

CLEAN & SMART ENERGY LEADER

2018 Sustainability Report



KOEEN
KOREA ENERGY

The image features a central white circle containing the KOEEN logo and the text 'KOREA ENERGY'. This circle is surrounded by a collage of energy-related images, including wind turbines, solar panels, a dam, a hand holding a globe with a plant, and a modern building. The collage is set against a background of overlapping teal and green geometric shapes.

About this report

The sustainability report of Korea South-East Power (KOEN) embodies its determination to contribute to national development and citizens' welfare by taking the lead in achieving sustainable future growth as an eco-friendly energy leader that shapes the future through technology. This report was issued to transparently disclose to all stakeholders information regarding KOEN's economic, social, and environmental efforts towards sustainability and the results, as well as to share about the major changes and future direction of management based on its new strategies and vision.

Reporting Principles

The seventh sustainability report of KOEN has been prepared in accordance with the Core option requirement of the Global Reporting Initiative (GRI) standards, an international guideline on sustainable management reporting, and includes additional indicators as part of the 'Electric Utilities Sector Disclosures.' This report contains four core aspects of sustainable management based on issues derived through an internal and external environmental analysis and stakeholder engagement. The reasons for the selection of these core aspects, their correspondence with issues, major policies, activities, and performances are explained through the Management Approach.

Reporting Period

KOEN publishes a sustainability report each year. This report covers KOEN's performance and activities from January 2017 through December 2017.

This report also includes data on significant issues that surfaced as recent as June 2018. It also provides data from three to four most recent years to facilitate analysis of the overall trend.

Reporting Scope and Boundary

This report applies to the headquarters and six business sites, including the Samcheonpo Power Division, Yeongheung Power Division, Bundang Power Division, Yeongdong Eco Power Division, and Yeosu Power Division. The financial information has been prepared in accordance with the accounting office rules for public and semipublic corporations on a consolidated basis of the Korean International Financial Reporting Standards (K-IFRS). Other information, such as energy consumption and greenhouse gas emissions, are presented based on a non-consolidated basis of KOEN. Some performance data and information that have remained the same since the previous report were stated again to aid understanding. Some data was revised and is indicated separately on the corresponding page.

External Assurance

This report has been assured by an independent assurance service provider, to ensure the propriety and integrity of the reporting processes as well as the accuracy and credibility of its contents. The Independent Assurance Statement can be found in the Management Switch section.

Contact Information

This report is available on the homepage (www.koenergy.kr). If you have any inquiry about this report, please contact us.

Headquarters 32, Sadeul-ro 123 beon-gil, Jinju-si, Gyeongsangnam-do, Korea

Department PR Office, Corporate Planning Department

Tel 070-8898-1138

E-mail showboyi@koenergy.kr

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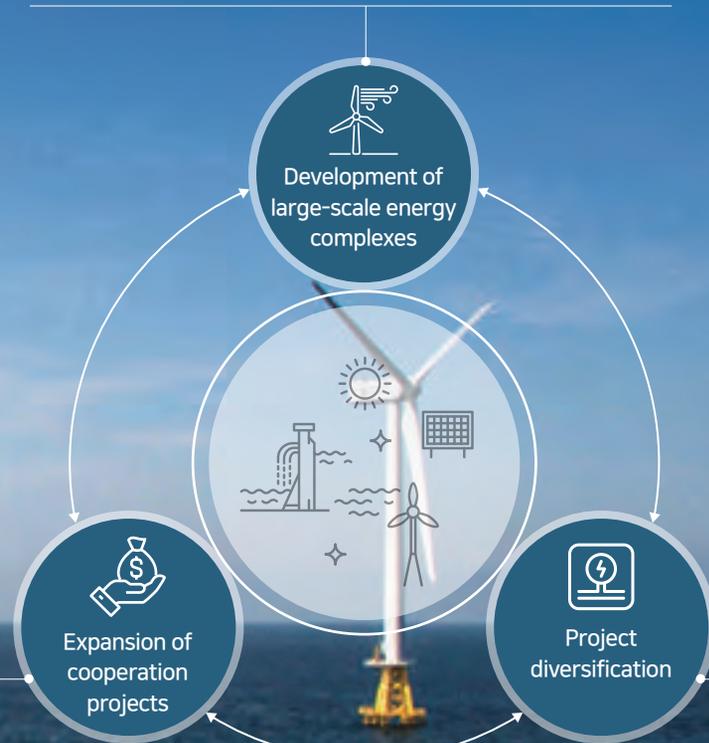
Highlights

KOEN takes the lead in shifting the paradigm towards eco-friendly energy by developing large-scale energy complexes and continues to discover various business models for sustainable growth and strengthened competitiveness of power generation projects.



Developed large-scale energy complexes in Haenam (self-developed, 400MW) and Shinan (jointly-developed, 1GW)

- Acquired large-scale unused land in Haenam that was damaged by saltwater and was selected as a representative project under government policy
- Concluded a joint development agreement of each project and installed wind monitoring system (Shinan)



Pursued floating solar power projects and established Korea's first agriculture-based solar power test site

- Carried out floating solar power projects in Gunsan (basins in industrial complexes) and Goheung Lake (freshwater lakes owned by the Korea Rural Community Foundation, KRC)
- Established Korea's first electric power system that was linked to agriculture-based solar power test site with a capacity of 100kW

Diversified project portfolios through overseas expansion and new project development

- Concluded O&M agreement with Indonesia's Amurang, a fluidized bed coal power plant
- Concluded the first government guaranteed long-term purchase contract (PPA) with Nepal's publicly owned hydropower company to develop a large energy complex



OVERVIEW

ENVIRONMENTAL SWITCH
SOCIAL SWITCH
MANAGEMENT SWITCH

OVERVIEW

Highlights

KOEN is advancing social values such as job creation and leading efforts for shared growth between small and large companies by enhancing its management system





CEO Message



Dear Stakeholders,

Korea South-East Power (KOEN) is committed to achieving sustainable growth and creating social values as a public energy corporation leading the electric power industry of Korea. In 2018, we published our 7th sustainability report to introduce our efforts in the past year.

As a 'Clean & Smart Energy Leader', KOEN operates the Yeongheung Power Division with Korea's largest power generation facility and 4 other power stations including the Samcheonpo Power Division, Bundang Power Division, Yeongdong Eco Power Division, and Yeosu Power Division. We are also expanding the eco-friendly power generation by engaging in renewable energy projects focused on solar energy and offshore wind power.

KOEN provides more than 13% of the nation's total electricity supply by operating facilities with a combined capacity of 10,344MW, develops multiple options to secure energy, and composes sensible portfolios of energy sources, contributing to a stable power supply.



KOEN strives to pursue sustainable management with a vision of becoming a 'Clean & Smart Energy Leader'. We ask for your support and encouragement in our journey of innovation after innovation as a leading renewable energy company.



President & CEO of KOEN
Hyang-reol Lyu

We will continue to challenge ourselves to become a leader in renewable energy.

The previous paradigm of Korean power generation industry which was centered on nuclear and coal power has faced dramatic shifts along with the government's renewable energy 3020 policy and environmentally friendly energy policies. In order to preemptively respond to the restructuring of the industry and policy changes, KOEN has set the goal to achieve 25% share of renewable energy in total power generation by 2030 and improved the portfolios of each energy source. In particular, Jeju Tamra Offshore Wind Power, which was completed at the end of 2017, is a large-scale project with the capacity of 30MW and is expected to be a renewable energy generation model in Korea. Also, we will make further efforts to expand innovative renewable energy projects starting with an agriculture-based solar power test site with a capacity of 100KW in Goseong, South Gyeongsang Province, which was installed two years ago.

We will continue to pursue green management in order to respond to the new climate regime.

In order to achieve the 2030 pledge of 37% below BAU under the Paris Agreement which went into effect with the participation of 197 countries across the globe, the power generation industry must reduce greenhouse gas (GHG) emissions by 19.9%. To this end, KOEN continues to make efforts to introduce advanced technologies to reduce GHG emissions and change coal byproducts into raw materials. Meantime, we have set mid- to long-term roadmaps to reduce fine dust and expanded the investment in technology development for environmental facilities to respond to various social issues.

We will realize the win-win management to create social values.

KOEN will take the lead in creating social values to fulfill its social responsibility as a public agency. We expect that about 5,000 new jobs will be created through new renewable energy projects, massive investment, and other cooperation projects with private companies in 2017. In addition, about 4,000 jobs in the private sector will be made with our efforts to support our business partners and vulnerable groups. Likewise, we will support the growth of the national economy and seek business opportunities to create jobs, and share the profits for mutual growth with local communities. Also, we will practice the win-win management by focusing on activities to create core social values such as identifying potential joint projects to establish an ecosystem for development and support for regional infrastructure, etc.

Dear stakeholders,

KOEN will preemptively respond to the changing domestic and foreign management environment and devote itself to sustainable growth to promote the values of various shareholders by implementing its 'Vision 2030.' The 2,300 staff members at KOEN will ceaselessly pursue innovation to become a clean public company that is trusted by the citizens. We appreciate your continued support, encouragement and hope to be with us in the future.

Thank you.

Company Profile

As a leading energy company holding power generation facilities with the largest unit capacity in Korea, KOEN has served as a solid basis for ensuring an environment where all citizens live happy. We are making efforts to become a company that leads sustainable growth in the future based on its vision of the 'Clean & Smart Energy Leader.' We will work hard to be a leading public energy corporation in Korea by contributing to the sound growth of national industry to improve the welfare of citizens.

Key Achievements

Based on consolidated financial statements as of December, 2017

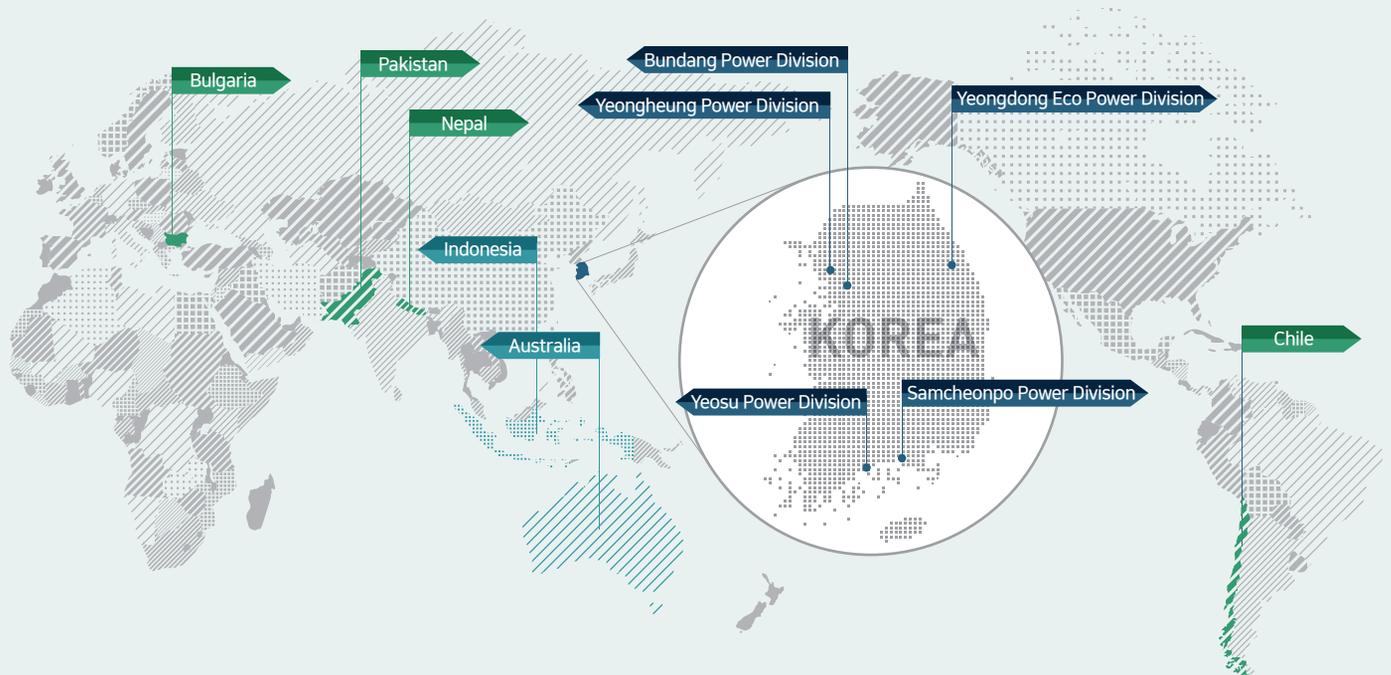


KRW **297.62** billion
Capital



KRW **5,399.93** billion
Sales

Main Business Activities



- Overseas power generation business
- Overseas resource development



KRW **10,344** MW
 Facility capacity \uparrow



66,709 GWh
 Power trading \uparrow



2,398 persons
 Number of employees \uparrow

Domestic Business

KOEN has five business sites – the Samcheonpo Power Division, Yeongheung Power Division, Bundang Power Division, Yeongdong Eco Power Division, and Yeosu Power Division – and each division operates its own power generation facilities. We are stably supplying 12.8% of the electricity transaction volume in Korea. All of the electricity generated from each division is traded to KEPCO through the Power Exchange.

Domestic market share based on power trading

- KOEN
- Korea Southern Power
- Korea East-West Power
- Korea Western Power
- Korea Midland Power
- Korea Hydro & Nuclear Power
- Others



Facility Status

Plant	Fuel	Facility capacity (MW)
Samcheonpo Power Division	Bituminous coal	3,240
Yeongheung Power Division		5,080
Yeosu Power Division		668.6
Yeongdong Eco Power Division	Anthracite coal and bituminous coal	200*
Bundang Power Division	LNG	922.1
Renewable energy	-	233.7
Total		10,344.4

*Youngdong Thermal Power Unit 2. Youngdong Thermal Power Unit 1 is fueled by wood pellets to generate renewable energy

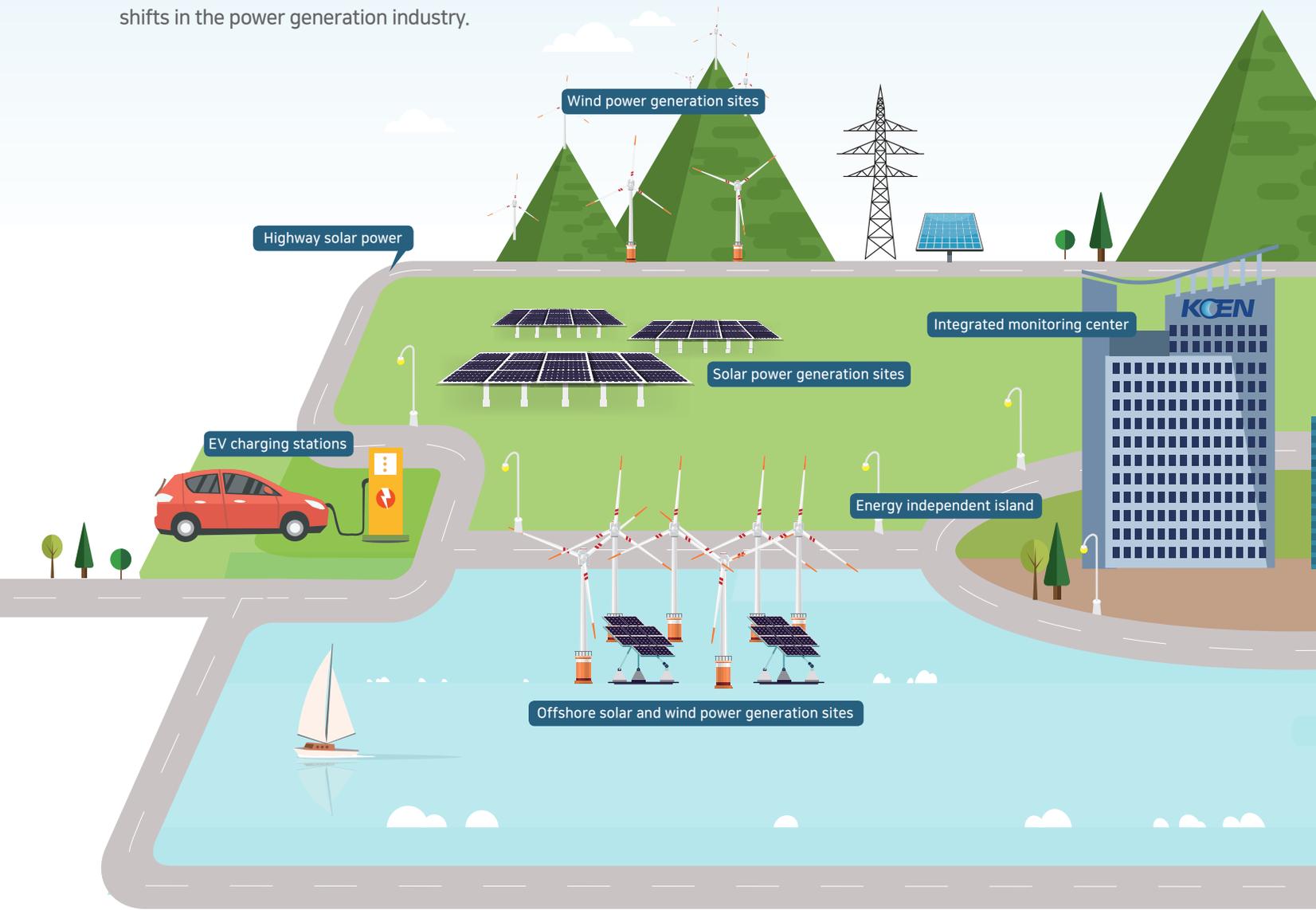
Overseas Business

KOEN has been diversifying its revenue structure through systematic overseas business, including overseas power plant construction and the operation business as well as performance recovery business, based on its construction and operation technologies. We have participated in overseas resource development for a stable fuel supply.



Business Value Chain

KOEN strives to enhance eco-friendliness and economic efficiency of power generation in order to contribute to the development of the national economy as well as the welfare of citizens. We intend to become a Clean Energy Leader by diversifying our overseas business while actively engaging in renewable energy projects along with the rapid paradigm shifts in the power generation industry.



Plan for power generation sources

- Set energy plans that are based on the government's national electricity procurement plan (8th)
- Establish a plan to increase the percentage taken up by renewable energy facilities to 25% in line with the government's mid-to long-term strategy of 'Vision 2030'

Construction of power generation facilities

- Conduct prior and follow-up environmental impact assessments on power plant construction areas
- Collect the opinions of stakeholders in construction sites and improve conditions of nearby areas



Procurement of fuels

- Promote eco-friendliness and economic efficiency through the procurement of eco-friendly and highly efficient fuel
- Ensure the stability in fuel procurement through over seas resource development

Power generation

- Expand the development of renewable energy (offshore wind power, solar power, floating solar power, etc.)
- Invest in and transform the existing power generation facilities into highly efficient power plants
- Promote technical cooperation and investment based on overseas renewable energy projects
- Expand the business of processing and other services relating to power generation byproducts

Power transmission/distribution

- Power sales (Power Exchange)
- Power transmission/distribution (KEPCO)

Business Sites

KOEN is making efforts to minimize environmental impact by promoting transformation of existing power generation facilities into those with high-efficiency and adopting eco-friendly technologies. It is also expanding eco-friendly development by engaging in various renewable energy projects such as solar, hydro, and wind power generation.



Site 2,210,000m² | Capacity 3,240MW

Pursuing the prosperity of human beings and nature — Samcheonpo Power Division

The Samcheonpo Power Division is the first large 500MW-class coal-fired thermal power plant in Korea. This large-scale facility has a total capacity of 3,240MW and is located in the southern part of Korea. It is engaging in the focused development of eco-friendly combustion technology that uses low-calorie coal for environmental preservation and low-cost power generation. Cutting-edge environmental facilities were installed and are operating, including desulfurization and denitrification facilities. It operates a refinery for the productive recycling of coal ash that is generated in the electricity production process. Active efforts are being made to develop renewable energy, such as the installment and operation of the first photovoltaic power plant in Korea. KOEN received the Environmental Management Award in recognition of these efforts, and is taking the lead in realizing eco-friendly management that strikes a balance between humankind and nature. The Division also became the first in the world to develop a 4,740kW small hydro power that utilizes cooling water, and is making other efforts to develop clean energy, thus taking the lead in implementing the government's low-carbon green growth policy.



World-class, state-of-the art, eco-friendly power plant — Yeongheung Power Division

As Korea's first 800MW-class large coal-fired thermal power plant, the Yeongheung Power Division is performing a pivotal role in the stable supply of electricity in the metropolitan area, which accounts for about 25%. It is equipped with highly efficient, cutting-edge eco-friendly facilities. It is growing into a mecca of the renewable energy business by building a 2MWp-class solar power plant, 12.6MW-class small hydro power plant, and 46MW-class wind farm in Korea. The Energy Park is an experiential information hall on electric energy that was opened in 2007. It is providing science education to the youth, providing a space for cultural activities for local residents, and is developing into a tourist attraction in the metropolitan area.



Site 5,958,153m² | Capacity 5,080MW



Clean power plant that resembles an urban park — Bundang Power Division

The Bundang Power Division supplies both electricity and steam for heating in the metropolitan area by adopting combined-cycle thermal power generation. It has minimized the discharge of pollutants by using LNG, which is a clean fuel. It is creating a power plant that is reminiscent of a pleasant park in the city by improving environmental protection facilities and preventing noise. It became the first in Korea to install a 300KW-class fuel cell in 2006 and additionally installed 3MW in 2013, which is under commercial operation. It also adopted 50KW solar power generators as part of its efforts to expedite the renewable energy business. Based on fundamentals and principles, communication and consideration for others, and the management policy of value creation, the Bundang Power Division is striving to create a better society in which all citizens can enjoy happy lives.



Site 215,016m² | Capacity 922.1MW



Focusing on the sustainable development of the local community and environment — Yeongdong Eco Power Division

The Yeongdong Eco Power Division has led the economic growth of Gangwon Province and produced electricity stably for over 40 years since the construction of unit 1 and 2 was completed in 1972 and 1979, respectively. All fuel supply facilities began using the coal burning method in 2010 in order to reduce generation costs. In 2017, it implemented the wood pellet fuel conversion project in unit 1 in order to respond to reduced efficiency of ageing facilities and curb the amount of air pollutants by using eco-friendly fuels. The division is leading the eco-friendly energy industry by constantly improving environmental facilities such as electric precipitators, silos, and others to realize complete combustion of massive wood pellets.

Site 1,359,018m² | Capacity 325MW



Enhancing the competitiveness of the industrial complex in Korea — Yeosu Power Division

Originally constructed as a heavy oil plant in 1977, the Yeosu Power Division has transformed into a circulating fluidized bed power plant using multiple types of fuels at reasonable prices in order to respond to the changing environment surrounding the energy industry and to operate its facilities more efficiently. The facilities of unit 2 (300MW heavy oil plant) were replaced with a circulating fluidized bed boiler (328.6MW) in September, 2011. The reconstruction of Unit 1 was completed in August, 2016, and equipped with a capacity of 340MW for stable electricity supply to the Yeosu National Industrial Complex and nearby areas. In particular, the division is leading the green management activities including reduction of GHG and development of renewable energy with eco-friendly co-firing of fuels. The Yeosu Power Division received the Prime Minister's Award at the Green Management Awards in 2016, the Presidential Award as the leading company in resource recycling in 2013, and the 22nd Safety Management Award by strengthening distinctive safety management in 2014. Also, the division is an eco-friendly and safe power plant of which excellence in safety management was officially recognized with the acquisition of KOSHA/OHSAS 18001 certificates.



Site 309,173.5m² | Capacity 668.6MW



External Environment Analysis

KOEN aims to achieve sustainable growth by presenting a challenging but feasible blueprint for the future named the 'Vision 2030.' We conducted an analysis on the surrounding environments such as policy and energy industry to develop the vision 2030. We are planning to fulfill our responsibilities as a public company and secure mid-to long-term business competitiveness based on this. We also recognize changing trends to respond to the upcoming 4th industrial revolution and identify the meaning and impact of social and technological changes on enterprises.

Policy Environment

The government encourages to reduce coal-fired power generation and expand renewable energy projects including solar and wind power generation in order to respond to the new climate regime. Hence, transforming the structure of the electricity industry to ensure eco-friendliness and stability and establishing power source portfolios has become more important than ever. Meanwhile, the government is emphasizing the social value creation in developing its policies with mutual growth, job creation, and development of the local community and others. There is a growing demand from the public for better treatment of irregular workers and improvement of the working environment, corporate ethics and human rights management as well.

<p>Changes in the government's energy-related policies</p>	<ul style="list-style-type: none"> · The current national basic plans for energy Energy master plan, national electricity procurement plan, basic plan for renewable energy · Focuses on new energy industries such as LNG and renewable energy, etc.
<p>Changes in fine dust and climate change related policies</p>	<ul style="list-style-type: none"> · Impact of government policy on fine dust reduction Special measures for fine dust, combined energy taxation, etc. · Global agreement on taking actions for climate change The Paris agreement and key agendas of the new climate regime
<p>Creating social value policies</p>	<ul style="list-style-type: none"> · Emphasis on job creation Job creation, equal opportunity, social integration, safety and environment, win-win cooperation and regional development, ethical management, etc.

Policy Environment
KO

Mega
4th industrial revolution and

Megatrends

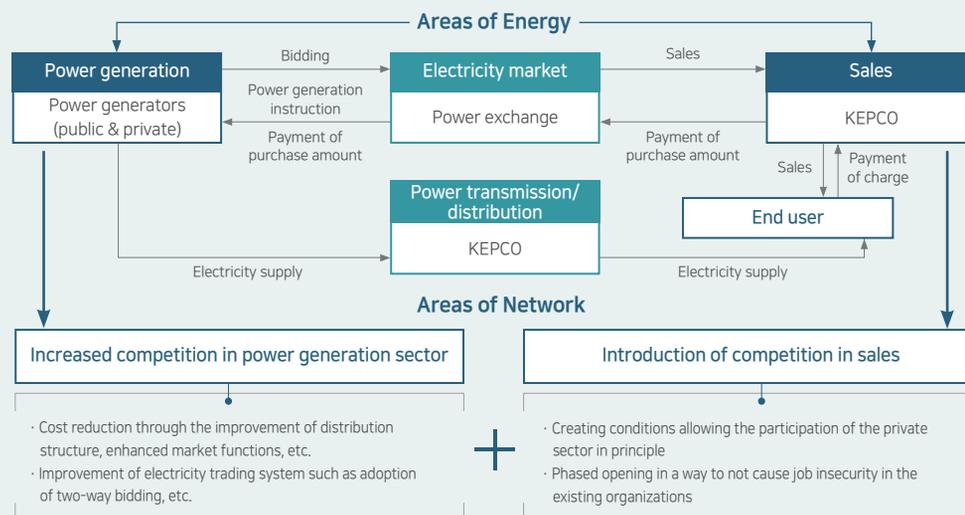
It is expected that the 4th industrial revolution will bring various changes in society, economy, and technology and areas related to smart energy management based on smart city, big data, and IoT will lead the energy industry

<p>Smart City</p>	<p>Virtual power plant</p>
<p>The electricity and gas infrastructure are connected via interactive digital communications in a city or an area to enable efficient energy management</p>	<p>A system that integrates various distributed energy sources in small capacities with digital technologies that operate and control them as a power plant</p>



Industrial Environment

With regard to the domestic electricity market structure, increasing competition in the power generation sector and introduction of price bidding are discussed as material issues. Thus, it is expected that competition in the power generation sector will be increased due to the improvement of the power trading system such as the introduction of price bidding, adjustment of coordination tariff and others as well as the adoption of the competition system through direct LNG application and increasing number of power plants. The introduction of the competition system in sales will expand the roles of power generation companies as suppliers, indicating different types of competition with private enterprises that can generate and sell power.



1) Two-way bidding refers to a method of real-time REC transaction for corresponding orders as multiple sellers and buyers participate, as in the case of the stock market

trends

Industry 4.0

Therefore, it is time to respond to the paradigm shift in the energy sector to realize the smart city vision and pay attention to destructive technological innovation and the Internet of Energy (IoE).

Optimization of energy systems

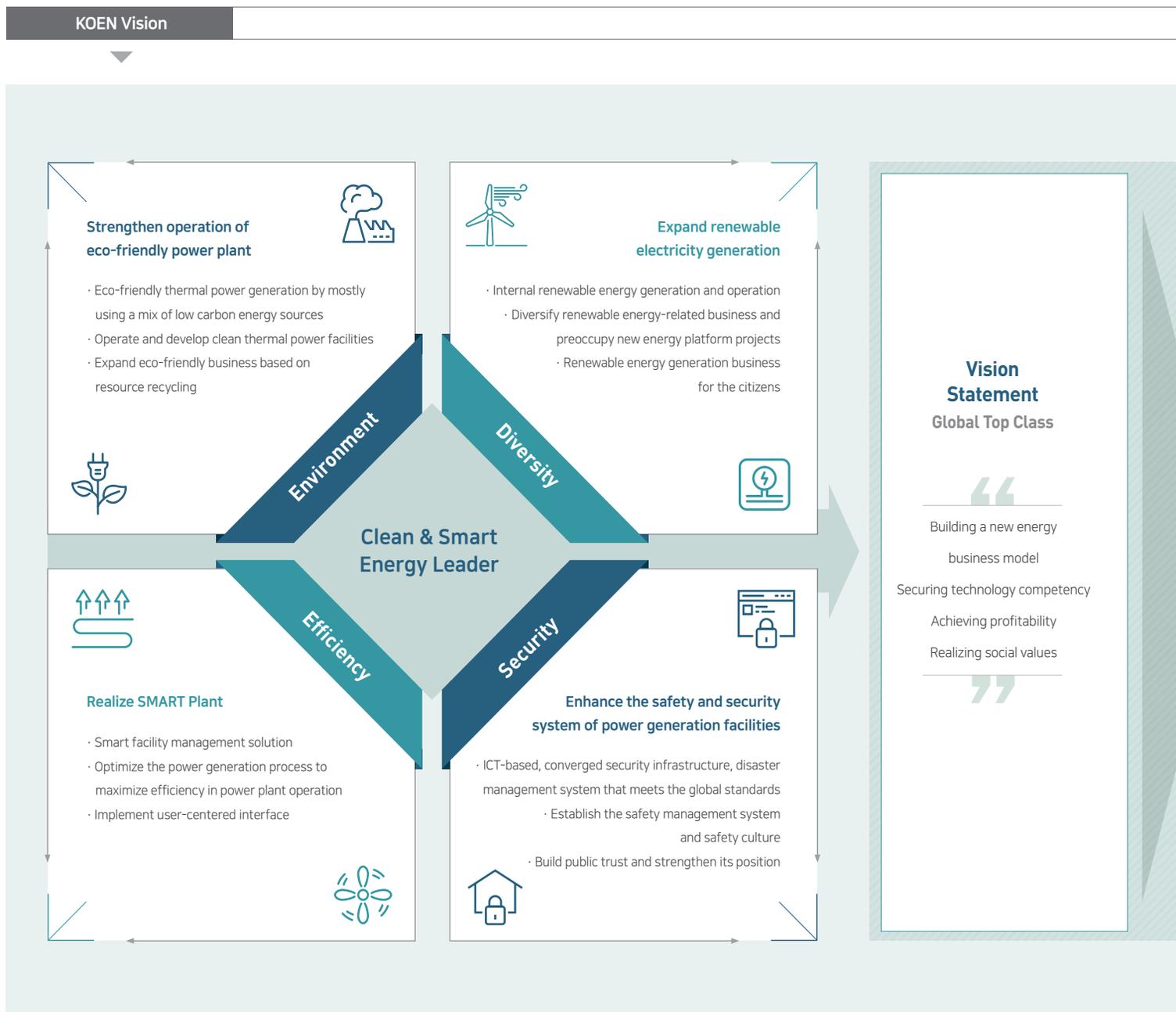
A system that optimizes each stage of energy value chains (power generation-system operation-sales) by utilizing IoT, AI, and other digital technologies

Blockchain-based energy platform

A model that provides the energy prosumer-consumer-supplier network through a blockchain-based platform in which smart contract is available and creates profits with distributed supply of renewable energy

Vision 2030

KOEN has reestablished the directions for growth and business goals via the 'Vision 2030' and responded to the changing environment preemptively. We have reset our power generation target in line with the renewable energy 2020 goal and other detailed environmental and energy policies of the government and engaged in overseas business and activities to replace the existing bituminous coal-based power plants. Also, we have improved our management structure by strengthening the objectives in social value to reflect values of various stakeholders.



2030 Managerial objectives for mid-to long-term

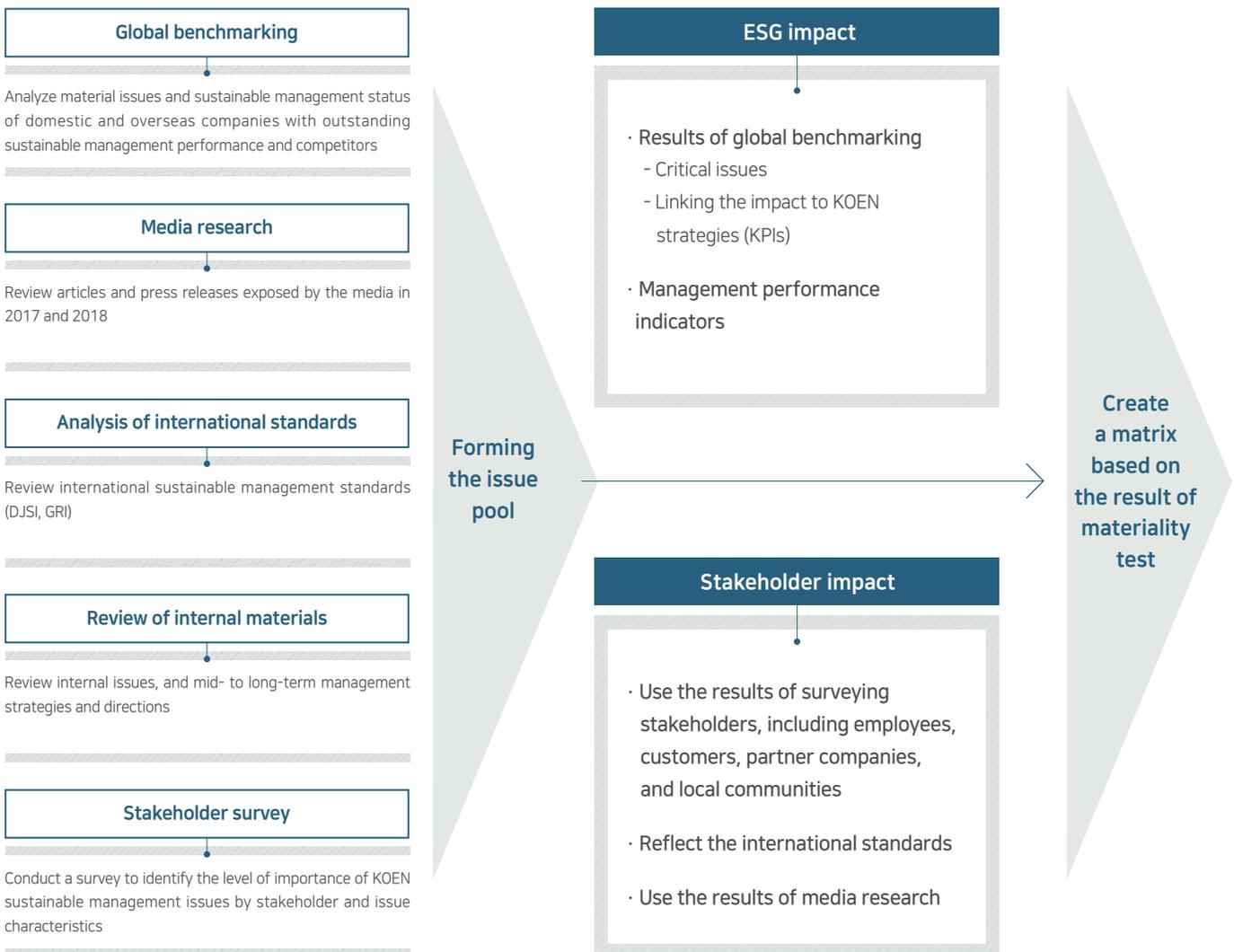
Strategic Directions	Economic Value	Social Value
1 Lead the renewable energy business in the future	Facility installment <ul style="list-style-type: none"> · Install renewable power generation facilities · Expand renewable energy-related business · Secure the competencies in carrying out new energy projects 	Creating synergies of cooperation <ul style="list-style-type: none"> · Build a business model through private-public-government cooperation · Become a leader in the infrastructure of energy industry
2 Strengthen the competitiveness of eco-friendly power generation business	Business diversification <ul style="list-style-type: none"> · Diversify thermal power generation business · Advance SMART power generation operation and related technological competencies · Expand overseas power generation business 	Improving eco-friendliness <ul style="list-style-type: none"> · Enhance the eco-friendliness of thermal power generation · Create an ecosystem in the power generation industry for mutual growth
3 Improve the management system centering on social value creation	Strengthening competencies <ul style="list-style-type: none"> · Establish a sustainable management system · Foster future-oriented/converged technology and core talents · Innovate corporate culture that is linked to core values 	Sustainability enhancement <ul style="list-style-type: none"> · Create more decent jobs · Fulfill the social responsibility as a public agency · Maintain the safety and security system for the public

Materiality Test

KOEN has conducted the materiality test based on the definitions of materiality from the guidelines of GRI Standards and the methodology of the Five Part Materiality Test in AccountAbility AA100SES to identify key issues related to its sustainable management. In 2017, we strengthened our assessment further by including the newly established 'Vision 2030' strategy and surveys of internal and external stakeholders.

Forming the issue pool and performing the materiality test

A total 22 issues were identified through benchmarking of global energy companies, analysis of international standards, review of internal materials, media research, as well as stakeholder survey. We performed a materiality test based on the 22 issues by analyzing their impact on KOEN in terms of environmental, social, and corporate governance (ESG) and stakeholders.



Create a matrix based on the result of materiality test and select material issues

A total of 10 material issues were identified from the materiality test and reported in conjunction with the Vision 2030. The mid-to long-term and potential issues are also included and we are continuously making efforts to enhance our sustainability.

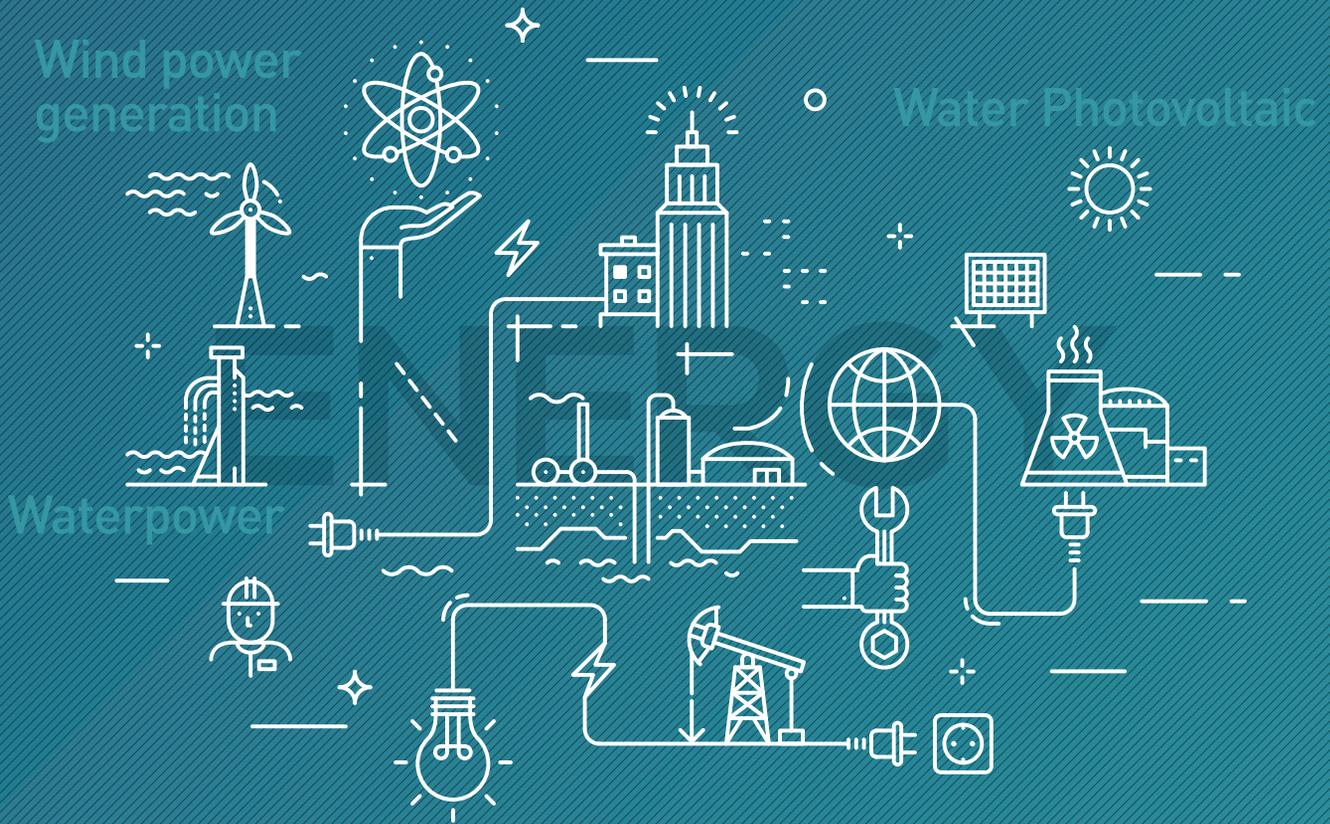


Material Topics	Material issues	Impact of issues		
		Cost	Benefit	Risk
Leading renewable energy business in the future	Respond to climate changes and eco-friendly policies		●	
	Invest in R&D and develop eco-friendly technologies		●	
Strengthening competitiveness of eco-friendly power generation business	Use resources efficiently and minimize environmental impact	●		
	Strengthen the efficiency in operating power generation facilities and stabilize electricity supply			●
	Promote the win-win growth		●	
Nurturing core value-based talents and innovating corporate culture	Respect for human rights and promote the welfare of employees			●
	Foster talents specializing in the power generation industry		●	
Fulfilling social responsibility of a public agency	Practice ethical management and secure fair trade			●
	Engage in social contribution activities			●
Maintaining safety and security system for the public	Operate a global safety management system			●



Sustainable Switch





Leading renewable energy business in the future 22

Strengthening Competitiveness of
Eco-friendly Power Generation Business 30

Leading Renewable Energy Business in the Future



Material Topic

The energy paradigm shifts rapidly centering on a renewable energy. As for the power generation business which is greatly affected by the government policy and industrial structure, it is critical to comprehensively respond to eco-friendly policies such as climate change and others. To this end, it is necessary to make efforts to gradually increase the share of renewable energy in power generation and diversify portfolios of each power plant. Also, companies need to increase the efficiency of eco-friendly electricity generation to secure future growth engines by expanding investment in R&D and developing eco-friendly technologies.

Material issues

- Respond to climate changes and eco-friendly policies
- Invest in R&D and develop eco-friendly technologies

Our Goal

Share of renewable energy in the total power generation by 2030

25%

Our Roadmap

- Achieve over 25% share of renewable energy in the total power generation by 2030
 - Build and operate massive offshore wind power systems with GW capacities (in Wando, South Jeolla Province, Shinan, etc.)
- Secure the competitiveness by identifying new business opportunities based on differentiated development strategies
 - Build and operate a large-scale renewable energy complex such as large-scale renewable energy complex, on-land and floating solar power sites, and others (Haenam Renewable Energy Complex, Gunsan Floating Solar Power, etc.)

Implementation Directions



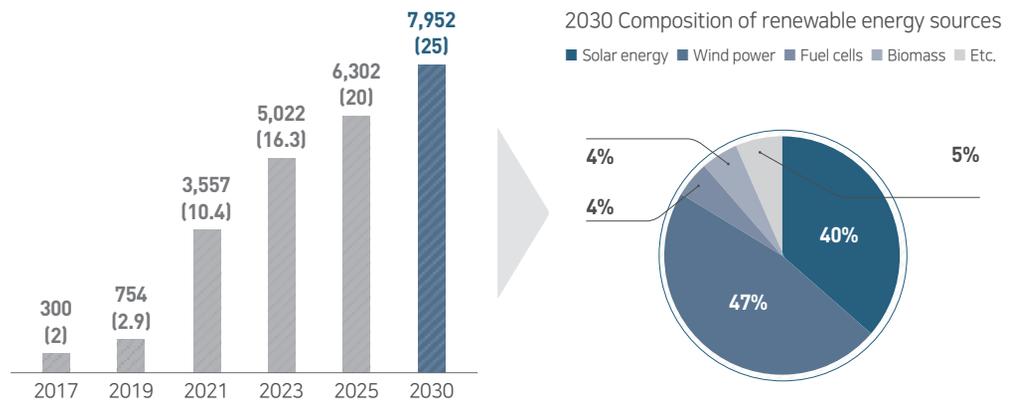
Expanding Renewable Energy Supply

Increase the share of renewable energy in power generation by 2030

KOEN will increase the percentage of the power generation capacity that comes from renewable energy to 25% of our total power generation by 2030 by further enhancing its portfolios of each energy source in conjunction with the government policy as well as KOEN managerial strategies. By doing so, we are solidifying the basis for continued growth while strengthening our competencies that allow us to promptly respond to paradigm shifts in the electricity industry centering on rapidly changing renewable energy.

Plan to expand the facility capacity¹⁾ of renewable energy

[Unit: MW (percentage to the total power generation, %)]



1) Facility capacity: Includes fuel production, own business, equity investment, REC purchase (equivalent), etc.

Etc.: Waste-to-energy, small hydro, ESS, tidal stream, etc.

Pioneering new markets to secure future growth engines

KOEN plans to lead new markets by expanding the areas of business centering on internal and SPC investment projects in the renewable energy sector and discovering a new business model in areas of solar and wind power in particular.

In the short term, KOEN is implementing large capacity energy source projects including on-land and floating solar power, fuel cells, bio energy sources in order to complete the RPS obligation stably and create a basis for large-scale projects by 2022. In the mid-to long-term, we are planning to engage in a 3GW offshore wind power project that is eco-friendly and coexistent with nature and create a renewable energy complex to create substantial results in offshore wind power projects and further expand renewable energy complexes by 2030.

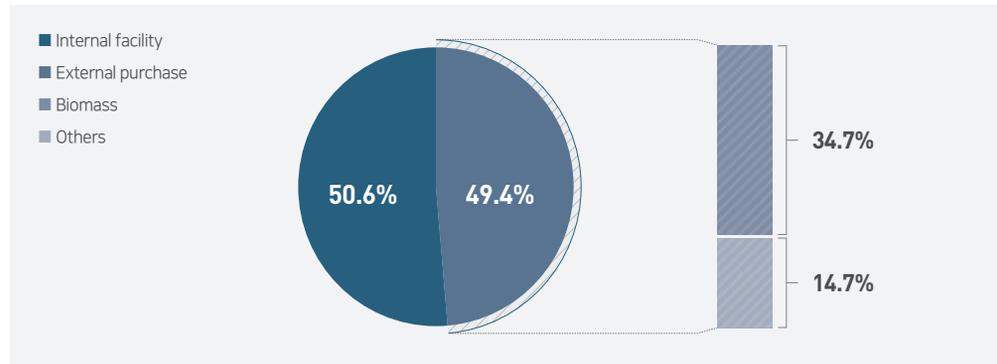
Roadmap for the development of renewable energy project

Directions	Expand strategic areas of business by pioneering and preoccupying new markets for renewable energy (discover new business model for clean energy such as solar and wind power and lead the new markets)	
Strategies	Short-term (by 2022)	Mid-to long-term (2023~2030)
Core implementation projects	<ul style="list-style-type: none"> Create a basis for stable implementation of RPS Create a basis for implementing large-scale projects 	<ul style="list-style-type: none"> Create substantial results in offshore wind power Expand the construction of renewable energy complex
	<ul style="list-style-type: none"> Promote the project development in areas of on-land & floating solar power, fuel cells, and bioenergy sources in particular Create a basis for implementing systems for large-scale energy sources (offshore wind power, energy complex) 	<ul style="list-style-type: none"> Commence a 3GW large capacity offshore wind power project Commence renewable energy complex construction projects (400MW in Haenam, 1GW in Shinan)

100% completion of the RPS¹⁾ obligation

The Renewable Portfolio Standard (RPS) is a system that obligates electricity generation suppliers that have a capacity of over 500MW, excluding renewable energy, to have renewable energy account for a certain proportion of the total generation capacity. In 2017, KOEN was assigned with an RPS obligation of 3.14 million Renewable Energy Certificates (RECs)²⁾, an increase of 430 thousand RECs from 2016. Through increased direct investments in renewable energy, such as new solar power generation as well as fuel cell and ESS³⁾-connected facility construction, and private project REC purchasing, we ranked No. 1 among generation companies in the RPS obligation fulfillment level for 5 consecutive years and achieved 100% in RPS implementation for 4 consecutive years. We also secured balanced renewable energy sources by reducing the ratio of biomass co-firing. We will continue our efforts to achieve balanced renewable energy development by diversifying RPS implementation methods and engaging in flexible external purchasing.

RPS status



Building a renewable energy complex

In order to establish a renewable energy complex that mutually grows and coexists with the local community, KOEN is developing solar and wind power-based energy complex centering on South Jeolla Province. To create an energy complex (self-developed, 400MW), we are facilitating the project development with the goal of completing the construction of the site by 2020 by acquiring a large-scale land in the region that remained unused and was damaged by saltwater as the first step. Also, we are promoting plans to build an energy complex in Shinan (jointly developed, 1GW) and plan to help the local community by sharing facilities in substations and expanding related projects to support local residents.



* Bird's-eye view of Haenam Renewable Energy Complex

Expanding offshore wind power sites

KOEN focuses its competencies to develop offshore wind power and floating solar power systems in order to overcome difficulties found in traditional approaches to develop renewable energy in land. In particular, we are planning to build offshore wind power system (600MW) in Wando (island) for coexistence with the fishing industry based on the know-how of completing Korea's first offshore wind farm (30MW) in Tamra and business model to be melded together with local residents. We aim to pioneer and preoccupy new markets of large-scale offshore wind power by utilizing quality energy source of wind in Southwest Sea and barren land in nearby areas.

Promotion of floating solar power project

We are working with local governments and public agencies to occupy emerging large-scale floating solar power markets in advance and developing business model of its kind by using public water surface. Based on this, we commenced Korea's largest floating solar power project in Gunsan (18.7MW) and concluded the agreement to implement the world's largest floating solar power project in Goheung Lake (60MW). KOEN successfully secured the potential capacity of developing 8.3GW floating solar power sites across the nation (135Km² or about 10%



* Bird's-eye view of Floating Solar Power Site in Goheung Lake

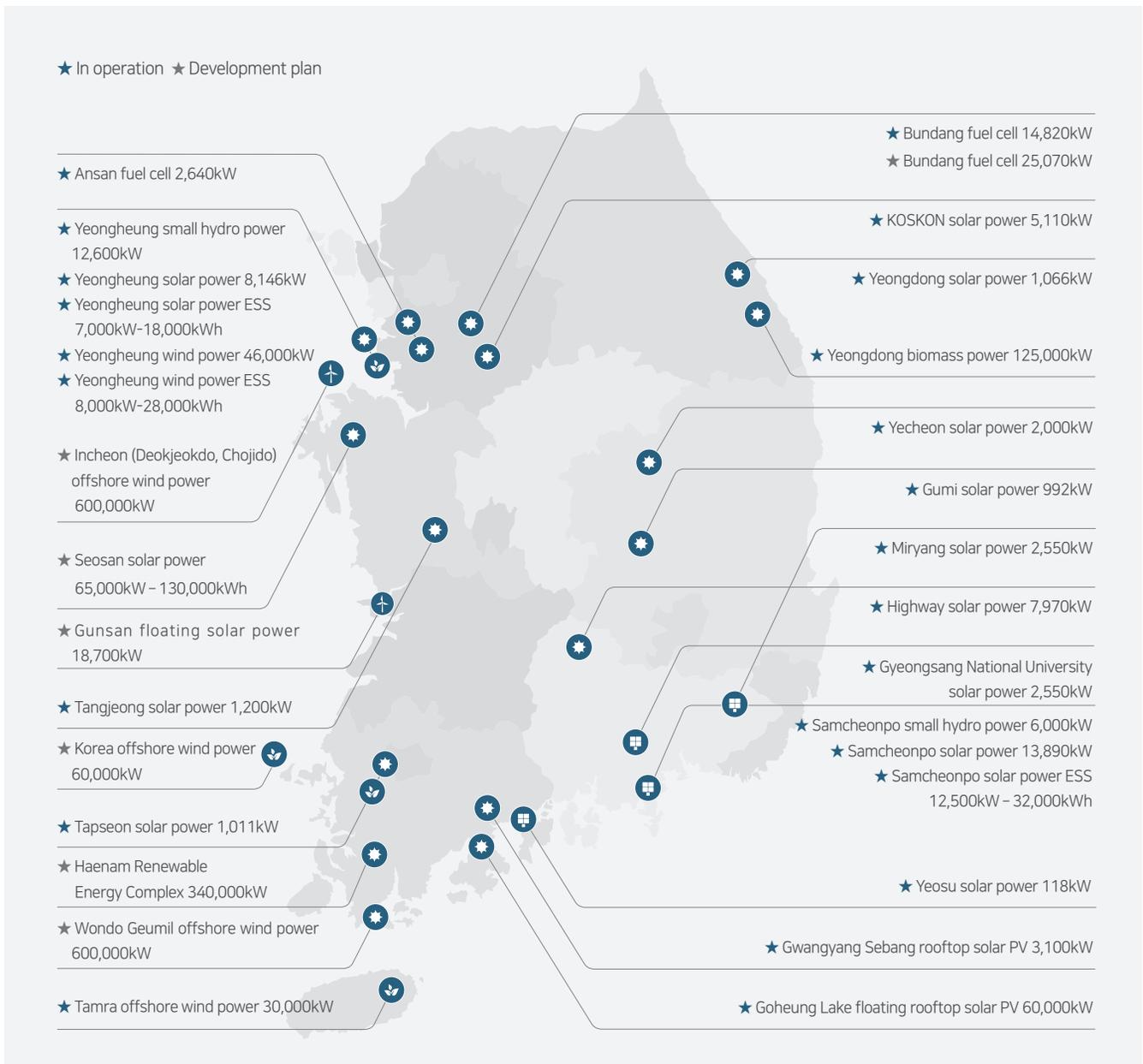
1) RPS(Renewable Portfolio Standard)
2) REC(Renewable Energy Certificate)
3) ESS(Energy Storage System)

of the entire water surface of Korea). It also plans to expand such projects with additional development projects with a capacity of 8.3GW including Ganwol Lake.

Generation shift in fuel cells

KOEN has adopted a solid oxide fuel cell (SOFC) model for the first time in Korea and increased the generation efficiency by 15%p to the maximum compared to previous liquid fuel cells. We adopted SOFCs with a capacity of 8.35MW in our 6-stage fuel cell project in Bundang, and which led Korea's fuel cell markets of each generation. By doing so, we successfully overcame locational requirements of having urban-type heat demand sources and maximized the use of idle lands by adopting patented multi-layer construction method at the same time, resulting in an increase of spatial use by 70% from the existing method.

Operation status and development plan for renewable energy



As of June, 2018

Create Added Values in New Businesses

New business implementation

KOEN is developing business mainly in its strategic locations by sophisticating risk management of each project phase based on the new business implementation strategies. We are advancing into new countries with a high development potential while pursuing projects in countries where we can utilize our business development know-how. As for domestic business strategies, we are focusing on the development of new energy complex project.

Overseas business development

KOEN is engaging in various overseas businesses centering on power generation and resource development projects. We are expanding the scope of power generation projects in Nepal, Pakistan, and other regions based on our business know-how and network and planning to enter into many countries with high growth rates such as Indonesia, Chile, etc.

Classification	Project name	Facility capacity (MW)	Business year	SPC composition
Power generation	Photovoltaic Power Generation Project in Bulgaria	41.62	2010~	KOEN, SDN
	Hydro Power Business in Gulpur, Pakistan	102	2015~	KOEN, Daelim, LOTTE E&C
	Upper Trishuli-1 Hydro Power Business in Nepal	216	2017~	KOEN, Daelim, International Finance Corporation, Jade Power
	Photovoltaic Power Generation Project in Chile	50	2018~	KOEN, CPP
Resource development	Moolarben mine in Australia	625,000 tons/year	2008~	KOEN, KEPCO, KOMIPO, KOWEPO, KOSPO, Korea Resources Corporation (KORES), Hanhwa
	Adaro mine in Indonesia	3,000,000 tons/year	2009~	KOEN, KEPCO

Achievements of new business in Korea and overseas



Nepal

- Secured business stability by concluding Nepal's first PPA
- Secured a right to engage in new business by utilizing the local network



Pakistan

- Expanded the possibility of expanding business by pioneering untapped territories
- Secured a right to engage in new business based on the know-how in Gulpur



Bulgaria

- Improved cash flow and paid dividend for the first time among public corporations with refinancing contract with on local financing institutions (KRW 1.6 billion)

New business in Korea

KOEN focuses on implementing private power generation projects included in the national electricity procurement plan and develops new energy complex construction projects to diversity energy source portfolios that is currently concentrated in coalfired power. We are planning new businesses of constructing new energy complexes in Yongin, Pyeongtaek, Myodo, and Haman with a total capacity of 3,800MW.

Power source	Project name	Facility capacity (MW)	Business year	SPC composition
Sales of steam	Hyundai Energy	48.4 Steam 700t/h	2009~	KOEN, Hyundai E&C, Boim Energy, Investors
Combined-cycle thermal power generation	S-Power	834.3	2012~	KOEN, Samchunri
Coal power generation	Goseong Green Power	2,080	2014~	KOEN, SK E&C, SK Gas, Investors
	Gangneung Eco Power	2,080	2014~	KOEN, Samsung C&T, Investors



Goseong Green Power

- Achieved a process rate (performance: 31%/ target: 30%)
- Expanded the bidding participation of local companies (19 cases)



Gangneung Eco Power

- Achieved the process rate (performance: 17%/ target: 16%)
- Shareholder companies agreed on key terms of the contract

Social Value Creation

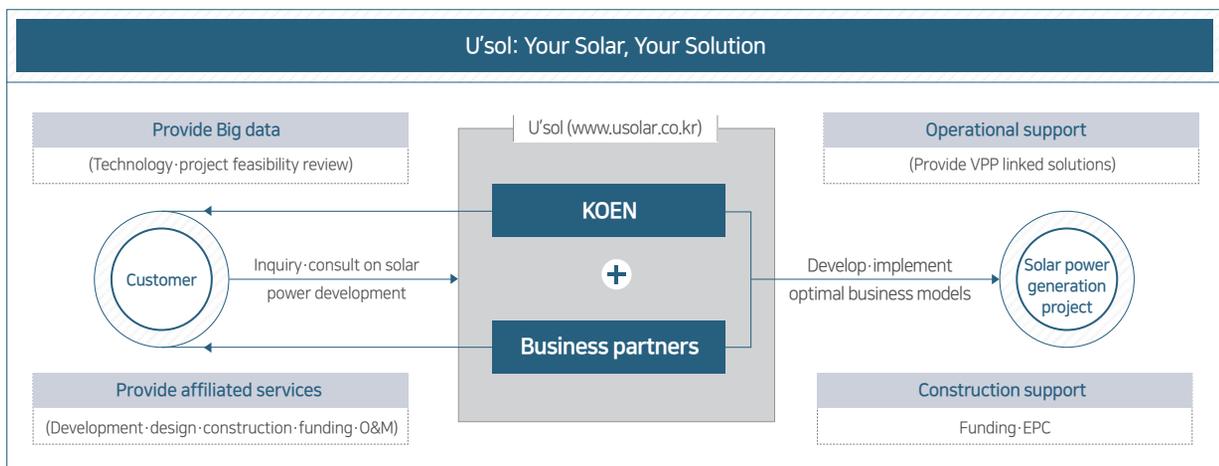
Discover new business in renewable energy sector in consideration of the acceptance of local residents and eco-friendliness

Create agriculture-based solar power generation model preemptively

Agriculture-based power generation refers to a method of carrying out both farming and solar power generation at the same time. It is a power generation model that uses excess solar energy that does not affect crop photosynthesis. By increasing the distribution of agriculture-based solar power systems, we have established a shared value creation model among farmers, power supplier, and the government. It is expected that the net farm income will increase by 7 folds with farmland lease and investment in solar power facilities (based on 16,859m², the figure may vary depending on models and land size) and the project may create about 54,000 new jobs when installing facilities with a capacity of 10GW. Power generation companies can expect many benefits such as additional acceptance by the local residents, reduce difficulties to find proper locations for renewable energy development, finding new distribution routes, and others. As for the government, it can secure the food security and expand the use of renewable energy sources in power generation at the same time. To increase the distribution of agriculture-based solar power systems, we have built an agriculture-based solar power test site that is linked to electricity system for the first time in Korea with a capacity of 100kW in Goseong, South Gyeongsang Province in June, 2017. The effectiveness of this site has been validated already with the amount of rice harvest that exceeds 80% (compared to the previous amount) and the solar power usage rate of 18% (compared to a 15% in general). We are planning to further enhance the system to reduce the engineering, procurement, and construction (EPC) amount and expand the system to private sector in phase for the growth of initial market.



Launch of U'sol, a public platform supporting the development of solar power generation project



KOEN has developed U'sol, a platform to utilize eco-friendly future energy sources with the aim of encouraging the participation of citizens based on public data (www.usolar.co.kr). U'sol is one-stop platform in conjunction with the government's renewable energy 3020 goal to increase the use of renewable energy and supports the entire process of solar power project from development to operation comprehensively. In carrying out such

activities, U'sol uses data related to the business from public agencies and private sector including geological information, amount of solar radiation, transmission system, licensing laws and regulations, etc. It also provides in-depth consultation service including calculation on the amount of power generated, project feasibility analysis process, etc. by utilizing the know-how of KOEN. Its one-stop inquiry service recorded over 20,000 searches and the feasibility analysis of projects with over 20MW capacity (16 cases) was carried out. As seen from the fact that our 13 business partners are registered to use the service, U'sol has become a useful platform to many providers and market participants. We will expand the scope of service and upgrade the system to enhance the feasibility analysis function, serving as a customized solution in the future. We are also considering to provide business supporting services such as construction cost estimation, matching to financial institutes and others based on case studies and market research. In addition, we will continue to upgrade its service such as tailored solutions by each type (farming, building, and land), and linking to virtual power generation.

Creation of eco-friendly energy town

KOEN is transforming waste disposal facilities, unpleasant units in local communities, into eco-friendly energy towns by converging renewable energy. We pioneered new energy business to share the profits for mutual growth with farmers and fishers by building distributed energy sources and eco-friendly agricultural and marine products in disused land of fly ash treatment sites in power plant of which size is about 661,157m². We were able to acquire the license of partially using the fly ash treatment facilities thanks to the efforts to improve related rules and regulations of the central government (the Ministry of Trade, Industry and Energy, and the Ministry of Environment) and local government (South Gyeongsan Province) and concluded a MoU to attract the government investment by conducting a task with regard to the R&D of win-win cooperation model with agriculture and fisheries sector. Based on this, we have built a large-scale solar power plant (10.6MW) and solar power linked ESS (32MWh) in the fly ash treatment site and enhanced eco-friendly images of coal-fired power generation by reducing its environmental impact. Local farmers and fishers jointly participated in the project to operate glass greenhouses and fish farms, contributing to job creation of the region.



Microgrid (MG)¹⁾ operation to create shared profits



KOEN is providing options for reasonable use of energy and models to reduce the amount of electricity charge to business sites that consume a large volume of electricity by using distributed energy sources. We successfully reduced the power rates by decreasing the amount of power delivered and base rate with the use of MG for distributed power sources (charging and discharging of ESS) during the electricity Peak times. We are sharing the amount saved with our customers, creating a shared profit. In September, 2017, we have established urban-type MG facilities in Changwon plant along with Doosan Engine. These facilities consist of distributed power sources including solar power facility (100kW), solar-power linked ESS (200kWh), and ESS for demand management (4MWh) and help to ensure the stability of national electricity system and reduce the electricity peak.

1) Microgrid (MG): it is a localized group of electricity source that is equipped with remote power supply and storage system centering on independent distributed power sources that enable power generation, storage, and consumption

Strengthening Competitiveness of Eco-friendly Power Generation Business



Material Topic

Fine dust, GHG emissions, and other environmental issues are gaining a huge attention from the society and regulations on fossil fuel-based power generation have reinforced. Hence, managing resources and byproducts of power generation has become all the more important. To achieve this goal, we need to increase the operation efficiency and minimize the environmental impact of the power generation industry. Also, management of partner companies and mutual growth have become critical issues as establishing a power generation ecosystem has emerged as a core policy task. To make this happen, efforts are needed to manage the supply chain to expand corporate social responsibility to its business partners. It requires support from partner companies as well.

Material issues

- Use resources efficiently and minimize environmental impact
- Strengthen the efficiency in operating power generation facilities and stabilize electricity supply
- Promote the win-win growth

Our Goal

Fine dust reduction ratio in 2030
(compared to 2015)

84%

GHG emissions reduction ratio in 2030
(compared to BAU)

35%

Our Roadmap

- Actively respond to the emissions trading scheme (ETS) by advancing carbon management system
- Implement sustainable management by operating eco-friendly facilities
 - Comply with environmental regulations by expanding co-firing of biomass, improving performances of outdate facilities, and timely investment in desulfurization facilities
- Realize resource-circulating power plants by increasing the recycling amount of fly ashes
 - Diversify the recycling usage such as using artificial aggregates and fly ashes as resources

Implementation Directions

2018~2020
(short-term)

- Activate domestic and overseas reduction projects
- Operate a situation room for emissions trading and advance carbon management system
- Secure the technology with direct operation of desulfurization facilities
- Commence commercial operation of resource production facilities in artificial aggregates and fly ashes
- Propose policies to the government to develop new usages of recycling fly ashes

2021~2023
(mid-term)

- Develop overseas reduction projects
- Expand renewable and low carbon energy sources
- Performance improvement and replacement of environmental facilities in Yeongheung, Samcheonpo, and Yeongdong
- Expand the fly ash recycling market

2024~2030
(long-term)

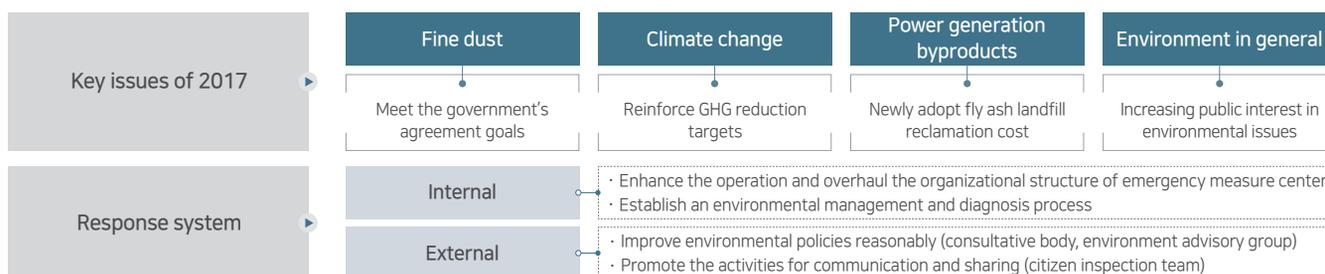
- Promote overseas reduction projects
- Expand R&D for new technologies such as CCUS
- Performance improvement of environmental facilities in Yeongdong unit 1 & 2
- Installation of follow-up projects for industrial production facilities of fly ashes
- Establish resource recycling power plant by achieving a 90% fly ash recycling rate

Response System for Eco-friendly Facility Operation

Enhance environmental response system by minimizing environmental pollutants

The importance of managing environmental risks is increasing each day along with the implementation of the government's comprehensive fine dust management polices (effective as of September, 2017), the emissions trading scheme, and other strengthened environmental regulations. Thus, KOEN has reinforced its competencies in responding to core issues that are closely related to the power generation industry and reorganized the management system to minimize environmental pollutants. We actively complied with the government's environmental policies by establishing contingency plans for each area (fine dust, climate change, etc.) and enhanced our organization and systems by newly installing the Fine Dust Countermeasure Team.

Environmental response system

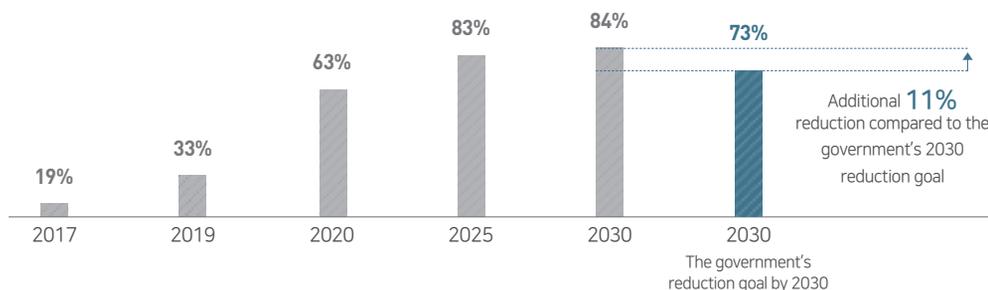


Leading the Practices of Reducing Fine Dust Emissions

Reducing fine dust emissions

KOEN has established a 'mid- to long-term roadmap to reduce fine dust by 2030,' in order to ease the anxiety of citizens over fine dust and to reduce air pollutants caused by power plants. We are making efforts to optimize environmental facilities and their operation in each operation and voluntarily discard outdated facilities in order to reduce fine dust emissions. Also, we are conducting researches on the expanding R&D to seek ways to reduce fine dust emission, impact assessment of fine dust in coal-fired power generation (contributions, etc.) and measures to improve air pollution prevention facilities. The research findings are applied to optimal environmental facilities and their operation in each power plant for fine dust reduction and performance enhancement of existing facilities, and application of the latest technologies, and ageing facilities are voluntarily discarded.

Roadmap to reduce fine dust (Fine dust reduction ratio compared to 2015)



Efforts to improve performance of environmental facilities

Classification	Subject	Implementation plan for 2017	Mid-to long-term plan
Aged at least 30 years	Unit 1 & 2 at Yeongdong Eco Power Division	Conversion of fuel (coal -> wood pellets), reinforce environmental facilities, etc.	Early conversion of fuels at Unit 2 (2019)
	Unit 1 & 2 at Samcheonpo Power Division	Add and replace catalysts of denitrification facilities (2nd layer -> 3rd layer), etc.	Early discard (2019)
Aged at least 20 years	Unit 3 & 4 at Samcheonpo Power Division	Replace catalysts of denitrification facilities and thermal devices of desulfurization facilities	Conversion of fuels after discarding the facilities voluntarily (2024)
Aged less than 20 years	Unit 5 & 6 at Samcheonpo Power Division	Overhaul electrostatic dust precipitators	Newly install denitrification and desulfurization facilities (2020)
	Unit 2 at the Yeosu Power Division	Overhaul desulfurization facilities, etc.	Performance improvement of environmental facilities (2021)
	Unit 1 & 2 at the Yeongheung Power Division	Overhaul desulfurization facilities, replace catalysts of denitrification facilities, etc.	Complete replacement of environmental facilities (2021)

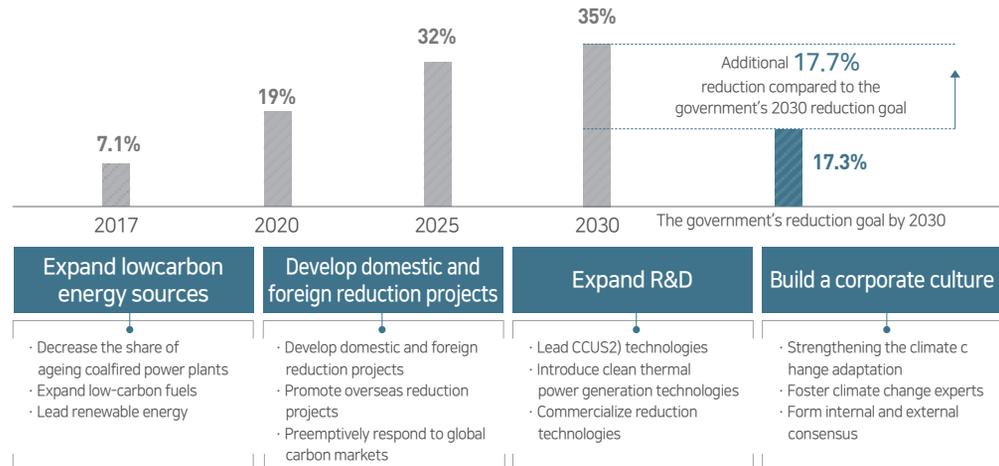
Enhancing Capacity for the New Climate Regime Response

GHG emissions reduction
(Compared to BAU¹⁾)

Mid-to long-term
Action Plans

2030 KOEN Roadmap to reduce GHG emissions

KOEN has established a 'mid-to long-term roadmap to reduce GHG emissions by 2030' to respond to the new climate regime and to join in implementing the national GHG reduction goal by 2030. Hence, we will actively respond to the shifts in the low-carbon energy paradigm in the sector.



Expanding low carbon energy sources

KOEN has successfully operated Yeongdong Unit 1 with our eco-friendly fuel (coal → wood pellet), which has been in operation for 45 years in order to preemptively respond to the government's renewable energy expansion and fine dust and greenhouse gas reduction policies. We are also leading the transition to clean and safe energy through the development of new biomass fuels to replace wood pellets, the use of Bio-SRF in municipal cooperation, and the introduction of eco-friendly Clean Coal (high-calorie coal, low sulfur and low-nitrogen coal).

Expansion of GHG Reduction Project

In March 2016, KOEN established the first carbon fund in Korea to develop the GHG reduction projects in partnership with SMEs to strengthen our reduction efforts. In 2017, we cooperated with Yongin City to reduce the GHG emissions and fine dusts by promoting a pilot project of heating system without starting a car for taxi. We are continuously expanding the GHG reduction projects through the carbon offset city forest (84,248 m²) with Daegu City and the cooperative MOUs in the agro-food sector.

R&D for new technologies in the power sector

KOEN is actively expanding CCUS²⁾ technology development to cope with climate change in the mid- to long-term. We are leading the development of carbon capture and utilization technologies for large-scale GHG reduction. In August 2017, we signed a technical cooperation MOU with the Korea Institute of Energy Research and are promoting the introduction of high efficiency wet absorbent test facilities. We are also in the process of developing additional carbon utilization (ceramic) technology to break the limit of carbon reduction.

Building a corporate culture of low-carbon

KOEN operates an adaptive capacity assessment and inspection system to enhance the implementation of climate change adaptation measures. We have various activities to create consensus both inside and outside of the company, including voluntary participation in CDP³⁾ and Carbon footprint labeling⁴⁾ by the Ministry of the Environment on every site and the headquarters. With these efforts being recognized, KOEN was awarded the Global Carbon Management 'Bearers Award' as the first public institution and was selected as an excellent public institution for implementation of measures to adapt to climate change in 2017.



MOU on high-efficient carbon capture technologies



Awarded the Global Carbon Management 'Bearers Award'

1) Business As Usual (BAU): Previous GHG emissions estimates

2) Carbon Capture, Utilization (reuse) & Storage (CCUS)

3) Carbon Disclosure Project (CDP): An initiative to disclose environment related information (climate change, water, etc.) organized by the UK's nonprofit organization and led by the world's leading financial institutes

4) Certificate GHG emissions generated during the entire product life cycle (production, distribution, disposal, etc.)

Social Value Creation

GHG reduction and active communications through the participation of citizens

- Operate a platform to encourage the citizens' participation, environment advisory group and citizen inspection teams -

KOEN actively engages in GHG reduction activities through an online platform that is operated based on the citizens' participation. We provide certified emission reductions (CERs) by supporting funds and one-stop service to improve facilities to SMEs and rural households. Also, we are enhancing communications with various stakeholders in power generation industry by operating environment advisory groups and citizen inspection teams. For the first time among power generation companies in Korea, we began to install and run environmental panel composed of 20 persons in three areas including environment and energy and reflected opinions of 100 representatives of citizens in our management direction through citizen inspection team in order to increase transparency in disclosing environmental information.

Run a cooperation platform to encourage the participation of SMEs and farmers

We improved the operation of carbon fund to expand the financial support, held business presentations and published guidebooks to inform the process and participation of reduction projects. Also, we are continuously identifying projects through role sharing of each site and engaging in activities to achieve the reduction target of 40,000 tCO₂e through 20 projects including one that is applied to taxi devices to provide heating without starting the engine. In December, 2017, we signed on a contract to encourage the participation of local farmers, intending to activate carbon reduction projects in agricultural sector. Under the project, meetings of consultative body will be held each quarter to carry out detailed activities such as selections of farmers, execution of funds, progress monitoring and others.

Mid-to long-term strategies to diversify GHG reduction projects

<p>Create an infrastructure to encourage participation (2015~)</p>	<ul style="list-style-type: none"> · Implement reduction projects for SMEs <ul style="list-style-type: none"> - Create carbon funds (worth KRW 13 billion) - Projects aims to improve the efficiency, conversion of fuels, etc.
<p>Business diversification (2017)</p>	<ul style="list-style-type: none"> · Increase activities to discover reductions projects in agricultural sector · Build a basis for implementing overseas reductions projects <ul style="list-style-type: none"> - Designate department in charge of the tasks and establish related procedures
<p>Overseas expansion (2018~)</p>	<ul style="list-style-type: none"> · Develop and implement overseas reduction projects <ul style="list-style-type: none"> - Renewable energy business (hydro power project in Pakistan, etc.) - Social contribution-type project (cooking stove project for developing countries, etc.)

Operation of environment advisory group·citizen inspection team

KOEN is contributing to reasonable improving environmental policies through activities of the 'Greenhouse Gas Emission Reduction Research Committee of the Generation Industry', government's consultative body relating to waste regulations, and environment advisory group. Based on the activities of environment advisory group that is composed of 3 specialized units of which members are mainly opinion leaders, we provided our proposals to improve polices such as the ETS market activation measures (amendment of enforcement decree), reasonable allocation of fly

ash landfill reclamation cost (enactment of laws and others). Also, all citizens can participate in discussions on environmental issues and experience environmental facilities by becoming a member of citizen inspection team. Other efforts are made to improve awareness of the public on power generation and communicate with various stakeholders by disclosing environmental information more transparently and operating environment supporters of university students.



Recycling Power Generation Byproducts and Environmental Conservation Activities

Power generation byproducts¹⁾ management

There is a growing need to recycle fly ashes along with difficulties in securing new or additional fly ash treatment sites and changes in systems such as the introduction of landfill reclamation cost due to the enactment of Act on Resource Circulation of Electrical and Electronic Equipment and Vehicles (as of 2018). In 2017, the thermal power plants in our Samcheonpo, Yeongheung, Yeongdong and Yeosu business sites generated approximately 2.67 million tons of fly ashes, while 2.90 million tons were recycled, resulting in a recycle rate of 108.9%, and thus exceeded the legally-binding recycling target of 75% by 33.9%p. We also achieved the 30 million tons recycling of power generation products for the first time in Korea and established a stable basis for recycling.

We are expanding the coal fly ash refinery facility installed in the Yeongheung Power Division to the Samcheonpo Power Division to manufacture products with fly ashes. We expect that the expansion of refinery facilities will lead to the recycling of 140,000 tons of fly ashes worth KRW 200 million each year. Furthermore, we are making efforts to discover new usages of fly ashes and wood pellets by sharing and discussing issues with cooperative agencies. For instance, we successfully found the usage of those materials such as ready-mixed concrete admixture and solidifying agent to recycle about 320,000 tons of fly ashes, establishing a recycling basis at the Yeongdong Power Division. We are seeking recycling options on a constant basis by developing eco-friendly business models, making products produced by recycling fly ashes under a brand, engaging in small packing sales, utilizing renewable facilities, and development of eco-friendly products.

Protecting biodiversity

We especially carry out activities that improve biodiversity through environmental management (ISO 14001) activities, and come up with ways to preserve the environment to reduce or avoid harmful environmental impact on biodiversity by investigating, forecasting, and evaluating the environmental impact of the generation business as well as businesses incidental to power generation.

Also, we chose water and water quality management and biodiversity improvement as part of our environmental goals in our environmental management policy. As a detailed task, we are conducting biodiversity risk management and restoration and improvement activities. In addition, we are adjusting our business plans for animals and plants that need to be protected and the ecosystem and establishing ways to minimize environmental changes in the ecosystem based on environmental impact forecasting and evaluation results. We are thus expanding the scope of our biodiversity protection activities. We plan to carry out activities that protect endangered species to preserve biodiversity.

Promise of KOEN to protect biodiversity

- KOEN will make efforts to protect biodiversity in nature reserves such as protective areas of native and natural habitats, natural monuments, national parks, etc.
- KOEN will recognize biodiversity in areas nearby its business sites and gradually develop strategies and activities to protect the species.
- KOEN will continue to expand and carry out its activities to protect biodiversity by concluding business agreements with the environmental groups and government of the region.

Biodiversity protection goals

Goals	▶ Endangered species in business sites protection projects (4 times per year)
Duration	▶ 2018~2019
Achievements	▶ Identify the number of endangered species, implement preservation activities

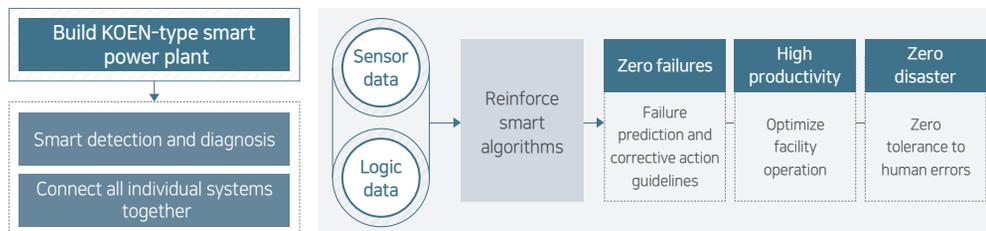
¹⁾ Fly ashes (byproducts generated after coal combustion) + Chemical gypsum (byproducts generated after operating desulfurization facilities)

Smart Plant Development

Implement Smart Plant¹⁾

We are preparing for introducing smart plants for failure-free and economic operation of power generation facilities by applying the technologies of the fourth industrial revolution to the power generation sector. To this end, we are developing technologies to secure home-grown source technologies for smart plant to create a high value-added business model in the future.

Introduction of smart power generation technology



Develop a smart plant model

KOEN is making efforts to secure homegrown technologies to come up with a KOEN-style smart plant model along with the Korea Institute of Science and Technology (KIST). We are fostering source technologies and preparing for establishing a foothold to advance into overseas markets based on the technological know-how of KOEN and collaboration with Korea's best research institute.

Mid-to long-term implementation roadmap

Phase 1: 2017~2019	Phase 2: 2019~2021	Phase 3: 2021~
Build a smart plant (establish platforms and develop solutions) <ul style="list-style-type: none"> · Develop business solutions · Build a smart infrastructure · Install a smart work center 	Smart plant test (apply the technology to unit 5 & 6 at the Yeongheung site) <ul style="list-style-type: none"> · Test the smart plant model · Establish a standard smart plant model 	Expand smart plants (to all business sites and power plants at home and abroad) <ul style="list-style-type: none"> · Expand the smart plant model · Create new business needs

Technological development records and future plans

- Core technologies: KOEN led a government-funded research task regarding the establishment of AI-based smart plant

Develop a big data platform dedicated to facility data	Develop AI-based algorithms for failure prediction and diagnosis
Developed an AI-based big data platform dedicated to the analysis of power generation facilities by applying Tupix ²⁾ , a technology used for big data analytics	Design algorithms for failure prediction and diagnosis by using sensor data and controlling logic data and make an application

- Element technologies: Apply element technologies to realize AI plants

Classification	Implementation results of 2017	Plans for 2018~2020
Technologies that enable optimal operation	Commenced 2 cases concerning rotor failure and life prediction system	Six cases including performance diagnosis system
Infrastructure technologies	Commenced 2 cases including IoT network infrastructure, etc.	Link separate systems to big data
Done and mobile technologies	Completed the development of drones for monitoring boiler tubes and commenced 2 cases including drones for stock pile of coal monitoring	Four cases including virtual reality system, etc.

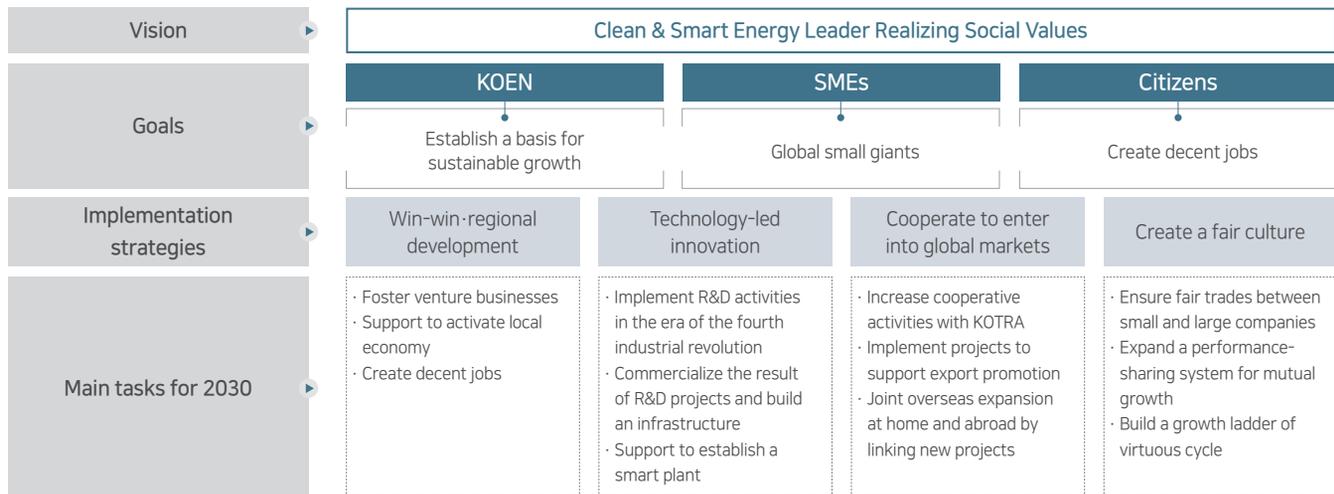
1) Smart plant: A plant where all systems and people are connected to create an environment that enable inexperienced persons to easily carry out given duties. All processes are optimized (decreasing failures and increasing productivity)

2) Tupix: A tool for multidimensional data analysis developed by the Korea Institute of Science and Technology Information (KISTI)

Create a Power Generation Industry Ecosystem for Coexistence

2030 win-win growth implement system

KOEN intends to establish a power generation ecosystem that mutually grow and coexist with SMEs based on share growth implementation system in conjunction with the vision 2030.



Take the lead in vitalizing the local economy for win-win cooperation

KOEN has been conducting the 'Namgaram Eco-Powertopia project' to respond to demand for vitalizing the local economy with relocation of government agencies to Innovation City and support an environment for growth that is unfavorable to SMEs located in nearby Gyeongnam Innovation City. Through this project, we are driving seamless collaboration among local universities, research institutes, SMEs, and local governments, and building a foundation for promoting balanced growth of the local economy. To this end, we have invested about KRW 150.6 billion (119 cases), creating 407 new jobs. Also, we are helping SMEs specializing in marine machinery and shipbuilding equipment to overcome difficulties and seeking various ways to support their expansion into the power generation sector.

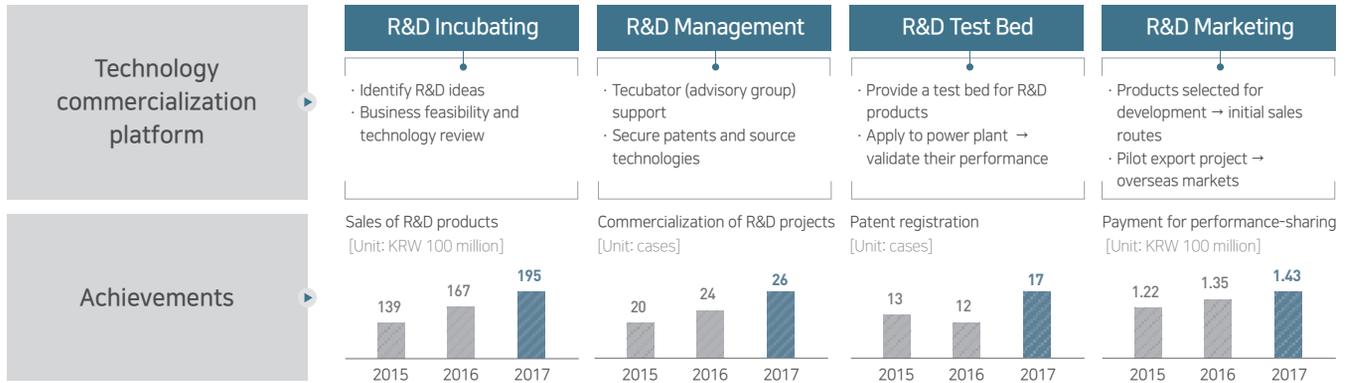
Detailed activities of Namgaram Eco-Powertopia project

Project team	Industry-Academia-Research Convergence Research Project Team	NEW BIZ team	SME startup·promotion team	Education·culture promotion team
Major activities	<ul style="list-style-type: none"> Established research centers in universities Connected the project to the energy-based industry Conducted government-funded tasks and R&D projects 	<ul style="list-style-type: none"> Built a growth belt for the power generation industry Commercialized and patented core technologies Provided technological support for the national power generation sector 	<ul style="list-style-type: none"> Supported SMEs to start a new business based on new technologies Built a R&D valley for SMEs Provided support for employment and export 	<ul style="list-style-type: none"> Provided educational programs to employees of SMEs Educated children in households living in areas nearby plants Supported local cultural festivals, etc.
Achievements	<ul style="list-style-type: none"> Selected 29 R&D tasks Realized a smart plant Installed the 4th industrial revolution promotion committee 	<ul style="list-style-type: none"> Developed 3 renewable energy projects : 25.3MW Developed agriculture-based solar power generation project 	<ul style="list-style-type: none"> Participated in local industry nurturing projects <ul style="list-style-type: none"> Supported the production of 7 prototypes Held a startup idea contest, etc. 	<ul style="list-style-type: none"> Completed the 1st techno business startup program Employed local talents for their experience Fifty-three cultural and social contribution activities

Support to strengthen the market competitiveness

In order to improve poor R&D conditions of SMEs due to the lack of funds and human resources, KOEN provides various technologies and know-how as well as funds to support them secure the required technologies. We also worked with an export agency (G-TOPS) and KOTRA to provide consulting and marketing services and held joint export meetings.

Achievements of technology commercialization platform



Social Value Creation

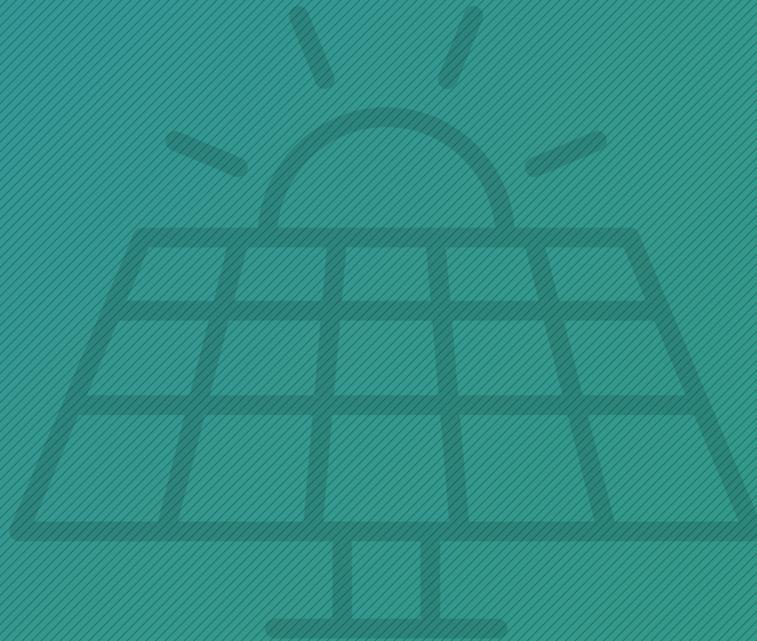
Realizing social values by building a corporate ecosystem for virtuous circle

KOEN is expanding the 'win-win settlement system' in order to prevent liquidity crisis of the secondary and tertiary suppliers that are mostly small and medium-sized companies. For instance, we are issuing win-win bonds to secondary and tertiary partners to prevent their management crisis in advance. Meantime, we are contributing to the sustainable growth of SMEs by establishing a growth ladder system. First, we classify them based on sales amount and then conduct supporting projects that are systematic and tailored to each stage of growth. Also, we carried out the 'KOEN Core Corporation Project' to support SMEs that we have partnered with can develop into global small giants. After selecting companies with core technologies of power generation facilities, we helped them further advance their technologies and explore foreign markets. As of 2017, we injected KRW 2 billion to 25 companies. We are planning to support their growth constantly by selecting 2 to 3 companies each year in the future. KOEN is the only public agency that operates programs to improve job satisfaction level, share the information, and having communication with its SME business partners. By holding the Huddling Company Conference, we have provided a venue for communication and harmony between large companies and SMEs and built the win-win cooperation model by engaging in continuous communication with our employees and those working for the SME business partners.

Growth ladder system

Classification	Sales basis	Supporting projects	Achievements
Start-up (startups)	Less than KRW 5 billion	<ul style="list-style-type: none"> Support SMEs-venture companies to start a business Provide tailored management supporters Support the industry innovation movement (to improve worksite conditions) 	<ul style="list-style-type: none"> Facility and management improvement (found in 31 companies) Technological development improved by 200% Financial performance: KRW 2.72 billion
Scale-up (promising companies)	Between KRW 5 to 10 billion	<ul style="list-style-type: none"> Core corporations fostering programs Support partnerships for productivity innovation Support the activities to reinforce competitiveness of business management solutions 	<ul style="list-style-type: none"> Sales and employment of 10 companies that are selected as core corporations increased by 10% and 2% from the year before, respectively Productivity increased by 30%
Level-up (leading companies)	At least KRW 10 billion	<ul style="list-style-type: none"> Global hidden champion fostering project Support the overseas expansion and marketing activities Support the efforts to establish test equipment, etc. 	<ul style="list-style-type: none"> Annual volume of exports 2015: USD 61.61 million 2016: USD 82.86 million 2017: USD 89.41 million

Social Switch





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Nurturing Core Value-based Talents and Innovating Corporate Culture



Material Topic

There is a need to foster future-oriented employees with converging competencies and nurture key talents in order to develop new businesses and strengthen core businesses in response to rapidly changing management environment and technological development. To make this happen, it is imperative to provide professional education and training programs and discover talents. Also, a company-wide effort to recruit and retain highly talented people is required. In the meantime, establishing a system to improve the welfare and human rights of employees has become equally important as demands for a work-family balance from the society are increasing.

Material issues

- Respecting the human rights and promoting the welfare of employees
- Fostering talents specializing in the power generation industry

Our Goal

Foster **290** key talents by 2025

Our Roadmap

- Reestablish HR management system and reinforce education and recruitment system to foster and retain talents with converging competencies
- Strengthen HR expertise, establish evaluation system to increase performance and foster talents, activate in-house labor market
- Promote the development and commercialization of new energy technologies for the future centering on the activities of Renewable Energy Convergence R&D Center
- Improve operating technologies for cooperation with accredited research institutes such as the Electric Power Research Institute (EPRI) and reinforce the industry-university-research institute cooperation system
- Foster key talents, centering on field technicians

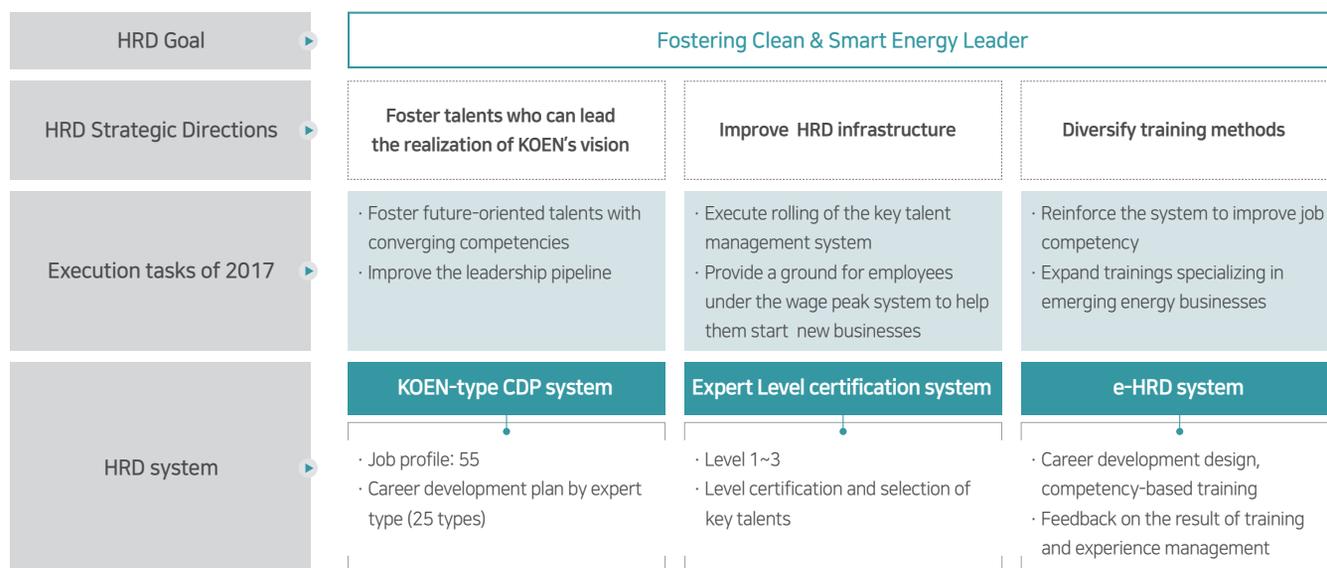
Directions



Foster Future-oriented/ Converged Technology and Key Talents

Human resources development strategy to improve job competency

KOEN has been running a strategic system to discover key talents related to its core and new businesses and foster their expertise. We have established an educational infrastructure that enables us to preemptively respond to changing management environment and enhanced educational effects through various training programs.



210

No. of key talents fostered

Foster future-oriented/converging competencies and key talents

KOEN is building newly emerging competencies required to meet the era of the fourth Industrial Revolution and fostering future-oriented talents with converging competencies. We have provided online training programs with regard to the fourth Industrial Revolution to all employees (2,100 employees completed the programs) as well as job competency improvement programs related to 10 core technologies to develop their expertise. For instance, we have run drone pilot certification (35 persons) programs to build the capacity of employees at sites for coal depot management and other activities. We also provided programs to share core ICT technologies and distributed work process (60 persons).

We are also constantly improving key talent management system to achieve our mid- to long-term management strategies. For customized fostering of experts, we are fostering key talents for each of 25 expert types. As a result, we fostered 210 key talents (or 9.1% of the total employees) in 2017. By doing so, we strive to retain 10% of total employees as our core talents and make efforts to increase their expertise.

Key talent management system





Operate training programs based on organizational and individual needs

KOEN conducts competency evaluations of all employees, discovers organizational and individual needs, and provides effective training programs. After identifying educational needs in the organization level, reflecting major government projects and management principles, we provided training programs related to the fourth industrial revolution and emotional education based on the needs of employees established identified through employee training satisfaction level and survey results. In 2017, we expanded the scope of the work-learning dual system for the improvement of job competency. As a result, we received a prize for excellence in the corporate category at the national competitive exhibition in the same year (hosted by the Ministry of Employment and Labor, MOEL).

Classification	Major needs	Training programs	Description	Targets (no. of persons)
Organization	Foster new energy business experts	Negotiation·new business	Foster negotiation·new business experts specializing in the present business sector	Persons in charge of new business (39 persons)
		CEOs of affiliated companies	Nurture project and risk management skills	Level 3 and above (15 persons)
	Strengthen job competency improvement programs	Work-training dual system (to the entire company)	Expanded to 4 Divisions after pilot operation at the Yeongheung Power Division ('16)	Applied to first-year employees (8 persons)
Individual	Enhance the career safety net through startup entrepreneurship training programs	Change senior employees under the wage peak system	Three-course training: Life planning + job function change + KOPI3 3 Steps Training	Employees under the wage peak system (11 persons)
		Career change management	Future design based on individual needs (applied to all 5 power generators)	Employees under the wage peak system (22 persons)
		Tech-business startup program (Korea Southern Power, Korea Midland Power)	Reemployment and startup entrepreneurship training	Employees under the wage peak system (24 persons) SMEs (21 persons)
		Specialized consulting services	Foster management consulting experts in SMEs and business partners	Employees under the wage peak system (8 persons)

25% increase

Number of female managers increased (compared to 2016)

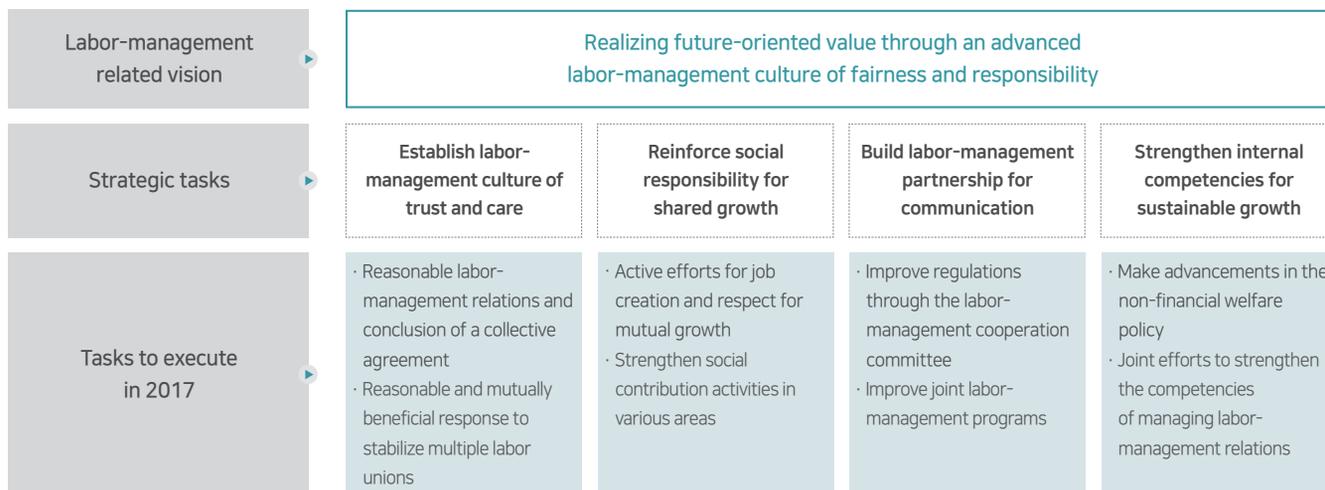
Effort and achievements fostering female talents

KOEN is cultivating female talents systematically in order to carry out balanced HR management policies without discrimination and expand the gender equality. We have supplemented the HR system and culture to improve the condition of having a low number of women employees in technical positions following the characteristics of the power generation industry and to reduce their difficulties while carrying out their duties at sites. Based on this, we intend to increase the number of female managers by 10% (and 5% for technical positions), and 15% and 10% for the share of women employees and key female talents by 2025, respectively.

Efforts to improve the HR system and corporate culture to increase the number of female managers

Classification	Description	Achievement	
HR system	Recruitment	<ul style="list-style-type: none"> Exclude discriminatory elements through blind recruitment and hire female managers with open contract bases Manage the target of hiring female workers to attract female talents and hold employment briefings in women's universities 	<ul style="list-style-type: none"> No. of female employees who passed the entry level manager promotion exam increased (from 17% in '16 to 25% in '17) Increase of female manager in technician positions (from 1.4% in '16 to 2.0% in '17) Actual no. of female employees increased (from 9.8% in '16 to 10.3% in '17)
	Promotion	<ul style="list-style-type: none"> Adopted the promotion qualification system that is based on the primary executive exam (employees who passed the primary exam is allowed to apply for the secondary exam three times) to avoid career interruptions Include the period of parental leave to assess qualifications for promotion (first child: 1 year, second+: 3 years) 	
	Placement	<ul style="list-style-type: none"> Assign female employees in technician positions in renewable energy business and other core positions (assignment rate: 79%, minimize their placement to general positions) Suspend the relocation upon promotion of entry-level female managers and upon return after parental leave, place women employees to a business site of their request 	
	Training	<ul style="list-style-type: none"> Run KOEN female leadership academy by each position as a regular program (237 women employees of the entire company completed the program) 	
Corporate culture	<ul style="list-style-type: none"> Prevention of sexual harassment, reinforcement of zero tolerance policy and responsibility of managers for sexual harassment perpetrators by applying a system of point deduction from internal evaluations Strengthen the execution rules and regulations through the 'Ribbon Committee (with regard to gender equality and work-family balance)' 	<ul style="list-style-type: none"> No. of female employee turnover rate declined (from 3 persons in '16 to 1 person in '17) 	

Innovate Corporate Culture that is Linked to Core Values



Efforts to build a win-win labor-management culture

KOEN has reestablished its strategy to win-win labor-management relations based on major projects of the new government and mid- to long-term roadmap. We are making efforts to build a sound labor-management culture where both parties fulfill their responsibilities and communicate with each other. In 2017, we particularly focused on converting more non-regular workers to regular employees and creating more jobs through mutual efforts through the labor-management cooperation.

Strategy to advance labor-management relations

95 points

Company-wide labor-management communication index increased (94.6 points in '16)

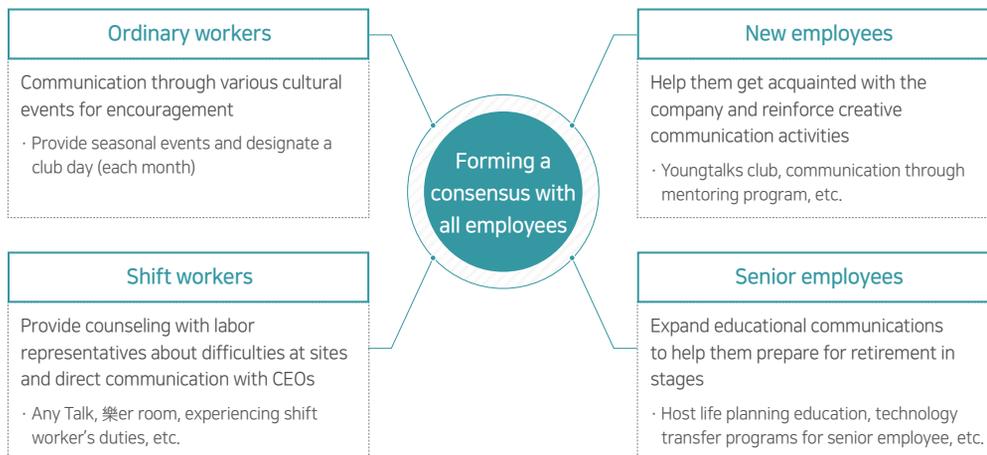
Increase activities of Labor-management council and expand communication channels to form a consensus

KOEN operates communication channels regularly to form a consensus between labor and management. We check current issues through daily labor-management meetings and manage complaints and conflicts via weekly labor-management executive council meetings. Monthly labor-management meetings are held (frequently) in the presence of Head of Division, Head of General Administration Dept. and Vice President to discuss unresolved issues. Also, negotiations and the labor-management council are activated to share various issues related to labor-management relations. In addition, we are operating communication programs tailored to working types and experience to form a consensus with our all employees.

93.1 points

Individual communication index increased (92.7 points in '16)

Customized communication programs

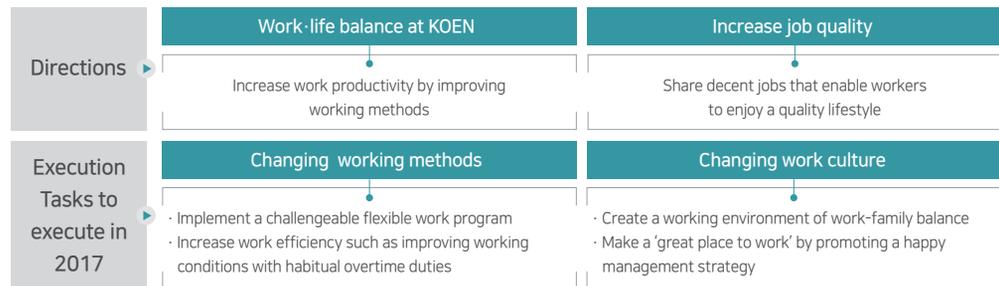


Create a Great Workplace with Work-life Balance

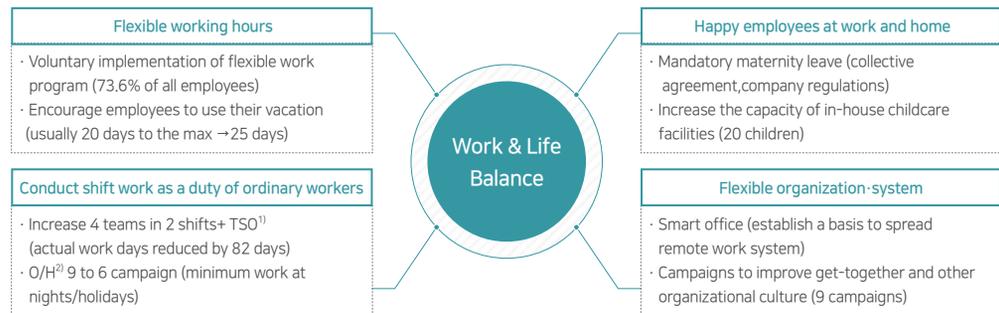
Promote work-life balance at KOEN

KOEN ensures regular intervals of work and rest for employees to make the company a 'great place to work' and one that creates decent jobs. For instance, we are changing the culture of working long hours and overtime by activating flexible work arrangements, encouraging employees to use their vacation, and protecting maternity leaves. Thanks to these efforts, KOEN received the comprehensive Grand Prize at the Top 100 Best Workplaces in Korea for 3 consecutive years, selected as one of the 65 Best Workplaces in Asia for the second year, and received numerous external recognitions.

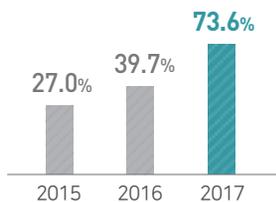
Work·life balance promotion system



Effort and achievement to eradicate the culture of extended work hours and strike a balance between work and life



Share of employees using the flexible work program



Improve working methods by implementing a flexible work program and reducing working hours

KOEN is implementing the leave-the-office-early-system across all divisions in order to promote the adoption of the flexible work program. The flexible work program was selected as the best KOEN system by employees with a high level of satisfaction, helped to drive employee engagement, and improved work productivity. The One-Sight System allows searches, applications, and approvals by type of flex time. A working hour simulation by each flexible time type is also provided to allow efficient adjustment of work hours. Users are informed about individual work hours through pop-up notifications when they check in, and work hours are automatically notified to the appropriate department manager to increase the convenience of flex time.

As for shift work or other tasks that requires overtime work, we are focusing our efforts to reduce such extended working hours and improve work efficiency. In 2017, we newly adopted the regular proposal system to improve inefficient work, merged and abolished similar or overlapping duties, and reduced simple tasks. Also, we are strengthening IT infrastructure to create a smart office and planning to constantly improve convenience and efficiency by redesigning spaces and enhancing a corporate culture.

1) Technical Supporting Operator (TSO): A talent pool supporting alternative work for all positions in shift work group upon the absence of employees due to leave, training, and others

2) Overhaul (O/H): Planned preventive maintenance activities including disassembly and repair

Focused efforts to reduce overtime

Year	~ 2016	~ 2017	Plans for 2018
Shift work	<ul style="list-style-type: none"> Agreed to adopt the flexible working hour system (4 teams in 2 shifts) Agreed to adopt the compensatory leave system and designated day-off 	<ul style="list-style-type: none"> Operate 4 teams in 2 shifts + TSO Expand compensatory leaves and enforce designated day-offs 	<ul style="list-style-type: none"> Adopt 5 teams in 3 shifts Increase efficiency in the operation of job positions (concurrent positions, etc.)
Ordinary work	<ul style="list-style-type: none"> Designate the required resources of each O/H process Minimize the number of resources allocated upon an outbreak and unit commitment 	<ul style="list-style-type: none"> O/H'9 to 6' campaign at the Samcheonpo Division (zero overtime policy, minimize holiday work days) 	<ul style="list-style-type: none"> Create KOEN-type smart plant Relocate resources of power plants of which operation is suspended
No. of extended work hours per person	118 hours	67 hours	Overtime will be reduced further in the future

Support the working environment for the work-family balance

KOEN has concluded the work-family balance agreement with Jinju office of MOEL, operated the 'Ribbon Committee (with regard to gender equality and work-family balance)', and made efforts to create an employee-friendly working environment. For maternity protection and childcare support, we adopted the 'Dodam Dodam Package (conversion-type time selection system)' and improved the work engagement and satisfaction level of employees who were in the phase of childbirth or childcare. All female employees are provided with maternity leave and male employees are also encouraged to take maternity leave and use reduced working hours during the childcare period. Details of reduced working hours during the childcare period and maternity protection hours are included in the company regulations for company-wide compliance and we are also providing parental training programs for working moms and dads. We have run various programs to ensure regular intervals of work and rest for employees. With the Home On Time (HOT) Day, Relaxation-Day, and Block Leave, we promote the use of annual leave and reflect the work-family balance index, which was developed through the labor-management agreement to internal evaluations. KOEN encourages employees to get sufficient rest and engage in self development by notifying them of the number of unused annual leave days, turning off employee PCs when they are on a leave, and prohibiting employees from receiving work orders via social media.

Dodam Dodam Package



Create a 'great place to work' by promoting a happy management strategy

KOEN plans to build a corporate ecosystem of communication and trust and motivate employees by themselves by creating a workplace where they are happy to work. To this end, we have run various programs that employees can participate with their family members and reinforced communication channels. Also, we are working hard to enhance employee engagement with special lectures to help them build knowledge in liberal arts, programs for employee support, and overseas volunteer activities, etc.

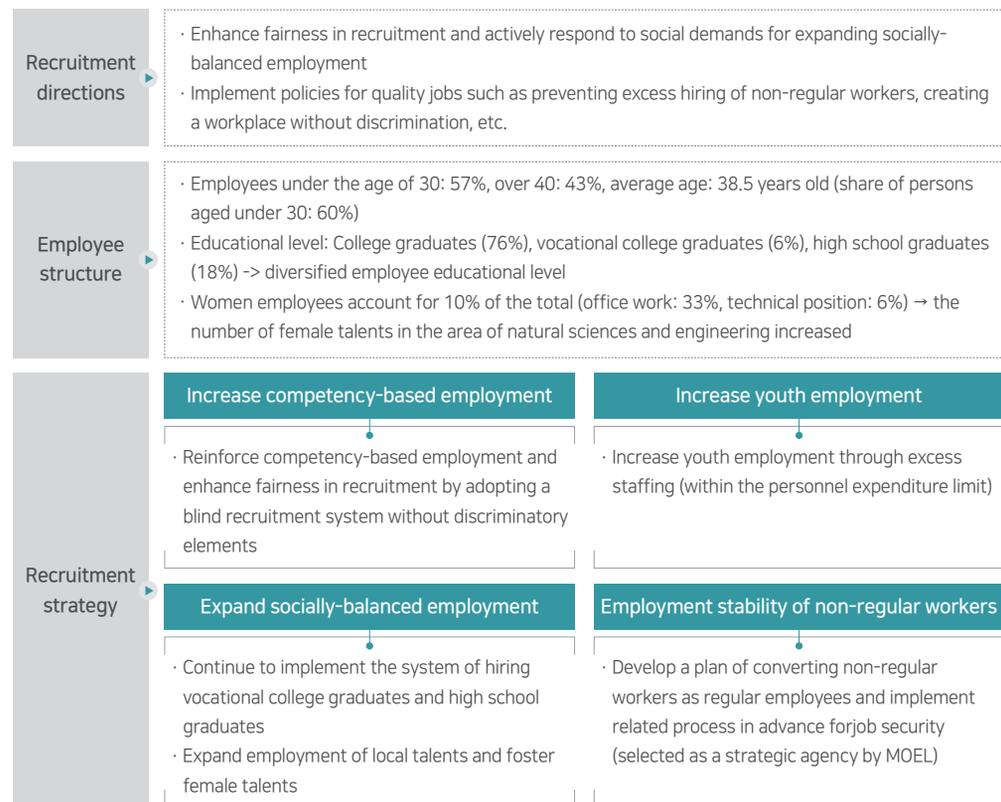


Enhance Decent Job Creation

Expand open recruitment and socially-balanced employment

KOEN operates a competency-driven recruiting system in line with the National Competency Standards (NCS) and contributes to creating jobs for local areas by implementing a recruitment quota system for local talents. In addition, we offer fair employment opportunities across the diverse spectrum of society by providing opportunities for vocational college graduates, career interrupted women, people with disabilities and national merit. Also, we adhere to the principle of minimizing non-regular workers. In 2017, we decided to convert 15 contract-based, dispatched, and outsourced workers as regular employees. Furthermore, we are complying with the guidelines for managing employees under unlimited contracts and applying the same retirement age as regular employees in order to prevent discrimination against non-regular employees in terms of remuneration and welfare.

Recruitment strategy to fulfill Corporate Social Responsibility



Open recruitment and socially-balanced employment results

Classification	Recruitment goal	Performance	Effort and achievement
Talents from the area of new headquarters	10%	15%	<ul style="list-style-type: none"> Employed additional local talents if the number of applicants was below the recruitment goal (excess staffing) Implemented preferential systems such as providing additional points to local talents, etc.
High school graduates	20%	20%	<ul style="list-style-type: none"> Implemented the recruitment system with limited competition for readily employed internships (vocational college graduates and high school graduates) to prevent reduced application
Vocational college graduates	10%	11%	<ul style="list-style-type: none"> Conclude MoUs for the industry-academia cooperation and provide internships for college students
People with disabilities	3.2%	3.5%	<ul style="list-style-type: none"> Exceeded the mandatory employment ratio: people with national merit (106%), people with disabilities (117%)
People with national merit	9%	9.5%	<ul style="list-style-type: none"> Received the Minister award from the Ministry of Patriots and Veterans Affairs (MVPS) for the excellence of hiring people with national merit

Social Value Creation

Effort and strategy to create jobs in the private sector

- Mid- to long-term job creation roadmap -

KOEN has established a mid-to long-term roadmap to create jobs in the private sector by reflecting the government's policy direction to its management goals named 'vision 2030.' Based on this, we aim to create decent jobs and preemptively respond to changes in the future by investing in core businesses in conjunction with the government's energy policies and the development of new businesses. In addition, we support various business partners to create a win-win ecosystem as well as sustainable jobs and continue to increase the number of jobs for groups vulnerable to employment such as youth, women, and seniors.

Mid- to long-term job creation roadmap

Directions ▶	<ul style="list-style-type: none"> · Create jobs by investing in core businesses in conjunction with the government's energy policies · Support business partners based on its know-how and technological prowess in the power generation sector · Make efforts to provide more jobs, focusing on the creation of social values 		
	Short-term (2017~2018)	Mid-term (2019~2020)	Long-term (2021~2022)
Mid- to long-term roadmap ▶	Target to create 18,000 jobs total	Target to create 54,000 jobs in total	Target to create 89,000 jobs in total
	<ul style="list-style-type: none"> · Reinforce environmental facilities, keep publicly-funded construction on track · Share of renewable energy generation accounts for 2.2% of the total 	<ul style="list-style-type: none"> · Convert fuels used in aging power plants, commercialize new technologies · Share of renewable energy generation accounts for 7.4% of the total 	<ul style="list-style-type: none"> · Construct new power sources, expand new business model · Share of renewable energy generation accounts for 13.4% of the total

Job creation records of 2017 in the private sector

Investment project	<ul style="list-style-type: none"> · Vitalize the national economy by investing in the construction of large-scale power plants and facility improvement projects · Improve power generation facilities, reinforce environmental facilities, invest in solar power, fuel cells, and others with regard to renewable energy 	734 persons
Private cooperation	<ul style="list-style-type: none"> · Timely implement privately-funded power generation and renewable energy projects at home and abroad · Promote privately-funded power generation projects at home and abroad, floating solar power projects based on public-private cooperation, etc. 	4,269 persons
Support for business partners	<ul style="list-style-type: none"> · Create jobs by enhancing the competitiveness of business partners · Improve the contract system, support the technological development and activities to discover sales routes, make efforts to expand purchase, etc. 	3,790 persons
Support for vulnerable social groups	<ul style="list-style-type: none"> · Make efforts to create jobs by fulfilling Corporate Social Responsibility and sharing values · Build a KOEN-public organization cooperation model for groups in employment challenges, establish and support disability enterprises and social enterprise 	121 persons
Balanced regional development	<ul style="list-style-type: none"> · Create jobs by vitalizing local economy · Create more jobs for local talents and support the industry based on the region by supporting recruitment of local talents and vitalizing the local economy 	109 persons

Fulfilling Social Responsibility of a Public Organization



Material Topic

There is a growing demand from the government and the public to create social values in public and private sectors in general. Also, Corporate Social Responsibilities are expanded to include value creation for various stakeholders, and creating shared values based on a business model is considered more important. As a public organization that is based on local communities, KOEN should make efforts to increase mutual growth of local communities and social contributions based on the power generation business, and respond to various human rights and ethics issues in multiple aspects.

Material issues

- Ethical management practices and establishment of fair-trade system
- Promotion of social contribution projects

Our Goal

KEMDEX score in 2030 **99** points
(KOEN's ethical management evaluation index)

Our Roadmap

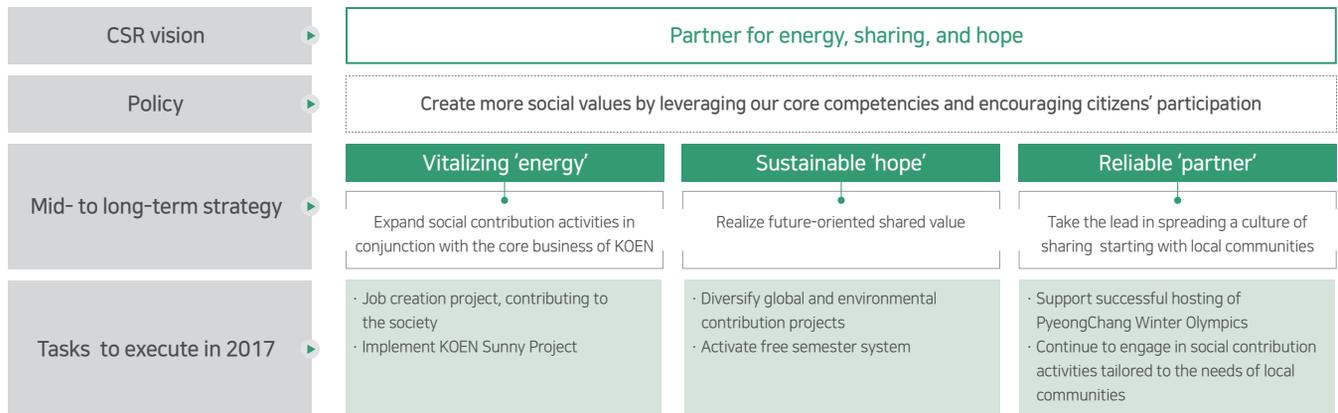
- Establish and improve KOEN integrity and anti-corruption infrastructure with an emphasis on integrity and transparency as a public organization
- Internalize integrity and ethics as a corporate culture and strengthen social contributions
- Secure a drive for sustainable growth by strengthening ethics and integrity

	2018~2020 (short-term)	2021~2023 (mid-term)	2024~2030 (long-term)
Establish a global ethics management system	<ul style="list-style-type: none"> · Establish a monitoring system complying with global standards - Establish a system to carry out compliance and monitor activities across the company 	<ul style="list-style-type: none"> · Expand organizations in charge of ethics management - Reinforce an ethical corporate culture and train experts 	<ul style="list-style-type: none"> · Develop an ethical management system complying with global standards - Establish codes of conducts reflecting global trends
Fully establish a corporate culture of ethics	<ul style="list-style-type: none"> · Reinforce programs to practice ethical behaviors - Expand the areas practicing ethical behaviors - Activate organizations to practice ethical behaviors at sites 	<ul style="list-style-type: none"> · Actualize open communication for KOEN - Diversify communication channels - Spread willingness and strengthen the participation system 	<ul style="list-style-type: none"> · Fully establish a corporate culture of ethics - Reinforce ethical management activities and communication channels - Strengthen transparency in work process
Strategic ethical management with stakeholders	<ul style="list-style-type: none"> · Expand plans to encourage stakeholder participation - Enhance the mindset of ethical management and increase participation-based activities to form a consensus 	<ul style="list-style-type: none"> · Reinforce activities to support stakeholder participation - Reinforce the effectiveness of ethical management trainings for stakeholders and performance analysis 	<ul style="list-style-type: none"> · Implement strategic ethical management for stakeholders - Run promotional activities of KOEN's ethical management - Strengthen monitoring of supporting activities
Establish a culture of practicing human rights protection activities	<ul style="list-style-type: none"> · Establish human rights protection system - Develop declaration of human rights and establish system - Disclose and report via the company homepage and reports constantly 	<ul style="list-style-type: none"> · Take the lead in the efforts of public organizations to spread the human rights management culture - Strengthen activities to spread the culture among public organizations - Strengthen the human rights management culture through ethics, integrity, innovation clusters 	<ul style="list-style-type: none"> · Engage in activities to spread the human rights management culture to the public - Engage in activities to strengthen human rights with the participation of citizens - Reinforce external reporting activities such as submitting a Communication On Progress (COP) to the UNGC

Expand Social Contributions to Build a Public Consensus

Establish a mid- to long-term system to promote social contributions in order to build a public consensus

KOEN aims to become a 'partner for energy, sharing, and hope' through social contribution activities to build a public consensus, creating shared values. To this end, we created a voluntary social contribution culture by strengthening our social contribution system and diversified models to support local communities. Also, we are running a strategic social contribution program based on the core business of power generation company with its unique social contribution brand.



8 DECENT WORK AND ECONOMIC GROWTH

 KOEN's efforts to support the UN SDGs

Enhance the company reputation, promote business, and respond to the government policy by supporting the local infrastructure

'KOEN Dream Job Project' to create jobs in the private sector

KOEN has signed on a business agreement with Korea Labor Force Development Institute for the Aged (KORDI), South Gyeongsang office of Community Chest of Korea, and other cooperative institutions to carry out KOEN Dream Job projects. Based on the agreement, we are implementing job creation projects for social contributions in various aspects with the aim of supporting financial independence of farmers, fishers and other vulnerable social groups and providing them with equal opportunities. In 2017, we created 67 new jobs for senior citizens and low-income groups in the private sector and supported the foundation of social cooperatives (local food markets). We received the grand prize in Korea Social Contribution Award and Korea Share People Awards and 4 other prizes from the government in 2017.

No. of jobs created in the private sector

67 persons



Sea Guardians



Silver cafe



KOEN's efforts to support the UN SDGs

Satisfaction level of stakeholders

97.8 points

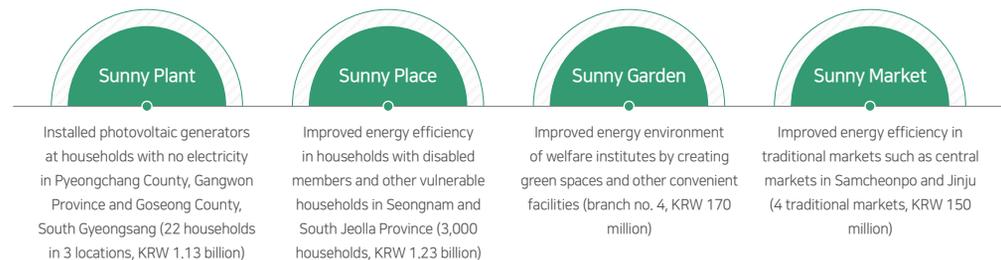
Accumulated no. of beneficiaries

3,200 households

'Sunny project' leveraging core competencies and the characteristics of a power generation business

The 'Sunny Project' is an energy welfare improvement project that provides light and hope to domestic households with no electricity, and makes a connection with energy, which is KOEN's key capability. Since the beginning of installing standalone photovoltaic facilities for the underprivileged in 2012, we have established four systematic support models - 'Sunny Plant,' 'Sunny Place,' 'Sunny Garden,' and 'Sunny Market,' and carried out activities that are connected with the key competencies of a public energy corporation.

Project details and achievements (accumulated)



'KOEN ECO Project' creating a rich natural environment

KOEN is implementing 'KOEN ECO Project' that contributes to creating a rich natural environment as well as sharing an eco-friendly value with local communities in order to fulfill environmental responsibilities of power plants. We expanded the 'Happy Spore Adoption Project', to improve facilities and protect the environment around the power plants in the entire division and improved roofs of 66 households of vulnerable groups in South Gyeongsang Province through the 'Asbestos Roof Improvement Project (a 2-year project to include 120 households in total).' Also, we adopted 'environmental experience programs' and provided various experience opportunities to children and local residents in the form of environmental film festival, program to provide correct information on coals, etc. The 'Urban Forest Creation Project for Carbon Offsets' is an eco-friendly project to share values, creating both environmental values to improve the urban environment in local communities and economic values to acquire emission credits. We are providing rest areas for citizens by creating a forest with a size of 12,000m² in the industrial complex and reducing GHG emissions (11tCO₂/year). Based on the eco-friendly project, we have received the grand prize in the Environmental-friendly Management Awards and a commendation from the Minister of the Interior and Safety (MOIS) for an outstanding group in spreading Happy Spore.



KOEN's efforts to support the UN SDGs

Promote implementation of a new hydropower project in Pakistan due to enhanced reputation

Improve brand image and create jobs in overseas business areas

'Global Sharing' activities with local residents in KOEN's overseas operating areas

In countries where we conduct our overseas business, such as Pakistan and Nepal, we carry out sharing activities in order to improve our brand image and provide a basis for new projects. A volunteer group that consists of KOEN expats, local groups, and university students is dispatched overseas twice a year to conduct volunteer activities, such as disaster recovery, installation of photovoltaic generators, educational and physical activities, and others. In 2017, we installed 20kW-class photovoltaic facilities and restrooms at schools with no electricity in Pakistan and walls at schools in flood-damaged areas in Nepal, providing a safe educational environment.



Building completion ceremony of Samcheonpo Central Market



Volunteer activities in rural communities

The 'Dream Growth Project' to foster future generations

The 'Dream Growth' project is an experiential education donation project for children and youth in areas located near power plants to help their academic achievement, career exploration, and social skill improvement. Through the 'Dream Growth Project', we provided educational programs to 2,747 underprivileged children and youth for the past three years, thus helping to resolve polarization. We also provided 8,180 children and youth with various career experience programs such as Sinbaram Energy School, Korea Edu-Donation Fair, and others. In 2017, we launched the KOEN volunteer group consisting of 50 university students in Jinju and provided tutoring, career counseling, and other mentoring services to children in local childcare facilities. In recognition of these efforts, KOEN received the Deputy Prime Minister's Award at the Korea Education Donation Awards for two consecutive years.

Support successful hosting of PyeongChang Winter Olympics and Paralympics 2018

KOEN was an official sponsor of PyeongChang Winter Olympics and Paralympics 2018 (financial support of KRW 5 billion) and provided game tickets to 624 elite child athletes, children of multicultural and single-parent families, and local residents. We also improved power generation facilities and convenience facilities in local communities in Pyeongchang, supported and conducted volunteer activities in three villages in Gangneung for a year. Furthermore, we provided sports equipment to squads in Nepal and Pakistan and operated Pakistan Supporters in cooperation with the local government of South Gyeongsang Province.

Taking the lead in spreading a culture of sharing with local communities

In September 2004, KOEN launched the KOEN volunteer sharing group and created the 'Sharing Fund' that composed of voluntary donations from employees and 'Matching Grants', corporate donations to implement volunteer and contribution activities tailored to the beneficiaries in consideration of the uniqueness of the region nearby the headquarters and power plants. We are providing various social contribution programs that aligns with the needs of local communities under the slogan of 'United people, a heartworm society'.

Status of KOEN social contribution activities

Classification		Major activities	No. of activities	Beneficiaries
Love neighbors	Support the underprivileged	Visit cultural sites with center for children in local childcare and provide daily necessities to welfare facilities	92	3,340 persons
	Share regional safety	Provide disaster recovery funds to the victims of Pohang earthquake, Yeosu fish market fire, etc.	5	KRW 290 million
Love culture	Support cultural events	Support Namgang Yudeng Festival, a cultural event for people with disabilities and children of multicultural families, and support film festivals	10	2,700 persons
	Host sports events	Host Gangneung environment and family sports competition, seaside marathon, etc.	2	3,500 persons
Love local communities	Support rural communities	Help with farm work during the busy season, volunteer, purchase and promote local agricultural products	34	40 rural households
	Support traditional markets	Company-wide activities to revitalize traditional markets by using Onnuri gift certificates and others	13	KRW 50 million
Love nature	Environmental clean-up activities	Environmental clean-up activities for roads, rivers, and villages in areas near power plants	122	6 cities and provinces
	Ecosystem protection activities	Plant trees, clean-up marine debris, activities to protect ecosystem	66	6 cities and provinces



Dream growth history school



Launching ceremony of Pakistani team supporters in South Gyeongsang Province for PyeongChang Winter Olympics

Establish a Global-level Ethics and Integrity Management System

Establish an execution ground for integrity and ethics based on ethics management system

KOEN has been operating the ethics management system based on "4Cs" – a detailed 'code' of ethics, 'compliance' system focusing on practices, and 'consensus' as tailored education system, as well as ethics management for 'cooperation' in order to establish an ethical corporate culture and internalize compliance culture. With the 4C ethics compliance system, we intend to improve the system that corresponds to the global standards. In 2017, we installed the human rights commission (with 5 members) to make decisions on issues related to human rights protection. Also, we have formed and operated the consultative body of integrity in Sacheon to expand the participation of local residents nearby power plants in carrying out activities to spread integrity. In addition, we amended our code of conduct for KOEN employees by reflecting the 'planned code of conduct for employees of organizations that are related to public services' in accordance with revisions of the 'Enforcement Decree of the Improper Solicitation and Graft Act' and the 'Code of Conduct for Public Officials' in 2018.



Violation of the Improper Solicitation and Graft Act

Zero cases

Assessment of the level of ethical awareness

97 points

Company-wide preventive activities to internalize a culture of compliance and integrity

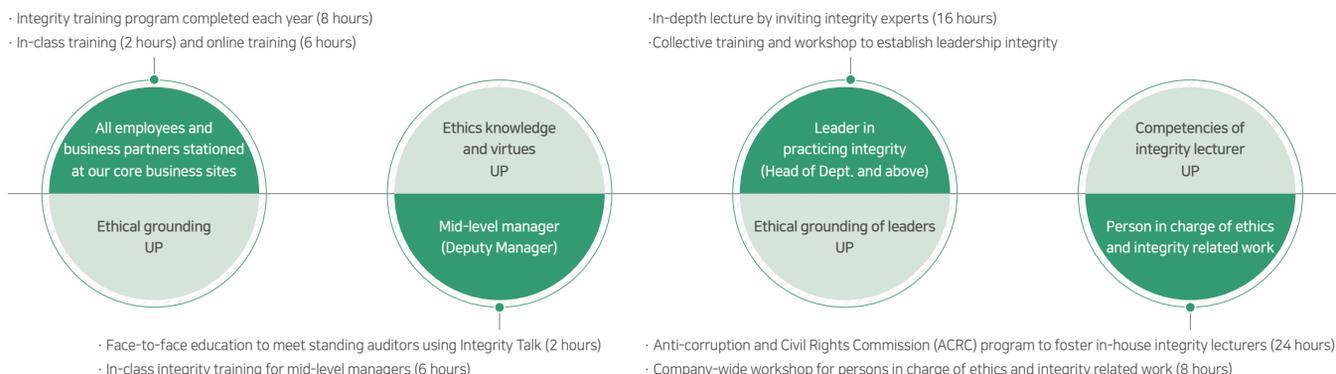
We conducted a self-diagnosis on all employees with regard to corporate culture to enhance internal integrity. Based on this, we launched a campaign to build a 'new corporate culture at KOEN' encouraging best practices such as flexible work program and eradicating unhealthy practices.

The compliance management system is gradually being reinforced after the implementation of the Improper Solicitation and Graft Act. For instance, we identified problems in operating the system and discovered areas for improvement such as reporting all external lectures, sending notice on the period of reporting changes (within 5 days after the change). Also, we are sending letters and educational materials with regard to compliance to stakeholders (including all employees and their families, private person performing public duties, and business partners). By sharing booklets on legal aid and promotional materials containing precautions in compliance, we are actively making effort to create a culture of compliance and integrity.

Provide customized ethics and integrity education and engage in participation-based activities to spread a culture of integrity

KOEN operates a competency-based ethics learning system to enhance a culture of integrity among employees and engages in activities to spread such culture with the participation of local residents via private-public-government network.

Ethics learning system based on level of competency



Ethics learning system based on the level of competency



KEMDEX compliance level

[Unit: points]



Improve the ethics management system through monitoring

Internal and external evaluations are used to systematically monitor our ethical management activities. We use the KOEN Ethics Management Index (KEMDEX)¹⁾ and internal anti-corruption evaluation results as part of our internal monitoring mechanism; and use the results of KSI evaluation and assessments conducted by ACRC and corruption prevention policy evaluations as part of our external monitoring mechanism. Based on the outcome of using these ethical management indices, we identify shortcomings, make improvements accordingly, conduct causal analysis, and provide counter measures.

Internal checking system to lead efforts to enhance publicness, transparency, and integrity

We have established a preemptive response system in order to come up with public interests in a fair, trusted, and transparent recruitment culture and operate a safe information security system in preparation for cyber terrors, etc. Based on this, we implemented internal control activities throughout the entire recruitment process and conducted joint investigations with the Board of Audit and Inspection on corruption in the hiring process. Also, we are actively implementing major government projects by auditing facility safety and in-house information security experts. In 2017, we were selected as an outstanding agency in the adoption of the blind recruitment system (and received the Minister Award by The Ministry of Economy and Finance, MOEF). We continue to identify shortcomings in safety systems at sites and information security management and take corrective actions.

1) KOEN Ethics Management Index (KEMDEX): This refers to KOEN's ethical management evaluation index. Ethical management is evaluated for all employees at all sites every year.

Establish Human Rights Management Principles and Stakeholder Participation

Establish a strategy system to promote human rights management principles

KOEN is making efforts to internalize human rights management principles that respect dignity and value of humans and promote sustainable development with stakeholders. Internally, we aim to create a healthy and happy workplace by eliminating various discriminatory elements related to employees. Also, we plan to promote the values of all stakeholders who are directly and indirectly involved in our management activities externally.

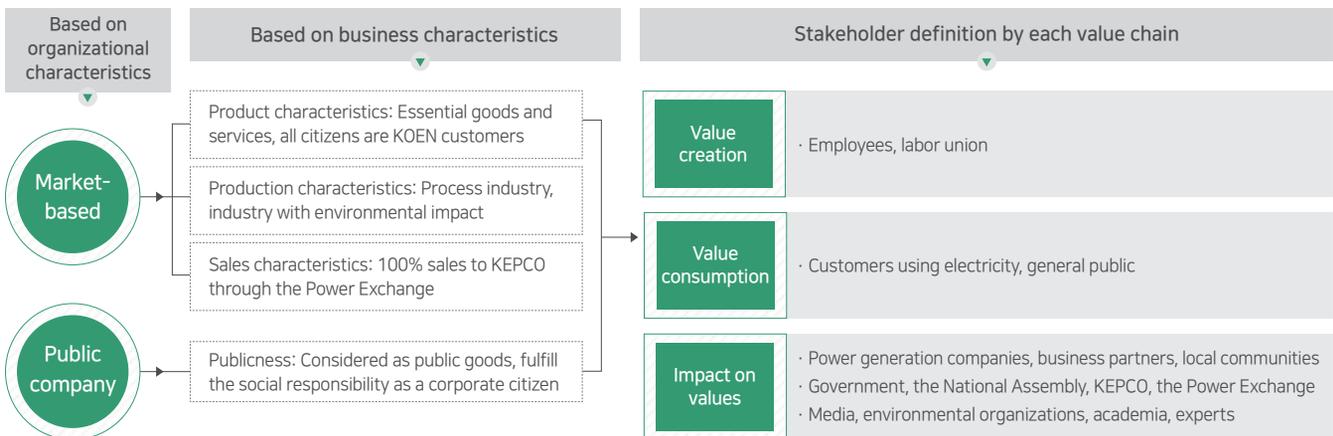
To this end, we have developed a strategic system to promote human rights management and the declaration of human rights management. The KOEN declaration of human rights management states the activities of human rights compliance and the basis for value judgment that all employees must follow. We also specified the criteria of practicing human rights declaration by establishing guidelines. Our human rights management efforts are disclosed internally and externally on the human rights management page of the company website.



Realize social values by protecting human rights

All employees of KOEN comply with the principles stated in the declaration of human rights management and strive to promote human rights of all stakeholders. We defined main players of production (employee and labor union) and consumption (end users of electricity and general public) based on the value chains and set various main players of society (local communities, business partners, government, media, and environmental organizations) who are affected by such values as stakeholders. We have developed a checklist in accordance with the human rights management guidelines of National Human Rights Commission of Korea (NHRC), checked the human rights status, and identified human rights issues of each stakeholder. Also, we are conducting a human rights impact assessment on a regular basis to discover and take corrective actions on issues found, and regularly report the outcome of inspecting the execution status of human rights management.

Definition and classification of stakeholder groups



Efforts to protect human rights

KOEN is dedicated to preventing human rights violations of stakeholders by identifying key human rights issues that are highly likely to occur and taking proper and valid actions for them.

Key human rights issues	Stakeholders	Detailed activities
Protect labor rights	Employees	<ul style="list-style-type: none"> Prohibit discrimination: We do not discriminate employees based on gender, religion, disability, age, social status, origin, etc. (utilize blind recruitment, set a criteria to disclose information on promotions) Guarantee freedom of association and collective bargaining: We recognize the freedom of association and collective bargaining of employees. Compliance with the working hours: We prohibit all types of forced labor including child labor and comply with the working hours stipulated in labor laws and regulations (enforce Hot-Day and flexible work program)
Guarantee occupational safety	Employees	<ul style="list-style-type: none"> Create a safe working environment: We always keep safety gears and facilities clean and safe (adoption of the workplace safety index). Protect vulnerable employees: We take separate safety and sanitary measures for pregnant workers, employees with disabilities, and other vulnerable workers.
Access to electric power services	Customers	<ul style="list-style-type: none"> Support energy vulnerable groups: We provide power to households with no electricity and other energy vulnerable groups (Sunny Project).
Responsible supply chain management	Business partners	<ul style="list-style-type: none"> Expand mutual growth: We establish a system for mutual growth and support our business partners to become Small Giants (the Huddling Company Conference for mutual growth). Support to enhance technological competitiveness: We support business partners to improve their technological prowess to ensure competitiveness (promote multilateral R&D alliances).
Protect human rights of local residents	Local residents	<ul style="list-style-type: none"> Spread a culture of sharing based on regional characteristics: We make efforts to vitalize local culture and economy by sharing activities considering the uniqueness of the region (Nangaram Eco-Powertopia project, activities to support traditional markets). Guarantee environmental rights: We protect the right to life of local residents with activities to prevent, reduce, or control environmental damages (operate environmental monitoring groups, environmental supporters).
Protect the human rights of children and migrant labor	Children Migrant labor	<ul style="list-style-type: none"> Prohibition of child labor: We do not hire young people under the age of 15. Prohibition of discrimination against migrant workers: We do not discriminate against migrant workers on employment or working conditions.

Identify potential human rights issues

We identify potential human rights issues related to key stakeholders and prevent elements that violate their human rights.

Stakeholders	Assessment ratio	Potential risk detection rate	Ratio of taking corrective actions	Identification of potential risks	Description of corrective actions
Employees	100%	13.83%	100%	Detect potential human rights violations of female workers and employees with disabilities	<ul style="list-style-type: none"> The Ribbon Committee Worksite child care centers Safety measures for disabled employees
Business partners	100%	10%	100%	CSR implementation of major suppliers	Implement supply chain evaluation and due-diligence process
Local residents	100%	4.9.11%	100%	Arsenic acid issues at the Yeongheung Power Division	Make efforts to avoid arsenic acid generation at fly ash treatment sites and relocate coal yards into the premise

Create customized communication system for each stakeholder

KOEN strives to share its vision and strategy with internal and external stakeholders and create shared social values. We have redefined our stakeholders considering the characteristics of market-based public corporation that produces and sells electricity and its value chains and operated customized communication systems reflecting the unique features of each group.

Effort and achievement to communicate with stakeholders

Stakeholders	Expectations	Communication efforts	Achievement and external recognition	Measurement and assessment result of communication activities
Employees	<ul style="list-style-type: none"> Direct communication with CEOs Effective communication with other departments for business activities 	<ul style="list-style-type: none"> Monthly management meetings (14 times), brand training (2 times) Proposals received to improve inefficient job position (123 cases) 	<ul style="list-style-type: none"> Maximum no. of proposals among domestic power generators (avg. 14 cases/person) Received the grand prize at Korea Idea Management Awards for 6 consecutive years 	<ul style="list-style-type: none"> Level of sharing vision, core values, and strategy 2016: 94.1 points -> 2017: 94.7 points Internal acceptance of opinions, fairness and cooperation index 2016: 94.6 points -> 2017: 95 points
Labor union	<ul style="list-style-type: none"> Wage increase and welfare expansion The Work-life balance management 	<ul style="list-style-type: none"> Sharing of current issues and visiting presentations on management (18 times) Labor-management councils (29 times) 	<ul style="list-style-type: none"> Selected as labor-management partnership program Accredited as implementing the best practices in terms of the labor-management social responsibility 	
Customers and general public	<ul style="list-style-type: none"> Transparently disclosing information Expanding participatory channels 	<ul style="list-style-type: none"> Expanded voluntary disclosure of information (219 cases in '16 -> 225 cases in '17) Selected as an open innovation task to encourage participation of citizens with outstanding results 	<ul style="list-style-type: none"> Achieved a Zero case of errors in materials disclosed in the website of Public Management Information System (ALIO) Received the Minister prize at Open Innovation Competition of the Ministry of Trade, Industry and Energy (MOTIE) 	<ul style="list-style-type: none"> Satisfaction level of local residents (citizens) 2016: 96.7 points -> 2017: 97.8 points Mutual growth satisfaction level of partner companies 2016: 95.2 points -> 2017: 96.2 points Voluntary disclosure of unique information 2016: 219 cases -> 2017: 225 cases
Local communities	<ul style="list-style-type: none"> Vitalize regional economy Increase social contributions 	<ul style="list-style-type: none"> Namgaram Eco-Powertopia (economic contribution) program Implemented the energy welfare Sunny Project (social contribution) 	<ul style="list-style-type: none"> Made investments to vitalize local economy (119 cases, KRW 150.6 billion) Received the grand prize at Korea Social Contribution Award 	
Business partners	<ul style="list-style-type: none"> Strengthen technological competitiveness Expand the mutual growth 	<ul style="list-style-type: none"> CEO's visit to business partners (9 times), round-table conferences (12 times) Hosted the Huddling Company for shared growth (470 participants) 	<ul style="list-style-type: none"> Ranked at the top on mutual growth by MOTIE for 6 consecutive years (the only public organization that achieved such feat) 	
Government and National Assembly	<ul style="list-style-type: none"> Job creation Implementation of major government projects 	<ul style="list-style-type: none"> Installed a team dedicated to job creation (in Sept, '17) Held Job creation Committee meetings (15 times) and related forums 	<ul style="list-style-type: none"> Created 9,530 jobs in the private sector in power generation construction, facility investment, privately-funded projects at home and overseas, etc. 	
Media and environmental organizations	<ul style="list-style-type: none"> Reduction of fine dust Environmental pollution prevention 	<ul style="list-style-type: none"> Citizen inspection team to provide corrective information on coal-fired power (100 persons) Operated KOEN environmental supporters (15 college students) 	<ul style="list-style-type: none"> Reduced fine dust emissions by 19.1% compared to 2015 Received the Environment Minister Prize for sustainability management 	

Social Value Creation

From conflict to harmony, from harmony to shared growth

- Response of the Yeongheung Power Division to environmental complaints-

KOEN's Yeongheung Power Division held 8 meetings with local residents to deal with arsenic in coal fly ash generated in the treatment facilities. The cultivated land nearby the Division was damaged by arsenic dust in November, 2017, due to unexpected cold climate and gusts of wind. It was not a one-time event and the land was continuously affected. Hence, the power division and local residents had formed a consultative body to discuss countermeasures. As a result, the entire employee of the Yeongheung Power Division directly engaged in damage recovery activities such as providing anti-dust covers and covering up seeds with soil. The Division also installed an emergency taskforce to resolve conflicts and faithfully engage in negotiations with local residents. After ceaseless efforts including 8 meetings and 2 negotiations, the Yeongheung Power Division and local residents came to an agreement on 'consultative body for damage recovery of Oe 1 ri (Sojang-gol) residents and mutual growth' on March 29, 2018. As for damage recovery and mutual growth, the Division promised to implement its environmental improvement plan that was disclosed in the presentation for local residents, which took place on January 11, 2018, and agreed to take measures for job creation, income increase, and improvement of living conditions of local residents. Also, the task force agreed to recycle fly ashes such as pond ash to efficiently use natural resources in order to facilitate power generation activities and for mutual growth with local residents. KOEN will take the lead in handling social and environmental issues in its operating areas as well as human rights issues of local residents to grow with the local communities.

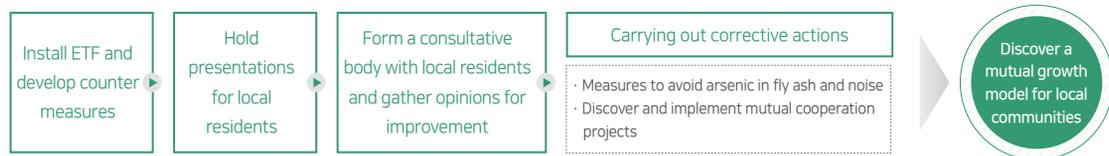


On-site visit by CEOs



Agreement signing ceremony

Develop comprehensive measures to handle environmental complaints, centering on emergency task force (ETF)



Improvement efforts based on the opinions of local residents

Classification	Reflect the opinions of local residents	Further improvement efforts	Strengthen monitoring
Avoid arsenic in fly ash treatment system	<ul style="list-style-type: none"> Ceased recycling of pond ash during the winter season and installed anti-arsenic nets Cover seeds with soil and reinforce watering facilities 	<ul style="list-style-type: none"> Separately manage areas with covered seeds and those for reclamation (recycling) Reclaim lands in nearby areas in advance and cover up seeds with soil Outsource cleaning and management of ash treatment sites to an expert organization for enhanced management 	<ul style="list-style-type: none"> Operate inspection teams to encourage participation of citizens (on a frequent basis) Promote installing additional measuring instruments
Relocate coal yards to the premise	<ul style="list-style-type: none"> Reduce the period of complete relocation of coal yards by 12 months in gradual stages * Shortened the period by 15 months compared to precedence cases (other power plants) 	<ul style="list-style-type: none"> Install anti-dust nets to windbreaks Install smart watering facilities considering wind speed and dust concentration Apply system and operate the scope by two-folds 	

Maintain the Safety and Security System for the Public



Material Topic

Efforts are needed to upgrade the safety and security system in response to natural disasters as well as intelligent cyber attacks which is getting bigger in size. In particular, it is imperative to respond to disasters comprehensively in prevention, preparation, and follow-up measures. This is due to the fact that disasters in power generation facilities directly affect the safety of the public and the national power supply. Also, we need to reinforce security to adopt new and emerging technologies of the fourth industrial revolution, such as smart plant, virtual plant, and others, to make them less vulnerable to cybercrimes.

Material issues

- Operate a global safety management system

Our Goal

No. of major disasters and industrial accidents **Zero**

Our Roadmap

- Reinforce the status of an energy corporation leading the efforts to promote energy welfare of the public and drive the growth of national industry through stable power supply
- Fulfill the social responsibility of a public organization to protect the safety and life of the general public and realize a secure society
- Improve public awareness of safety and security and substantially decrease the occurrence of such accidents

	2018~2020 (short-term)	2021~2023 (mid-term)	2024~2030 (long-term)
Prevention	<p>Secure and invest in disaster safety infrastructure</p> <ul style="list-style-type: none"> · Build a disaster management system based on risk assessment and analysis · Develop a disaster prevention system 	<p>Establish a disaster management system based on risk assessment and analysis</p> <ul style="list-style-type: none"> · Operate a disaster prevention system in conjunction with public/private big data 	<p>Develop and upgrade an integrated KOEN disaster management system</p> <ul style="list-style-type: none"> · Operate and upgrade an integrated disaster prediction system
Preparation	<p>Strengthen a cooperation network upon disaster and response capabilities</p> <ul style="list-style-type: none"> · Reinforce operation of cooperation network in preparation for disasters · Establish a platform to foster KOEN-type disaster management experts 	<p>Establish a governance network in preparation for disasters</p> <ul style="list-style-type: none"> · Upgrade the platform to foster disaster management experts 	<p>Establish disaster management governance based on the communication and experiences of the public</p> <ul style="list-style-type: none"> · Maximize individual and organizational disaster response capabilities at sites
Response	<p>Maximize organizational capabilities of responding to disasters and making decisions</p> <ul style="list-style-type: none"> · Build an integrated control and response system based on manuals · Strengthen decision-making capabilities by using disaster prediction system 	<p>Operate smart disaster response manuals</p> <ul style="list-style-type: none"> · Strengthen capabilities of control tower based on the information and situation 	<p>Develop disaster response manuals designed to solve problems</p> <ul style="list-style-type: none"> · Upgrade functions and capabilities of control tower
Recovery	<p>Reinforce execution of continuity plan for core business</p> <ul style="list-style-type: none"> · Enhance the recovery plan to secure functional continuity · Reinforce feedback system to investigate causes of disaster and further improvement 	<p>Establish a resilience-based recovery plan and execution process</p> <ul style="list-style-type: none"> · Apply scientific methods to investigate causes of disaster and develop countermeasures 	<p>Establish a sustainable management system for business continuity</p> <ul style="list-style-type: none"> · Upgrade methods to develop a disaster management plan

Establish an Integrated KOEN Disaster Management System

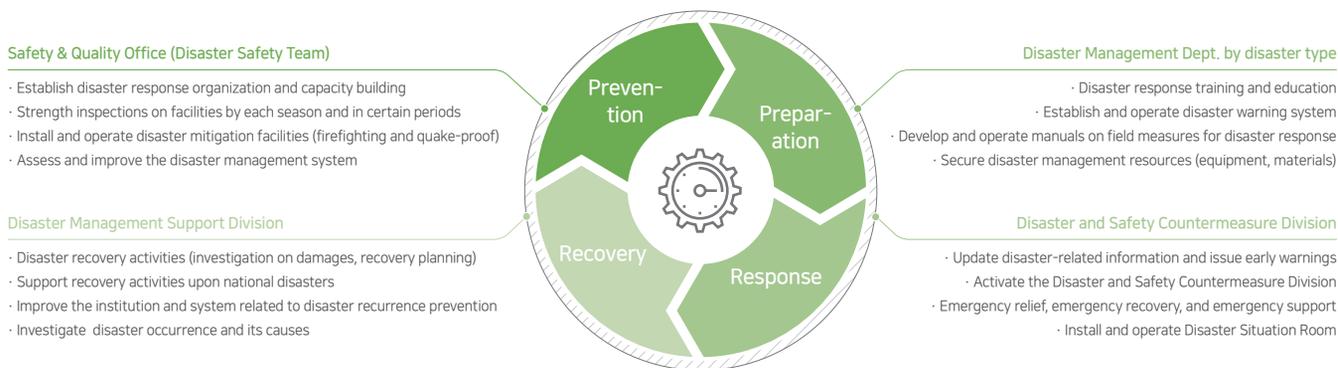
Operate on-site centered disaster management system

We have established three major disaster management strategies – ‘safety awareness,’ ‘safety system,’ and ‘safety infrastructure’ – in order to thoroughly prevent major disasters and industrial accidents and create a safe workplace. Based on major strategies, we are engaging in various activities such as operating the on-site centered disaster management system. We aim to respond to complex and massive disasters in various forms. We have established the disaster management systems to consist of 4-Steps and a disaster response process. We have also conducted disaster preparation inspections (18 times) and disaster response trainings (154 times) to effectively prepare for the disaster.

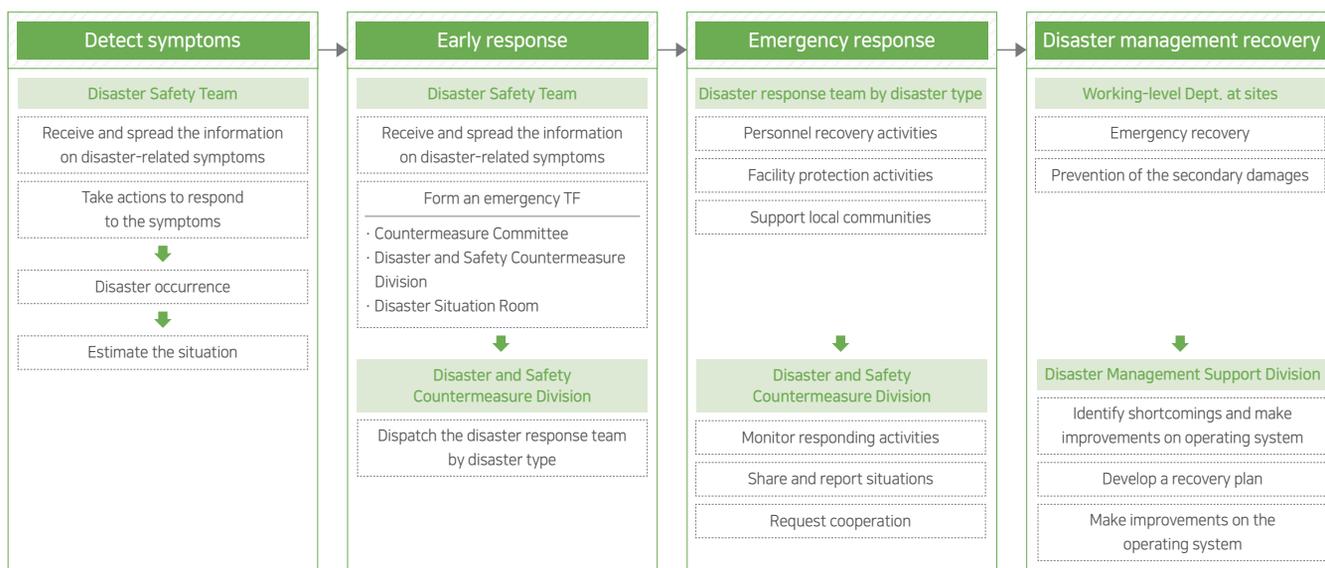


KOEN disaster management system

· The 4-Step disaster management



· Operate the disaster response process



No. of field safety
management experts fostered

70 persons

Establishing the KOEN Disaster Safety Management System

KOEN has built the KOEN Disaster Safety Management System (KDSMS) in June, 2018. This integrated computer system is for the comprehensive management of disaster, safety, process safety, and chemicals, and enables disaster safety management and information sharing in real-time. We are also promoting the voluntary execution of safety management by identifying and improving weak points based on performance monitoring.

No. of disaster response
experts fostered

31 persons

Reinforce expertise in disaster management

We are fostering safety management staff to increase on-site safety management capabilities. We have fostered 70 on-site safety management experts through training programs customized to KOEN. In the meantime, we are also nurturing disaster response experts to respond to various types of large scale-disaster and upgrade the disaster prevention and preparedness system with our know-how. In 2017, 31 employees acquired certifications, we established self-protection plans of each power plant, and we upgraded manuals on field measures by disaster type.

Social Value Creation

Strengthen social responsibility of a disaster management agency

- Disaster prevention and management of local communities -

KOEN is making efforts for disaster prevention and prompting mitigation in local communities to fulfill social responsibility as a public organization. For example, the Bundang Power Division launched the 'Fire-free village' project in a housing complex nearby the Division for disaster prevention and preparedness. To make the village safe, the Division has provided fire extinguishers and fire detectors (1,568 units), and offered other firefighting appliances for socially vulnerable groups as it was designated by the government as a support center to provide firefighting equipments for households.

When a disaster or fire occurs nearby the Division, our fire brigade is dispatched, contributing to suppressing the fire. We worked hard for the safety of local communities by promptly responding to multiple fire accidents that occurred in the forest in Gangwon Province, the sawmill and plant in Mojin-ri, and the ones that took place in houses and parking lots in Wolyeong Village and others. In recognition of our disaster mitigation efforts, we received a Prime Minister citation in the 2017 disaster management assessment of the national infrastructure system, and the MOIS awards (the Samcheonpo, Bundang, and

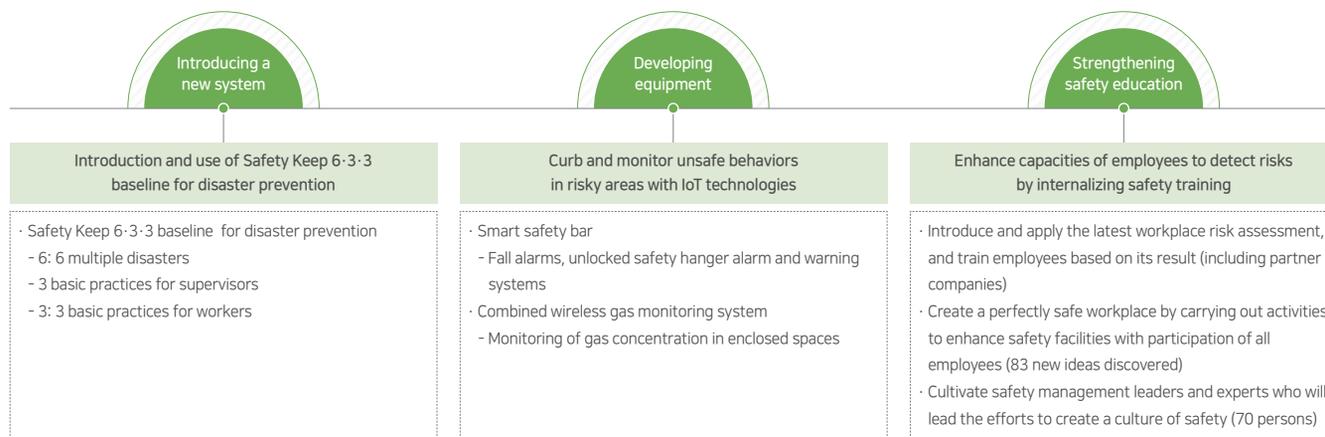
Yeongheung Divisions) at the Korea Safety Awards. Meanwhile, we are actively providing disaster training and safety education programs for local residents. Our training programs are discussion-based learning in which local residents participate from the planning and the design phase, and the private-government-public joint drills are carried out in preparation for fire accidents. Our safety education is composed of experiential firefighting and safety learning programs. To be specific, we have provided children, senior citizens, people from migrant families, and those who are vulnerable to safety accidents by providing them with safety experiences using virtual reality. In addition, we are launching nationwide campaigns to inform disaster responses by disaster types and vulnerable periods to raise public awareness on disaster preparedness. In 2018, we participated in the large-scale national safety assessment along with the central government, local governments, and citizens, conducted assessments on facilities, buildings, and safety-related systems, and checked our safety-related systems for the purpose of preventing safety-related accidents and large disasters throughout the society.

Create a Safe Work Environment

Systematize safety management based on the analysis of industrial disaster

KOEN has developed three directions for safety improvement – safety system, safety infrastructure and safety awareness – by analyzing safety-related accidents for the last 10 years. Based on the directions, we are engaging in activities to fundamentally reduce safety-related accidents by controlling employee's unsafe behaviors that are the main causes of industrial disasters and introducing IoT technologies with regard to high-risk works.

Three measures to enhance safety management



Provide optimal employee health management programs

KOEN has been providing a comprehensive mental health care service for employees (EAP) since 2015. Through EAP, we are providing professional consulting services to handle job stress, organizational conflict, family issues, financial problems, and others. It is designed to help our employees to create a safe workplace and a sound family. In 2017, we provided 617 medical consulting services to employees by concluding an agreement with 4 general hospitals. We plan to expand the program to include employees of partner companies as well as local residents who are vulnerable to safety-related issues to provide them with an opportunity to consult their job stress and other conflicts in their daily lives in 2018.

Support partner companies to reinforce their safety competencies

We are implementing the 'Safety Plus' activities to reinforce safety management of all employees of partner companies stationed in our plants. The 'Safety Plus' is unique set of activities that we have established for the safety of workers of partner companies as they are most prone to safety-related accidents. Heads of the safety management department of KOEN and those in the main office of business partners conduct safety checks at each site. We also operate safety diagnosis and safety improvement activities with our business partners in collaboration with safety experts. In addition, we are holding joint discussions with partner companies to come up with measures for improvements and spread the measures found to all our partners to prevent major industrial disasters.

KOEN is providing disaster and safety mentoring services to support partner SMEs to check their status of disaster and safety management and develop a voluntary safety management system. In April, 2017, we conducted disaster and safety mentoring services to 4 partner companies, detected potential risks (42 cases), and developed counter measures. In addition, we are engaging in various safety-related activities such as supporting their efforts to acquire the safety and health management system (KOSHA 18001), providing 'safety inspection checklists used before work (forklift, hoist, etc.)' and safety goods. Moreover, we are holding safety meetings once or twice a month with the managers and safety administrators of partner companies to prevent industrial disasters.

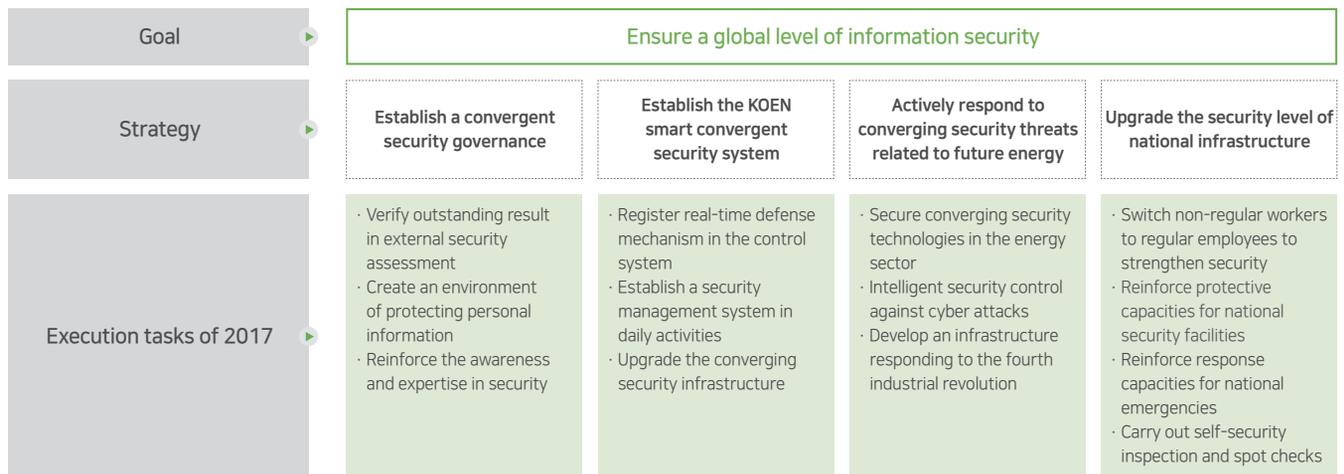
Establish the KOEN Convergence Security System

Preemptively secure an information security base

We have established a preemptive information protection strategy along with growing needs to strengthen the security system due to the expansion of renewable energy use and sophisticated and intelligent cyberattacks. Also, we have strengthened our capabilities to respond to cyberattacks by upgrading the control function of our internal Cyber Safety Center through the introduction of a big data-based next generation integrated safety monitoring system. A KOEN convergence security master plan was established to preemptively respond to security issues of the 4th industrial revolution.

In 2018, we have reinforced an information security-related organization by creating the ICT Security Office to create synergy effects between organizations in charge of information security and safety and ICT. By creating the ICT Security Office, cooperation with departments that are responsible for ICT operation has strengthened, and their organization capacities have enhanced. We are allocating and executing over 30% of our ICT budget to information protection-related activities each year.

Information protection strategy



Improve and reinforce the management system to internalize a culture of information protection



¹⁾ KIISC Technical Committee on Cyber Physical Systems (CPS) Security: It is the largest research association under the Korea Institute of Information Security & Cryptology (KIISC) and conducts researches on converging security technologies



Build a dedicated network for renewable energy facilities

Best organization

Drills and practices against cyber-attacks at Eulji training (received the MOIS Minister Prize)

Zero case

No. of cyber intrusions
No. of personal information leaks and exposures

Building an information protection infrastructure based on core security technologies

We have established Korea's first safety monitoring system in power generation control along with recently increasing threats against industrial control system (ICS). Currently, we have completed the safety monitoring system in the control system at the Yeungheung Power Division. We are planning to develop the safety monitoring system at the Samcheonpo Power Division in the second half of this year.

We strive to resolve security issues of renewable energy facilities whose numbers are rapidly increasing along with new paradigms of the government's energy policy. In particular, we have built a dedicated network for renewable energy in order to remove vulnerabilities of such facilities that are exposed to external Internet networks due to their characteristics. With the establishment of dedicated lines, internal and external data of renewable facilities are safely linked and managed. In addition, we are conducting research to develop an integrated security management platform for renewable energy in collaboration with private companies. It is an R&D project with the aim of securing data integrity and visibility in products regardless of energy sources.

Reinforcing response capabilities for future cyber attacks

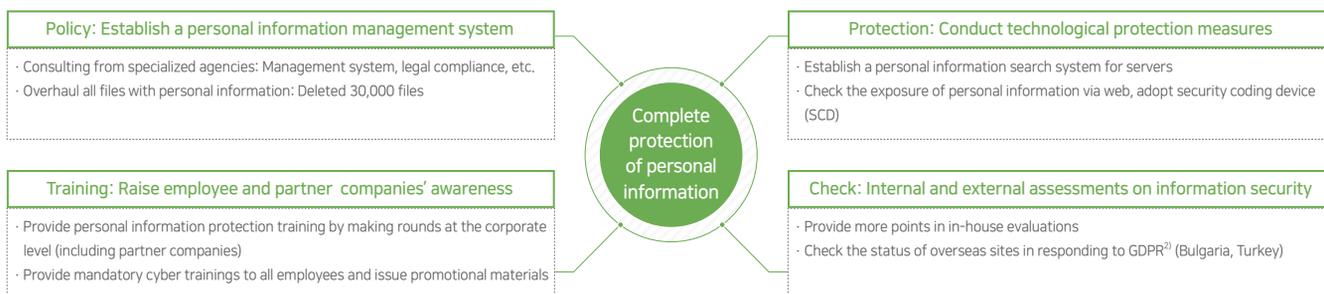
In the meantime, we are fostering experts in order to respond and defend against cyber-attacks that are getting more sophisticated each day. We plan to nurture 30% of our security personnel as key talents in information security by 2020. Furthermore, we are providing quality training programs to our employees, including the one that is provided at private security companies (5 persons for a month), and training for special security equipment operators at site (2 persons). In addition, we have been discovering talents at sites by holding the KOEN hacking competition since 2017. Our efforts to reinforce capabilities responding to future cyber-attacks produced outstanding results in the government's cyber hacking competitions. We received the second prize and the third prize at the hacking competition of MOTIE and the National Intelligence Service (NIS), respectively.

Considering that external email services are main roots for hacking accidents, we are implementing the 'KOEN email authentication system.' For emails of which safety is guaranteed, a certification mark is displayed to ensure reliability and we provide a two-step security measure to read emails in order to block malicious codes in advance. Such system is used to prevent automatic execution of malicious codes that may arise from a user's malpractice. Also, we share the cyber threat information in real-time that is provided in various sources from private companies, government agencies, and public organizations and upgrade Cyber Safety Center by adding more shift workers.

Setting a safe personal information protection system

KOEN has established the personal information management system, provided multiple technological protection measures, conducted inspections, prevented massive information leaks, and responded to the strengthened Personal Information Protection Act. Based on such efforts, we successfully renewed the Personal Information Management System (PIMS¹) certification and upgraded the level of personal information protection.

KOEN's efforts for personal information protection



1) Personal Information Management System (PIMS): A certification of personal information protection management system. It is accredited to outstanding companies and organizations in terms of personal information protection after review by the Korea Communications Commission (KCC)

2) General Data Protection Regulation (GDPR): It is a regulation in EU law on data protection and privacy for all individuals in Europe

Smart and Win-win Security System to Protect Information Asset

Create a secure and smart working environment

Our working environment is changing with the adoption of smart office and smart plants. Hence, we are creating a security environment for smart working by introducing ICT technologies in the information protection system. Based on this, we have taken measures to activate a systematic security system in daily activities such as sending and receiving materials and implemented a safe and effective security system with IoT technologies.

KOEN's efforts for Smart Work

Classification	Smart work-related areas	Description	Impact on information protection
Store document data in central server	<ul style="list-style-type: none"> Smart office Data sharing with partner companies 	Block saved documents and data in PCs for work, store them in the central server <ul style="list-style-type: none"> Prevent information leak in advance through management of documents in central server, unify document storage for management and control 	<ul style="list-style-type: none"> Integrated security monitoring Prevent data leaks
Build a basis for IoT communication	<ul style="list-style-type: none"> Smart plant Implement IoT 	Build a private-LTE network dedicated to KOEN to utilize IoT technologies <ul style="list-style-type: none"> Prevent potential hacking and security-related accidents by using a common communication network 	<ul style="list-style-type: none"> Prevent mobile hackings Protect critical data and information
Mobile photo transfer system	<ul style="list-style-type: none"> Maintain power generation facilities Use photos of sites to conduct businesses 	Immediate transfer of photos taken by using smart phones to in-house operating system <ul style="list-style-type: none"> Based on the security infrastructure of mobile phones, photos are not saved internally 	<ul style="list-style-type: none"> Use immediate transfer instead of USB devices Block malicious codes with access to the KOEN system

Actualize win-win security by boosting the security level of partner companies

We support partner companies in their efforts to develop an information protection management system and strengthen a basis for information protection as they are considered as weak points for security. We proactively block personal information leakage through partner companies by building dedicated networks and providing virtual PCs, and carrying out monitoring 24/7 through the Cyber Safety Center. Also, we conduct security checks at sites and provide consulting services, and conduct information protection trainings for partner companies. In addition, we have donated a recyclable security system and supported their efforts to acquire the information protection management system certificate to enhance the security level of both KOEN and partner companies.

Win-win security system

Classification	Policy	Infrastructure	Training
Major achievements in 2017	<ul style="list-style-type: none"> Included items related to the security management and supporting measures for partner companies to our guidelines and procedures Established a dedicated email drill system for partner companies and conducted drills that are the same as those carried out in KOEN 	<ul style="list-style-type: none"> Supported security devices and equipment that is on the level of those in KOEN (for blocking cyber intrusions and malicious websites, etc.) Established a dedicated data exchange system → minimized the use of USB devices 	<ul style="list-style-type: none"> Expanded training opportunities such as security workshops, external security training programs, etc. Implemented security trainings by sharing the results of internal and external security checks and case studies

Management Switch



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Corporate Governance

2017 BOD meetings

15 times

Participation rate in BOD meetings

96%

Transparent composition and operation of the BOD

KOEN is making rational business decisions by securing transparency, expertise, and independence of the Board of Directors (BOD) based on a sound corporate governance. The BOD consists of nine directors – four executive directors, including the president and standing auditor, and five non-executive directors. One of the non-executive directors is appointed as the BOD chairman in accordance with Article 21 of the Act on the Operation of Public Organizations and Article 3 of the Regulation of the BOD.

Authorization of making business decisions that are related to company management are delegated to the BOD and the CEO and the president has the practical decision-making authority on general company business except for matters decided by the BOD. Decisions made by the BOD are disclosed transparently through the company homepage and the State-owned/State-controlled organization information disclosure system (ALIO; www.alio.go.kr).

There are general BOD meetings and extraordinary BOD meetings, and they are held at the request of the chairman or request of at least one-third of the registered members. Conflicts of interest are prevented by disallowing directors whose interests are related to the matters to be decided from exercising their right to vote.

Composition of the BOD (as of June 30, '18)

	Classification	Name	Specialized areas	Key experience	Tenure	Concurrent holding of positions
Executive Directors	President & CEO	Lyu, Hyang-reol	Management, power generation	Senior Executive Vice President of Overseas Business Operation Division, KEPCO	Feb. 13, '18~Feb. 12, '21	-
	Standing Auditor	Choi, Sang Hwa	Management, administration	Chief of the Presidential Press 'Chunchugwan,' Office of the President	Jul. 18, '16~Jul. 17, '18	
	Head of Planning & Management Support Division	Lee, Yong Jae	Power generation	Head of Corporate Planning Department	Jun. 1, '18~May 31, '20	
	Head of Power Generation & Construction Division	Kim, Hak Hyun	Power generation	Head of Samcheonpo Power Division, KOEN	May 9, '16~May 8, '18	
Non-executive Directors	BOD Chairman	Kim, Jong Sung	Management, economy	Vice President of Hanam Economic Development Research Institute	Mar. 6, '15~Mar. 27, '18	-
		Choi, Chi Gyu	Technology	Acting President, Jeju National University	Jul. 8, '16~Jul. 7, '18	Emeritus Professor of Department of Physics, Jeju National University
		Park, In Cheol	Economy	Commissioner of Daegu-Gyeongbuk Free Economic Zone Authority	Feb. 8, '17~Feb. 7, '19	-
		Ma, Ho Seop	Regional development	Chairman, Korean Society of Forest Engineering	Feb. 8, '17~Feb. 7, '19	Professor of Department of Forestry, Gyeongsang National University
		Lee, Jong Eun	Regional development	Secretary General, Gyeongnam Sustainable Development Council	Apr. 9, '18~Apr. 8, '20	Head of Gyeongnam Information Society Institute

Disqualifications of non-executive directors

1. The spouse or a lineal ascendant or descendant of an executive officer of the company
2. A person who engages in the practice of auditing or tax agent services of the company
3. A lawyer, chartered accountant, tax accountant or person who provides advisory services under the consulting agreement with the company such as legal and management services

Appointment of the Board of Directors

Candidates for the Board of Directors are recommended by the Director Recommendation Committee. The Board members are finalized at the annual general meeting (AGM) after review by the Public Organization Operation Committee of the Ministry of Strategy and Finance. Members of the Director Recommendation Committee is composed of persons who have extensive professional knowledge and experience in various fields such as legal affairs, the economy, the press, and the labor group. Article 4 of the Operational Directive of the Director Recommendation Committee stipulates that candidates for members of the Board should be not be discriminated based on nationality, gender, religion or origin to ensure the diversity and independence of the BOD. As for recruiting candidates, we are complying with three options – open recruitment, recommendation, and combination of open recruitment and recommendation. The screening criteria and requirements for ensuring independence of the Board are disclosed in the Public Management Information System (ALIO).

Criteria for selecting the president

1. Professional knowledge and experience in the power industry
2. Organizational management and corporate management capabilities
3. Willingness and a strong driving force for innovation
4. Vision and strategy of a CEO
5. A sound business ethics mindset including integrity and morality

Criteria for selecting non-executive directors

1. Understanding of the power industry
2. Knowledge and experience in management
3. Willingness to improve transparency and efficiency in management
4. Capabilities to provide a vision for corporate management as a member of the highest decision-making body
5. A sound business ethics mindset and a sense of responsibility

Subcommittees of the BOD

Five subcommittees have been installed and operated within the Board, which are the Audit Committee, Fuel Procurement Committee, New Business Committee, Environment Committee, and Win-win Growth Committee. To be specific, the Audit Committee conducts audits on work and accounting with regard to management and the power generation business, and reports the outcome to the Board. The Fuel Procurement Committee deliberates and provides advice on such matters as establishing fuel procurement strategies. The New Business Committee analyzes risks and provides advice on new businesses in Korea and abroad. For sustainable growth and development, the Environment Committee provides advice on environmental policies of recent issues, and the Win-win Growth Committee handles deliberation and advice on win-win growth with partner companies.

The status of subcommittees of the BOD

Composition	Subcommittee	Roles		
		Chairperson	Executive Director	Non-executive Director
Audit Committee	Audits on work and accounting	Kim, Jong Sung	Choi, Sang Hwa	Ma, Ho Seop
Fuel Procurement Committee	Provides advice for improving matters related to fuel procurement	Park, In Cheol	Lee, Yong Jae	-
New Business Committee	Analyzes risks of new business at home and abroad	Choi, Chi Gyu	Kim, Hak Hyun	-
Environment Committee	Provide advice for responding to the government's environment policy	Lee, Jong Eun	Kim, Hak Hyun	-
Win-win Growth Committee	Reviews the execution of win-win growth tasks	Kim, Jong Sung	Kim, Hak Hyun	-

Ratio

2.23

 times

(CEO compensation against avg. employee compensation)

CEO compensation

KRW

174.094

 million

Average employee compensation

KRW

77.961

 million

Fair performance evaluation and compensation of the BOD

We operate a performance evaluation and compensation system so that directors are effectively compensated through fair and externally competitive compensation methods. Members of the Board are required to conduct a self-performance evaluation before his or her tenure has expired and such evaluation items include participation of the BOD meetings, contributions, key comments, etc. Compensation for directors consists of a base salary and performance-based incentives in accordance with the director salary policy. It is provided based on the director salary policy as well as the compensation limit that is approved by the BOD and at the AGM. As for non-executive directors, they are paid a fixed amount each month. Compensation details of CEOs and non-executive directors are disclosed in our business report and the Public Management Information System (ALIO).

Directors & Auditors compensation (As of Dec. 31, '17)

Unit: KRW thousand

Classification	No. of persons	Total compensation amount	Avg. compensation per person
Registered directors (excluding outside directors and members of the Audit Committee)	3	467,603	155,867
Outside directors (excluding members of the Audit Committee)	3	90,000	30,000
Audit Committee members	2	60,000	30,000
Auditor	1	167,398	167,398

Integrated Risk Management System

Integrated risk management system for preemptive response

Strengthened environment policies, such as calls for reducing fine dust emissions and shutting down aging power plants; the unit-cost of electricity for sales decreased due to the adjustment of coordination factor. Likewise, the business environment surrounding KOEN is changing every moment. Also, an increase in benchmark rate at home and overseas leads to the increase of procurement costs as well as expansion of currency fluctuations. We are operating a company-wide risk management system in order to respond to various environmental changes.

We define major financial risks, such as the exchange rate and interest rate, as well as non-financial risks, such as fuel procurement, facility operation, and environmental risks. We operate a management organization by risk, including the Exchange Ratio Risk Committee and Investment Business Risk Management Assessment Committee (Investment Review Committee), and monitor major risk indexes on a regular basis for strict risk management.

Key Risk Indicator (KRI)

Financial risk		Non-financial risk	
Market risk (Exchange rate, bituminous coal price)	Liquidity risk (Interest rate, credit ratings, cash on hand)	Operational risk (Settlement adjustment factor, usage rate)	Investment risk (New business risk)

Company-wide risk management system



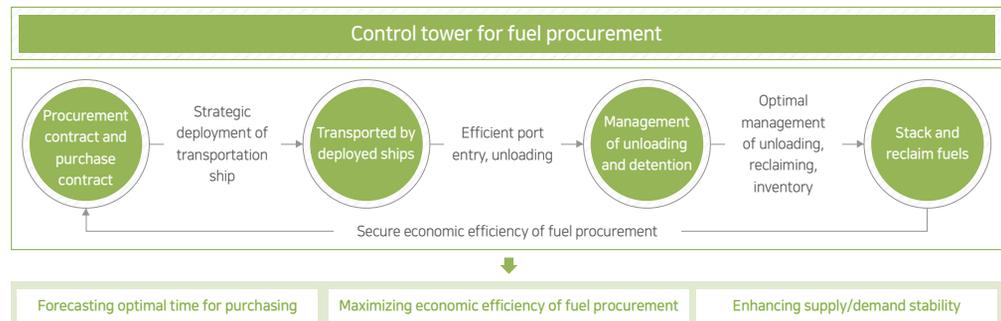
KRW **198.5** billion

Fuel cost savings (considering market conditions)

Upgrade SMART Fuel Center

KOEN has upgraded the 'SMART Fuel Center', a big data and deep learning-based fuel procurement system, realizing the world's lowest procurement price. The 'SMART Fuel Center' supports the efforts to make prompt procurement decisions by upgrading the price predication system and enable us to purchase fuel at the optimal time by reflecting the period of falling market price and fluctuations in spot and future prices. We are also reducing shipment cost and demurrage by operating an optimal shipment portfolio based on the prediction of changing freight charges.

SMART Fuel Center²⁾



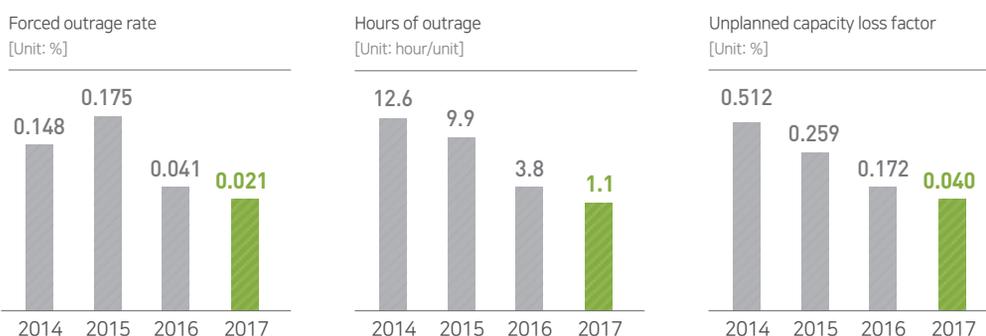
Achieve the highest reliability compared to the capacity factor

KOEN has established a maintenance portfolio by life cycle stages of power generator based on short- and mid-term failure analyses and carried out failure prevention activities. Thanks to the lifecycle-based facility management, we successfully eliminated failures caused by vulnerable facilities and boiler tubes that were newly installed at the Yeongheung Division. We actively respond to newly detected failure types and prevent massive failure caused by external factors besides the facilities. Also, we are making efforts to develop facility protection equipment to prevent the occurrence of similar failures, protect our key devices by improving the system, and reinforce the operating capabilities. As a result, our forced outage rate was 0.021% in 2017, the best performance since the company's founding.

Failure prevention activities by generation facility lifecycle

Early failure	Random failure	Wear out failure	Degradation failure
(Breakdown maintenance) Fix design fault	(Preventive maintenance) Eliminate potential failure factors	(Preventive maintenance) Improve maintenance quality	

Key failure prevention achievements



Mid- to long-term potential risk management

We analyze risk factors that may have a serious impact on the company's management environment, recognize potential risks, and strategically respond to the risks.

Potential risk	Increased possibility of large-scale disasters, such as earthquakes	Demands to shut down the government's policy's coal-fired power plants and to expand renewable energy
Risk impact analysis	The possibility of earthquake occurrence in the Korean Peninsula was relatively low. However, people began to pay attention to the safety of power plants due to a series of earthquakes that took place recently at a high magnitude. Hence, the scope of management for corporations has expanded to include not only the primary suppliers but also secondary and tertiary ones, providing the needs for comprehensive safety management.	There are changes in the direction of the government's energy industry policy, such as the policy of phasing out nuclear power, reduction of coal-fired thermal power generation, and strategy of spreading new energy businesses. These changes are calling for the need to establish a preemptive response system. In addition, policies and systems are being strengthened to implement the UN Sustainable Development Goals (SDGs) and promote the nation's sustainable development. Also, concerns over a slowdown in the growth and deterioration in profitability resulting from an energy portfolio that is heavily concentrated in coal power generation are raised.
Risk response	Strengthen measures against earthquakes and build an optimal disaster management system	<ul style="list-style-type: none"> · Increase the share of renewable energy generation to 25% · Develop core alternative energy technologies to replace fossil fuel · Develop new business models and diversify power generation-connected businesses

Economy

Consolidated financial performance

KOEN has achieved the second highest net profits among Korean thermal power generation companies, despite the challenging business landscape that featured a decline in company profits due to the decrease in settlement adjustment factor, rise in raw material prices, and mandatory Renewable Portfolio Standard (RPS) requirements. In addition, thanks to our relentless endeavors to improve our financial structure based on the debt reduction plan, our debt to equity ratio was recorded at 99.9%, down reduced by 0.8%p from 2016. Sales increased 6% to reach KRW 5,399.3 billion, and operating profit and net income recorded KRW 270.7 billion and KRW 175.7 billion, respectively, mainly owing to the increase in unit-cost of electricity for sales.

Consolidated basis | Unit: KRW million

Classification	2015	2016	2017
Current assets	1,288,755	1,541,010	1,692,185
Accounts receivable and others	711,901	967,008	1,164,660
Inventories	195,642	242,674	248,481
Other	381,212	331,328	279,044
Non-current assets	8,099,103	8,336,442	8,339,195
Property, plants, and equipment	7,771,138	7,774,582	7,752,594
Investments in associates and joint ventures	209,944	243,450	269,861
Other	118,021	318,410	316,740
Total assets	9,387,858	9,877,452	10,031,380
Current liabilities	1,102,417	1,529,615	1,745,451
Non-current liabilities	3,829,061	3,425,524	3,268,996
Total liabilities	4,931,478	4,955,139	5,014,447
Paid-in capital	1,073,607	1,154,104	1,154,104
Capital surplus	3,205,260	3,543,568	3,613,680
Hybrid instrument	398,910	398,910	398,910
Other components of equity	-232,229	-191,286	-166,964
Equity attributable to owners of the parent	4,445,548	4,905,296	4,999,730
Non-controlling interest	10,832	17,017	17,203
Total equity	4,456,380	4,922,313	5,016,933
Sales	4,971,415	5,101,915	5,399,328
Operating income	933,288	834,056	270,650
Profit attributable to:	583,272	479,990	175,696
· Owners of the parent	586,085	480,336	175,474
· Non-controlling interests	-2,813	-346	222
Earnings per share (KRW)	9,870	8,043	2,723
Number of companies subject to consolidation	4	6	6

Distribution of economic values

KOEN distributes economic values to diverse stakeholders such as employees, partner companies, shareholders, and local communities through dividends for shareholders, donations to local communities, and through fulfilling our tax duties.

Classification		Unit	2015	2016	2017
Employees	Salaries	KRW 100 million	2,011	2,146	2,365
Partner companies	Raw materials		29,201	28,467	36,623
	Purchase of electricity		285	272	260
Shareholders	Dividends		709	1,376	1,199
Creditors	Interest		1,249	1,233	1,179
Local communities	Donations		13	20	76
Central and local governments	Taxes		2,229	1,857	809
Total				35,697	35,371

Power trading performance

In 2017, we generated and sold 70,632GWh and 66,709GWh of electricity respectively. This is worth KRW 5.1804 trillion thanks to the efforts to secure the competitive edge in power trading and increase the capacity factor. Our shares of electricity generation and sales are 13.4% and 12.8% of the total amount of electricity generated and sold in Korea, which stand at 528,839GWh and 520,751GWh respectively. KOEN accounts for 8.8% of facility capacity and 12.0% of electricity transaction volume in the Korean power market as of 2017.

Power trading

Classification		Unit	2015	2016	2017
Power sales	GWh		67,118	67,264	66,729
Power sales revenue	KRW 100 million		47,387	48,148	51,032
Foundation fund revenue			16	25	2
Heat sales revenue			712	687	823

Power generation

Classification		Unit	2015	2016	2017
Facility capacity	MW		9,979	10,331	10,344
Generation volume	GWh		70,991	71,759	70,632
Usage in percentage	%		81.21	80.28	78.06
Energy efficiency			38.20	38.49	38.68
Auxiliary power ratio			5.22	5.34	5.40

Stable fuel supply and facility operation

KOEN's facility capacity in 2017 was 10,344MW, accounting for 8.8% of Korea's total capacity, and facility usage rate decreased 2.3% compared to last year with 77.98%. Our efforts for efficient fuel procurement and reasonable management of facility operating cost resulted in a power generation cost of KRW 80.92 per kWh. Thus, it contributed to a stable supply of quality electricity at a reasonable price that was the lowest among Korean power generation companies for 17 consecutive years. In addition, we ranked at No. 2 in terms of the lowest forced outage rate by overcoming weak points in facilities to record the highest reliability among power generators in Korea.

Stable fuel supply

Classification	Unit	2015	2016	2017
Bituminous coal	KRW 100 million	23,761	23,332	31,960
Anthracite coal		468	368	173
LNG		2,833	2,567	2,831
Kerosene		141	207	210
Wood pellets		897	841	999
Bio-SRF		10	7	17
Total		28,110	27,322	36,190

Stable facility operation

Classification	Unit	2015	2016	2017
Unplanned capacity loss factor	%	0.259	0.172	0.04
Forced outage rate		0.175	0.041	0.021
Forced outage rate during the peak season		0.128	0.023	0.046
Hours of outage	Hour/Unit	9.9	3.8	1.1

Additional information on organization and supply chain

In the investigation result briefing on potential import of North Korean anthracite coal by South Korean firms in breach of sanctions, which was held on August 10, 2018, the Korea Customs Service officially confirmed that it had found no fault in KOEN.

To import anthracite coal, KOEN transparently selects the successful bidder in accordance with the international open tendering process. It also fulfills the fiduciary duty during the process of customs clearance and goods acquisition.

Environment

Air pollutant management

By implementing world-class and state-of-the-art environmental facilities such as desulfurization, denitrification and electric dust collection facilities, KOEN is able to effectively remove sulfur oxide, nitrogen oxide, and dust generated from the use of fossil fuel.

Classification		Unit	2014	2015	2016	2017
Samcheonpo	NOx	ppm	115	104	105	75
	SOx		48	47	56	49
	Dust	mg/Sm ³	5	7	6	6
Yeongheung	NOx	ppm	19	16	16	16
	SOx		19	16	16	15
	Dust	mg/Sm ³	3	3	2	2
Yeongdong	NOx	ppm	205	212	241	246 / 64 / 14 ¹⁾
	SOx		18	18	17	14
	Dust	mg/Sm ³	7	7	10	5
Yeosu	NOx	ppm	35	25	30	27
	SOx		22	8	12	11
	Dust	mg/Sm ³	3	2	2	3
Bundang	NOx	ppm	43	42	44	36
	SOx		-	-	-	-
	Dust	mg/Sm ³	-	-	-	-

1) NOx at the Yeongdong Division (Standard oxygen concentration, %): Unit 1&2 in the first half (6)/ Avg. concentration of unit 1 in the second half (6)/ Avg. concentration of unit 2 in the second half (15)

- NOx emissions standard (first/second half): Unit 1 (320(6) / 90(6), Unit 2 (320(6) / 25(15))

Water and wastewater management

We are constantly carrying out various activities to reduce the amount of water used, such as water conservation campaigns. We treat wastewater generated from power generation and desulfurization processes at a level lower than the effluence quality requirement in the comprehensive wastewater treatment facility and the desulfurization wastewater treatment facility.

Amount of water used and reused

Classification	Unit	2014	2015	2016	2017
Total amount of top water used	M3	3.9	5.9	5.9	5.8
Amount of surface water used		5.6	5.1	5.4	5.3
Amount of fresh water used		0.7	0.7	0.6	0.4
Amount of water discharged*		0.3	0.3	0.4	0.3
Total amount of net fresh water used		9.9	11.4	11.5	11.2

2) The amount of water discharged back into natural water sources among the amount of surface and fresh water used with the same and similar quality of the original state

Wastewater volume, discharge, and recycling ratio

Classification		Unit	2015	2016	2017
Samcheonpo	Volume of wastewater	1,000 tons	528	606	782
	Discharge of wastewater		-	-	-
	Recycling ratio of wastewater	%	100	100	100
Yeongheung	Volume of wastewater	1,000 tons	1,088	1,054	1,174
	Discharge of wastewater		-	-	-
	Recycling ratio of wastewater	%	100	100	100
Yeongdong	Volume of wastewater	1,000 tons	12	17	10
	Discharge of wastewater		-	-	-
	Recycling ratio of wastewater	%	100	100	100
Yeosu	Volume of wastewater	1,000 tons	163	273	195
	Discharge of wastewater		161	260	185
	Recycling ratio of wastewater	%	1	5	5
Bundang	Volume of wastewater	1,000 tons	145	147	133
	Discharge of wastewater		138	139	158 ¹⁾
	Recycling ratio of wastewater	%	4.83	5.44	-18.80
Total	Volume of wastewater	1,000 tons	1,936	2,097	2,294
	Discharge of wastewater		299	399	343
	Recycling ratio of wastewater	%	84.56	80.97	85.05

1) The amount of water discharged was overly calculated by including the amount water discharged by households during the period of TMS facility improvement (per minute) by 24 hours/day (Korea Environment Corporation, Aug. and Sept.) - Avg. amount of water discharged in ordinary times: 50 tons/hours, 400 tons/day)

Wastewater quality

Classification		Unit	2015	2016	2017
Bundang	COD	mg/ ℓ	5.1	4.8	3.8
	SS		0.5	0.7	0.5
Yeosu	COD		6.8	9.8	7.4
	SS		2.1	2.1	1.1

Chemicals management

KOEN uses chemicals necessary for the production of power generation water, boiler water treatment and denitrification facilities, and wastewater treatment facilities. Such chemicals are legally managed in accordance with the relevant regulations such as the Material Safety and Health Regulations and the Toxic Chemicals Control Act. In addition, the LDAR system and a number of advanced water treatment technologies is in place as a response to the Chemicals Control Act and membrane-based technology and oxygen treatment are implemented to continuously reduce the use of chemicals.

Use of hazardous chemical materials

Classification		Unit	2015	2016	2017
Hydrochloric acid and other chemicals		Ton	18,778.70	20,301.10	20,852.90
Coagulation and other chemicals			6,292.80	4,623.00	6,867.80

Waste and power generation byproducts management

Our entire waste lifecycle from delivery to final disposal is managed in a transparent manner via the National Waste Comprehensive Management System (Allbaro) in order to minimize environmental impacts of waste and byproducts resulting from the power generation process. Each year, we set up goals in waste reduction activities, reduction plans, and then submit the results of such activities.

Weight and recycling ratio of waste

Classification	Unit	2014	2015	2016	2017
Regular waste	Ton	12,477	12,719	13,045	16,024
Construction waste		22,119	18,207	31,713	25,798
Specified waste		851	701	1,166	961
Food waste		13	15	6	3
Recycling volume of waste		11,918	22,885	36,468	26,317
Actual weight of waste		23,542	8,757	9,462	16,469
Recycling ratio of waste	%	33.6	72.30	79.40	61.50

Recycling of fly ashes and chemical gypsum

Classification	Unit	2014	2015	2016	2017	
Fly ashes	Yields	10,000	222.8	253.1	284.8	266.7
	Recycling volume	tons	171.7	207.2	238.8	290.4
	Recycling ratio	%	77	82	84	109
Chemical gypsum	Yields	10,000	54.2	66.5	70.4	66.4
	Recycling volume	tons	53.2	66.1	68.1	63.7
	Recycling ratio	%	98	99	97	96
Total	Yields	10,000	277	319.6	355.2	333.1
	Recycling volume	tons	224.9	273.3	306.9	354.1
	Recycling ratio	%	81	86	86	106

Follow-up of environmental evaluation and environmental investigation

In addition to performing environmental evaluations during the generation facility construction period, we regularly conduct follow-up of environmental evaluations after construction to analyze the impact on the surrounding environment and ecosystem for operating a generation facility for a certain period. This is to identify environmental changes that are not found during the environmental impact analysis or additional impacts on the environment nearby the plants caused by inaccurate estimations. As part of efforts to minimize environmental impacts on local communities, we are carrying out transparent follow-up management, such as reporting evaluation outcomes to relevant organizations and disclosing the information through the government's Environmental Impact Assessment Supporting System.

Disclosure and monitoring of environmental information

KOEN measures the amount of NOx, SOx, and dust from the exhaust gas found at the chimney of each plant at regular intervals and provides such information to relevant local autonomous governments and the Korea Environment Corporation. When the emission concentration of each pollutant exceeds our criteria, we issue alerts to the central control team and the manager on duty to take prompt actions. In addition, the Samcheonpo Power Division and Yeongheung Power Division have a real-time monitoring system in place to investigate the marine environment in the surrounding waters that measures the real-time water temperature, etc. This information is not only provided to local residents, but also leveraged to devise measures to minimize the impact on the marine environment and used for scientific identification in case of environmental disputes.

Managing energy and greenhouse gases

KOEN continually endeavors to reduce the level of energy consumption and greenhouse gas emissions by improving the carbon management system and operating a comprehensive greenhouse gas management system and efficient power generation facilities. We are also carrying out activities such as low carbon and high efficiency fuel use as well as domestic and overseas reduction projects in order to meet the greenhouse gas reduction targets. Global carbon management certification and the corporate-wide low-carbon campaign for all employees embody our commitment and consensus built on low carbon management.

Energy usage

Classification	Unit	2014	2015	2016	2017
Purchase and use of non-renewable fuels for power generation	MWh	3,654,000	3,875,000	3,994,000	3,923,000
Purchase of non-renewable electricity		60,895	174,398	49,357	120,177
Purchase of non-renewable energy fuels for steam, heating and air conditioning or other purposes		592	875	1,185	1,233
Total amount of renewable energy purchased and generated		154,000	184,000	190,000	791,000
Total sales of non-renewable energy		63,769,000	66,932,000	67,575,000	65,918,000
Total consumption of non-renewable energy		-60,053,513	-62,881,727	-63,530,458	-61,873,590
Total energy consumption cost	KRW	-4,175,140,440,551	-4,615,450,703,465	-4,750,208,988,235	-5,029,738,667,601

Greenhouse gas emissions¹⁾

Classification	Unit	2014	2015	2016	2017
Headquarters	Scope1	0	0.1	0.1	0.1
	Scope2	1	1.5	1.6	1.8
Samcheonpo	Scope1	22,341	21,656	21,654	20,156
	Scope2	9	11	8	17
Yeongheung	Scope1	28,616	32,300	31,559	31,956
	Scope2	27	13	20	12
Yeongdong	Scope1	2,127	2,135	1,881	841
	Scope2	33	37	35	25
Yeosu	Scope1	2,126	1,660	3,482	3,998
	Scope2	2	6	12	6
Bundang	Scope1	1,262	935	1,072	1,119
	Scope2	7	9	9	10
Total	Scope1	56,472	58,687	59,648	58,070
	Scope2	80	77	85	71

1)) Calculated in accordance with the direction on emissions reporting and authentication regarding GHG emissions trading system (ETS)

SF6 emissions

Classification	Unit	2014	2015	2016	2017
SF6 emissions	Ton	0.017	0.017	0.021	0.021

Society

Employee status

KOEN has established recruitment goals and continued to make a variety of policy efforts in order to expand open recruiting and socially-balanced employment; we embrace high school graduates, local talents, women, the disabled, and people with national merit. We hire new staff through a recruitment system in line with the National Competency Standards (NCS), and thus take the lead in promoting a competency-driven recruiting system. With the adoption of a blind recruitment system, we are hiring our employees based on job competencies by eliminating discriminatory elements such as academic background, gender, etc. In recognition of our efforts, we were selected as an outstanding agency at The Best Practice Competition of Blind Recruitment and received the Minister Award by The Ministry of Economy and Finance (MOEF) in 2017. We are furthering our contribution to creating jobs for local areas by implementing a recruitment target system for local talents. In addition, we offer fair employment opportunities across the diverse spectrum of society by providing opportunities for vocational college graduates, who are likely to be at a disadvantage compared to high school and college graduates, and by improving our internship programs.

Number of employees

Classification		Unit	2015	2016	2017
Number of employees			2,199	2,268	2,398
By employment type	Regular employees	Person	2,192	2,261	2,377
	Employees under unlimited contracts		6	6	20
	Non-regular Employees		1	1	1
	Male		1,976	2,045	2,151
By gender	Female		223	223	247
	20s		369	378	415
By age	30s		819	822	809
	40s		614	589	633
	50s and above	397	479	541	

Employee diversity¹⁾ (2017)

Classification	Unit	No. of persons	Percentage of employees
Female employees in management positions	Person / %	35	4.8% ²⁾
Disabled		78	10.5%
National merit recipient		181	

1) The percentage of employees was calculated based on the total number of employees in 2017 (2,466 persons) including ones who took the leave of absence

2) 722 employees in management position: Level 3 and above (including CEOs) + employees to be promoted to level 3 + Type A contract worker - equivalent to level 3 + employee to be promoted to level 3

Labor union membership

Classification	Unit	2015	2016	2017
Number of people eligible for labor union membership	Person	1,624	1,681	1,698
Number of people with labor union membership		1,620	1,677	1,696
Labor union membership percentage	%	99.80	99.80	99.90

Create an employee-friendly working environment

We are improving the satisfaction level and work efficiency of employees by preventing the turnover of key talents and creating a friendly workplace. In particular, we encourage them to take maternity and child-care leave to secure outstanding female talents and create a corporate culture of work-family balance. As a result, we are keeping a 100% record in terms of return rate after parental leave and the rate of their continued service after returning to work.

Employee turnover and retention

Classification	Unit	2015	2016	2017
Number of people who transferred jobs	Person	11	33	15
Turnover rate	%	0.50	1.46	0.63
Retention period	No. of years	13.56	13.98	14.12

Childcare leave and parental leave

Classification	Unit	2015	2016	2017	
Number of people on parental leave	Male	Person	101	101	78
	Female		30	26	20
Return rate after parental leave	%	100	100	100	
Number of people on childcare leave	Male	Person	1	6	7
	Female		47	61	66
Return rate after childcare leave	%	100	100	100	
Percentage of people that left within 12 months after their return	%	0	0	0	

Employee satisfaction level

Classification	Unit	2014	2015	2016	2017
Employee satisfaction level	Points	8.7	8.9	9.0	9.0
Scope of data (employees)	%	75	59.3	71	70

Employee safety and health

Lost time injury frequency rate (LTIFR) - employees

Classification	Unit	2014	2015	2016	2017*
LTIFR for employees	No. of employees/ million work hours	0.21	0.58	0.16	0.16
Scope of data (employees)	Yeongdong Power Generation Division	100	100	100	100

* Yeongdong Power Generation Division

Lost time injury frequency rate (LTIFR) – contracting companies

Classification	Unit	2014	2015	2016	2017
LTIFR for contracting companies	No. of employees/ million work hours	1.37	4.79	1.21	1.63
Scope of data (workers who are engaging in contract-based construction work)	%	100	100	100	100

Social contributions

In accordance with the Sunny Project, an energy sharing program leveraging the core competencies of KOEN, and the law regarding support for the areas surrounding power plants, we are fulfilling our CSR activities by enhancing the income level of the surrounding areas and funding local projects that are most desired by nearby residents. Such efforts are in line with our will to grow jointly with the local community and become a hopeful partner for energy sharing.

Execution of social contribution expenditure

Classification	Unit	2015	2016	2017
Total	KRW million	11,991	10,748	12,605

Social contribution expenditure by type¹⁾ (2017)

Classification	Unit	Charitable donation	Investment in local communities	Commercial initiative
Share of social expenditure in the total spending	%	4.6	63.9	31.5

1) Charitable donation: A sum of cash and in-kind donations and time expenditure of employee volunteer activities

Investment in local communities: Donations to welfare facilities and other supporting projects nearby power plants in conjunction with local partners

Commercial initiative: Promotional activities by sponsoring PyeongChang Winter Olympics and Paralympics 2018, and other sporting events

Social contribution value by type (2017)

Classification	Unit	Cash donation	Hours of volunteering ²⁾	In-kind donation	Expenditure in social contributions
Value by spending type	KRW	7,076,658,329	1,472,328,000	493,906,585	139,171,380

2) 58,080 hours are spent for employee volunteer activities in 2017, avg. hourly wage: KRW 25,350 (as of December 2017)

Local resource facility tax

In addition to local support projects, KOEN pays local resource facility taxes for each power station in order to compensate for various disadvantages such as environmental pollution, an inevitable byproduct of pursuing the public goal of providing a power supply through thermal power generation.

Payment of local resource facility taxes

Classification	Unit	2015	2016	2017
Samcheonpo	KRW million	7,543	7,425	6,851
Yeongheung		11,840	11,583	11,820
Yeongdong		714	631	401
Yeosu		576	1,139	1,344
Bundang		569	595	698
Total		21,242	21,373	21,114



GRI Standards Index

Topic	Disclosure		Page
	No.	Title	
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	102-2	Activities, brands, products, and services	8~9, 12~13
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	102-4	Location of operations	8~9
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	102-6	Markets served	8~9
	102-7	Scale of the organization	8~9
	102-8	Information on employees and other workers	77, Alio(No significant changes)
	102-9	Supply chain	10~11
	102-10	Significant changes to the organization and its supply chain	72(No significant changes)
	102-11	Precautionary Principle or approach	68~69
	102-12	External initiatives	85~87
	102-13	Membership of associations	88
	EU1	Installed capacity, broken down by primary energy source and by regulatory regime	71
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	EU11	Average generation efficiency of thermal plants by energy source and by regulatory regime	71(M)
GRI 102 : Strategy	102-14	Statement from senior decision-maker	6~7
GRI 102 : Ethics and integrity	102-16	Values, principles, standards, and norms of behavior	16~17
GRI 102 : Governance	102-18	Governance structure	66~67
GRI 102 : Stakeholder Engagement	102-40	List of stakeholder groups	56
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	102-46	Defining report content and topic Boundaries	18~19
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	102-48	Restatements of information	Not Applicable
	102-49	Changes in reporting	No significant changes
	102-50	Reporting period	About this report
	102-51	Date of most recent report	About this report
	102-52	Reporting cycle	About this report
	102-53	Contact point for questions regarding the report	About this report
	102-54	Claims of reporting in accordance with the GRI Standards	About this report
	102-55	GRI content index	80~81
102-56	External assurance	82~83	

Topic	Disclosure		Page
	No.	Title	
GRI 103: Management Approach	103-1	Explanation of the material topic and its Boundary	22~23, 30~31, 40~41, 48~49, 58~59
	103-2	The management approach and its components	
	103-3	Evaluation of the management approach	
GRI 201 : Economic Performance	201-1	Direct economic value generated and distributed	71
	201-2	Financial implications and other risks and opportunities due to climate change	23~24, 31~32(M)
GRI 203 :Indirect Economic Impacts	203-1	Infrastructure investments and services supported	49~50(M)
	203-2	Significant indirect economic impacts	47
GRI : 302 Energy	302-1	Energy consumption within the organization	76
GRI : 303 Water	303-1	Water withdrawal by source	73
	303-3	Water recycled and reused	74
GRI : 304 Biodiversity	304-2	Significant impacts of activities, products, and services on biodiversity	34
GRI : 305 Emissions	305-1	Direct (Scope 1) GHG emissions	76(M)
	305-2	Energy indirect (Scope 2) GHG emissions	76
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GRI : 306 Effluents and Waste	306-1	Water discharge by quality and destination	74
	306-2	Waste by type and disposal method	75
GRI 401 : Employment	401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	44~45
	401-3	Parental leave	78
GRI 403 : Occupational Health and Safety	403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	78(M)
GRI 404: Training and Education	404-2	Programs for upgrading employee skills and transition assistance programs	41~42(M)
GRI 405: Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	77
GRI 412 : Human Rights Assessment	412-1	Operations that have been subject to human rights reviews or impact assessments	54~55

Reference. (M): Material Issue, Material Topics

Independent Assurance Statement

Introduction

Korea South-East Power Co., Ltd. ("KOEN") commissioned DNV GL Business Assurance Korea Ltd. ("DNVGL"), part of DNV GL Group, to undertake independent assurance of KOEN 2018 Sustainability Report (the "Report"). DNV GL's assurance engagements are based on the assumption that the data and information provided by the client to us as part of our review have been prepared in good faith.

Scope of assurance

The scope of assurance includes a review of non-financial data and sustainability activities and performance data over the reporting period from 1st January to 31st December 2017 in the KOEN 2018 Sustainability Report (Korean version). This also includes:

- Evaluation of the adherence to the AccountAbility principles set forth in AA1000 AccountAbility Principles Standard (APS) 2008.
- Review of the process for determining material topics for reporting, the management approach to material topics and the process for generating, gathering and managing the data and information in the Report.

Basis of our opinion

We performed our work using AA1000AS(2008) and DNV GL's assurance methodology VeriSustainTM1(Version 5), which is based on our professional experience, international assurance best practices. We provide Type 1 and the moderate level of assurance, and we applied the Type 2 for the selected data. The assurance was carried out from August and till September 2018. The site visits were made to KOEN's Headquarters in Jinju, Korea. Assurance activities were conducted based on sampling as follows:

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

Limitations

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

Conclusion

On the basis of the work undertaken, nothing comes to our attention to suggest that the Report does not properly address the adherence to the AccountAbility Principles in AA1000APS(2008) nor is prepared 'in accordance' with GRI Standards Core option. Further opinions with regards to the adherence to the Principles are made below:

Foundation Principle of Inclusivity

As KOEN recognizes the importance of stakeholders in its corporate management, KOEN has implemented various stakeholder communications and philanthropic and charitable works. In particular, KOEN has identified internal and external stakeholder groups along the value chain process, such as creation of value (employees, labor union), use of value (electricity consumers, Korean citizen), influenced by value (local communities, partner companies, Government, National assembly, media and environmental NGOs). KOEN discloses in the Reports the information on the engagement channels and engagement activities with each stakeholder group. In addition, KOEN is committed to protecting the human rights of stakeholders through the formulation of declarations and implementation guidelines on human rights management. The assurance team has reviewed that KOEN identifies potential human rights risks to key stakeholders and implements measures to prevent stakeholders from violating human rights.

¹ The VeriSustain protocol is available upon request at DNV GL Website (www.dnvgl.com)

Principle of Materiality

KOEN has conducted the materiality assessment to prepare the Report. The 22 issues were pooled by analysing the various topics discussed in global sustainability initiatives and standards, reviewing global energy company's reports, reviewing internal data, and analyzing domestic sustainability management articles, and stakeholder survey. Based on this analysis, KOEN analyzed the environmental, social and governance structures impacts and the stakeholder impacts and conducted materiality assessment. A total of 10 material issues were selected through materiality assessment, and material issues were classified into 5 final material topics linked to Vision 2030. The assurance team has reviewed the materiality assessment process and noted that the relevant material topics are prioritized as described in the Report.

Principle of Responsiveness

KOEN discloses management approaches for the reported material topics. The Report describes the changes of interest in the issues, risks and opportunities of the issues in terms of sustainable development. KOEN's approach to the issues, mid- and long-term goals, roadmap, direction are addressed in the Report. In particular, this Report discloses the efforts and achievements of achieving the goals of material topic through 'Social Value Creation' for each material topic. In addition, the evaluation of the adherence to the principles related to report quality is as follows.

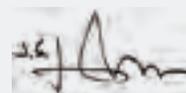
Findings related to specific performance information

In addition to the evaluation of the adherence to the AA1000 AccountAbility Principles as described above, the reliability of the selected data including waste volume generated and waste volume recycled, weight of air pollutant, recycled volume of coal ash and desulfurization gypsum, SF6 emissions are tested with Type 2 assurance. DNV GL has interviewed the data owners in order to figure out the data control process and verified the selected data against the relevant documents and records. The greenhouse gas emissions and energy consumption are reviewed by comparing the greenhouse gas inventory report and verification reports submitted to the Korean government. DNV GL also conducted in-depth review the business ethics management process. Data owners in KOEN can explain the source of data and data handling process and demonstrate to trace the consolidated data back to the raw data set in a reliable manner. The assurance team has not noted any intentional error or misstatement regarding the selected data.

Competence and Independence

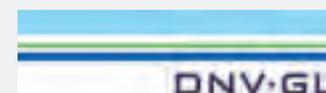
DNV GL applies its own management standards and compliance policies for quality control, in accordance with ISO/IEC 17021:2011 - Conformity Assessment Requirements for bodies providing audit and certification of management systems, and accordingly maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. We have complied with the DNV GL Code of Conduct² during the assurance engagement and maintain independence where required by relevant ethical requirements. This engagement work was carried out by an independent team of sustainability assurance professionals. DNV GL was not involved in the preparation of statements or data included in the Report except for this Assurance Statement. DNV GL has provided assurance on 2017 Carbon Management Report in 2018. In our opinion, this does not affect the independence or impartiality of our work.

September 2018
Seoul, Korea



Jang Sup Lee

Acting Country Representative DNV GL
Business Assurance Korea Ltd.



² DNV GL Code of Conduct is available from DNV GL website (www.dnvgl.com)

GHG Emission Verification Statement

Certificate No. GHGV-2018-08141

The Emission of Greenhouse Gas reported by Korea South-East Power Co., LTD

#123beon-gil Sadeul-ro, Jinju-si, Gyeongsangnam-do, Korea

Verification Institute

DAEIL E&C Verified the Greenhouse Gas & Energy STATEMENTS of 2017 reported by KOSEP Co., Ltd.

Verification Criteria

The Comprehensive Standards and Guidelines on the Operation of Greenhouse Gas and Energy Target Management Scheme (Notification No. 2016-255, Korea Ministry of Environment).

Verification Conclusion

We, DAEIL E&C, Verify the Greenhouse Gas Emission and Energy STATEMENTS 2017 of KOSEP Co., Ltd are based on a Reasonable Level of Assurance.

- Energy Consumption: 652,401 TJ
- GHG Emission: 58,140,662 CO₂eq. ton
 - Direct emission(scope 1): 58,069,879 CO₂eq. ton
 - Indirect emission(scope 2): 70,786 CO₂eq. ton

August 14, 2018
CEO & President DAEIL E&C CO., LTD



ISO26000

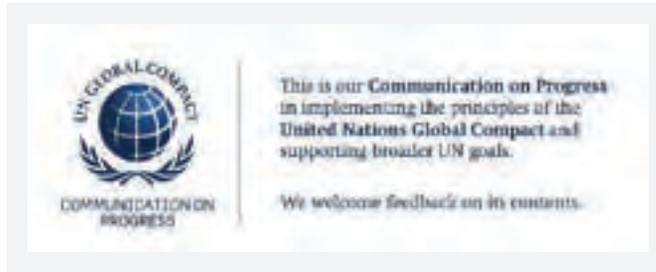
ISO 26000 is a standardized, comprehensive international guideline for social responsibility. Established and announced by the International Organization for Standardization, it defines organizational roles and responsibilities on seven major issues – organizational governance, human rights, labor practices, the environment, fair operating practices, consumer issues, and community involvement and development. KOEN complies with ISO 26000 and continually manages its performance upon it.

ISO26000 Index		Core Subjects	Core Issues	Page
6.2	6.2.3	Organizational governance	Decision making process and structures	66~67
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	6.3.4		Human rights risk situations	
	6.3.5		Avoidance of complicity	
	6.3.6		Resolving grievances	
	6.3.7		Discrimination and vulnerable groups	
	6.3.8		Civil and political rights	
	6.3.9		Economic, social and cultural rights	
	6.3.10		Fundamental principles and rights at work	
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	6.4.5		Social dialogue	
	6.4.6		Health and safety at work	
	6.4.7		Human development and training in the workplace	
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	6.5.5		Climate change mitigation and adaptation	
	6.5.6		Protection of the environment, biodiversity and restoration of natural habitats	
6.6	6.6.3	Fair operating practices	Anti-corruption	52~53
	6.6.4		Responsible political involvement	
	6.6.5		Fair competition	
	6.6.6		Promoting social responsibility in the value chain	
	6.6.7		Respect for property rights	
6.7	6.7.3	Consumer issues	Fair marketing, factual and unbiased information and fair contractual practices	58~64
	6.7.4		Protecting consumers' health and safety	
	6.7.5		Sustainable consumption	
	6.7.6		Consumer service, support, and complaint and dispute resolution	
	6.7.7		Consumer data protection and privacy	
	6.7.8		Access to essential services	
	6.7.9		Education and awareness	
6.8	6.8.3	Community involvement and development	Community involvement	46~51
	6.8.4		Education and culture	
	6.8.5		Employment creation and skills development	
	6.8.6		Technology development and access	
	6.8.7		Wealth and income creation	
	6.8.8		Health	
	6.8.9		Social investment	

UNGC

Support for UN Global Compact (UNGC)

The UN Global Compact (UNGC) has ten principles encompassing human rights, labor, environment, and anti-corruption and has its roots in the ILO Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention against Corruption. KOEN has been supporting these ten principles of UNGC and submitting the Communication on Progress (COP) each year since 2006.



KOEN's response to implement the ten principles of UNGC

KOEN is disclosing its efforts for implementing the ten principles of UNGC to stakeholders to provide information on our activities of sustainable corporate management and achieve outstanding performance results that complies with the global standards

Principles		Page
Human Rights	Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights; and Principle 2 make sure that they are not complicit in human rights abuses.	54~57
Labour Standards	Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; Principle 4 the elimination of all forms of forced and compulsory labor; Principle 5 the effective abolition of child labor; and Principle 6 the elimination of discrimination in respect of employment and occupation.	55
Environment	Principle 7 Businesses should support a precautionary approach to environmental challenges; Principle 8 undertake initiatives to promote greater environmental responsibility; and Principle 9 encourage the development and diffusion of environmentally friendly technologies.	30~34
Anti-Corruption	Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery.	52~53

UN SDGs

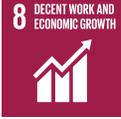
Supporting UN SDGs

The UN Sustainable Development Goals (SDGs) are goals that the United Nations (UN) and the international community must achieve between 2016 and 2030, in order to resolve the global poverty issue and thus realize sustainable development. The SDGs were approved by the member states of the UN in September 2015, as the follow-up to the Millennium Development Goals (MDGs) which had provided an important development framework from 2000 through 2015. The SDGs are organized into 17 Goals and 169 detailed targets. More information related to the goals is available at <http://sustainabledevelopment.un.org>.



KOEN's response to UN SDGs

KOEN carries out activities to support the UN SDGs, in our efforts to contribute to sustainable development of the international community.

	Core goals	Main activities	Page
	Goal 5 Achieve gender equality and empower all women and girls	<ul style="list-style-type: none"> Improve the corporate culture and carry out diverse activities to foster female talents 	42p
	Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all	<ul style="list-style-type: none"> KOEN CSV project to create shared values 	28~31p
	Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	<ul style="list-style-type: none"> Develop future growth drivers through new businesses Expand open recruitment and socially-balanced employment 	26~27p 46~47p
	Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	<ul style="list-style-type: none"> Strengthen the basis for business by supporting the infrastructure in areas of KOEN's overseas business 	50p
	Goal 10 Decrease intra-national and cross-national inequality	<ul style="list-style-type: none"> Carry out energy-sharing programs leveraging our core competencies, such as the Sunny Project 	50p
	Goal 13 Take urgent action to combat climate change and its impacts	<ul style="list-style-type: none"> Develop new and renewable energy Establish a response system to climate change Build a corporate culture of low-carbon 	30~34p

Memberships and Awards

Memberships

Organization	Purpose of membership
Korea Electric Association	Advance and develop technologies in the overall field of electricity, including the electric power industry, electricity industry, and safety
Korea Society of Mechanical Engineers	Advance and develop the study and technologies in the field of machinery
Korean Institute of Electrical Engineers	Advance and develop the study and technologies in the field of electricity
Korea Smart Grid Association	Take leadership in projects driven by national policies
AESIEAP	Five generation companies participate in AESIEAP as executive committee members and promote mutual exchange and cooperation among electric power companies and experts
Korea Carbon Capture and Storage Association	Build an industry-led organization to commercialize CCS and industrialize its exports
Business Institute for Sustainable Development of Korea Chamber of Commerce and Industry	Provide reasonable solutions based on joint studies and voluntary alliance with academia and other players
National Assembly Forum on Climate Change	Discuss and participate in the policy development and legislative proposals regarding climate change as a stakeholder
Project Management Association of Korea	Foster construction experts through PMP certificate acquisition and contribute to the construction of economically efficient power plants
Korea Society of Big Data	Big data technology and information exchange
Business Ethics and Sustainable Management Forum	Joined the forum to share business cases of other companies to efficiently conduct ethical management
CEO Club for Business Ethics and Sustainable Management	Joined the club to cooperate with other companies from the CEO and executive level
Korea Association of HR Managers	Share current issues about human resource management
Korea Audit Association	Improve the expertise of auditors and learn about the latest audit-related issues
Korea Electric Association	Acquire information on the power industry policy and technical standards and reinforce the execution base
Maekyung Safety and Environment Institute	Strengthen the basis for implementing and responding to the government's safety and environment policy
Korean Welding and Joining Society	Support training and technology for welding

Awards

Award name	Awarding organization
Grand Prize at the 2017 Eco-friendly Management Award	Ministry of Trade, Industry and Energy (MOTIE), Ministry of Science, ICT and Future Planning (MSIP)
Grand Prize in the category of public companies at the Korea Ethical Management Prize	MOTIE, MSIP
Grand Prize of technological innovation industry at the 2017 Korea Industry Award	MOTIE, MSIP, Small and Medium Business Administration
Green Climate Prize at the 2017 Korea Green Climate Awards	National Assembly Forum on Climate Change
Speaker of the National Assembly Award (special prize) at the 2017 Adding Happiness Social Contribution Awards	Korea Employers Federation, Association of Korean Journalists
Presidential Citation for Government Innovation Merit	Ministry of the Interior
Grand Prize at the 2017 Korea Global Leader Awards	Maekyung Media Group
Korea TPM Grand Prize at the 2017 Global Industrial Innovation Conference	Korean Standards Association
Presidential Citation at the 2017 Global Green Management Excellence Awards	MOTIE, Ministry of Environment
Grand Prize in the social contribution for regional development category at the 2017 Korea Management Awards	Dong-A Ilbo
Prime Minister's Award at the 2017 Korea Renewable Energy Awards	MOTIE, Korea Energy Agency
Minister Award at the 2017 Korea Sharing Awards	Ministry of Health & Welfare, KBS, Community Chest of Korea
Creativity Award at the 2017 Korea Mecenat Awards	Korea Mecenat Association, Maeil Business Newspaper
Grand Prize at the 2017 Korea Sharing Volunteer Awards	United National Volunteers Korea
Minister's Award at the 2017 Korea Safety Awards	Ministry of Government Administration and Home Affairs



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