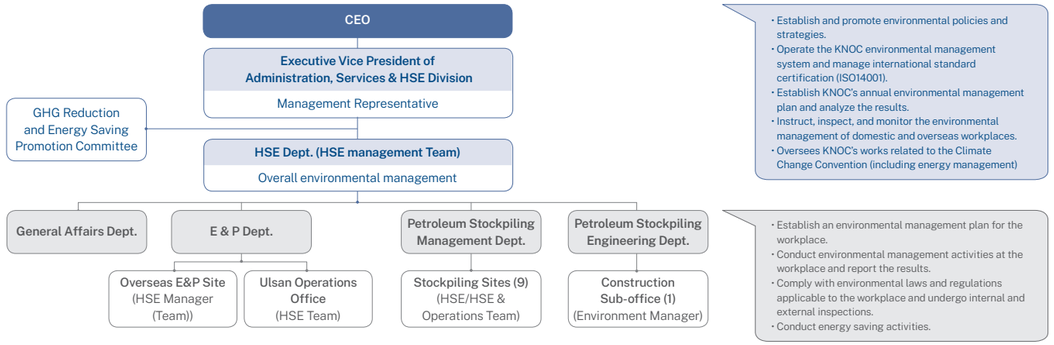
Management of Environmental Risks

Minimization of environmental impact

Environmental goal, strategy and organization

Goal	Minimize the environmental impact caused by storage and management of strategic oil reserves and oil development		
Strategic Elements	Atmospheric & Marine Environment	Soil & Groundwater Environment	Local community & Climate change
	• VOCs*, Fine dust • Oil odor and water treatment odor • Oil spills in the ocean • Untreated wastewater inflow to the ocean	• Oil content of the effluent from underground storage facilities • Oil spill from ground tanks, etc.	• Local community's awareness of hazardous facilities • National environmental policies on climate warming, fine dust, etc.
Direction	Diversification of environmental conservation efforts by subdivided environmental management		
Tasks	① Reduce VOCs and fine dust. ② Prevent marine pollution. ③ Prevent soil and groundwater pollution. ④ Ensure regular environmental monitoring system. ⑤ Preserve the environment with local communities. ⑥ Prepare for the future environment and manage GHG.		

* VOCs(Volatile Organic Compounds): oil vapor generated from gasoline storage tanks



Improvement of air quality

In order to collect and incinerate all the VOCs that are discharged from the gasoline storage tank to the atmosphere, react with nitrogen oxides to form ozone, which finally helps the formation of particular matter, causing air pollution, KNOC established a roadmap for the 5-year VOCs treatment plant construction project. Once the VOCs treatment plant project is completed, it is expected to reduce 460 tons of VOCs (11 tons of particular matter equivalent) per year.

CO_2

Estimated reduction after installing VOCs treatment facilities in storage sites (~2023)

460 tons of VOCs per year

Domestic workplaces in the past 3 years

Zero oil spills

In VOCs emission using optical inspection equipment in stockpiling sites

55.5% reduction

Prevention of marine pollution

In order to minimize the risk of marine pollution and eliminate the risk of oil leakage during the marine transportation, KNOC conducts regular inspections and preventive maintenance of transport facilities and equipment. To improve the ability to respond to accidents and minimize damage, it conducts joint response drills at least once a year with the Korea Marine Environment Management Corporation, the Korea Maritime Police, and local governments. In order to improve the quality of oil-containing effluent discharged to rivers and seas, it has improved its wastewater treatment facilities and regularly conducted wastewater analysis to monitor wastewater quality, resulting in zero oil spills in the past three years.

Prevention of soil and groundwater pollution

Oil leakage from storage facilities (storage tanks, oil transfer equipment) is major factors of soil and groundwater pollution. In order to prevent soil and groundwater contamination by improving the quality of wastewater, KNOC has upgraded its wastewater treatment facilities in the underground storages, operated a groundwater observation system and conducted flow analysis to ensure airtightness and safety, and has conducted periodic preventive and oil leakage inspections on its ground storage facilities.

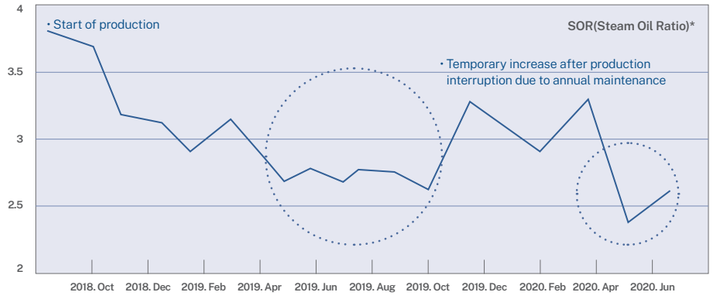
Constant environmental monitoring system

Advanced monitoring is always required to minimize and continuously manage the environmental impact that occurs in the process of business activities. In order to evaluate and manage environmental risks, KNOC is operating a preemptive environmental monitoring system, such as measuring the concentration of environmental hazards and analyzing environmental impacts. KNOC measured and checked the VOCs emissions of 12 crude oil tanks with optical inspection equipment in 2019, and reduced VOCs emissions by 55.5% by installing and operating sprinklers on the floating roof of crude oil tanks. It also established a new environmental pollutant licensing management system to prevent omissions and delays in reporting licenses and permits and block the possibility of environmental pollution and violation of laws and regulations.

Water reduction activities

KNOC continues its efforts to minimize the impact on the surrounding environment by actively introducing the latest technologies in the oil industry, such as Injector Retrofit*, to reduce the consumption of groundwater that is essential for the production of non-traditional resources such Canadian oil sand.

* Injector Retrofit: Technology to effectively produce a lot of oil with less steam injection by evenly injecting steam into a specific reservoir section



* SOR: The ratio of steam to oil, which is a measure of the energy (steam) required to produce oil sands. Operation is being performed below the design value of 3.0 to conserve water resources and preserve the environment.

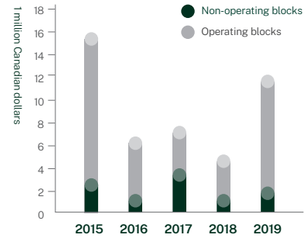
Minimization of pollutants

KNOC applied the ZLD(Zero Liquid Discharge) system, a state-of-the-art water treatment technology to recover and reuse produced water(wastewater) without discharging it to the outside, to the BlackGold Oil Sand production facility in Canada. KNOC recovers as much as possible the produced water that has been generated in the process of processing crude oil to produce bitumen* and reuses it as boiler water. The remaining small amount of wastewater is solidified and disposed of, thereby minimizing the use of groundwater and reducing the possibility of environmental pollution.

* Bitumen: Injecting hot steam underground to extract high-viscosity heavy oil components contained in the oil sand, a mixture of water, sand, and crude oil that has moved close to the surface.

Responsible ARO(Asset Retirement Obligations)

In oil wells that are judged to have no productivity or economy, production is stopped, oil wells, pipelines, and related production facilities are demolished, and restoration work begins. KNOC complies with the laws and procedures of each country in dismantling oil wells, pipelines, and production facilities and restoring the developed area to its original state. In particular, Harvest Operations Corp., a Canadian subsidiary, has applied the ABC* program since 2019 for effective recovery, and has calculated and disclosed the ARO(Asset Retirement Obligations) on a quarterly basis according to financial reporting standards. The ARO includes obligations for the dismantling of oil wells, pipelines and facilities, and for the restoration of nature, resulting in KNOC's responsible implementation of oil well disposal and natural recovery.



* ABC(Area-Based Closure): A program to encourage oil and gas licensees to work together to decommission, remediate, and reclaim their energy infrastructure and sites. It reduces costs incurred during the closure process.

Response to climate change

Preparation for future climate change

In order to respond to climate change and the resulting natural disasters, KNOC has established "Climate Change Adaptation Measures for Storage Sites," and is implementing detailed annual implementation plans. It achieved 113% of its 2019 GHG emission target* by continuously monitoring GHG emissions. To save energy, it has introduced three eco-friendly electric vehicles, and has raised the LED lighting penetration rate at its business sites to 92.1%. Besides, it completed a 275 kW solar power generation facilities in Seosan, Donghae, and Yongin storage sites to expand the supply of new and renewable energy. KNOC will realize a low-carbon energy future by continuously reducing GHG emissions and managing energy targets.

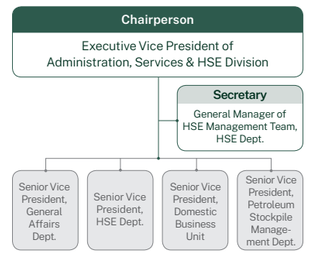
* The public sector's GHG and energy target management system

GHG emissions reduction target in 2019

Achieved 113%

GHG Reduction and Energy Saving Promotion Committee

KNOC is operating the GHG Emission Reduction and Energy Conservation Promotion Committee to establish a systematic plan for GHG emission reduction and efficient energy use, and to analyze and evaluate the results. The committee meets at least once in each of the first and second half of the year to establish its own GHG reduction and energy saving plans, and to discuss and decide on the results.



Enhancing Win-Win value based on Shared Growth

KNOC strives to grow with its business partners and contribute to the realization of happiness for the people. To this end, it is carrying out win-win activities that reflect the characteristics of its business, and has improved the distribution structure by supporting economical gas stations, thereby increasing the benefits of the people. In addition, it is creating an ecosystem for shared growth in the domestic oil industry through practical support for SMEs, such as localization of parts and equipment for stockpile sites and profit sharing system.

Strategies	Major Achievements
Maximization of People's Happiness	• National benefits of KRW 72.7 billion • 124 million annual users of Opinet
Creation of Oil Industry Ecosystem	• Selected as the best practice of the profit sharing system • Contributing to an increase in sales for SMEs by localizing parts and equipment for stockpile sites
Establishment of Fair Cooperative Relationship	• Lower bid/win ratio increased to 88.0% due to system improvement • No cases of payment delay in 2019



Social Values



UN SDGs

Goal 7

Ensure access to affordable, reliable, sustainable, and modern energy for all.

Goal 9

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

interview

Economical gas stations, realizing happiness for small businesses and people

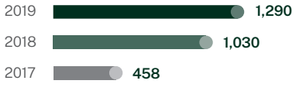
The economical gas stations distribute high-quality oil purchased at a low price from KNOC at a reasonable price by minimizing additional services. In addition, they post their own oil prices to Opinet, KNOC's oil price information service, affecting the prices of gas stations nationwide and thereby contributing to the reduction of national fuel costs.
KNOC is subsidizing construction costs for new gas stations to revitalize economical gas stations, and conducts regular inspections on facilities and oil quality to create a pleasant gasoline environment and eradicate fake oil. It also helps small operators overcome difficulties by operating a fuel price discount system based on monthly purchases, and providing financial support such as extension of repayment of debt and interest exemption in response to the recent COVID-19 situation.
Since the first opening of economical gas stations 9 years ago, the market share of economical gas stations has reached 10%. In order to create a favorable market environment in the future, economical gas stations will need to actively advance into metropolitan areas and narrow the physical and psychological distance from consumers based on trust. I look forward to seeing KNOC and economical gas stations actively communicate and work together to achieve this goal.



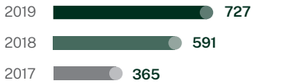
Lee Cheol-gyu, President of Gyeongnam Office of the Self-Employed Economical Gas Station Association

Maximizing People's Happiness

Oil supplied by self-employed economical gas stations (Unit: million liters)



Consumer benefit (Unit: KRW 100 million)



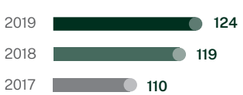
Reduction in people's fuel costs

In the domestic oil market, price competition is limited and the fuel cost burden is high due to the vertical distribution structure between refiners, agencies and gas stations. KNOC operates its economical gas station business to realize a simple distribution structure composed of refiners, KNOC, and economical gas stations, thereby suppling high-quality oil products at low prices and suppressing price increases so that the people can feel the reduction in fuel costs. It signed a joint purchase agreement with Nonghyup to increase contract volume by 1.9 billion liters, and signed an agreement with the Korea Expressway Corporation to increase annual contract supply by 100 million liters. With the increase in purchase volume, the purchase cost per liter was reduced by KRW 5, and the supply price discount between KNOC and economical gas stations was expanded to increase the supply to economical gas stations by 25% compared to the previous year. As a result, in cooperation with economical gas stations, KDHC is providing oil to the public at a price which is lower by KRW 33.5 than the average selling price of gas stations nationwide.

Enhancement of economical brand value

	Accessibility Improvement	Marketing Diversification	Proactive quality management
Back-ground	· High land prices and rental fees make it difficult for new business operators to enter the gas station market in large cities · Decreased access to economical gas stations in large cities	· Decreased customer satisfaction for economical gas stations	· Need to improve the detection rate of illegal activities at self-employed economical gas stations
Tasks	· Give preferential treatment to economical gas stations that have been newly converted from gas stations in large cities · Increase support for opening expenses	· Offline : 120 billboards and 140 banners nationwide · Media : National traffic broadcasting and leading newspapers · Online : KNOC's YouTube and blog	· Expand quality checks for suppliers (refiners) · Expand quality checks through K-Petro · Encourage participation in the quality certification program and supply oil at discounted prices to participating gas stations
Results	· 64 economical gas station in large cities (8% up compared to the previous year) · 6.79 self-employed economical gas stations per million vehicles (0.44 stations increased from the previous year)	· 2.02 billion liters of supply by economical gas stations (471% increase over 8 years) · 3.5 points of reputation index of economical gas stations (0.9 points increase compared to before promotion)	· Self-employed thrifty gas station's illegal activity detection rate: 0.5% (0.8%p decreased from the previous year) · 86 gas stations joined the quality certification program (11 increased from the previous year)

Annual Opinet users (Unit: million people)



Petroleum information service

KNOC is operating Petronet, a comprehensive oil information network, and Opinet, a real-time oil price information service, which will be convenient for the public to access and take advantage of. Petronet aims to systematically collect and analyze various information on the domestic and foreign oil markets, provide it to stakeholders, and support the government's oil policy. On the other hand, Opinet provides the sales price of oil at 11,498 gas stations and 1,939 LPG charging stations nationwide to the public in real time online, and provides free oil price information API* to SMEs, resulting in creating 128 jobs.

* API: Application Programming Interface supplying real time oil price data

Creation of Oil Industry Ecosystem

Win-win growth strategy

Strategic goal	Global Oil Platform, Growing with SMEs		
Strategic direction	Strengthening oil platform competitiveness	Strengthening SMEs' capabilities and providing sales channels	Spreading a culture of win-win growth
Strategic tasks	Support for technology development and commercialization	Provide sales channels at home and abroad	Share cooperation outcomes
	Strengthen the competitiveness of secondary and tertiary partners and local companies	Support for SME growth	Strengthen the win-win growth promotion system
Performance goal	① SME sales creation ② SME cost reduction ③ Localization of parts and equipment ④ Building the foundation for a win-win growth oil platform ⑤ Strengthening the SME competitiveness through direct and indirect transactions		

Localization of parts and equipment of storage sites

KNOC supports SMEs' efforts to localize parts and equipment in order to reduce the dependence on foreign products and strengthen the competitiveness of domestic SMEs. It supports SMEs to create economic results by participating in major localization processes such as discovery of SMEs, technology development, and performance verification. In 2019, partner companies localized 16 parts and equipment, generating KRW 234 million of new sales, and the performance index for localization of parts and equipment exceeded the target by 23-39%.

Support for pioneering domestic and overseas markets

KNOC is contributing to vitalization of the domestic oil industry ecosystem by supporting SMEs to enter domestic and foreign markets. It held purchase briefing sessions at each storage site for SMEs and participated in SME products purchase consultations organized by local governments to support the domestic sales of SME products. Besides, it actively introduced SME products to the Vietnamese and UAE markets, where it has already entered. It also provided necessary information to domestic SMEs participating in the UAE ADIPEC*, so 12 SMEs received requests to enter the overseas market and 14 SMEs achieved new domestic sales of KRW 601 million.

* ADIPEC: Abu Dhabi International Petroleum Exhibition & Conference

Indicators	Targets	Performance
Localization of parts and equipment (Cases)	13	16
SME sales increase (KRW million)	200	234
KNOC's budget savings (KRW million)	400	482

Domestic Sales Performance

KRW 601 million

Overseas Sales Performance

USD 14,000

Cooperative profit sharing system

Best Practice

Leading the profit sharing system

The profit sharing system is a system to support the growth of SMEs and maximize win-win value, in which public enterprises and SMEs share the profits when they achieve their goals. KNOC lowered the oil supply price for economical gas stations by a total of KRW 176 million through joint purchase and management cost reduction. As a result, it was selected as the best practice and a public organization that best performs the cooperative profit sharing by the Ministry of SMEs and Startups in 2019.

Support for SMEs' industrial innovation movement

KNOC supports SMEs' efforts to innovate their manufacturing processes and management for sustainable growth. In 2019, it expanded the target of the existing win-win growth program from primary suppliers to secondary and tertiary suppliers to support more small and medium-sized suppliers. KNOC's Win-Win Growth Working Committee provided a total of KRW 50 million to 3 SMEs, including 2 companies in Ulsan, and these companies received solutions in the fields of process, quality, cost, and environment and achieved remarkable results, such as exceeding their financial targets by 23%.

Zero industrial accidents

KNOC has set zero industrial accidents as a mid- to long-term goal to improve the safety and working environment of employees of contractors. In 2019, we ran a safety training program that trained 84 employees of our contractors and their sub-contractors, as part of a (construction) safety promotion campaign. It also interviewed the employees of contractor companies to check their safety awareness level and grievances of the safety system operation, and created a rest area for them. As a result, it achieved zero accidents in its stockpiling sites in 2019, laying the foundation for spreading safety culture.



Safety training for contractors



Conducting safety interviews for employees of contractor companies

Fair Cooperative Relationship

System improvement to establish fair economic order

Fair trade with business partners must be supported by an appropriate system. KNOC improved the standard for calculating the basic amount of suppliers, raised the prepayment rate for service up to 60%, and revised the qualification criteria in order to establish a fair economy with SMEs. It also reinforced regulations on prohibiting unfair trade practices, such as newly establishing a provision to prohibit penalizing those who report unfairness.

Strengthening practical ability for fair economic order

KNOC practices fair economy by improving the subcontract management and monitoring system. In 2019, it mandated that the primary suppliers disclose information including contract terms and payments to secondary and tertiary suppliers on the "Subcontractor Keeper," an electronic payment system, and the "Knowledge Information System of Construction Industry (KISCON)". It also conducts an examination for unfair special contracts when the subcontract amount is less than 64% of the planned order price to prevent low-priced subcontracting. Besides, it identifies the factors that affect the unit price of supply and monitors them so that a reasonable price is paid to the secondary and tertiary suppliers and that the unit price is increased reasonably. In 2019, KNOC did not delay any payment, and raised the unit cost of ready-mixed concrete for the construction of Ulsan storage site by 5.9%, realizing win-win growth with partners.

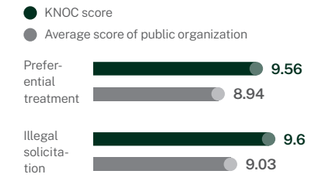
Culture of fair trade

KNOC is leading the fair trade culture through education and promotion for internal employees. It provides education on fair, such as integrity and prohibition of power abuse, to contract managers, and disseminates improvements across the company in case of a system revision. It also distributed casebooks and conducted specific audits to prevent misconduct in business, thereby raising employees' awareness and understanding of fair trade. As a result, it received higher scores than other public organizations in the integrity evaluation conducted by the Anti-Corruption & Civil Rights Commission in 2019.

Lower bid/win ratio increased

80.5% → 88.0%

2019 External Integrity Assessment by the Anti-Corruption & Civil Rights Commission (Unit : point)



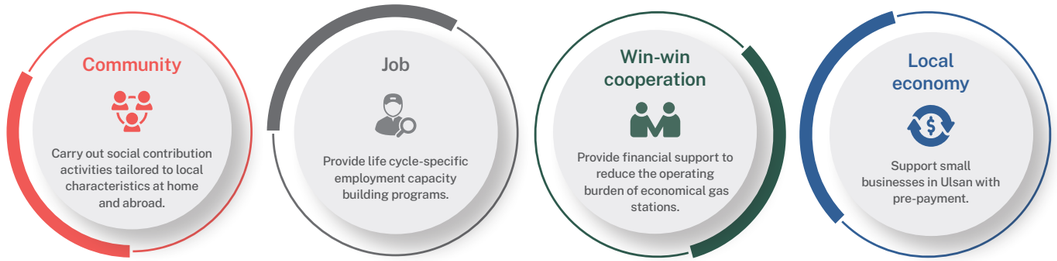
Contribution to Local Community Development

KNOC is fulfilling its social responsibility as a compassionate partner of stakeholders. It created jobs in various fields, and in particular, hired employees in disability sports to expand employment opportunities for people with severe disabilities. In addition, it continued to support medical staff who are struggling to overcome COVID-19 pandemic early and small businesses who are experiencing economic difficulties.

Strategies	Major Achievements
Job creation tailored to KNOC	• Grand prize in the 2019 Job Creation Exemplary Management of Korea (employment friendly for the vulnerable section) • Created 4,335 jobs in 2019
Revitalization of Local Communities	• Increased 48% compared to the previous year in the purchase amount from local markets • Donated KRW 200 million to overcome the COVID-19 crisis.



Social Values



UN SDGs

Goal 3

Ensure healthy lives and promote well-being for all ages.

Goal 8

Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

interview

Support for disabled athletes, the beginning of hope and happiness in the community

The Ulsan Sports Association for the Disabled is pushing forward a project to promote health and leisure life for the disabled through sports activities. Our association has been supporting the employment of disabled athletes together with 12 companies and organizations including KNOC since 2019. KNOC is the only public corporation in Ulsan that has participated in this movement by employing 16 disabled athletes in three sports so that they can focus on their sports in more stable environment. In particular, we are deeply grateful to KNOC for hiring the disabled athletes even in times of financial difficulties.

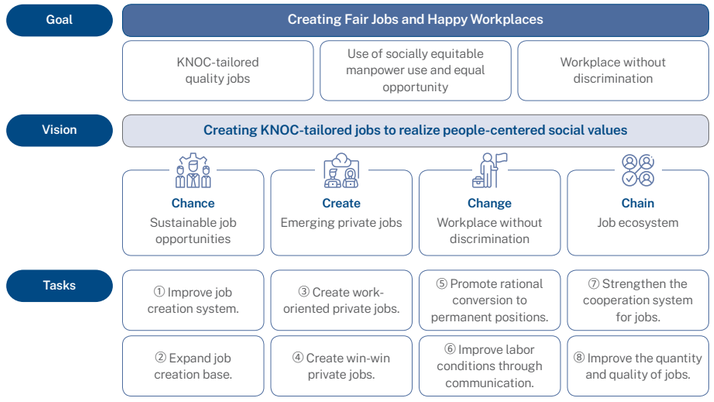
The city of Ulsan holds sports competitions for each sport every year, and is expecting the Ulsan World Dance Sports Championships for the Disabled in 2021 and the National Sports Games for the Disabled in 2022. We hope that KNOC will continue to volunteer at various sports events for the disabled to give greater meaning to the activities for improving the quality of life of the disabled and lead a healthy culture to support the disabled.



Kim Sun-Jeoung, Secretary General of the Ulsan Sports Association for the Disabled

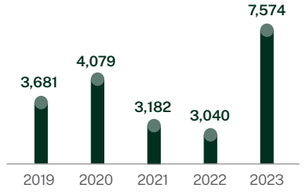
Job Creation tailored to KNOC

Strategies for creating quality jobs to realize people-centered social values



Five-year job creation roadmap

(Unit : person)



KNOC re-established its five-year job creation roadmap and specified annual job creation goals. In 2019, it created 4,335 jobs, equivalent to 118% of the target, from direct hiring, establishing a subsidiary to convert non-regular workers to regular workers, private collaboration, and support for startups.

Direct and indirect employment (As of December 31, 2019)

Job creation activities	Main Content	Direct/indirect employment (persons)
Storage construction and maintenance	· Constructing the Ulsan underground oil storage · Improving storage site facilities, such as replacing old pipelines	1,217*
New growth engine	· Promoting Northeast Asian Oil and Gas Hub project · Establishing a floating offshore wind farm in the Donghae Gas Field	108
Private collaboration and business consignment	· Operating economical gas stations · Providing oil field test bed · Consortium for direct import of UAE crude oil · Consignment of construction operation and management tasks such as office building management	2,191
Support for startups and SMEs	· Providing oil price information for free to support startups. · Technical cooperation with SMEs for the localization of parts	680
Conversion to full-time positions	· Conclusion of reasonable conversion to full-time positions after a total of 13 meetings	102
Direct jobs	· Direct employment reflecting various social classes and working types	37**

* Based on the construction industry's employment induction coefficient published by the Bank of Korea

** Including 16 employees working for disabled sports

Expansion of employment opportunities for the disabled

Employment of disabled athletes

Our goal when it comes to job creation is to provide good quality jobs for individuals. In particular, we focus on providing more opportunities to those who are disadvantaged in the job market, and on operating stable and healthy work environments. So, in cooperation with the Korea Employment Agency for the Disabled and the Ulsan Sports Association for the Disabled, KNOC hired disabled athletes so that they could focus on their sports in a stable environment. It directly hired 16 weightlifting, bowling, and boccia players in 2019, and recruited 4 additional players in 2020. KNOC's athletes won a total of 13 medals at the 39th National Paralympic Games.

Short-term job experience internship program for the disabled in Ulsan

KNOC operated a short-term job experiencing internship program for 25 disabled people in Ulsan from November 2018 to February 2019 to increase employment opportunities for the disabled and strengthen their job capabilities. Each intern was assigned to a business department, received training from a mentor within the department, and learned how to get a job. At the end of their internships, 9 people were employed by other organizations as a result of strengthening their employment capabilities.

Career education for disabled youth,"Dream Maker"

In cooperation with the Ulsan Metropolitan Office of Education and the Ulsan Welfare Center for the Disabled, KNOC has been operating a vocational skill program to provide interview training, job training, and local community adaptation training for youths who are expected to graduate from special classes at five schools in Ulsan. In 2019, 37 youths participated in the program, and two of them were employed by other organizations.

Employment competency programs by life cycle

KNOC is operating a life cycle-specific employment competency programs for citizens. It provided middle and high school students with opportunities for career exploration by running a free semester systems and a career experience programs. In addition, in cooperation with the Ulsan Metropolitan Office of Education, it held an open school for vocational high school students to introduce oil development and stockpiling and strengthen their employment capabilities. Besides, as part of a pilot project to foster regional leading universities, it provided a public institution-linked curriculum for the University of Ulsan and offered a job experiencing internship programs. It also opened an offline course for KPA (KNOC Petroleum Academy) to college students and employees from relevant industries share the knowledge and experiences of experts.

Targets	Support programs	(Collaborators) Main Contents	Beneficiaries (persons)
Middle school students	Free semester system	Career exploration and field trips to storage sites	769
High school students	Open high school	(Ulsan Metropolitan Office of Education) Oil-related job training and employment lecture for vocational schools	10
College students	Regional leading university promotion project	(Ulsan University) Oil-related job training and employment lecture for job-experience interns	15
Workers	E-learning, KPA course	(Ulsan SMEs) KNOC's online foreign language courses and KPA courses	16



Luncheon meeting with athletes in charge of sports for the disabled

At the 39th National Paralympic Games

5 gold medals, 5 silver medals, 3 bronze medals

In the 2019 Job Creation Exemplary Management Prize of Korea

Grand prize



Donation to overcome the COVID-19 pandemic

KRW 200 million



Sharing lunchbox for medical staff



Unmanned local food store

Local economy revitalization

Response to COVID-19

Lunchbox sharing for medical staff at screening clinics

KNOC provided 900 lunch boxes to medical staff at the Ulsan Screening Clinic, who were working without holidays to prevent the spread of COVID-19. Considering medical staff often skip meals due to busy schedules such as counseling, medical treatment, and examination, KNOC employees prepared and delivered lunch boxes with a heart of appreciation and support.

Relieving the burden of operating economical gas stations

To alleviate the burden of economical gas station operators suffering from COVID-19, KNOC decided to extend the payment deadline from 14 days to 28 days and to reduce interest accruing therefrom for six months from April to September 2020 for 400 economical gas stations nationwide. It also provided hand sanitizers for customer use to 125 gas stations with an average monthly sales of less than 0.2 million liters.

Good payment, Pre-payment

KNOC is promoting the Good Consumer Prepayment Campaign to support small businesses in Ulsan, which are suffering from a recession. To this end, it allowed each department to prepay for goods and services at nearby restaurants and stores up to 80% of the annual budget. It also signed agreements with two national airlines to pre-purchase overseas business trip tickets for its employees, helping those airlines overcome the business crisis.

Promoting the consumption of local agricultural products

KNOC set up an unmanned local food store in the lobby of the headquarters to help local farmers who are having difficulty selling agricultural products. At that store, producers will set the prices of goods they are selling and consumers pay the prices using an unmanned payment machine. Thus, employees will be able to purchase fresh agricultural products inexpensively and conveniently while practicing social distancing to respond to COVID-19. In addition, it is contributing to revitalizing local commercial districts by purchasing products from the Ulsan area first, and purchasing food materials from traditional markets. In part of this effort, the amount of purchases in local commercial districts in 2019 was increased by 48% compared to the previous year.

Social contribution activities at home and abroad

KNOC has established and implemented the Strategy for social contribution activities to become a public energy company full of love and compassion. All Domestic offices are carrying out social contribution activities, supporting the energy underprivileged in connection with their own businesses, and establishing alliances with traditional markets to revitalize local businesses. Also, it conducts global social contribution activities that suit the characteristics of the countries in which it has operated.

Division	Programs	Main activities
KNOC's headquarters and all domestic offices (100% social contribution activities)	Support for the energy-underprivileged	• House repair and boiler replacement for low-income families in Ulsan • Free replacement of LED lights for low-income families and welfare institutions near local stockpiling offices
	Revitalization of local commercial districts	• Management & labor union shopping event at Taehwa Market in Ulsan • Regular purchase of food materials and souvenirs at Hakseong Market in Ulsan • Closing the cafeteria once a month to support local restaurants
Vietnam Block 11-2	Building a house of love for the underprivileged	• Improving the residential environment of underprivileged families in Ba Ria-Vung Tau area • Donation to a foundation supporting underprivileged families in HCMC and Cao Bang area
Vietnam Block 15-1	Support for the families of defoliant victims	• Donation to the families of defoliant victims in Vietnam
KNOC Caspian Branch	Training of local employees in Korea	• 40 Kazakhstan employees (KNOC Caspian Branch) visited Geoje stockpiling sites Office (22/09/2019 -03/10/2019)
Dana	Support for hospitalized children	• Donation to the Charlie House Charity
	Support for children, youth and vulnerable groups	• Donation to the Notrhsound Cash for Kids
	Education support	• Support for the community of college students majoring in oil engineering such as Technical University Delft
ANKOR	Support for nonprofit organizations	• Supporting the amount equal to the voluntary donation of employees • United Way of Southeast Louisiana • March of Dimes • Toys for Tots (Anonymous donation of Christmas gifts)
Harvest Energy	Support for Korean Orchestra	• Donation for performances of a Korean Orchestra



Happy Workplace for Employees

KNOC is making various efforts to assure work-life balance of employees. The company improved its recruitment system to enhance the fairness for candidates and to promote partnered growth with the socially vulnerable. It creates a cooperative relationship with its employees based on active communication, and realizes work-life balance by introducing a flexible work system that fits the life cycle of its employees.

Strategies	Major Achievements
Health, Safety and Welfare in the Workplace	• Fair recruitment satisfaction in 2019: 93.72 points • Advanced technical skill holders in 2019: 41% increased
Workplace with Work-Life Balance	• Transition to full-time position in 2019: 100% achieved (102 people) • Spaces for in-house daycare center: 30% increased



Social Values



UN SDGs

Goal 5

Achieve gender equality and empower all women and girls.

Goal 10

Reduce inequality within and among countries.

interview

KNOC sharing happiness and suffering

As oil resource development becomes increasingly important for national resource security, KNOC has grown in line with the changes in government policy. KNOC and labor union have worked together to resolve conflicts that arise in the process, stabilize management and create a healthy organizational culture.

Recently, KNOC has made positive changes for the happiness and well-being of its employees, such as introducing a flexible working system and a staggered commuting system. To respond to this, the labor union also carried out a regular commuting campaign to actively support the early settlement of a culture in which work and life are balanced.

KNOC is in a difficult situation due to the COVID-19 outbreak and other negative conditions. To overcome this, KNOC, the labor union, and employees should work together and prepare for the upcoming post-corona paradigm. I hope that KNOC will not only discuss internally but also actively communicate with the government and the public to lay a solid foundation for sustainable growth.



Kim Byung-soo, Chairman of KNOC Labor Union

Respect for Members

Fair recruitment and competency development

Improvement of selection system for fair recruitment

In order to meet the social demand for fair hiring, KNOC manages and supervises the entire recruitment system, from recruitment to sanctions against misconduct. For hiring professional career staff, it has raised the selection criteria and ratio of external judges over the government guidelines. Also, it has introduced a system to review application documents in the presence of an auditor and discloses the applicant's score and ranking upon announcement of successful applicants to guarantee the right to know of applicants and strengthen the fairness of recruitment. Offenders are subject to disciplinary action based on separate standards, and restricted from engaging in personnel and audit work for 3 years. As a result, satisfaction with the hiring process in 2019 was 93.72 points, 5.94 points up from the previous year, and the number of objections against recruitment dropped to one and the number of information disclosure requests to four.

Objections against recruitment



Recruitment information disclosure



Fair recruitment satisfaction in 2019

93.72 points

Socially equitable employment

KNOC is strengthening institutional support for the underprivileged, including high school graduates, local talents, and the disabled in the hiring process, thereby realizing a sustainable society without discrimination.

	High school graduates	Women	Disabled	Local talent
Results In 2019	· Increased recruitment rate for high school graduates, from 18% (2018) to 32% (2019)	· Entry-level female recruitment rate remained above 25% * Recruitment of career interrupted women in the first half of 2020	· Recruitment and training support for 16 people (including those with severe disabilities) in sports job positions · Selected as an organization that meets the mandatory employment rate for the disabled	· Recruitment of local talents exceeding the statutory number of recruitments (0 obligations / 3 recruitments) · Recruitment of non-metropolitan talent: 54.5%

* According to the Special Act on the Creation and Development of Innovation Cities, KNOC don't have to hire people from the area where it is moving, but it hired three people from Ulsan to achieve the goal of the local recruitment system.

Core training by employee competency

KNOC provides professional education programs based on the strategic direction of human resource development. In order to enhance technical/business competency, it has supported expert group studies and seminars, accounting training, and safety and firefighting certification courses, resulting in 41% increase in advanced technical skills. It has also been providing safety training and information security training, and achieved the highest grade in terms of personal information protection level and accident rate reduction evaluated by the Ministry of Public Administration and Security.

Advanced technical skills holders in 2019

increased by 41%

Expansion of educational opportunities for members

KNOC is strengthening its ability to secure future talents by providing education for employees on leave and ordinary students, as well as employees who are currently working. We provide all employees including those who are converted to full-time employees the opportunity to achieve degrees in areas relevant subject to their work and to be trained through collaboration.

Desirable communication culture

Increased communication with the CEO

Increasing numbers of companies are striving to create a healthy and flexible organizational culture through good communication between employees and management. In 2019, KNOC diversified its online and offline communication channels and prepared various opportunities for communication with the CEO, such as Pizza Time, Dinner Companion, and Open Get-Together. As a result, in 2019, communication between the CEO and employees increased by about five times compared to the previous year, and KNOC won the grand prize in the Korea's Most Trusted CEO (communication section).

CEO communication

increased by about 5 times

compared to the previous year (12 times → 59 times)

Untact Town Hall Meeting

KNOC holds the Untact Town Hall Meeting to transparently communicate management issues and directions to employees, and share common goals and visions. In 2019, communication activities centered on the CEO and employees were expanded to strengthen the solidarity between management and employees. In 2020, due to COVID-19, employees are freely inquiring and expressing their opinions to top management in real time through postings and comments on YouTube. These communication activities expanded to the department level, so the two-way communication between leaders and employees will continue without stopping.



Grand prize in the Korea's Most Trusted CEO (communication section)



The first public enterprise to pursue online internal communication through Youtube

Innovation in the way of doing business

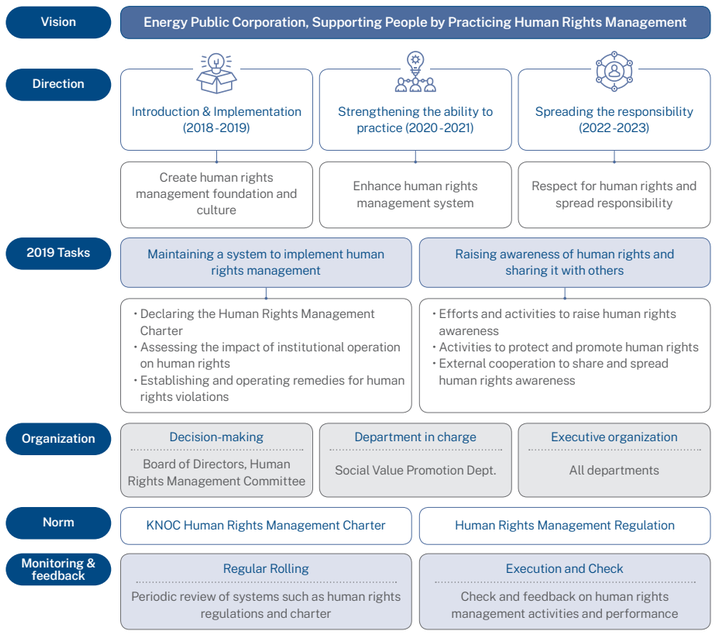
Rational decision-making and efficient work methods are the basis of productivity. KNOC established a paperless digital reporting system and developed a report data management system to innovate the work environment and improve efficiency. In 2019, it shortened the reporting time per case to 2.6 hours by enabling preliminary identification of report items and search and inquiry of related reports. In addition, KNOC encourages all employees to participate in innovation activities, such as holding a "one person one idea contest". In 2019, 1,027 ideas were collected from employees, of which 23 highly effective initiatives were selected, including "Cheer up, Ulsan!" and "Go together, Ulsan!" KNOC will continue to strive for a flexible organizational culture to lead to innovation in the working culture.

Due to the introduction of paperless reporting system

Reporting time decreased by 2.6 hours per report

Human Rights Management

Human Rights Management System



Proclamation of the human rights management charter

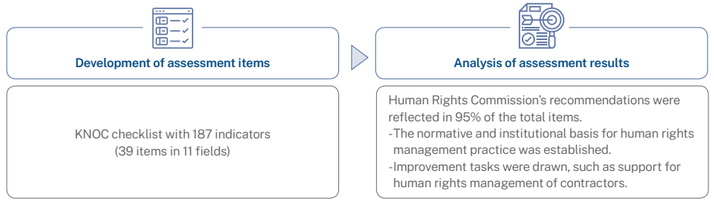
KNOC announced its will to practice human rights management by the declaring the Human Rights Management Charter in March 2019. As a public organization, KNOC is committed to fulfilling its social responsibilities and responding to social demands for human rights management. The charter contains the principle of respecting the human rights of internal and external stakeholders such as employees, contractors, and local residents, and promptly responding to human rights violations that have occurred in the course of business activities.



Declaration of the Human Rights Charter

Human rights impact assessment

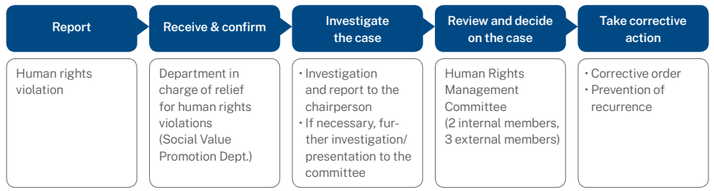
KNOC introduced a human rights impact assessment to identify actual and potential human rights risks that may arise from business activities. In 2019, The General Human rights impact assessment developed 187 indicators composed of 39 items in 11 fields reflecting social issues and derived improvement tasks to implement effective human rights management.



Procedure to remedy human rights violations

With the increasing social interest in workers' human rights, KNOC is operating a human rights violation relief procedure to respond to human rights violations. It also operates a sexual harassment and violence counseling center, a workplace harassment counseling center, and an online personnel counseling and grievance handling center to cope with various types of human rights violations. Besides, it guarantees the protection of reporter identity to prevent secondary damage that may occur during the investigation of human rights violations.

Establishment and operation of remedies for human rights infringement



Human rights education

KNOC conducts educational activities to raise awareness of human rights among employees. In 2019, it identified 10 issues for human rights management and selected 7 human rights education courses based on those, and provided a total of 18,325 hours of human rights education for employees. In addition, it runs a pop-up quiz program for human rights on the 22nd of every month (E-E day) to raise awareness and understanding of human rights among employees and to form a human rights-friendly organizational culture.

Human rights education

18,325 hours

Activities to protect and promote the human rights of stakeholders

KNOC is carrying out activities to protect and promote human rights with stakeholders including business partners, customers, and local communities. It improved the special conditions of the simple labor service contract to guarantee the labor's three primary rights, improved resting spaces and provided safety handbooks after holding special safety training sessions and meetings with the CEO for contractors, and conducted joint safety inspections with partners. In order to prevent leakage of customer personal information, it is operating a personal information management system. In addition, it has established a cooperative system with local communities, such as joint public-private drills and public presentations on VOCs* reduction facilities to ensure environmental rights and safety rights for local residents.

* VOCs(Volatile Organic Compounds): Oil vapor generated from gasoline storage tanks



Human Rights Awareness



CEO's safety training for contractors

Workplace with Work-Life Balance

Sound labor-management culture

Redefining the strategy for developing labor-management relations

To create a better working environment and organizational culture, it is necessary to actively collect the opinions of employees. In 2019, KNOC re-established its strategies for labor-management relations by reflecting the opinions of employees and changes in the labor-management environment. In order to improve the executive power of the Labor-Management Joint Committee, KNOC regularly checks the implementation of tasks and provides feedback on improvements. In addition, it has established a consultation system between labor and management based on mutual cooperation and participation to ensure practical operation and implementation.

Goal	Cooperative labor-management partnership to overcome management crisis and ensure sustainable growth			
Direction	Labor-management conflict management	Active communication	Labor management expertise	Organizational fairness
Tasks	・Expand and substantialize labor-management consultation channels ・Expand project monitoring system	・Activate direct and bottom-up communication ・Enhance the effectiveness of communication channels	・Strengthen labor-management relations management capabilities ・Strengthen support by utilizing external experts	・Continue to implement execution tasks ・Conclude legal and reasonable collective agreements on wages

Operating various labor-management councils and establishing customized consultation channels



Industrial Safety & Health Committee
1st (Aug. 2019), 2nd (Feb. 2020)

KNOC announced a declaration to build cooperative labor-management relations in 2018. In 2019, it made many improvements in terms of working hours, vacations, health and childcare, such as expanding the flexible working system, introducing a compensatory leave system and an annual leave promotion system, and increasing the number of places at in-house daycare centers by operating various labor-management councils. Besides, it launched an occupational safety and health committee to spread consensus on workplace safety among employees and improve working conditions through labor-management cooperation. KNOC will endeavor to build a two-way cooperative relationship in which labor and management can discuss and resolve issues together.

Forming and operating a joint labor-management TF to reduce working hours

With the legislation of 52-hour work week, there is a need for improvement of working types. In response, KNOC formed a joint labor-management TF team to improve the shift work system and introduce a flexible working hour system. In this way, labor and management were able to come up with effective systems by participating in the entire process.

TF composition	Workshop	Agreement	Education & Feedback
Labor-management joint TF and basic agreement	Labor-management joint workshop	Detailed agreement between labor and management	Training for business managers related to working hours reduction

Work-Life Balance

Flexible work system and vacation system

KNOC has introduced a flexible work system for the work-life balance of employees. In 2019, to reflect the CEO's will, the flexible work system was changed to 30-minute increments, creating a culture that respects individual lifestyles. In addition, it is building a family-friendly culture by introducing an annual leave savings system to encourage long-term vacations and supporting maternity leave and parental leave.

Flexible working system



Flexible working system
31 users increased

Expansion of in-house daycare center

To alleviate the burden of raising children for employees, KNOC is running a dolphin daycare center, an in-house daycare center. In 2019, it increased the number of places in its daycare center by 30% by reflecting the opinions of employees so that all waiting children over the age of one could be accommodated. As a result, KNOC is operating the largest in-house daycare center among public companies in Ulsan. The dolphin daycare center was awarded by the Minister of Health and Welfare for its high-quality childcare environment and curriculum, and selected as a model daycare center for the revised nuri curriculum certified by the government in 2020.



Opening ceremony of Dolphin Daycare Center



Inside of the Dolphin Daycare Center

Daycare capacity

increased by 30%
(125→163)

Operate a family-friendly EAP* program

A variety of stresses arising from interpersonal relationships, work, and family problems adversely affect the lives and work of employees. KNOC operates a family-friendly EAP program for the psychological health of employees, as well as an online stress test and professional counseling program. In 2019, the number of family-related consultations accounted for 65.1% of the total number of consultations, and 143 employees were tested for Mind Dagnosis, a type of stress test.

* EAP : Employee Assistance Program

Number of counseling



Number of counseling
increased by 39%

Appendix

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ESG Performance

Economic Performance

Financial Summary

Category		Unit	2017	2018	2019
Assets	Current assets	KRW million	1,620,761	1,525,244	1,713,354
	Non-current assets		17,890,939	16,713,757	16,948,448
	Total assets		19,511,700	18,239,001	18,661,802
Liabilities	Current liabilities		4,264,354	2,426,696	2,609,144
	Non-current liabilities		12,863,456	15,048,240	15,521,812
	Total liabilities		17,127,810	17,474,936	18,130,956
Equity	Capital		10,434,865	10,481,534	10,515,106
	Others		-8,952,680	-10,234,260	-10,533,206
	Controlling Interests		1,482,185	247,274	-18,100
	Non-controlling interests		901,705	516,791	548,946
	Total equity		2,383,890	764,065	530,846
Debt ratio		%	718.48	2,287.10	3,415.48

Comprehensive Income Summary

Category	Unit	2017	2018	2019
Revenue (Sales)	KRW million	2,312,486	3,149,265	2,929,993
Net sales		2,312,486	3,149,265	2,929,993
Cost of sales		1,850,290	2,171,933	2,052,413
Selling & administrative expenses		286,325	433,971	306,110
Operating profit		175,871	543,361	571,470
Other operating income		152,269	76,489	93,597
Other operating expenses		207,236	37,791	8,259
Other profit (loss)		-463,150	-849,323	-2,095
Financial income		304,558	231,241	402,068
Financial cost		713,173	783,491	731,433
Profits related to companies subject to equity method, etc.		-127,757	-112,547	53,712
Profit before income tax		-878,618	-932,061	379,060
Income tax expense (benefit)		-194,163	228,334	533,812
Net income		-736,792	-1,159,541	-154,752
Other comprehensive income		-381,771	-35,902	-108,923
Total comprehensive income		-1,118,563	-1,195,443	-263,675
Net income attributable to owners of the company		-851,372	-1,205,947	-173,257
Net income attributable to non-controlling interests		114,580	46,406	18,506
Return on sales	%	-31.86	-36.82	-5.28
Equity turnover		97.00	412.17	551.95

Economic Performance

General Information

Category			Unit	2017	2018	2019
E&P Business	Production		MMboe[1]	64	72	68
	Daily production		Mboed[2]	176	198	186
	Reserves secured		MMboe[1]	1,480	1,339	1,237
	Domestic gas field	Gas production	Mboe[3]	1,945	1,714	1,452
		Condensate production	Mbbl	175	147	119
Oil Stockpiling	Oil reserves leased	Crude oil	Mbbl	6,205	8,654	6,041
		Petroleum products	Mbbl	0	0	335
	International joint stockpiling attracted		MMbbl	24	19	11
	Stockpiling		MMbbl	95.7	96.0	96.5
	Stockpiling capacity (cumulative)		10 Mbbl	135.7	135.7	135.7
	Profit from international joint stockpiling		KRW 100 million	762	614	497
	Oil storage facilities leased		KRW 100 million	11	42	32
Sales by business[4]	E&P business		KRW million	2,004,759	2,924,848	2,662,816
	Stockpiling			300,129	220,050	260,441
	Other business			1,701	1,855	145
	Government subsidy and contracting			6,210	2,512	6,591
	Management support and others			722,272	406,770	774,449
Financial status	Stability	Current ratio	%	38.01	62.85	65.67
		Debt ratio		718.48	2287.10	3415.48
		Dependence on borrowings		68.82	75.57	76.40
		Interest coverage ratio	Time	43.86	127.54	120.41
	Profitability	Operating income to sales	%	7.61	17.25	19.5
		Net income to sales		-31.86	-36.82	-5.28
		Return on assets		-3.54	-6.14	-0.84
		Return on equity		-43.87	-139.46	-151.2
	Growth & Activity	Sales growth rate	%	-4.64	36.19	-6.96
		Operating profit growth rate		175.71	208.95	5.17
		Net income growth rate		34.15	-57.38	86.65
		Total asset growth rate		-11.58	-6.52	2.32
		Asset turnover	Time	0.11	0.17	0.16

1) MMboe : Million Barrels of Oil Equivalent 2) Mboed : Thousand Barrels of Oil Equivalent per Day 3) Mboe : Thousand Barrels of Oil Equivalent 4) Other business in sales by business include sales from discontinued operations, and management support and other sales are not included in the sales of the income statement because they are non-operating income.

Distribution of Economic Results

Category		Unit	2017	2018	2019
Government and public institutions	Tax	KRW million	64,250	71,740	79,094
Employees	Total salaries		103,892	106,668	116,414
Suppliers	Total purchases		173,391	128,721	146,102
Communities	Investment Cost		446	1,443	379

Economic Performance

Research & Development

Category		Unit	2017	2018	2019
Investment in R&D		KRW million	10,975	3,308	2,755
R&D expenses/sales		%	1.28	0.56	0.47
Number of R&D staff		Person	33	16	11
R&D achievements	Research tasks	Number	2	3	4
	Industrial property rights (patent)		0	0	0

Other Economic Performance

Category	Unit	2017	2018	2019
Countries entered	Number	17	17	16
Projects participated	Number	31	30	29
New blocks secured	Number	0	0	1

Remuneration for Directors and Auditors

Category		Unit	2017	2018	2019
Remuneration	Executive officers	KRW million	131	96	129
	Auditor general		104	108	144
	Executive directors		103	104	144
Average amount of remuneration per standing executive			108	140	141

Operation of the Board of Directors

Category	Unit	2017	2018	2019
Number of holding	Time	13	15	12
Number of resolutions	Number	32	25	31
Preliminary review rate	%	1	1	1
Number of reported agenda	Number	12	11	8
Number of amendments	Number	2	0	4
Directors' attendance rate	%	96	88	96
Non-executive directors' attendance rate	%	86	92	92
Number of management suggestions	Number	34	39	32

Performance of Committees under the Board of Directors

Category	Unit	2017	2018	2019
Number of audit committee held	Times	4	5	7
Number of executive recommendation committee held		6	9	2

Diversity of the Board of Directors

Category	Unit	2017	2018	2019
Female	Persons (%)	0(0)	0(0)	1[1](11)
Male		10(100)	9(100)	8(89)
Under 30		0(0)	0(0)	0(0)
30–50 years old		6(60)	4(44)	5(56)
Over 50		4(40)	5(56)	4(44)

1) Resigned as of May 4, 2020

Credit Rating

Agency		2017	2018	2019
Credit Rating	S&P	Aa2(Stable)	Aa2(Stable)	Aa2(Stable)
	Moody's	AA(Stable)	AA(Stable)	AA(Stable)

Environmental Performance

Domestic workplace

Energy Consumption [1)]

Category		Unit	2017	2018	2019
Consumption	Direct consumption	TJ	11	11	11
	Indirect consumption		130	145	140

1) Based on the public sector's GHG and energy target management system

GHG Emissions [1)]

Category		Unit	2017	2018	2019
Emissions	Direct GHG emissions(Scope 1)	tCO2eq	646	646	612
	Indirect GHG emissions(Scope 2)		6,716	7,066	6,789

1) Based on the public sector's GHG and energy target management system

Water Resource Consumption

Category	Unit	2017	2018	2019
Tap water	Ton	114,872	90,697	105,908
Industrial water		577,400	562,978	598,519
Underground water		12,142	19,743	16,479
Other water		98,271	126,437	104,748
Total water consumption		802,685	799,855	825,654
Water reuse	Ton	44,769	4,050	3,966

Wastewater Discharge [1)]

Category	Unit	2017	2018	2019
Discharge	Ton	1,302,404	1,365,998	1,446,571

1) Yeosu, Seosan, Geoje, Ulsan, and Guri offices with wastewater treatment facilities

Water Pollutant Management [1)]

Category		Unit	Regulation Standards	2017	2018	2019
BOD [2)]	Yeosu Office	ppm	10	2.79	2.91	1.42
	Seosan Office		10	2.65	0.63	1.33
	Geoje Office		30	0.75	1.8	2.39
	Ulsan Office		10	1.56	1.45	1.55
	Guri Office		10	1.10	0.90	0.57
COD [3)]	Yeosu Office	ppm	10	4.89	7.05	6.3
	Seosan Office		15	7.07	0	8.4
	Geoje Office		40	3.37	3.72	4.53
	Ulsan Office		23	2.67	3.13	1.98
	Guri Office		40	3.24	2.2	2.64
SS [4)]	Yeosu Office	ppm	10	1.28	2.01	1.42
	Seosan Office		10	1.08	0.9	3.2
	Geoje Office		30	0.68	1.43	1.62
	Ulsan Office		10	1.28	1.04	2.46
	Guri Office		10	1.1	0.6	0.84
N-H [5)]	Yeosu Office	ppm	1	0.16	0	0
	Seosan Office		1	0	0	0
	Geoje Office		1	0	0	0
	Ulsan Office		5	0	0	0
	Guri Office		1	0	0	0

1) Yeosu, Seosan, Geoje, and Ulsan Offices (marine facilities subject to the Marine Environment Management Act) are subject to the environmental impact assessment standards, and Guri Office is subject to the Water Environment Conservation Act. The results are average values. 2) BOD (Biochemical Oxygen Demand): The amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample. 3) COD (Chemical Oxygen Demand): Converted value of the amount of oxidizer($K_2Cr_2O_7$, $KMnO_4$) used to chemically oxidize organic in water, into oxygen. 4) SS (Suspended Solid): A substance whose particle diameter is less than 2mm that remains insoluble in water. This is used as an index to indicate the quality of contaminated water. 5) N-H: A substance, soluble in n-Hexane (normal hexane), is extracted with normal hexane, and the normal hexane is evaporated to measure the weight of the residue (e.g., hydrocarbons, hydrocarbon derivatives, oil and grease, and mineral oil that are relatively non-volatile in wastewater)

Environmental Performance

Domestic workplace

Sewage Management [1)]

Category		Unit	Regulation Standards	2017	2018	2019
BOD [2)]	Seosan Office	ppm	10	4.57	5.39	5.31
	Pyeongtaek Office		20	6.85	4.82	4.8
	Yongin Office		20	4.76	2.94	3.56
	Gokseong Office		20	4.93	6.46	4.32
SS [3)]	Seosan Office	ppm	10	1.38	1.99	2
	Pyeongtaek Office		20	6.13	4.91	4.33
	Yongin Office		20	3.63	2.48	2.06
	Gokseong Office		20	4.36	5.05	2.29

1) Seosan Office is subject to the environmental impact assessment standards, and Pyeongtaek, Yongin, Gokseong Offices are subject to the Sewage Act (living sewage). The results are average values. 2) BOD (Biochemical Oxygen Demand): The amount of dissolved oxygen needed by aerobic biological organisms to break down organic material present in a given water sample. 3) SS (Suspended Solid): A substance whose particle diameter is less than 2mm that remains insoluble in water. This is used as an index to indicate the quality of contaminated water.

Ocean Effluent [1)]

Category		Unit	Regulation Standards	2017	2018	2019
Oil in water	Ulsan Operations Office	ppm	15	0.28	1.09	0.8

1) Offshore platform, which is a marine facility subject to the Marine Environment Management Act, is subject to the environmental impact assessment standards (general wastewater), and the result is an average value.

Air Pollutant Management [1)]

Category		Unit	Regulation Standards	2017	2018	2019
$PM_{2.5}$	Ulsan Construction Sub-office	$\mu g/m^3$	35	22.15	18.55	15.70
PM_{10}		$\mu g/m^3$	100	47.70	38.90	28.60
NO_x [2)]		ppm	0.060	0.023	0.021	0.017

1) 24-hour average based on air quality standards of Ulsan. The results are average values. 2) NOx (Nitrogen Oxide): A compound of nitrogen and oxygen, including nitrous oxide, nitrogen dioxide, and nitrogen monoxide, can cause respiratory disorders, reacts with ultraviolet rays and soot to induce photochemical smog, and dissolves in moisture in the air to become acetic acid, resulting in acid rain.

Severe Hazardous Chemical Substance Spill [1)]

Category	Unit	2017	2018	2019
Number of spills	Number	0	0	0
Spilled quantity	Ton	0	0	0

1) Applicable only to Ulsan Operations Office

Waste Management [1)]

Category	Unit	2017	2018	2019
Designated waste	Ton	321.60	82.89	99.82
General waste		804.73	457.43	408.53
Construction waste		247.06	127.62	26.00
Total Wastes		1,373.39	667.94	534.35
Recycled wastes	Ton	353.14	198.63	170.45

1) Marine wastes included

Violation of Environmental Laws and Regulations

Category	Unit	2017	2018	2019
Fine	KRW	0	0	0
Number of litigations filed	Number	0	0	0
Number of non-monetary restrictions	Number	0	0	0

Environmental Expenditure and Investment

Category		Unit	2017	2018	2019
Eco-friendly purchase	Green Product	KRW million	410	1,115	1,517

Environmental Performance

Overseas workplace [1]

Environmental Management

Category		Unit	2017	2018	2019
Energy consumption	Direct consumption [2]	TJ	7,160	12,243	12,118
	Indirect consumption [3]		3,502	3,494	3,114
GHG emissions [4]	Direct emissions (Scope1)	tCO2eq	573,063	675,785	690,648
	Indirect emissions (Scope2)		166,647	171,180	116,542
Air pollutant emissions [5]	NMVOCs [6]	Ton	4,169	5,079	3,279
	SOx [7]		370	106	211
	NOx [8]		1,824	1,773	1,854
Oil spill	Number of spills	Number	11	4	0
	Spilled quantities	Ton [9]	58.37	0.04	0
Produced water [10]	Produced water throughput	Ton	31,800,516	25,716,799	22,540,093
	Produced water recycled [11]	Ton	15,269,191	14,917,661	15,943,138
Waste	Hazardous waste	Ton	15,325	40,302	51,043
	Non-hazardous waste		51,976	49,573	15,564
	Waste recycled		295	269	352
Violation of environmental laws and regulations	Fine [12]	USD	26,133	0	26,479
	Number of litigations filed	Number	0	0	0

1) ANKOR, Dana, Harvest Energy, KNOC Caspian Branch, and Vietnam 11-2 (only for projects with operatorship)
2) 1 Sm^3 = 40 MJ (For Energy-Gas, Sustainability reporting guidance for the oil and gas industry, IPIECA&API&IOGP)
3) 1 Mwh = 0.0096 TJ (Sustainability reporting guidance for the oil and gas industry, IPIECA&API&IOGP))
4) 2019 ANKOR Data not included
5) ANKOR only reports data for 3 years according to GOADS (Gulf-wide Offshore Activities Data System). Its data is not included due to postponement of 2019 report.
6) NMVOC (Non Methane Volatile organic compounds) : All hydrocarbon volatile organic compounds except methane
7) SOx (Sulfur Oxides): A compound of sulfur (S) and oxygen, including sulfur dioxide, sulfuric acid, and sulphate such as copper sulfate. It is a major air pollutant that causes acid rain.
8) NOx (Nitrogen Oxides): A compound of nitrogen and oxygen, including nitrous oxide, nitrogen dioxide, and nitrogen monoixide, can cause respiratory disorders, reacts with ultraviolet rays and soot to induce photochemical smog, and dissolves in moisture in the air to become acetic acid, resulting in acid rain.
9) 1 bbl = 0.134 ton (Sustainability reporting guidance for the oil and gas industry, IPIECA&API&IOGP)
10) Produced Water: By-products or wastes produced on the surface along with crude oil and gas from oil and gas wells, also known as formation water or brine, or saltwater. It refers to water that exists as connate water or bottom water in the reservoir, or that was injected into the reservoir during a waterflood.
11) Applicable to Dana and Harvest Energy
12) Fines for violations of environmental regulations, such as oil-base mud leakage and air pollutants emission

Society

Domestic Employment

Category			Unit	2017	2018	2019
Number of employees	Social minority	Female	Person	220	256	256
		Disabled [2]		22	64	52
		National veterans [3]		80	79	80
	Age [1]	20s	Person	102	127	116
		30s		448	448	403
		40s		433	415	460
		50s or over		350	401	393
	Position/ Employment type [1]	Executives Male	Person	3	4	4
		Executives Female		0	0	0
		Level 1-3		237	229	224
		Level 4		406	417	424
		Level 5		538	505	466
		Level 6 or less		89	132	138
		Wage peak system		18	35	38
		Special position (service)		34	68	62
		Special position (professional, general contract)		8	1	16
	Recruitment [4]		Person	1	39	21
	Retirement [5]		Person	33	44	54
	Average years of service		Person	13	15	15
Employees of overseas subsidiary [6]			Person	1,798	1,809	1,725
Labor union	Number of union members		Person	1,078	1,132	1,094
	Union membership rate		%	100	100	100
	New recruitment for full-time position	Female	Person	0	10	3
		Disabled		0	2	0
		Local talent		0	20	11
		High school graduate		0	7	7
	Out of total	Number of women in the rank of team leader or higher	Person	5	9	11
		All current employees [1]		1,333	1,391	1,372

1) Including the wage peak system, excluding employees other than the number of seats (Leaves for parenting and military service for more than 6 months)
2) One severely disabled person is counted as two in accordance with the Employment Promotion and Vocational Rehabilitation for Disabled Person Act.
3) Based on the survey on the status of persons subject to employment protection (as of March every year)
4) Full-time employees (level 1-8), excluding those who have converted to full-time positions
5) Non-executive directors and interns excluded
6) Overseas workforce status is based on subsidiaries (Dana, Harvest Energy, KNOC Eagleford, ANKOR, KNOC Kazakhstan B.V. (Altius, KNOC Caspian), KNOC Trading Singapore Pted Ltd, Vietnam 11-2)

Society

Employee Training and Welfare

Category			Unit	2017	2018	2019
Training (HR development)	Total number of trainees		Person	14,733	10,585	15,333
	Total training budget		KRW million	1,258	1,235	1,239
	Training expenses per person		KRW 10,000	98	89	91
	Training hours per person		Hour	101	97	89
	Satisfaction with training		Point	93	92	84
Use of flexible working system	Staggered commuting system		Person	293	312	308
			Use rate (%)	22.0	22.4	22.2
	Working hours selection system		Person	222	264	297
			Use rate (%)	16.6	20.0	21.4
	Flexible working hours		Person	0	0	5
			Use rate (%)	0	0	0.4
	Time selection system		Person	14	15	12
			Use rate (%)	1.0	1.1	0.9
Satisfaction with welfare benefits			Point	70	79	80
Maternity and parental leave system	Employees whose parental leave has ended	Male	Person	10	13	22
		Female		5	19	36
	Those who remain employed for at least 6 months after the end of male/female parental leave		Person	15	32	56
	Return rate from parental leave[1]		%	100	100	96.60
	Maternity leave users	Male	Person	28	23	25
		Female		43	31	38
		Total		71	54	63
	Number (rate) of people returning to work after using maternity leave[2]	Male	Person (%)	28(100)	23(100)	25(100)
		Female		43(100)	31(100)	38(100)
		Total		71(100)	54(100)	63(100)

1) Return rate (Ministry of Gender Equality and Family): 100 x Male and female employees who remained employed for more than 6 months after the end of parental leave / Male and female employees whose parental leave has ended
2) Anyone who converts his or her maternity leave to parental leave is considered to have returned to work.

Shared Growth

Category	Unit	2017	2018	2019
Number of Economical Gas Stations	Number	1,174	1,175	1,194
Purchase from SME (Small & Medium-sized Enterprises)	KRW million	62,723	60,062	71,840
Share of SME products in total purchase	%	36.17	46.66	49.17
Purchases from women's companies	KRW million	7,350	4,112	6,379
Purchase from companies employing people with disabilities	KRW million	1,169	618	817
Purchase from social enterprises	KRW million	202	271	788
Purchase rate of technology development products	KRW million	970	447	1,287
Rural community win-win fund[1]	KRW million	-	118	92
Number of violations of fair trade	Number	0	0	0
Fines imposed	KRW million	0	0	0

1) Contribution to the rural community win-win fund started in 2018 with the signing of an MOU with the Korea Foundation for Cooperation of Large & Small Business and Rural Affairs so there was no fund contribution in 2017.

Society

Integrity Evaluation by the Anti-Corruption & Civil Rights Commission

Category		Unit	2017	2018	2019
Evaluation of overall integrity		Ratings	3	3	3
	External integrity		2	2	3
	Internal integrity		3	3	3
	Policy customers		5	5	4
Corruption prevention measures			3	2	3

Education on Ethics and Human Rights

Category	Unit	2017	2018	2019
Number of employees who completed ethics education (completion rate)	Person(%)	1,239(95.8)	1,257(92.6)	1,288(95.9)
Total hours of ethics education	Hour	10,873	10,877	13,995
Ethical management education hours per person		9	9	11
Number of employees who completed human rights education (completion rate)[1]	Person(%)	-(-)	-(-)	1,200(89.4)
Total hours of human rights education[1]	Hour	-	-	18,325
Human rights management education hours per person[1]				15

1) Introduced in the second half of 2018, and thus there is no record of performance in 2017 and 2018

Violation of Information Security Rules

Category	Unit	2017	2018	2019
Number of customer data leakage, theft, and loss	Number	0	0	0

Industrial Accidents at Domestic Workplaces

Category	Unit	2017	2018	2019
Number of industrial accidents[1]	Number	1	5	2
Industrial accident rate[2]	%	0.44	1.13	0.40
Number of fatalities[2]	Person	2	0	0
Number of injuries[2]		3	3	2

1) Based on the approval date for industrial accidents by Korea Occupational Safety and Health Agency 2) Based on the standards for reporting industrial accident of ordered construction by Ministry of Employment and Labor

HSE Performance at Overseas Workplaces[1]

Category	Unit	2017	2018	2019
Hours worked[2]	Hour	8,506,671	10,236,966	8,695,381
LTI[3]	Case	0	5	3
LTIF[4]	-	0.00	0.49	0.35
Fatal accidents	Case	0	0	2

1) ANKOR, Dana, Harvest Energy, KNOC Caspian Branch, and Vietnam 11-2 (only for projects with operatorship)
2) Hours worked : the sum of the actual hours worked of KNOC and contractors
3) LTI (Lost Time Injury) : the sum of fatalities and incident cases resulting in at least one day off work
4) LTIF (Lost Time Injury Frequency) : Work related the number of lost time injuries incidents per 1 million hours worked ((LTI x 1 million hours)/hours worked)

Violation of Anti-Corruption Rules

Category	Unit	2017	2018	2019
Number of anti-corruption violation cases	Number (Person)	0(0)	0(0)	0(0)

Customer Satisfaction

Category		Unit	2017	2018	2019
Customer satisfaction for public institutions		Point	86.1	81.3	82.7
Inspection of public institution's management disclosure		-	No penalty	No penalty	No penalty
Number of oil information service members	Annual users of Opinet	Person	110,208,000	119,353,968	124,042,991
	Annual users of Petronet		806,692	826,314	765,227

Social Contribution Activities

Category		Unit	2017	2018	2019
Social contribution investment		KRW million	446	1,443	379
Employee participation in social contribution	Hours spent in social contribution	Hour	36,079	34,235	43,111
	Number of employees who participated in social contribution (cumulative)	Person	1,062	1,059	1,221
	Average volunteer hours per employee	Hour	34	32	35
	Employee donation	KRW million	74	76	97
Support for school development fund, etc.			10	12	4

GRI Standards Content Index

Universal Standards

GRI 102: General Disclosure

Topic	Disclosure		Report Page	Verification	ISO 26000	UN SDGs
Organizational Profile	102-1	Name of the organization	4p	●	6.3.10/ 6.4.1-6.4.2/ 6.4.3/6.4.4/ 6.4.5/6.8.5 /7.8	
	102-2	Activities	4p	●		
	102-2	Brands, products, and services	4p	●		
	102-3	Location of headquarters	4p	●		
	102-4	Location of operations	4-5p	●		
	102-5	Ownership and legal form	4p	●		
	102-6	Markets served	4-5p	●		
	102-7	Scale of the organization	4p	●		
	102-8	Information on employees and other workers	77p	●		
	102-9	Description of the organization's supply chain	50-55p	●		
	102-10	Significant changes to the organization and its supply chain	50-55, 77p	●		
	102-11	Precautionary Principle or approach	49p	●		
	102-12	List of other initiatives that the organization subscribes to and supports	57, 86p	●		
	102-13	Membership of associations	27, 86p	●		
Strategy	102-14	Statement from senior decision-maker	2-3p	●	4.7/6.2/7.4.2	
Ethics and integrity	102-16	Values, principles, standards, and norms of behavior	18-19p	●	4.4/6.6.3	
Governance	102-18	Governance structure	14-15p	●	6. 2/7.4.3/ 7.7.5	
	102-19	Committee responsible for making decisions on economic, environmental and social topics	14-15p	●		
Stakeholder Engagement	102-40	List of stakeholder groups	20p	●	5.3	
	102-41	Collective bargaining agreements	77p	●		
	102-42	Identifying and selecting stakeholders	20p	●		
	102-43	Approach to stakeholder engagement	20p	●		
	102-44	Key topics and concerns raised	21p	●		
Reporting practice	102-45	Entities included in the consolidated financial statements	4, 71-72p	●	5.2/7.3.2/ 7.3.3/7.3.4	
	102-45	Whether the report does not include what is included in the organization's consolidated financial statements or equivalent	71-72p	●		
	102-46	Defining report content and topic Boundaries	20-21p	●		
	102-46	Details on report content and topic boundaries	20-21p	●		
	102-47	List of material topics	21p	●		
	102-48	Any restatements of information provided in previous reports, and the reasons for such restatements.	-	●		
	102-49	Significant changes from previous reporting periods in the list of material topics and topic Boundaries.	20-21p	●		
	102-50	Reporting period for information provided.	1p	●	7.5.3/7.6.2	
	102-51	Date of most recent previous report	1p	●		
	102-52	Reporting cycle	1p	●		
	102-53	Contact point for questions regarding the report	1p	●		
	102-54	Claims of reporting in accordance with GRI standards	80-83p	●		
	102-55	GRI content index	80-83p	●		
	102-55	GRI Index for Disclosure	80-83p	●		
	102-56	Description of external verification and its execution	84-85p	●		

Topic-specific Standards

Topic	Disclosure		Report Page	Verification	ISO 26000	UN SDGs
Topic 1: Stable Production and Supply of Oil						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 32-33p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	34-37p	●	6.8.1-6.8.2/ 6.8.3/6.8.7/ 6.8.9	
Topic 2: Customer-Oriented Service						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	18-19, 21p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 205: Anti-corruption 2016	205-2	Communication and training about anti-corruption policies and procedures	18-19p	●	6.6.1-6.6.2/ 6.6.3	
Topic 3: Financial Soundness based on Management Efficiency						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 32-33p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 201: Economic Performance 2016	201-1	Direct economic value generated and distributed	35p	●	6.8.1-6.8.2/ 6.8.3/6.8.7/ 6.8.9	
Topic 4: Future Growth Engines from New Energy Business						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 26-27p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
-	-	Investment in new and renewable energy technology development	28-29p	●		
Topic 5: Contribution to the Development of Local Communities						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 56-57p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 413: Local Communities 2016	413-1	Percentage of operations with implemented local community engagement, impact assessments, and/or development programs	61p	●		
Topic 6: Risk management for Oil Development Business						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
-	-	Financial and non-financial risk management	16-17p	●		

Topic-specific Standards

Topic	Disclosure		Report Page	Verification	ISO 26000	UN SDGs
Topic 7: Risk Management for Business Partners' Sustainability						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 50-51p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 414: Supplier Social Assessment 2016	414-2	Suppliers identified as having significant actual and potential negative social impacts	44, 54p	●		13
Topic 8: Fair Trade Culture						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 50-51p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 419: Socioeconomic Compliance 2016	419-1	Non-compliance with laws and regulations in the social and economic area	55, 78-79p	●		16
Topic 9: Protection of the Rights of Indigenous People near the Workplace						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 411: Rights of Indigenous Peoples 2016	411-1	Total number of incidents of violations involving rights of indigenous people and actions taken	45p	●		
Topic 10: Privacy and Information Security						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 418: Customer Privacy 2016	418-1	Substantiated complaints regarding breaches of customer privacy and losses of customer data	46p	●		
Topic 11: Job Creation and Employment						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 56-57p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 401: Employment 2016	401-1	Number and percentage of new hires and turnovers	58, 77p	●		8
Topic 12: Win-Win Culture for Shared Growth						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 50-51p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
-	-	Support for partners	53-54p	●		9
Topic 13: Advanced Safety and Health Management System						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 42-43p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 403 Occupational Health and Safety 2016	403-2	Types of injury, injury rate, occupational disease rate, lost day rate, absentee rate, and work-related fatalities	44, 79p	●	6.4.6/6.8.8	3

Topic-specific Standards

Topic	Disclosure		Report Page	Verification	ISO 26000	UN SDGs
Topic 14: Compliance with Environmental Laws and Policies						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 42-43p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 307: Environmental Compliance 2016	307-1	Non-compliance with environmental laws and regulations	75-76p	●		13, 15
Topic 15: Prevention of Soil and Marine Pollution due to Oil Spill						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 42-43p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 306: Effluents and Waste 2016	306-3	Total number and total volume of recorded significant spills	75-76p	●		14
Topic 16: Site Safety and Disaster Response						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 42-43p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 403: Occupational Health and Safety 2016	403-2	Types of injury, injury rate, occupational disease rate, lost day rate, absentee rate, and work-related fatalities	44, 79p	●	6.4.6/6.8.8	3
Topic 17: Energy Saving and GHG Emission Reduction						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 42-43p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 305: Emissions 2016	305-1	Direct GHG emissions (Scope 1)	74p	●	6.5.5	13
	305-2	Energy indirect GHG emissions (Scope2)	74p	●		
Topic 18: Employee Training and Capability Improvement						
GRI 103: Management Approach 2016	103-1	Explanation of the material topic and its boundary	21, 62-63p	●		
	103-2	Management approach and its components		●		
	103-3	Evaluation of the management approach		●		
GRI 404: Training and Education 2016	404-1	Average hours of training per year per employee	78p	●	6.4.7	4
	404-2	Programs for upgrading employee skills and transition assistance programs	64, 78p	●	6.4.7/6.8.5	
	404-3	Percentage of employees receiving regular performance and career development reviews	64, 78p	●		

Third-Party Verification Statement

LR Independent Assurance Statement

Relating to KNOC's Sustainability Report for the 2019 calendar year

This Assurance Statement has been prepared for Korea National Oil Corporation in accordance with our contract but is intended for the readers of this Report.

Terms of engagement

Lloyd's Register Quality Assurance Limited (LR) was commissioned by Korea National Oil Corporation (KNOC) to provide independent assurance on its 'KNOC Sustainability Report 2020' ("the report") against the assurance criteria below to a "moderate level of materiality" using "accountability's AA1000AS (2008)" where the scope was a Type 2 engagement.

Our assurance engagement covered KNOC's operations and activities in Korea and specifically the following requirements:

- Evaluating adherence to AA1000 Accountability Principles of Inclusivity, Materiality and Responsiveness
- Confirming that the Report is in accordance with:
  -GRI Standards : Core option
- Evaluating the accuracy and reliability of data and information for only the selected indicators listed below:
  -GRI 200 (Economic): GRI 201-1, GRI 205-2
  -GRI 300 (Environmental): GRI 305-1, GRI 305-2, GRI 306-3, GRI 307-1
  -GRI 400 (Social): GRI 401-1, GRI 403-2, GRI 404-1, GRI 404-2, GRI 404-3, GRI 411-1, GRI 413-1, GRI 414-2, GRI 418-1, GRI 419-1

Our assurance engagement excluded the data and information of KNOC's suppliers, contractors and any third-parties mentioned in the report.

LR's responsibility is only to KNOC. LR disclaims any liability or responsibility to others as explained in the end footnote. KNOC's responsibility is for collecting, aggregating, analyzing and presenting all the data and information within the report and for maintaining effective internal controls over the systems from which the report is derived. Ultimately, the report has been approved by, and remains the responsibility of KNOC.

LR's Opinion

Based on LR's approach nothing has come to our attention that would cause us to believe that KNOC has not, in all material respects:

- Met the requirements above
- Disclosed accurate and reliable performance data and information as all errors or omissions identified during the assurance engagement were corrected
- Covered all the issues that are important to the stakeholders and readers of this report.

The opinion expressed is formed on the basis of a moderate level of assurance and at the materiality of the professional judgment of the verifier.

Note: The extent of evidence-gathering for a moderate assurance engagement is less than for a high assurance engagement. Moderate assurance engagements focus on aggregated data rather than physically checking source data at sites. Consequently, the level of assurance obtained in a moderate assurance engagement is substantially lower than the assurance that would have been obtained had a high assurance engagement been performed.

LR's approach

LR's assurance engagements are carried out in accordance with our verification procedure. The following tasks though were undertaken as part of the evidence gathering process for this assurance engagement:

- Assessing KNOC's approach to stakeholder engagement to confirm that issues raised by stakeholders were captured correctly. We did this through reviewing documents and associated records.
- Reviewing KNOC's process for identifying and determining material issues to confirm that the right issues were included in their Report. We did this by benchmarking reports written by KNOC and its peers to ensure that sector specific issues were included for comparability. We also tested the filters used in determining material issues to evaluate whether KNOC makes informed business decisions that may create opportunities that contribute towards sustainable development.
- Auditing KNOC's data management systems to confirm that there were no significant errors, omissions or mis-statements in the report. We did this by reviewing the effectiveness of data handling procedures, instructions and systems, including those for internal verification. We also spoke with those key people responsible for compiling the data and drafting the report.
- Reviewing supporting evidence made available by their Social Value Promotion Department at the 305 Jongga-ro, Jung-gu, Ulsan Metropolitan City in Republic of Korea
- Checking that the GRI Content Index allows stakeholders to access sustainability indicators.

Observations

Further observations and findings, made during the assurance engagement, are:

- Stakeholder inclusivity: We are not aware of any key stakeholder groups that have been excluded from KNOC's stakeholder engagement process.
- Materiality: We are not aware of any material issues concerning KNOC's sustainability performance that have been excluded from the report. It should be noted that KNOC has established extensive criteria for determining which issue/aspect is material and that these criteria are not biased to the company's management.
- Responsiveness: KNOC reported not only the interested issues from its stakeholders but also by reported the related UN Sustainable Development Goals. Also, KNOC has the response system to correspond with queries of its stakeholders. It is to consider to improve responsiveness by following the biennial issuance plan since the reporting cycle has not been constant.
- Reliability: KNOC has reliable data management systems for the indicators related to this assurance scope in the Report.

LR's standards, competence and independence

LR implements and maintains a comprehensive management system that meets accreditation requirements for ISO 14065 Greenhouse gases–Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition and ISO/IEC 17021 Conformity assessment – Requirements for bodies providing audit and certification of management systems that are at least as demanding as the requirements of the International Standard on Quality Control 1 and comply with the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants.

LR ensures the selection of appropriately qualified individuals based on their qualifications, training and experience. The outcome of all verification and certification assessments is then internally reviewed by senior management to ensure that the approach applied is rigorous and transparent.

This verification engagement is the only work undertaken by LR for KNOC and as such does not compromise our independence or impartiality.

Dated: 7th September 2020

Hee-Jeong Yim
LR Lead Verifier
On behalf of Lloyd's Register Quality Assurance Limited
17th Floor, Sinsong Building, 67 Yeouinaru-ro, Yeongdeungpo-gu, Seoul, Korea

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Awards

Date	Awards	Organizers
Dec. 2017	Award in recognition of excellent resource management in preparation for emergency	Ministry of Public Administration and Security
Feb. 2018	Grand Prize for Happiness Plus Social Contribution	Korea Institute of Sustainability Management Evaluation
Jan. 2018	Plaque of appreciation for social contribution activities	53rd Army Division
Nov. 2018	Grand Prize in the Korea Volunteering Grand Award	UN Volunteers Korea
Nov. 2018	Oil & Gas Authority's Maximizing Economic Recovery UK Award	OGA/OGUK
Dec. 2018	Commendation for merit in joint training in response to complex disasters	Yongin Fire Station
Mar. 2019	Award in recognition of one company-one river conservation movement and environmental conservation activities	Ulju County
Sep. 2019	Grand Prize in the 2019 Job creation Exemplary Management Prize of Korea	Dong-A Daily News
Sep. 2019	Grand Prize in the 2019 Korea's Most Trusted CEO Award (Communication Management Section)	Dong-A Daily News
Oct. 2019	Commendation for civil, public, military, and police cooperation to improve facility protection capability	Commander of the 55th Infantry Division
Oct. 2019	Achievement award for contribution to spreading sharing culture	Ulsan City
Nov. 2019	Plaque of appreciation at the 39th National Paralympic Games	Ulsan Sports Association for the Disabled
Dec. 2019	Commendation from the Prime Minister for the readiness in response to emergency	Ministry of Public Administration and Security
Feb. 2020	Commendation from the Minister of Defense for contributing to integrated defense	Ministry of Trade, Industry and Energy
Mar. 2020	Commendation for the 64th anniversary of the opening of the stock market	Korea Exchange
Mar. 2020	Commendation for merit in integrated defense operations	Gyeonggi-do

Memberships

* As of June 30, 2020

Associations & Organizations		
UNGC (UN Global Compact)	Korea New & Renewable Energy Association	Onsan Industrial Complex Mass Dangerous Goods Safety Management Council
WEC Korea Committee	Korean Society of Mineral and Energy Resources Engineers	Onsan Industrial Complex Safety Management Council
WPC Korea Committee	Korea Electric Engineers Association	Ulsan Public Institution Audit Council
Public Institution Audit Council	Korean Society of Earth and Exploration Geophysicists	Ulsan Major Public Institutions Council
Korea Industrial Safety Association	Korean Society of Soil & Groundwater Environment	Ulsan Innovation City Development Committee
Korean Dietetic Association	Korean Association of Occupational Health Nurses	Ulsan Energy Forum
Korean Society of Earth and Exploration Geophysicists	Korea Wind Energy Industry Association	Ulsan Regional Innovation Council
Geological Society of Korea	Korean Association for Public Administration	Taean Maritime Security Council
Emergency Planning Council (Ministry of Trade, Industry and Energy)	Energy & Mineral Resources Development Association of Korea	Citizens Loving Pyeongtaek and Dangjin Ports
Energy Future Forum	Korea Environmental Preservation Association	Oil and Gas UK(OGUK)
Institute of Internal Auditors Korea	Gangwon Regional Process Safety Council	East of England Energy Group (EEEGR)
Korea Customs Logistics Association	Southern Gyeonggi Process Safety Council	Netherlands Oil & Gas Exploration & Production Association
Korea Industrial Technology Association	Seosan Development Council	
Korea Fire Safety Institute	Seosan Residents Autonomous Environment Monitoring Council	