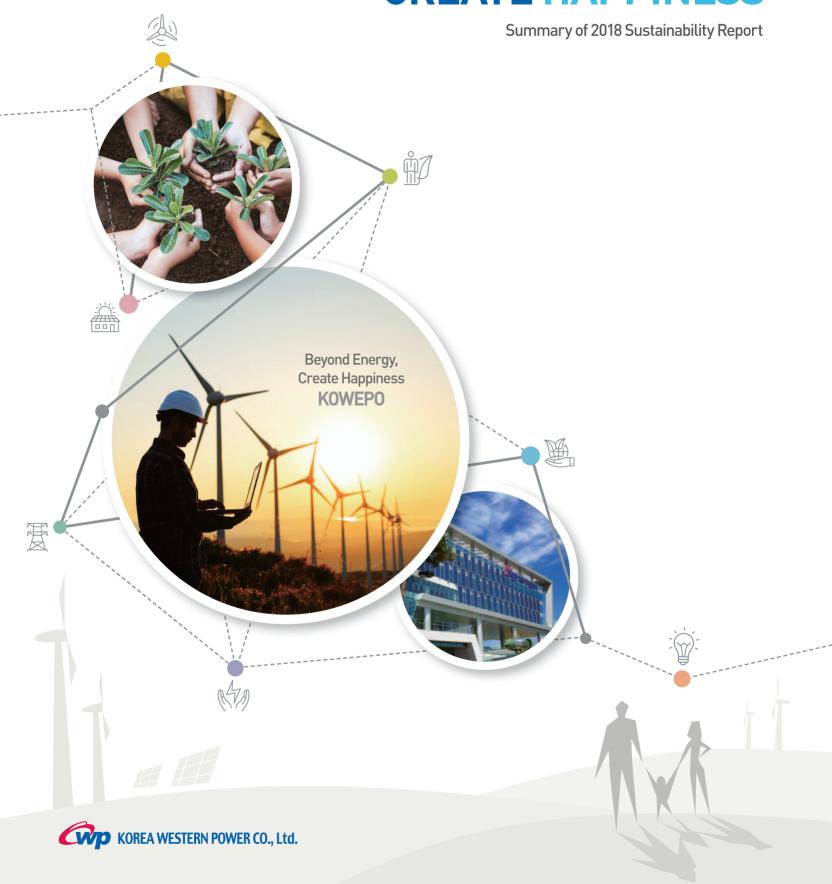
# BEYOND ENERGY, CREATE HAPPINESS





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# **CEO Message**



"We will build the foundation for sustainable growth through fundamental innovation and lead materializing social value to solidify our place as the energy company that creates happiness for the people."

#### Dear stakeholders.

I would like to express my gratitude for your interest in and support of KOWEPO.

KOWEPO is a power company established in April 2001 and has been growing into Korea's leading government-owned energy company by continuously innovating internally and openly communicating externally for the past 17 years. We have contributed to the stable national power supply by recently completing the construction of large power plants such as Taean Units 9 and 10 and IGCC Power Plant. We are also investing heavily on the expansion of renewable power generation systems such as the development of Lake Iwon floating solar panels and establishment of offshore wind farms. We are also leading the efforts to improve citizens' quality of life through clean energy, such as establishing the foundation to reduce fine dust drastically by introducing a new technology for the first time in Korea to solve the problem that has become a public concern.

KOWEPO is facing a rapid change of business environments such as the limitation of large-capacity thermal power generation due to the shift of energy paradigm, launch of new climate scheme, and proliferation of the Fourth Industrial Revolution. Hence, KOWEPO would like to present the following three promises to our stakeholders to leap forward in sustainable growth based on these changes.

#### First, KOWEPO will transform itself into a differentiated power company through extensive and fundamental innovations.

We are implementing the WP-MOVE project which is the company-wide innovation project to build the sustainable management base. We intend to secure differentiated competitiveness by implementing 55 innovation programs from the faithful execution of its role as the governmentowned power company to the transformation into the future-oriented corporate culture as identified by employees.

#### Second, KOWEPO will focus on securing growth engines in the future.

As we are facing the limitation of the growth potential of thermal power generation in Korea, KOWEPO has announced 3025 Renewable Energy Roadmap to build the foundation to expand the power generation from renewable energy to 25% by 2030. We are expanding our business centered on the key regional base such as Indonesia to develop highquality overseas businesses and making full efforts to enter Panama, Kenya and other fast-growing emerging markets. Moreover, we intend to actively pursue new challenges such as the development of high value-added business models in the power generation industry by converging the accumulated power plant operating know-how and new technologies in the Fourth Industrial Revolution.

#### Third, KOWEPO will become the company that is trusted by and endeared to the public by leading the embodiment of social values.

We will fulfill our social responsibility as a public enterprise by creating good jobs, growing together with business partners, and continuously identifying and carrying out KOWEPO's differentiated business to promote the local economy. Moreover, we will do our best to meet the expectation of our stakeholders by establishing transparent and fair culture.

#### Respected stakeholders,

This eighth Sustainability Report contains KOWEPO's efforts and commitment to keep the above three promises. I look forward to your continued support and encouragement to the endeavor of KOWEPO to fulfill its role as a good neighbor of the community, a strong partner of small and medium enterprises, and the energy company to create the happiness for the people. Thank you.

September 2018

Kim Byung Sook

President & CEO of Korea Western Power Co., Ltd.

>1 Hz 5

# **Company Introduction**

#### Company Profile

KOWEPO operates four power generation complexes in Taean, Pyeongtaek, Seoincheon, and Gunsan for a total capacity of 11,314 MW or about 10% of total installed capacity in Korea. About 2,350 employees of KOWEPO are responsible for contributing to the national economic development and people's livelihood by providing the stable and economical supply of high-quality electricity. In line with the government's policy to expand renewable energies, KOWEPO plans to expand the portion of renewable energy to 25% of total power generation by 2030. Moreover, KOWEPO is participating in the construction and operation of power plants in Indonesia, Laos, Myanmar, India, and other countries to expand future growth engines and improve our capabilities.

Company Name	Korea Western Power Co., Ltd.			
Date of Establishment	April 2, 2001			
CEO	Kim Byung Sook			
Type of Business	Power generation, power development, and audit			
Employees	2,352			
Business Domain	Electric power			
Address of Headquarters	285, Jungang-ro, Taean-eup, Taean-gun, Chungcheongnam-do			

Asset (KRW million) **9.628.671** 



Sales (KRW million)
4,222,449

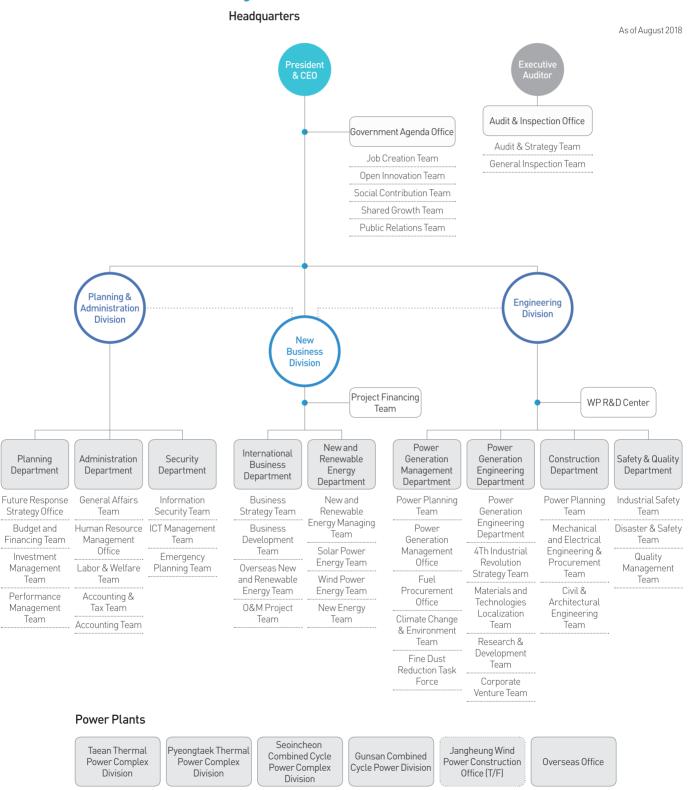


Debts (KRW million) **5.746.278** 





#### **Organization Chart**



#### **Current Status of Business**

#### **Domestic Business**

#### **Power Plant Operation**

KOWEPO operates four power generation complexes (Taean Thermal Power Complex Division, Pyeongtaek Thermal Power Complex Division, Seoincheon Combined Cycle Power Complex Division, and Gunsan Combined Cycle Power Division) in Korea for a total power generation capacity of 11,314 MW (as of June 30, 2018) which accounts for 9.7% of total domestic installed capacity. In order to provide a stable electric power supply, which is the primary purpose of the power generating business, KOWEPO carries out the expansion of domestic facility capacities, replacement of obsolete equipment in a timely manner, and quality assurance at the construction stage.



#### Seoincheon Combined Cycle

- Installed capacity: 1,800 MW
- Construction completed in: 1992
- Fuel: LNG





• Fuel: Heavy oil





#### 3 Taean #1-10

- Installed capacity: 6,100 MW 4
- Construction completed in: 1995 2017
- Fuel: Bituminous coal

#### 2 Pyeongtaek 2 Combined Cycle

- Installed capacity: 869 MW
- Construction completed in: 2014
- Fuel: LNG





#### 4 Gunsan Combined Cycle

- Installed capacity: 718.4 MW
- Construction completed in: 2010
- Fuel: LNG



#### N New & Renewable

- Installed capacity: 424 MW
- Construction completed in: 2007 2017
- Fuel: IGCC, solar energy, small hydro, fuel cell and wind energy
- Taean Yeongam, Hwaseong Samrangjin, Sejong City, etc.









#### **New Construction**



#### Shinpyeongtaek Combined Cycle

KOWEPO is constructing the power generation facility with 942.9 MW capacity using natural gas as fuel inside the Pyeongtaek power plant to secure the highest competitiveness through the direct supply of fuel and the increased synergy through sharing the facilities of Pyeongtaek No. 2 Combined Cycle Power Plant. Its construction began in January 2017 and will be completed in November 2019.

#### Taean Thermal Power Complex Division

The Taean Thermal Power Complex Division is the core power generation complex of KOWEPO. It operates thermal power plants that take approximately 45% of the company's generation facility capacity and is equipped with cutting-edge automatic control facilities. It strives to build eco-friendly power plants by equipping them with the latest flue gas desulfurization facilities, continuous coal handling machines to prevent coal dust, and wastewater treatment facilities for all generators. The division is the model of the Korean standard thermal power plant and produces the clean and highquality electricity as the energy leader for the Era of West Coast.

#### Pyeongtaek Thermal Power Complex Division

The Pyeongtaek Thermal Power Complex Division operates the steam power plants that use natural gas and heavy oil and the combined cycle power plants that use only the natural gas. It is transforming itself into eco-friendly power plants with the world's top class technology in operation and the environmental system and has completed construction of the new combined cycle power plant using natural gas to fulfill its role as the largest hub power plant in the capital region. With the motto of "Love for Humankind, Love for Nature, and Love for Culture," it is creating warmhearted neighborhoods and happy energy by contributing the development of local community through the increase of income and welfare of residents and enhancement of educating environment in the local communities.

#### Seoincheon Combined Cycle Power Complex Division

The Seoincheon Combined Cycle Power Complex Division is an eco-friendly power plant which uses the natural gas of clean fuel, generating almost no air pollution. The division has an excellent load follow capacity that can respond flexibly to power demand and contributes to the stable operation of the power system due to the quick start-stop function of gas turbines.

#### Gunsan Combined Cycle Power Division

The Gunsan Combined Cycle Power Division is an eco-friendly power plant that uses LNG for fuel. Although it was built in a densely populated area within a city, it is considered as the role model for urban power plants through the thorough environmental management and the use of clean fuel to solve the environmental problem. In particular, it has the highest generating efficiency domestically by applying the latest G-class gas turbine for the first time in Korea. It supplies the stable power the Saemanguem region, which is becoming the economic hub in northeast Asia, based on the cuttingedge power generation system and is contributing to the economic growth of Jeollabukdo region.



#### Taean No. 2 Small Hydro

Taean No. 2 Small Hydro Plant will generate power using the pressure head of the cooling water drainage from the integrated gasification combined cycle (IGCC) of Taean Units 9 and 10 and have the installed capacity of 5 MW. Its construction began in December 2016 and will be completed in March 2020.



#### Jangheung Wind Power

KOWEPO is constructing a wind farm with the capacity of 16 MW in the Jangheung region to expand the portion of new and renewable energy. Its construction began in June 2018 and will be completed in May 2019.

## **Company Introduction**

#### **Overseas Business**

KOWEPO is diversifying the profit-generating structure by building business structures for the overseas plant O&M (operating and maintenance) and the CM (construction management) service using internal construction personnel. In particular, KOWEPO is carrying out the overseas business centered on coal and gas power generation that the analysis of global energy consumption trends shows patterns of the steady increase of consumption; hydraulic power generation that is expected to bring stable profits; and 0&M projects that can realize maximum profits with minimum investment based on the company's core capabilities. KOWEPO plans to carry the overseas projects forward by laying the profit foundation and enhancing the efficiency of promoting projects using the core capabilities.

#### Operation (7 Cases)



1,204 MW • Saudi Arabia Rabigh Heavy-oil O&M • Australia Moolaben Coal Mine

Indonesia Sumsel 5 0&M

300MW

• Indonesia Floating Coal Terminal 8.0 million ton/year

• Bayan Resources Tbk 8.0 million ton/year

• Panama Colon CCPP Commissioning 380 MW

• India Maharashtra Gas Combined Cycle 388 MW

#### In Progress (3 Cases)

as of December 2017

• Laos Xe-Namnoy Hydro 410 MW

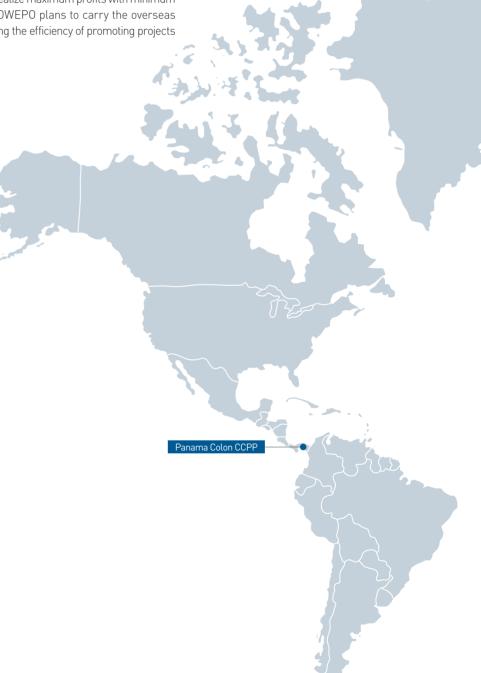
 Australia Bylong Mine 5.0 million ton/year

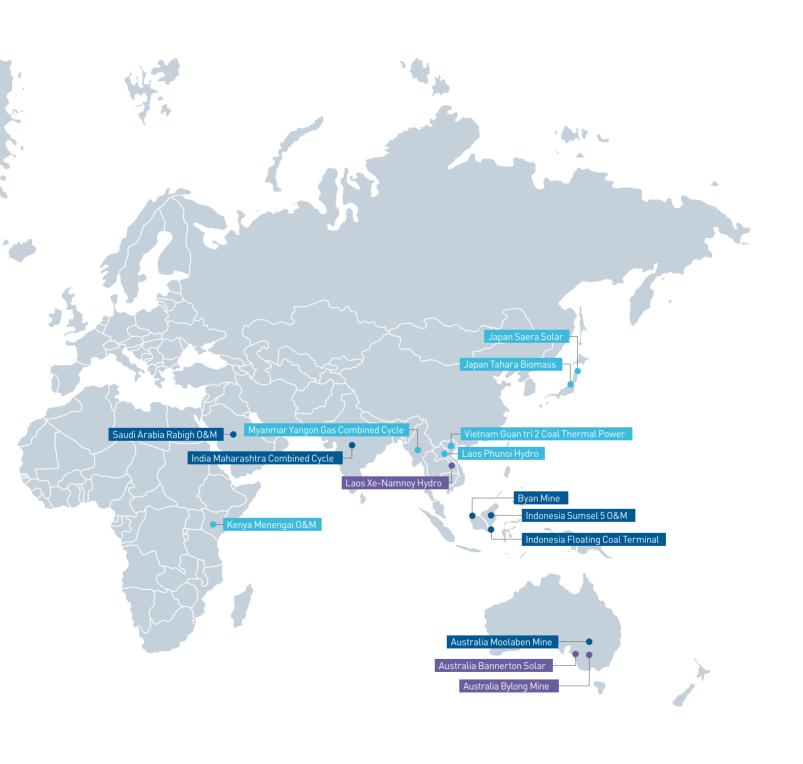
 Australia Bannerton Solar 110 MW

#### In Development (6 Cases)

as of December 2017







# WP HISTORY 2001-2018

2011

- **01** Designated as a market-type public enterprise
- 03 Sponsorship for the "Seed Bank Account"
- **04** Ceremony for WP-TOPS win-win growth
  Starting ceremony for university students volunteer group
- 11 Groundbreaking for Taean IGCC



Starting ceremony for university students volunteer group

2017

- 02 Began power generation of Taean Unit 10
- 05 Received the Energy Environmental Technology Grand Award
- 06 Received Korea Innovation Grand Award
- 07 Completed construction of Seoincheon Solar
- **09** Declared WP STAR-10 for essential safety guidelines
- 11 Received Presidential Award for Organization in Shared Growth Received Presidential Prize in Active Administration Contest
- 12 Completed construction of Taean Units 9 & 10

2016

- **05** Completed construction of Taean Floating Solar Generator
- 06 Received 2016 Korea Innovation Grand Award
- 10 Received Project Management Grand Award
- 11 Received 10 Mechanical Technology Award of the Year Received Global Standard Safety Management Award
- 12 Received Idea Management Grand Award



Construction completion ceremony of Taean Units 9 &~10



Completed construction of Taean Floating Solar Generator

2018

- **03** Achieved the highest rating for three consecutive years in shared growth performance evaluation of public institutions
- **04** Signed the Agreement for Joint Development of Solar Power Generation in Agricultural and Fishery Villages
- **05** Received 2018 Grand Award in Employment Friendly Section for National Industrial Award

Received 2018 Korea Innovation Grand Award in Management Innovation

Received 2018 Deputy Prime Minister's Prize for National Sustainability Grand Award

Selected as 2018 Korea's Top 100 Companies for Employment

07 Achieved the highest rating in 2018 Safety Korea Training for Disaster Management



Signed the Agreement for Joint Development of Win-Win Solar Power Generation in Agricultural and Fishery Villages

#### 2012

- **01** Signed SS-SHA ceremony of Maharashtra power generation
- **04** Leading event for the spread of mutual growth culture
- **10** Signed MOU for promoting the second project of "Happy City Solar Power Generation"
- 11 Groundbreaking Taean Units 9 & 10
  Won a Prize in the Public Corporation Category at Sustainable Management Awards



Signed SS-SHA ceremony of Maharashtra power generation project

#### 2013

- **02** Signed a contract to purchase power from Xenamnoy Hydro Power in Laos
- **08** Constructed Safety Experience Centers in All Operation Sites
- 10 Won the First Prize in the Public Company Category at the 1st "The Most Loved Companies Award"
- 12 Signed contract for Sumsel 5-0&M in Indonesia



Signed a contract to purchase power from Xenamnoy Hydro Power in Laos

#### 2015

- **04** Pre-Commissioning of Taean Thermal Power Plant Unit 9
- **08** Relocation of KOWEPO Headquarters to Taean-gun
- 09 Won the 1st in the Sustainability Index
- 10 Established the Safety Management Master Plan
- 11 Won the Presidential and Minister Prizes at the Korea Safety Awards
- 12 Won the Presidential Prize for the Contribution to Job Creation



- 11 Completion of the 2nd Pyeongtaek Combined Plant Completion of Fuel Cell Plant in Seoincheon Declaration of Vision 2025
  - Taean & Western Power Signed the MOU for Industry Innovation 3.0
- **12** The first Grand Prize Winner at Korea Great Work Place among Public Companies

Achieved 1st Place in the Shared Growth Assessment for Public Institutions for two consecutive years

Achieved the P grade of PSM twice in a row among power corporations Won the Grand Prize at the Korea IDEA Management Awards



Declaration of Vision 2025



Relocation of KOWEPO Headquarters to Taean-gun

# BEYOND ENERGY, CREATE HAPPINESS

14

The KOWEPO's value chain activities are to create values suitable for completing KOWEPO's vision, "Beyond Energy, Create Happiness." To that end, KOWEPO shares values created through the establishment of the optimal operating system with society by placing values in the entire supply chain from the necessary resource development to electric supply to distribution in terms of sustainable management.



in accordance with the national power supply plan.



**Installed Capacity** 

**1,791**<sub>w</sub>



**Raw Material Purchase** 

KRW 2,731 billion



Investment in R&D

KRW 15.4 billion



**Investment in Training** 

KRW **5.8** billion



No. of Employees Engaged in Social Contribution

7,515



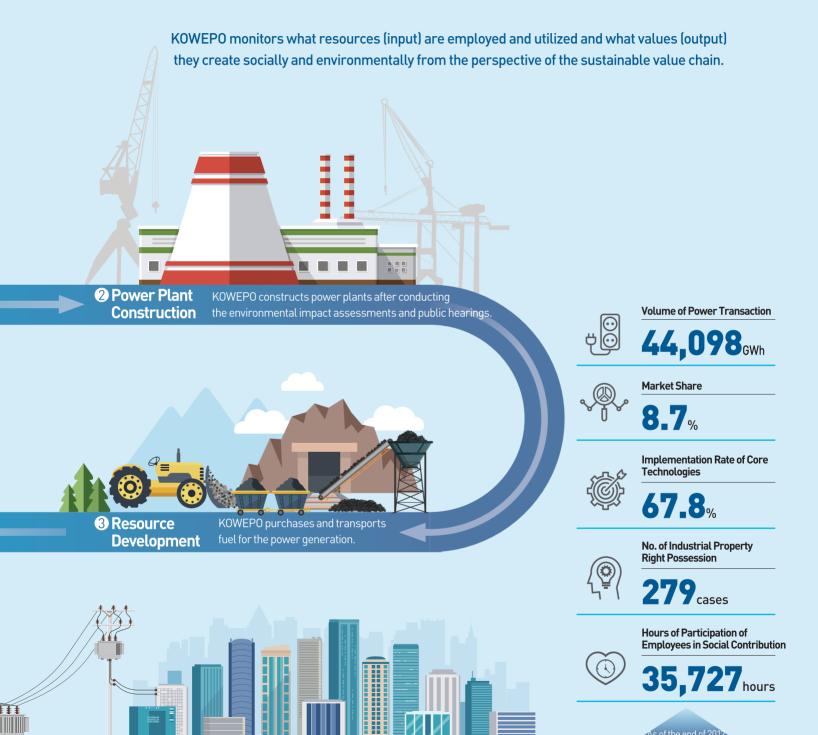
**4** Power Generation

to generate electricity.



**5** Power Transmission

KOWEPO transmits the generated electric power

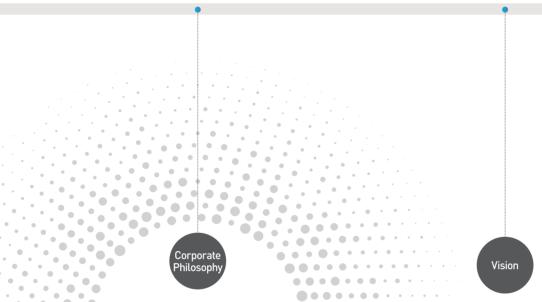


KOWEPO distributes the

electric power to customers.

**6** Power Distribution

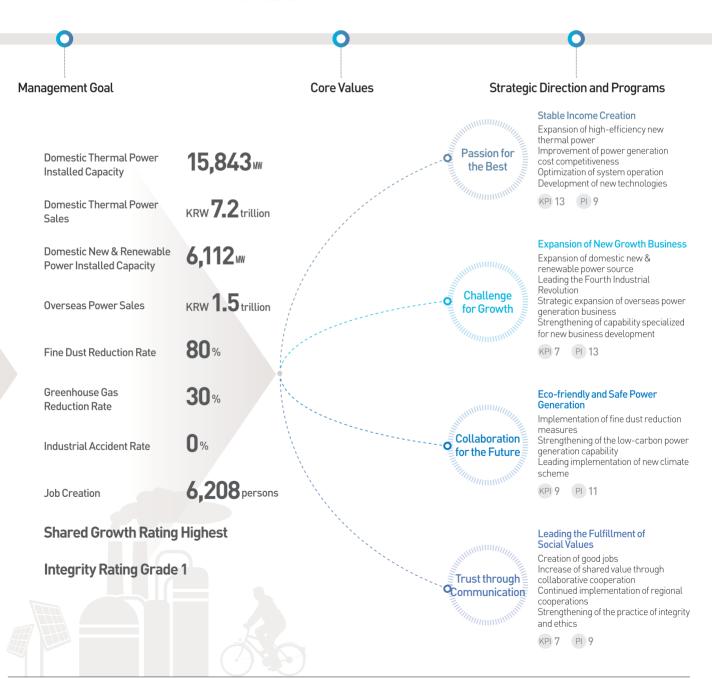
# **KOWEPO Vision 2030**



To create the best energy by harmonizing humankind, technology, and environment.

Beyond Energy, Create Happiness
The energy company creating
citizens' happiness

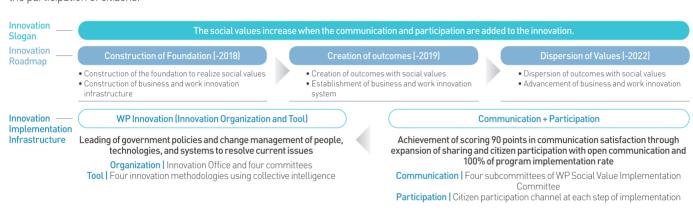
Since establishing Vision 2025, KOWEPO has faced the change of business environments such as accelerated slowing down of domestic power demand growth, power supply structure change centered on eco-friendliness and safety, spread of technology innovation by the Fourth Industrial Revolution, and emphasis on fulfilling social responsibilities of public institutions. To prepare for a better future through change and innovation, KOWEPO established KOWEPO Vision 2030 by reflecting the government's energy policy and opinions of inside and outside stakeholders. KOWEPO is committed to growing into the differentiated power company to lead the energy market and broaden its presence by leading the fulfillment of social values through the achievement of KOWEPO Vision 2030.



### **Management Innovation**

#### **Establishment of Management Innovation Implementation System**

KOWEPO is striving to maximize the business performance through the management environment changes by establishing the management innovation system. We expanded the management innovation domain for the advancement of management innovation system to the public service domain to fulfill the social values and launched the public institution's first "WP Social Value Implementation Committee" in December 2017 to actively reflect the opinions of the stakeholders. We are fulfilling the social values that the public can experience through the open communication with residents, NGOs, and vendors. Moreover, we unified the national affair tasks such as innovation programs that had been spread through various organizations and built the collective intelligence utilization system centered on communication and collaboration through linking of innovation implementation organizations and strengthening the participation of citizens.



#### **Promotion of Management Innovation Implementation**

#### Construction of Innovation Ecosystem Based on Utilization of Internal and External Collective Intelligence

KOWEPO strives to build the more productive innovation ecosystem by utilizing the internal and external collective intelligence to implement totally new innovations.



CoP Activities



Enterprise-wide Process Improvement



Suggestion Activity

Internal Suggestion

Work improvement

and R&D through the

employee's ideas

Strenathening of

linking with the internal

evaluation to improve

quality through

advanced suggestion,



#### Innovation Project Enterprise-wide

Innovation Event

Group activities
centered on collective
intelligence and
collaboration to solve
current issues

**Projects** 

Reestablishment of the implementation process to fulfill the social values

Improvement Direction

Strengthening of Communications and Collaboration

#### **Constant Learning**

#### 23 power generation technical expert group in new & renewable energy, etc.

Strenathenina of future response power centered on new technologies of the Fourth Industrial Revolution

Improvement Direction

Technology Innovation for Future Response

#### 6-Sigma

#### Large programs to solve top-down type management issues

Resolution of root problem through the customer-centered statistical thinking

\* First introduction among power company in 2003 and internalization phase

Improvement Direction Improvement Direction

Resolution of Management Issues

#### **Quality Improvement**

#### Small group activities to resolve bottom-up type field themes

127 active quality control groups company-wide and external spread of resolved themes

#### Improvement Direction

Strengthening of Improvement of External Spread Suggestion Quality

#### **Customer Suggestion**

#### Identification of R&D and collaboration projects using customer's ideas

Expansion of communication channels and opinion gathering for fulfillment of social values

Improvement of management substance reflecting CEO's commitment to innovation and participated by all employees

WP Move project: 1,377 cases received and 55 innovation projects selected

Improvement Direction

Expansion of Citizen's Suggestion

Improvement Direction

Improvement of Management Substance

#### WP-MOVE project to improve the management substance

KOWEPO is carrying out the WP-MOVE project to achieve the management goal. The WP-MOVE project is the innovation project with the goal of Motivating the employees for innovation, Optimizing the business process, Vitalizing the organizations, and Evolving into the best energy company. KOWEPO selected 55 innovation programs from 1,377 suggestions through the feasibility review by experts and then will evaluate the projects and award them at the end of 2018. The key implementation programs such as WP-2030 Clean Air Project that includes the expansion of fine dust reduction measures, which are currently limited to coal-fired thermal power, to heavy oil thermal power and combined cycle thermal power and the drastic increase of the reduction target and WP Carbon Mileage which offers incentives to employees' voluntary carbon reduction activities. Moreover, KOWEPO has initiated various programs to restructure itself into the ecofriendly business by implementing "New & Renewable Energy 3020." They include securing the technologies and sites such as the reclaimed regions, mud flat, and seawater fish farm; developing the new & renewable business model based on resident participation using the private equity fund led by local financial sector; and commercialization of virtually integrated, ultralight wind power generation technologies.

### Construction of foundation for citizen participation and collaboration at each step of innovation programs

KOWEPO is carrying out the innovation activities that the public can experience under the leadership of the WP Social Value Implementation Committee by gathering the needs at each step such as collecting citizens' opinions, strengthening advice from outsiders, and citizen participation in deliberation. The first step of identifying projects systematically manage the citizens' suggestions and reflect them in business by expanding the communication channels with citizens such as Innovation Idea Contest, WP Citizen Suggestion Card, and WP Citizen Suggestion Lot. The second step of selecting and implementing projects enhances the advice from outsider's viewpoint, and the third step of sharing and feedback strengthens feedback and sharing the outcome with the public by introducing the citizen evaluation system of the project outcomes.

#### Expansion of compensation for innovation activities

KOWEPO operates the incentive scheme under the comprehensive performance compensation rule to provide motivation for innovation activities. It includes linking awards with human resource system, financial performance compensation, awards for creative ideas, overseas training, and mileage.

#### Strengthening of Capability for Future Innovation Growth

KOWEPO is committed to growing into the energy company leading the future power generation industry through the continuous expansion of future growth engine, strengthening of global level engineering capability, and continuous investment in R&D and human resource development based on the company-wide management innovation.



1st general meeting and expert advisory group initiation ceremony for 2018  $\,$ 



WP-Move project kick-off meeting and briefing at HQ

#### **STEP 1** Identification of Projects

**Communication and participation**Gathering of citizen's opinions, contest, etc.

Citizen participation channel WP Social Value Implementation Committee, etc.

#### STEP 2 Selection and Implementation

**Communication and participation**Participation of expert advisory group in

Citizen participation channel Citizen opinion group, advisory group,

selection and sharing

#### council, etc.

#### STEP 3 Sharing and Feedback

Communication and participation

Citizen evaluation and review, sharing of BP cases, etc.

Citizen participation channel

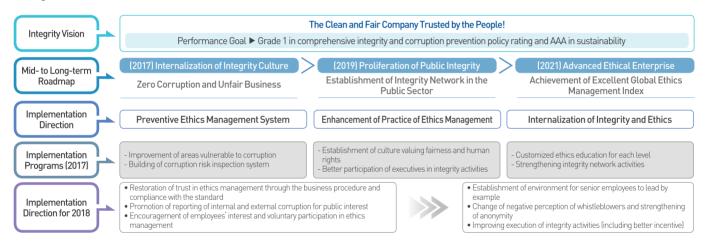
Citizen opinion group, advisory group, and contest council, etc.

## **Ethics Management**

KOWEPO has continuously practiced ethics management since the "KOWEPO Code of Conduct" was proclaimed in October 2002 as the standards for the ethical judgment and behavior of its employees to become a global leader in ethics management. KOWEPO is committed to moving forward to be a global leading ethics management corporation trusted by the public.

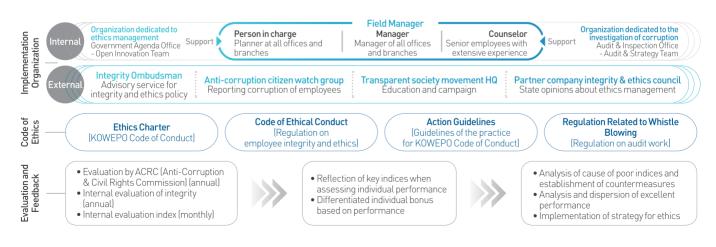
#### **Ethics Management Vision and Strategy**

Under the vision of "The Clean and Fair Company Trusted by the People!," KOWEPO selected three major directions of the preventive ethics management system, strengthening ethics management practices, and internalizing integrity and ethical awareness and six implementation programs. We practice ethics management in compliance with international standards on anti-corruption management.



#### Implementation System

KOWEPO is operating the practice program with the dedicated organization and system to implement the ethics management effectively. The organization dedicated for ethics management is responsible for establishing and executing the detailed plan for implementation of ethics management, employee education on ethics management, dispersing corporate ethics culture, and registering the internal and external unethical cases.





ISO 37001 certification ceremony



Integrity and Ethics Education



Contest for Integrity and Ethics Practice



On-site briefing to share examples of unfair work order

#### Implementation Activities of Ethical Management

#### Acquisition of ISO 37001 Certificate for Anticorruption

In recognition of active efforts and participation of its employees for establishing the integrity culture, KOWEPO's head office and power generation complexes in Taean, Pyeongtaek, Seoincheon, and Gunsan acquired the ISO 37001 anti-corruption certificate for the first time in Korea in August 2017.

#### Ethics Education of All Employees

KOWEPO conducts lifecycle-specific ethics education from new hires to high-ranking employees to comply with the Improper Solicitation and Graft Act and internalize the ethical awareness. The education programs maximize the effect of integrity messages by breaking away from conventional one-way lecture and strengthening the integrity education through cultural experience and seek voluntary changes through emotional communication.



ISO 27001 certificate

#### Holding of Contest for Integrity and Ethics Practice

KOWEPO held the Contest for Integrity and Ethics Practice for all employees at its headquarters in Taean on January 13, 2017. Furthermore, KOWEPO formed a department dedicated to integrity and ethics to establish the organizational culture of transparency and integrity since the enactment of the Improper Solicitation and Graft Act. It has published the action manual to increase understanding of the law and is carrying out various programs such as the customized education and integrity events.

#### Publication of Casebook of Unfair Work Order

KOWEPO held the workshop to identify unfair work order cases in June 2017 and published the casebook in August to establish a fair and clean working environment. Moreover, it is holding a field briefing to share cases to establish a clean organizational culture and encourage voluntary lead-by-example of senior-level employees. KOWEPO intends to implement the anti-corruption policy that the public can experience by continuing its integrity programs to eradicate unreasonable practices in the viewpoint of outside stakeholders as well as internal unfair work orders and communicating with various stakeholders.

#### Operation of Fair Hiring Process

KOWEPO has been conducting the blind and NCS-based hiring process since 2015 to provide fair opportunities to applicants. In particular, KOWEPO deleted the gender and age information and photo attachment in the application form and reduced the details of education and experience in the application form to prevent prejudice against high school graduates at the application stage. Moreover, it selects the recruitment contractor through open competitive bidding to secure the objectivity of evaluation. As a result, the hires from areas outside of the capital region increased by 44.8%.

KOWEPO has reestablished its management strategy
Vision 2030 that reflects the paradigm shift of
the energy industry to expand the new growth business and
strengthen overseas business for sustained growth.

**New Growth Business** 

Creation



**Industrial Revolution** 

**Overseas Business** 

Performance (As of the end of 2017) Sales KRW **4.222** trillion Sales from Overseas Business KRW 30.0 billion Investment in R&D KRW 12.8 billion Average Education Time per Person **143** hours 4 15 x x x x x

# **Economy**

Mid-term (2023)

Cycle (2021)

### **Stable Income Creation**

#### Mid to Long-term Roadmap

**Combined Cycle** 

Demonstration R&D

and Joint Projects

KOWEPO segmented the mid to long-term thermal power generation roadmap to the current level, mid-term, and long-term for stable income creation and had established the goal of securing the

installed capacity of 15,843 MW by 2030. • Performance improvement of Taean Unit 3 Current Level (2018) [2022] • Performance improvement of Taean Unit 4 • Establishment of performance improvement plan for [2023] Performance of Taean Units 3 and 4 the Old Coal-Fired Construction start of Taean Units 1 and 2 • Execution of governmental preliminary feasibility study Replacement project (2022) Replacement with • Reflection of the Eighth Power Master Plan to the Taean Combined Cycle (2019) Units 1 and 2 LNG Combined Cycle Replacement project High-efficiency Gas

· Preparation of replacing the old combined cycle facilities • Execution of a preliminary feasibility study of Korean

Model Combine Cycle R&D · Signing of Agreement on Joint Project of Yeoju Combined

Long-term (2030) Performance Improvement of Taean Units 5-8 • Construction completion of Taean Units 1 and 2 • Construction completion of Pyeongtaek Steam and Seoincheon Unit 1 Replacement project · Construction completion of Shinpyeongtaek • Field demonstration of the Korean model of • Building new combined cycle power plants combined cycle power generation (2022) · Construction completion of Yeoju Combined

#### Prompt Implementation of Domestic Thermal Power Projects

#### Sequential implementation of performance improvement of the old coal-fired thermal plant to secure stable income base

KOWEPO is carrying out the project that increases the boiler steam temperature (538°C  $\rightarrow$ 600°C) and optimizes core systems such as the turbine and feedwater heater to improve the efficiency of the old coal-fired thermal power plants by 2.4%p.

#### Increase of profitability by promptly replacing old system with high-efficiency gas combined cycle systems

KOWEPO strives to improve the profitability by replacing the old combined cycle system with low utilization rate with high-efficiency power generation system such as converting Taean Units 1 and 2 into gas combined cycle plants.

#### Development of demonstration R&D project and joint projects to take an early lead in domestic gas turbine operation

KOWEPO will secure the domestic gas turbine operating know-how by carrying out the demonstration R&D project and create continuous income by entering the overseas O&M markets.

#### **Installed Capacity** 15.043 **Installed Capacity** 12,603 15,843 2018

#### Smart and Distributed Purchase of Bituminous Coal

#### Saving of bituminous coal purchase cost by monitoring the global market change

KOWEPO changed the bituminous coal procurement and optimized the shipping country combination (South African second shipment + Australian second shipment). As a result, we saved the procurement cost of KRW 490 million.

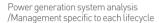
	Туре	30 Days	60 Days	90 Days	Total V (10,00	olume Otons)	CFR (USD/ton)	Total (Volume x CFR)
Existing	Australia(Long-term Chartered Ship)	165,000 tons	165,000 tons	165,000 tons	49	.5	93.03	USD 46,049,850
Ch	Australia (Commodity Chartered Ship)	82,500 tor	ns	32,500 tons	/0.5	16.5	85.87	USD 45,614,250
Change	South Africa (Long-term Chartered Ship)	165,000 to	ns 1	65,000 tons	49.5	33.0	95.29	(Saving of USD 435,600)

#### Economic efficiency by securing high-quality and low-calorie coal

KOWEPO had been procuring low-quality and low-calorie coal mostly from Indonesia but decided to procure high-quality and low-calorie coal mostly from the US after analyzing the quality and economic efficiency and saved the total cost of KRW 60 million.



#### Management for Each Lifecycle





#### Prevention of Similar Failures

Development of reoccurrence prevention system / Sharing and feedback of failure information



#### **Elimination of Human Error**

Strengthening of emergency response capability / Improvement of diagnosis and maintenance capability



#### Utilization of Predictive Diagnosis Technology

Development of predictive diagnosis system/Construction of predictive diagnosis room



#### Focused Management of Four Factors to Prevent Failure

KOWEPO has selected four factors including the lifecycle management, prevention of similar failures, elimination of human error, and predictive diagnosis technology to minimize the shutdown from failure. The key activities includes the elimination of threats by categorizing the failure type according to the lifecycle of power generation system and establishing the countermeasures for each type, early stabilization by analyzing the failure type of previous units and establishing the preemptive countermeasures, selection of system vulnerable to severe failure that reflects the analysis of the failures in the past five years, and continuous identification of improvement and reinforcement measures. Moreover, it tries to minimize the shutdown time due to the failure of power generation systems by reinforcing the old system through identification and improvement of potential risk factors and generating the technical information report (TIR) that tracks the bidirectional failure data. As the results of such efforts, KOWEPO recorded the unplanned loss rate of 0.066% which was the historically low level in 2017.

#### Strengthening of Failure Prevention during Peak Period

KOWEPO analyzes the cause of failure during the peak periods in the past three years and manages the key items to reduce the risk of failure of power systems during the period and has upgraded the preventive inspection by developing KOWEPO standard maintenance model (WP-PM\*) and advance technical inspection.



\* WP-PM: The maintenance model that optimizes the maintenance items and interval according to the operating environment received the EPRI Technical Transfer Award for the first time in Asia

We also operate the dedicated technical support team to build the collaboration and technical support system with relevant institutions and formed the mobile combined cycle support team to prepare for failures of combined cycle systems. In addition, we operate the mobile standby teams during the vulnerable period to upgrade the mobile failure preventive activities. As a result, the number of failures during the peak periods decreased by two to five in 2017, and there was no major failure during the severe cold and hot seasons.

# **Expansion of New Growth Business**

#### Establishment of New & Renewable Energy 3025 Roadmap

In step with the government's policy to expand new & renewable energy, KOWEPO established the New & Renewable Energy 3025 Roadmap that stipulates the investment of KRW 9.3938 trillion to increase the portion of power generation from new & renewable energy to 25%. According to the Roadmap, the installed capacity of KOWEPO's new & renewable energy facilities will be 6,112 MW, and the power generation from new & renewable energy will increase to 18,758 GWh by 2030. KOWEPO intends to build the balanced new & renewable energy portfolio by developing various new & renewable energy sources such as solar energy, wind energy, fuel cell, ESS, and bio. KOWEPO cooperates with local municipalities and residents for development of new & renewable energy through participation and profit sharing as the way to solve the local acceptance problem faced by large-scale new & renewable energy projects. KOWEPO signed MOU with Shinsung Solar Energy, which is the domestic solar energy module manufacturer, to jointly develop the solar power generation

project in Dak Nong Province in Vietnam as the first overseas new & renewable energy project as part of its effort to expand its presence in the global market. ent of new & renewable energy
cal acceptance problem faced by
OU with Shinsung Solar Energy,
evelop the solar power generation

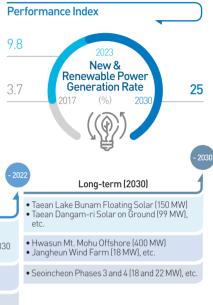
-2022

Mid-term (2023)

Lake Iweon Floating Solar (90 MW)
- Jindo-gun Floating Solar (90 MW)
- Anmyeondo Doosan Salt Pond and Farm (330 MW), etc.

Ansan Pungdo (360 MW)
- Wando Saengil-myeon (400 MW), etc.

Cheonan Cheongsu (5 MW)
- Hwaseong Namyang (40 MW), etc.



#### Development of Large-scale New & Renewable Energy Projects

• Yeongam F1 Racetrack Solar (13 MW)

• Seoincheon Fuel Cell First (11 MW) • Seoincheon Fuel Cell Second (5 MW) etc

Hwasun Wind Farm (16 MW)
Hwasun Wind Darm ESS (4 MW), etc.

Daegu Sewage Treatment Center Solar (7.6 MW)

Current Level (2018)

#### New & renewable business model converging tourism

KOWEPO has been constructing on-ground solar (about 20 MW) and floating solar (about 2 MW) using the existing facilities such as idle lots in power plants, roof of coal warehouse, seawater and cooling water intake path in power plants and utilizing the accumulated know-how to establish the business model that converges the new & renewable energy and tourism business. Such tourism converged new & renewable energy business models by KOWEPO include Taean Lake Iweon Solar (45 MW), Anmyeondo Amadeus Solar (330 MW), Anmyeondo Byeongsulman Solar (22 MW), and Taean Iweon Reclaimed Land Solar (400 MW).

#### Offshore wind farm projects participated by residents

After benchmarking the offshore wind farm projects in leading countries, KOWEPO has launched the offshore wind farm projects with resident participation that uses the area of the offshore wind farm not only for generating power but also for fishery industry such as developing the multi-purpose fish farm and establishing the fishery resources. The currently active projects include Ansan Pungdo Offshore Wind Farm, Shinan Jaeun Offshore Wind Farm, and Wando Offshore Wind Farm.

#### Fuel cell projects

Solar Power Generation

Wind Farm (On Ground,

On Water) and ESS

Fuel Cell (Short-term)

KOWEPO is carrying out the fuel cell projects of about 280 MW in idle grounds in power plants (Seoincheon and Gunsan) and urban areas demanding for heat (Busan Jeonggwan, Daejeon Hagha, Cheonan CHeongsu, etc.). The fuel cell project is the new energy project with high utilization rate (90% or higher) and REC weight factor (REC=2.0), and we expect they will contribute significantly in increasing obligatory RPS implementation. It discharges almost no environmentally harmful substance since it uses the clean LNG as fuel, and it can be installed in urban areas as the alternative to the distributed power source, nuclear, and coal-fired thermal power generation. Moreover, supplying low-cost heat source will ease the burden of local residents and cope with the government energy policies centered on new & renewable energy.



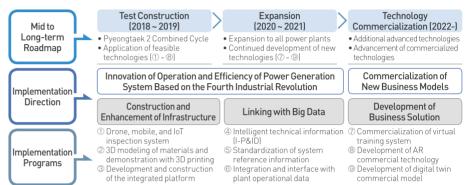
Nighttime View of Taean Lake Iweon Floating Solar Power Plant

# Leadership in the Fourth Industrial Revolution

### Mid to Long-term Roadmap for the Technology Innovation of Fourth Industrial Revolution

KOWEPO is implementing the WP-Smart Plant strategy to lead the power generation industry through technology innovation in the Fourth Industrial Revolution. WP-Smart Plant is the system that allows the employees to acquire data and give work order related to power generation systems using smart devices. Its purpose is to enhance the productivity and efficiency of power plant operation.







Smart Inspection System Applying Drone

#### elcome tr orea W O India enchron encydri

Virtual Training System



Mobile Smart Inspection System

#### Application of the Fourth Industrial Revolution Technologies

#### Smart inspection system applying drone

KOWEPO utilizes drones equipped with high-performance, high-resolution zoom cameras to inspect the blind spots of power generation maintenance, such as the state of the lightning conductor on top of the chimney, floating light for private navigation routes, and stack on top of the boiler building that are usually difficult to access. KOWEPO developed the system to transmit and receive real-time images with the drone in 2018 to inspect the power generators remotely and enhance the capability to manage disasters.

#### Construction of virtual training system applying VR and AR

KOWEPO developed the virtual training system applying the virtual reality (VR) and augmented reality (AR) to train the personnel on power generator disassembly maintenance in the same way as the field training. KOWEPO's virtual training system allows the trainees to disassemble and assemble the equipment and freely move inside outside to observe the appearance and detailed parts using the 3D images on the VR system.

#### Company-wide deployment of the mobile smart inspection system

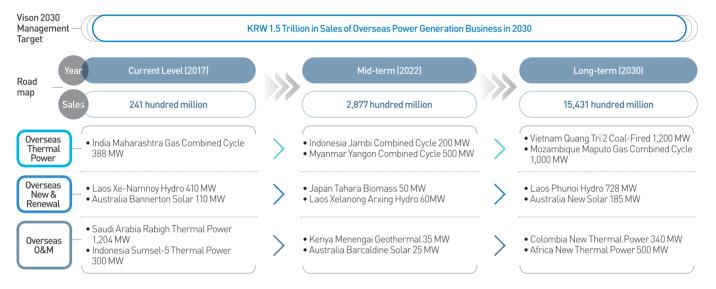
KOWEPO is deploying the mobile smart inspection system of power generation sites throughout the company following the successful testing after its development. KOWEPO's Taean Thermal Power Complex Division developed the smart inspection system, which has the small inspection kits such as the thermal imaging camera and endoscopic camera mounted in mobile devices to inspect the power generation sites, and has been testing it since August last year. The test system had a wide range of functions such as TM (Trouble Memo) query and issuance, history query QR code, log sheet, and drawing query, and the new functions such as the work order and on-site issuance of red tag were added before the deployment company wide.

# **Strengthening of Overseas Business**

#### Mid- to Long-term Overseas Business Target and Roadmap

KOWEPO is actively trying to enter the growing overseas power generation markets to achieve the company management target.

#### Overseas business target



#### Status of Overseas Business

#### Overseas O&M Business

#### Saudi Arabia Rabigh 0&M

The Rabigh Power Plant is the largest privately funded power plant in Saudi Arabia. The heavy-oil thermal power plant has the power generation capacity of 1,204 MW. KOWEPO owns 40% of the 0&M company which conducts the 0&M of the power plant for 20 years from 2013 to 2033. The 0&M company was able to overcome the difficulties due to the low-quality Chinese EPC at the beginning of the operation and has been maintaining a high utilization rate of more than 90% and creating the stable income.



#### Laos Xe-Namnoy Hydro O&M

KOWEPO owns 100% of the 0&M company which began the preparation of test operation of the hydraulic power plant with the capacity of 410 MW. It is preparing for the test operation and full plant operation by incorporating and hiring local personnel to conduct the process timely.

#### Operation technical support (TSA) for Indonesia Sumsel-5 Thermal Power Plant

Sumsel-5 Power Plant that began commercial operation in January 2017 is a 300 MW coal-fired thermal power plant. KOWEPO was able to minimize failure and secure stable sales by focusing on management of vulnerable system at the beginning and providing technical support such as the precise diagnosis. Utilizing the experience and accumulated network, KOWEPO is developing new power generation projects such as 200 MW gas combined cycle in Jambi in Sumatra and 62 MW hydraulic power.

#### **New Business Development**

#### Australia Bannerton Solar Power Plant

KOWEPO was the first Korean power business group to enter Australia's new & renewable energy market and is constructing 110 MW solar power plant in Bennerton, Victoria. KOWEPO invested KRW 4.1 billion for 6% equity share and expects total sales of KRW 30.0 billion for 25 years.

#### Kenya Menengai Geothermal Power Plant 0&M

KOWEPO used its technology competitive superiority to enter the geothermal power generation business in Kenya that has high growth potential and is establishing the base to expand the African business. We expect the sales of KRW 2.3 billion annually for 25 years and plans to create stable income from the power market in east Africa by acquiring equity shares after booking the 0&M project which has the relatively low risk.

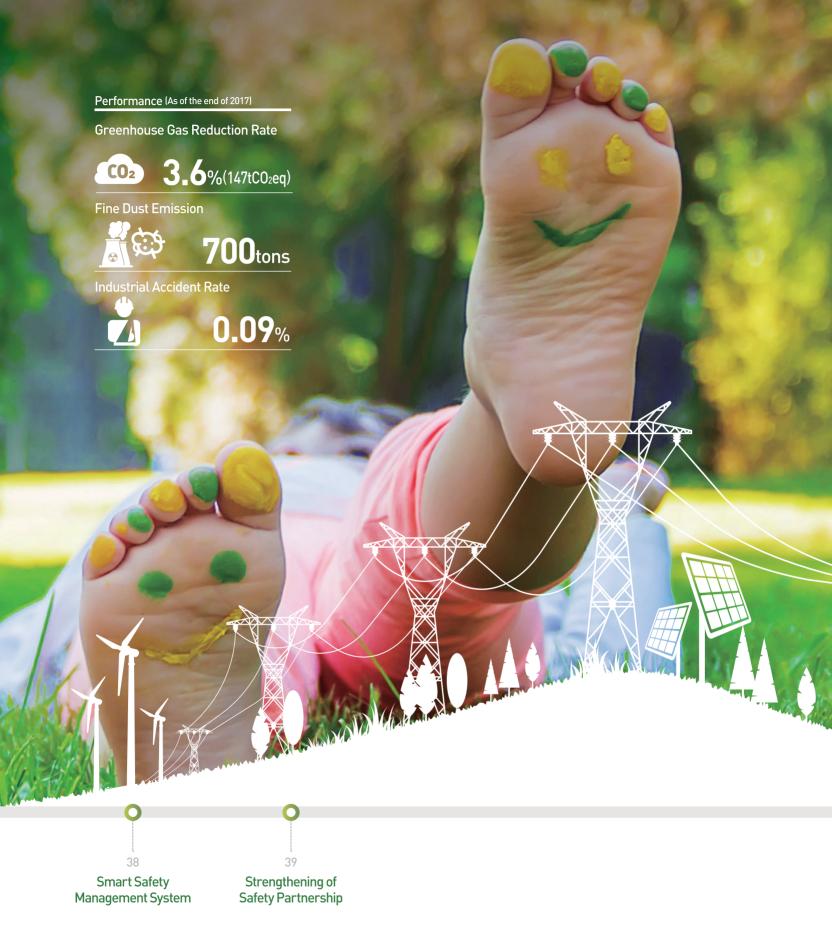
#### Vietnam Quang Tri 2 Coal-Fired Power Generation

Quang Tri 2 Coal-Fired Power Plant in Vietnam is a supercritical, high-efficiency power plant with the capacity of 1,200 MW. KOWEPO has the equity share of about 25% and plans to construct and operate the world's top level power plant by utilizing its construction and 0&M experience with coal-fired thermal power plants. This project is expected to be part of Vietnamese Master Plan for Power Supply and Demand at the end of 2018, and KOWEPO will implement the project by forming a consortium with a domestic partner.

#### Laos Phunoi Hydro Power Generation

This project is the latest project added based on KOWEPO's experience of development, construction, and 0&M of a hydraulic power plant in Laos. KOWEPO signed the MOU for joint project development with CEWA, an affiliate of CP Group that is the largest business group in Thailand, and verified the commercial value through the feasibility study and site survey. We plan to sign an agreement for joint development with an additional business partner to implement the project.





# **Environment and Safety**

# **Environmental Vision and Strategy**

With the environmental vision of "Eco-Friendly Management for Sustainability," KOWEPO has set the environmental satisfaction goals of 30% reduction of greenhouse gas compared to BAU (Business As Usual), 80% reduction of fine dust, 100% recycling of byproducts, and improvement environment satisfaction. We established four strategic tasks and 16 implementation plans to achieve the targets.

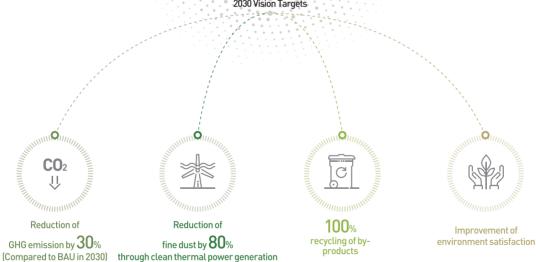


(The energy company creating citizens' happiness)



#### **ECO-FRIENDLY MANAGEMENT** FOR SUSTAINABILITY

#### 2030 Vision Targets



#### Strategic Tasks

#### Leadership in New Climate System

- Expansion of greenhouse gas reduction projects
- · Implementation of the new energy business
- Response to emission right trade scheme
- Creation of the low-carbon culture

#### Emission of Environment Hazardous Material

- Strengthening of cutting-edge environmental systems
- Use of eco-friendly materials • Development of eco-friendly technology
- Advancement of environmental impact assessment

#### Construction of Resource Recycling Power Plants

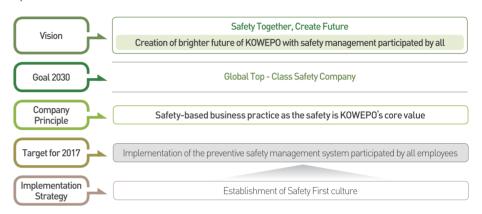
- Conversion of by-products into low-carbon and high-quality energy
- · Conversion of waste into fuel • Conversion of unutilized heat into
- Creation of new demand for high added value

#### Creation of Public Interest Value through Environment

- Transparent environmental information
- Strengthening of environment communication channel
- Practical environmental preservation
- Identification of local collaborative cooperation projects

# Safety Management Vision and Strategy

KOWEPO selected the establishment of Safety First culture, Smart Safety management system, and strengthening of Safety Partnership as the implementation strategies to achieve safety management and successfully implement the preventive safety management system participated by all employees. KOWEPO intends to become a global top class safety company in 2030 by continuously practicing safety in all business operations.





Safety education before starting work

Power cutoff and inspection before starting electrical work





Measurement of oxygen and gas **concentration** before starting work in sealed space



Wearing of the safety belt when working at a high place



Work after the approval of the Permit to Work Dangerous Work KOWEPO SAFETY RULES (WP-STAR 10)

Safety Together Action Rules

Creation of brighter future of KOWEPO with safety management participated by all Thorough cleaning of work sites



Wearing of safety gears suitable for work



Exercise the right to terminate and deny work when there's a recognized danger





Compliance with rules related to no alcohol, no smoke, and mobile phone

Risk assessment and compliance with the work procedure



### **Greenhouse Gas Emission** and Reduction

#### Establishment of the Low-Carbon Management System to Achieve the National **Greenhouse Gas Reduction Roadmap**

KOWEPO increased its greenhouse emission target from 23% to 30% compared by BAU in 2030 to reflect "Basic Roadmap Revision to Achieve 2030 National Greenhouse Gas Reduction Target" and is carrying out four implementation strategy to achieve the target.

- Latest high-efficiency equipment and performance improvement
- Expansion of power generation with new & renewable energy
- Identification and implementation of internal reduction projects
- Identification and implementation of external reduction projects

### Response to Emission Right Trade Scheme

- Advancement of the trade response system
- · Saving of cost of securing emission right
- Strengthening of capability organization to responding to new climate scheme (cultivation of specialists)

2030 Climate Change Future Plan (30% Reduction Compared to BAU in 2030)

#### Creation of Future New Market

- Development and commercialization of CCU technology
- Development of CO2-free biofuel
- Overseas greenhouse gas reduction project
- Leadership in response to climate

#### Creation of the Low-Carbon Culture (Collaboration and Shared Growth)

- · Leadership in production and consumption of the low-carbon product policy
- Creation of the low-carbon organizational culture
- · Sharing of the low-carbon concept with stakeholders





Microalgae Greenhouse, To Be Installed in Early 2019





0.5 MW MAB Demonstration Facility

#### First Planning Period of Emission Right Trade Scheme (2015~2017) Saving of purchase cost and fulfillment of obligation by diversifying trade methods

KOWEPO is operation the integrated greenhouse gas information system for accurate management of greenhouse gas emission and execution of efficient emission right trade. We saved the purchase cost of about KRW 3.1 billion through the long-term contract, swap, and diversification of greenhouse gas emission right during the first planning period and fulfilled the obligation for the period without penalty by conducting various greenhouse gas reduction programs.

#### Development of New Greenhouse Gas Reduction Technologies and Projects

#### Leading new technologies by developing CO₂ reduction technology CCUS\*

KOWEPO is developing the wet capture CO<sub>2</sub> absorbent which reduces the energy consumption by 20% and maximizes durability and creating new energy industry by securing the mass production technology of microalgae feeding on CO<sub>2</sub> from coal-fired thermal power plants.

\* CCUS: Carbon Capture Utilization & Storage

#### Farmer-Business Collaborative Greenhouse Gas Reduction Project

KOWEPO is carrying out the greenhouse gas reduction project jointly with the Ministry for Food, Agriculture, Forestry and Fisheries and Chungcheong Province to secure the external reduction for emission right trading through the collaborative cooperation with local farmers.

Subject	Number of Farmers	Technology	Greenhouse Gas Reduction (tCO <sub>2</sub> /year)	Total Reduction during Project Period (tCO₂)	
Pilot Project	2	Geothermal heat pump, etc.	3,229	67,809	
Projects for 2018	40	Multilayer insulating curtain, etc.	12,000(Expected)	180,000(Expected)	

### **Reduction of Fine Dust** in Power Plants

KOWEPO is transforming into an eco-friendly enterprise that answers the demand for reduced fine dust by citizens who want a safer living environment. It also changes its power plant operation paradigm to conform to the government's energy policy.

#### Establishment of Eco-friendly Power Plant Operation Roadmap through Open Communication

KOWEPO actively reflects the opinions gathered through continuous bidirectional communication with citizens in its power plant operation policy.

# Establishment of Fine Dust Reduction Roadmap

Reduction of the level of power plants in the capital region by 2030 (61% reduction in 2030)



#### Revision of Fine Dust Reduction Roadmap (June 2017)

- More challenging upward change of
- 2 Focus on resource distribution Better disclosure of environmental

#### Setting of Aggressive Reduction Target that Reflects Communication Result

Tyme	Existing Fine Dust Poduction Readman (August 2014)							
Туре	Existing Fi	Existing Fine Dust Reduction Roadmap (August 2016)						
	2015 (Base Year)	2017	2025	2030				
Installed capacity (MW)	4,000	6,480	6,480	6,480				
Reduction rate (%)	-	16	39	61				
Discharge (Ton)	35,317	29,655	21,718	13,900				

ouncer



Revised Fine Dust Reduction Roadmap (June 2017)						
2015 (Base Year)	2017	2017 2022				
4,000	6,480	6,480	6,480			
-	30	48	61			
35,317	24,700	18,430	13,900			

• Improvement of the environmental system operating standard (Existing) Degree of compliance with legislation (Improvement) Operation in maximum

#### Mid-term Measures (2017 - 2020)

- Performance restoration and upgrade of the environmental system
- Replacement of dust collecting plate and the discharge electrode
- Additional installation of the catalyst layer to the denitrification facility

#### Long-term Measures (2021-2025)

- Total replacement with the latest environmental systems
- Maximum efficiency
- Fuelswitch(coal→gas)forTaeanUnits1and2

#### Establishment of Improvement Measures to Achieve Fine Dust Reduction Target

KOWEPO has established the three-step (Quick Action - Mid-term Measures - Long-term Measures) measures to achieve its aggressive fine dust reduction target and is implementing it.

#### Introduction of New Technologies

KOWEPO intends to adopt the cyclone-type desulfurization technology to reduce SOx and fine dust level in the capital region. The cyclone-type desulfurization technology is the new SOx and fine dust reduction technology currently applied in power plants in China, and KOWEPO will establish a design suitable for the systems and operating conditions in Korea and apply it to all KOWEPO power plants after the verification by experts. KOWEPO applied the cyclone-type desulfurization technology in Taean system in June 2017 and confirmed that the technology was effective for reducing SOx and fine dust.

Туре	S0x (unit: (ppm)				Finedust(unit:mg/Sm³)			
	Capital Region	2016	2017	Improvement rate	Capital Region	2016	2017	Improvement rate
Concentration	25.0	27.0	9.4	65.2%	5.0	7.8	3.6	53.8%
Removal efficiency (%)	-	90.0	98.7	8.8%	-	59.4	83.3	40.2%

# **Expansion of Eco-Friendly New Business**

KOWEPO strives to promote the recycled economy that minimizes resource usage by constructing the resource recycling power plants through the enhancement of the value of waste resources.



### Creation of Social Value by Using Oyster Shell Waste as Desulfurization Fuel in Power Plants

Although the oyster shells are the good recycled resource to replace limestone, they have been disposed of in villages and shores to become the source of environmental pollution. As such, KOWEPO, Taean-gun, local fishermen, and Gunsan National University cooperated to develop the technology to use the oyster shells as the fuel for desulfurization after reviewing their properties and relevant technologies. KOWEPO plans to install the system to handle about 60,000 tons of oyster shells in Tonyeong City which is the largest oyster-producing area in Korea. We expect the facility will increase fishery income, create jobs in small companies, and even create social values by solving the oyster shell waste problem.



#### **Expanded Recycling of Power Plant By-Products**

KOWEPO is creating sales income by improving the quality of desulfurized gypsum and sulfuric acid, which are the by-products of the power plant and recycling the coal ash. We are developing technologies and new businesses for continued expansion of recycling.



#### Technology Development Status

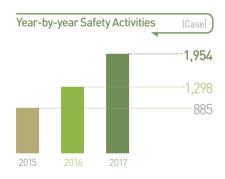
Collaborating Agency	Description	Development Period	
Chungnam Province, F1 Tech, and K0WEP0	Development of asphalt filling using coal ash	August 2015-July 2017	
Gunsan National University	Development of filling for excavation restoration using landfilled ash	August 2015-August 2018	
HJ Enterprise and Hatbat National University	Development of building interior board from coal ash	May 2016-May 2017	
KIGAM	Development of artificial basalt (building material, foundation, etc.) manufacturing technology using landfilled ash	July 2017-July 2918	
Institute of Advanced Engineering	Development of geopolymer production technology using molten slag from a coal gasifier	June 2015-May 2018	
Korea National University of Transportation	Development and commercialization of construction material (fine aggregate) using molten slag from a coal gasifier	September 2017-September 2019	
Sambo Engineering	Development of mineral fiber manufacturing technology using brown gas	November 2016-February 2018	

### **Establishment of Safety First Culture**

### Expansion of Award Standard for Sites Achieving Zero Accident

KOWEPO is carrying out the zero-accident campaign jointly with the labor union to establish autonomous safety culture. The programs participated by all employees to prevent safety accident include the safety watchdog, Safety Day each month, and site inspection to identify potential risk factors. Moreover, KOWEPO has eased the standard for rewarding long-term target time achievement, and increased the rewards and training for employees as incentive for achieving zero-accident. Active adoption of outstanding cases identified through benchmarking also helped to maintain zero accident in all sites since 2015.





### Safety Performance Mileage Scheme

KOWEPO is carrying out the safety performance mileage scheme to verify and reward safety outcomes such as the identification and correction of safety problems, sharing of secondary accident cases, and acquiring professional certification related to safety. As a result of encouraging employee participation through the safety performance mileage scheme, KOWEPO performed 1,954 cases of safety activities in 2017.

### **Declaration of WP STAR-10**

KOWEPO proclaimed "KOWEPO 10 Essential Safety Rules (WP STAR-10)" established through the analysis of accident, gathering of employee opinions, and advice of outside experts. "STAR" in WP STAR-10 refers to "Safety Together Action Rules" with which all KOWEPO employees, vendors, and visitor must comply. KOWEPO was the first public institution to establish the practice-centered safety culture by spreading the essential safety rule enacted by active employee participation throughout all sites.



### Smart Safety Management System

### **Expansion of Mandatory Checking of Dangerous Work**

Severe accidents related to diving, excavation, and chemical handling are continuously occurring on work sites all over the world. KOWEPO is operating the autonomous inspection checklist for each dangerous work by categorizing all contracted works into nine dangerous works. Moreover, we conduct the joint inspection of 41 potential risk factors by vendors, supervising, and safety departments to build a workplace that is free from risk.

Number	Work Item	Risk Factor	Inspection
1	Work at high place	Falling	Safety belt, life line, and net to prevent falling
2	Sealed space	Suffocating	Measurement of oxygen concentration and installation of the ventilation fan
3	Use of fire	Fire and explosion	Removal of flammable material, installation of fire extinguisher, and assignment of a supervisor
4	Heavy object	Strangulation	Assignment of signaler and installation of work section
5	Electrical charging (cutoff)	Electric shock/burn	Grounding and wearing of safety gears such as insulation gloves
6	Use of radioactivity	Exposure	Access restriction and wearing of radiation safety equipment
7	Diving	Strangulation	Communication, diving equipment, and checking of diver health
8	Excavation (30 cm or more)	collusion and collapse	Review of drawing, marking of work area, and checking of equipment
9	Chemical substance	Suffocation and explosion	Ventilation and wearing of safety gear

### Integrated Safety Management System Applying ICT (Information and Communications Technologies)

Taean IGCC (Integrated Gasification Combined Cycle) is the industry's first chemical plant-based power generation system and thus is vulnerable to severe industrial accidents. KOWEPO must consider that employee and equipment security is the top priority. To this end, KOWEPO has implemented the integrated safety management system converged with the cutting-edge ICT. It will be converged with the latest technologies such as IoT, VR, and AR and distributed to all sites.

### Big Data-Based Safety Accident Statistical System

KOWEPO operates the accident statistical analysis system that identifies the accident types by period and category by analyzing the data of accidents that have occurred on its sites and used them for safety management. The results of the disaster type analysis showed that the falling accounted for the majority (72%) of the accidents, and thus KOWEPO has strengthened the procedure for working at high place and established the standards for safety inspection of structures, wearing of safety belt, installation of safety net, and installing double safety lines.

### Certification of Safety and Health Management System at Head Office and All Business Sites

KOWEPO acquired the certification of the safety and health management system at its head office and all regional sites to reflect the policy of top management, prioritizing company safety and health system and managing all safety and health management activities systematically and autonomously. The certification process recognized the excellence of compliance with the requirements of the international safety and health management system and the safety and health regulation, faithful execution of the safety and health management system, and continuous identification and improvement of risk factors.

### Real-time Safety Monitoring Using Smart Device

### $Integrated\,Safety\,Management\,System$

- Sending of warning message for a dangerous situation
- Sending of worker position and physical/ emotional state

### Personalized Safety Management System

- Approval of people in and out of dangerous areas
- Company-wide real-time sharing of dangerous work situation

### IGCC Process Area Access Management System

- Building of DB of work details and harmful substance information
- Real-time monitoring of the risk level of each site, department, and process

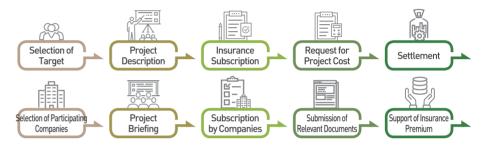
Long-term Measures (2021-2025)

### **Strengthening of Safety Partnership**

### Support for Vendors to Subscribe to the Disaster Liability Insurance

KOWEPO provides the support for its vendors to the subscribe the employee disaster liability insurance to create a workplace free from the danger of industrial disaster and conforming to the government's policy for shared growth. KOWEPO supports up to 75% (maximum of KRW 5 million per company) of insurance subscription cost at the time of the accident to reduce the industrial disaster rate and management risk of small companies by providing the financial support for the victims and easing the burden of small companies.

### **Project Implementation Procedure**



### Support of Safety and Health Management System for Maintenance Vendors

KOWEPO created the mandatory certification scheme of safety and health management system for the vendors to achieve zero-accident and sustained growth. It also supports up to KRW 3 million to reduce the burden of acquiring the certificate. Nine small vendors in 2016 and five in 2017 received the safety and health management system certification through the support scheme and secured the safety management competitiveness. KOWEPO plans to strengthen the safety partnership to continue supporting the vendors in creating a safe workplace.

### Strengthening Standards for Appropriation of Occupational Health and Safety Management Cost for Projects

According to the occupational health and safety management cost guidelines by the Ministry of Employment and Labor, KOWEPO can pay the occupational health and safety management cost for the order in the amount of KRW 40 million or more, when it is difficult to secure the safety budget for small projects. KOWEPO has established its own standard to support the safety cost and pay 100% of design safety cost for small projects to solve the difficulties. KOWEPO additionally paid KRW 780 million of safety cost in 2017 for the program to create the virtuous cycle for prevention of safety accident through the increased investment in safety facilities.

# 0.49 2016 National Occupational Accident Rate (%) 2015 2017 0.48





KOWEPO launched "WP Social Value Fulfillment Committee" to lead fulfilling social values and is actively developing business models and supporting welfare benefits to create jobs and carry out collaborative cooperation programs with local communities. We also strive to protect the human rights of stakeholders.



Management Infrastructure

Model for Local Collaboration



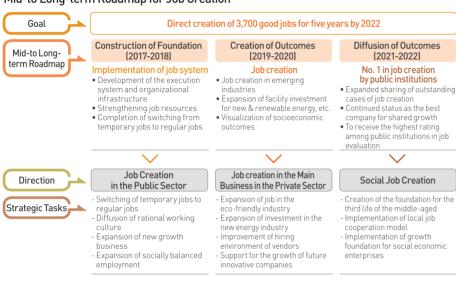
Welfare Benefits for Local Community

# the Implementation of Social Values

### **Job Creation**

KOWEPO strives to execute all projects from the job creation aspect to be in step with the national policy that has job creation in highest priority and plays the pioneering role as the role model in job creation for public institutions by faithfully carrying out the fundamental duty to fulfill social values. Moreover, we gather ideas for job creation through contests and try to provide support for the neglected group by identifying new projects for job. In recognition of its efforts, KOWEPO was named as the best organization for job creation in the private sector in the Public Institution Job Contest jointly held by the Presidential Committee on Jobs and the Ministry of Strategy and Finance. It also received the Presidential Award after it was selected as one of the top 100 Korean companies in job creation which was equivalent to the medal for outstanding job-creating companies.

### Mid-to Long-term Roadmap for Job Creation



### Establishment of Three Strategic Direction through Expansion of Paradigm for Main Business-Linked Job Creation

KOWEPO expanded the job creation paradigm for the creation of good jobs to the employment domain for increased public interest. We are carrying out a company-wide effort for creating good jobs by selecting the job creation in the public sector, job creation in the main business of the private sector, and social job creation as three strategic directions for job creation and then 23 focused implementation projects and in 11 strategic tasks according to the strategic direction.

### Job Creation in the Public Sector

### **Employment Expansion**

KOWEPO hired 198 new employees in 2017 by hiring the maximum number of employees within the scope of the Guidelines on Public Institution Organization and Quota Management to comply with the employment policy based on increased job availability through identification of new business and adoption of wage peak scheme.



### **Expansion of Job Creation Paradigm** 底♠ Expanding Focusing on @ Outsourcing in-house fundamental by KOWFPO core functions 1) Switching from @ Creation of jobs to regular social employment Expansion of 3 Job creation linked to main the job domain.

≅ Fconomic

Factor

Public

Interest

to improve

public interest



		(1	CI JUIIJ)
Туре	2015	2016	2017
Quota (A)	2,166	2,296	2,426
Current status (B)	2,077	2,177	2,352
Difference (A-B)	89	119	74
Temporary leave of absence	83	76	79

### Switching from temporary jobs to regular jobs

KOWEPO is switching the temporary employees who perform the continuous tasks into to regular employees at KOWEPO or its subsidiary. The Regular Job Conversion Deliberation Committee and Management/Labor/Expert Council verified the procedural justification of the policy. Moreover, we apply the optimal conversion for each job type with consideration to the characteristics of the task to ensure fair switching by improving the status of switched employees and eliminating discrimination.

### **Expansion of Job Creation Paradigm**



Management-Labor Agreement in 2017



Management-Labor Agreement in 2017

### Sharing of Jobs

KOWEPO plans to hire 100 new employees in three years by improving the unneeded job practice, reducing overtime, and promoting the use of vacation.

### Creation of Private-Sector Jobs Linked to Main Business

KOWEPO created 251 private-sector jobs linked to the main business in 2017 and plans to create 218 in 2018.

- Large Investment in Eco-friendly Industry
- Investment in New Energy Business to Secure Future Growth Engine
- Shared Growth with Vendors through Establishment of Job-Friendly Ecosystem
- Support for the Growth of Future Innovative Companies to Be Ready for the Fourth Industrial Revolution

### Social Job Creation

KOWEPO created 44 social jobs in 2017 and plans to create 53 in 2018.

### Creations of Jobs for Senior People - "60-Year Old New Employee"

TheTaeanregionurgentlyneedsthemeasuresof senior people as 27% of the total population is 65 years or older and 28% of the elderly live alone. KOWEPO has established a systematic process with the local residents and collaborating agencies to perform rational support measures to create jobs for the elderly.

### Support for employment of local human resources: "One-Stop Experiential Internship Program"

KOWEPO analyzed the results of the internship program for 2016 and launched the "One-Stop Experiential Internship Program" in 2017 to enhance the employment competitiveness of local human talents. The program for 2017 selected 70 interns five universities (Gongju National University, Korea University of Technology and Education, Dankook University, Seonam University, and Korea Nazarene University) and diversified the operation period to short term (two months) and long term (four months). Moreover, we expanded the power company experience to the whole company, upgraded the introductory education on power generation from two weeks to four weeks, and created the employment capability strengthening education that included the exercise on generating the application and the interview and the special lecture by the NCS specializing agency.

### Expansion of employment opportunity for the vulnerable group: High school graduates, national meritorious, females in career break, disabled.

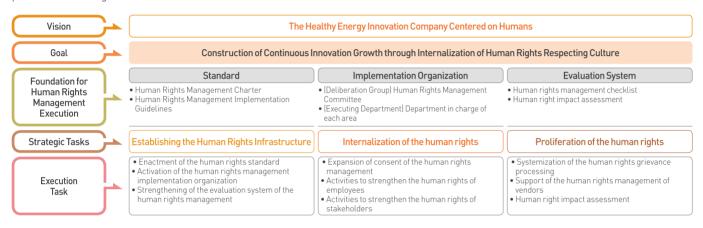
KOWEPO is expanding the employment opportunities of the vulnerable groups such as the high school graduates (24 people), national meritorious (19 people), and disabled (4 people) through a separate process. We also allocate extra points to the females in career break, local talents, national meritorious, and the disabled to enhance their competitiveness.



### **Establishing the Human Rights Management Infrastructure**

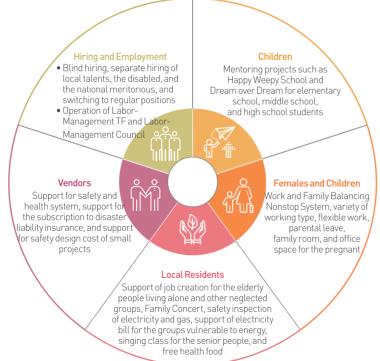
### **Human Right Management System**

KOWEPO as "The healthy energy innovation company centered on humans" as the human rights management vision and is committed to building a foundation for sustained innovative growth by internalizing the culture of respect for human rights. For that, KOWEPO established construction of the human rights infrastructure, internalization of the human rights management, and proliferation of the human rights management as three strategic tasks and generated the detailed execution plan for each strategic task.



### Internalization and Spread of Human Rights Management

KOWEPO is carrying out various projects specific to each area such as employment, female, safety, environment, vendor, and the local community to internalize the spread human rights management and strives to increase the awareness of the human rights and strengthen execution capability of its employees.



### Development of Business Model for Local Collaboration



Signing of Agreement for Constructing Horticulture Complex Using Warm Drain Water from Taean

### Use of Warm Drain Water from Power Plants

### Use of Warm Drain Water from Power Plants

Realizing that the warm drain water used to cool the outer boiler wall at the power plants is about 7 °C higher than surrounding water, KOWEPO uses it for smart farm and fish farm projects to contribute to the income increase of local farmers and fishermen. The smart farm project (construction of the greenhouse to be completed in December 2018) will be Korea's first leading country-level smart farm demonstration complex and expected to create 55 new jobs and income of KRW 11.9 billion to 24 villages in Weonbuk-myeon in Taean in five years. Moreover, it is carrying out the high-efficiency fish farm using the warm water heat source and the cutting-edge fish farm technology jointly with the operating council participated by local fishermen. We expect the increases income of KRW 800 million for fishermen and ten new jobs when the fish farm opens for business.











### New project to support sustainable sales channel specialized for Taean which is known as the City of Flower - WP Social Flower

The number of floriculture farmers in Taean-gun decreased from more than 390 in 2005 to about 190 in 2017, and they are selling their flows at bargain through auctions as there are no direct sales channels. KOWEPO has been collaborating with Taean-gun, Taean Floriculture Association, floriculture startup ventures, and floriculture farmers to identify the ways to develop new sales channels since 2017 and has been carrying out "WP Social Flower" project since Mary 2018. KOWEPO has been collaborating with Taean-gun, Taean Floriculture Association, floriculture startup ventures, and floriculture farmers to identify the ways to develop new sales channels since 2017 and has been carrying out "WP Social Flower" project since Mary 2018. We developed the online sales channel platform called "Farm to Table @Taean (Honest Flower)" in May 2018 and plan to carry out the marketing campaign beginning in September. The "WP Social Flower" project uses the floriculture production process for storytelling and has adopted the direct sales from the farm (farmers) to customers (table) for continuous creation of high added value. We purchase the flowers from the floriculture farmers and donate them to the welfare facilities in Taean to be used for horticulture treatment (Flower Healing) of the neglected elderly people. KOWEPO expects the project will lead to "Killing four birds with one stone" effect with the benefits of increased farmer income (KRW 250 million/year), job creation (8 people/year), emotional support for the elderly (150 people/year), and cultivation of startup venture.

### Farmer-Business Collaborative Greenhouse Gas Reduction Project

KOWEPO signed the "Agreement to Create Jobs through Innovative Farmer-Business Collaborative Greenhouse Gas Reduction Project" with the Foundation of Agri. Tech. Commercialization & Transfer (FACT) in April 2018. Both parties have been carrying out the business-farmer collaborative greenhouse gas reduction project since 2016. KOWEPO provides the low-carbon facilities (geothermal, multi-layer insulated curtain, biogas plant, etc.) to reduce greenhouse gas to the farmers jointly with the government and municipalities, and the enterprises use the emission right secured through the reduced greenhouse gas. As the project that began with two farmers in 2016, expanded to 43 in 2017, and is expected to expand to more than 200 in 2021, KOWEPO plans to train local college students, retirees, and returned farmers to be the project professionals and assign them to the field. The business-farmer collaborative greenhouse gas reduction project that KOWEPO initiated for the first time Korea is spreading to other organizations. It has contributed to human resource development and job creation for the young and old people of the region.

### Welfare Benefits for Local Community

### **Education donation**

### KOWEPO Happy Weepy School

KOWEPO Happy Weepy School is the educational talent donation program in which the college student mentors nationwide provide the learning guidance, career counseling, and emotion interchange for the elementary school, middle school, and high school student in Taean, Chungnam Province where KOWEPO's head office is located. The mentoring program provides the learning opportunity and motivation to local mentee students and the opportunity to grow into the talent with the warmhearted personality and leadership for the college student mentors. Under the slogan of "We share yesterday's learning today," 60 college student mentors and about 700 local student mentees completed "KOWEPO Happy Weepy School" by phase 3 in July 2018. The program is very popular as shown by the high competition rate of 10 to 1 for mentor selection and the number mentees rapidly increased from 165 when the program began in the summer of 2017 to 270 in phase 3 in 2018, attracting the interest and positive response of local communities.

### **Dream over Dream Career Mentoring**

"Dream over Dream Career Mentoring" is the close-up mentoring program that provides practical education on education and opportunities for experiential activities such as practical technology transfer and visits to industrial sites led by KOWEPO's quality maestros to the vocational school students. The Dream over Dream Career Mentoring program launching event held in April 2018 was participated by 160 students and the national quality maestros of KOWEPO to form the lasting mentoring relationship.

### Support of free semester scheme - field trip to power plants

KOWEPO has developed the customized education and field trip program for the middle school student to support the free semester scheme sponsored by the Ministry of Education. 1,972 students from 14 middles school visited in 2016 while 2,451 students from 19 middle schools visited in 20117 to help the students explore careers.

### **Culture Welfare**

### WP Emotion Generation School to Add Dream and Share Happiness - Promotion of culture and art clubs in local schools

KOWEPO has carried out "WP Emotion Generation School to Add Dream and Share Happiness" program to promote the culture and art clubs in local schools since July 2018. The program cooperates with Taean Office of Education and local schools to support the culture and art clubs in 16 schools to train future talents with artistic sensitivity and balanced personality for creativity and convergence in Taean region where the culture and art infrastructure are in shortage compared to other regions. The types of clubs sponsored by KOWEPO include orchestras, bands, dances, choruses, and fine arts. The bidirectional social contribution model in which the supported clubs donate their talents in local events and festivals.



WP Emotion Generation Plant - Small concert



WP Emotion Generation Plant - Talent donation



Agreement signing for KOWEPO Happy Weepy School



Cultural visits and job experience as part of KOWEPO Happy Weepy School



Signing ceremony for 2018 Dream over Dream Career Mentoring program



### Culture and art performance for local communities

KOWEPO sponsored "Happy Family Music Concert" jointly with Taean-gun and Taean Culture and Art Center to provide the opportunity to view various cultural performances to local residents in the Family Month of May. The performance was an open concert for all audience and featured the performance by the Seoul Philharmonic Orchestra and the repertoire of classical music, musicals and traditional music to celebrate the sunny spring day to more than 3,000 spectators.

### **Social Contribution Activities**

### Social Contribution (Local Cooperation) Projects in 2017

	Main Projects	Project Description
Education	KOWEPO Happy Weepy School (learning mentoring for local students)     Dream over Dream Career Mentoring     Support of educational materials for elementary schools	Learning, career, and emotional mentoring to local students [167 students]     Support for career design of master high school (80 students)     Providing educational materials and improving learning environment to elementary school
Culture	Sponsoring the teenagers from neglected families to view opera performance     Sponsoring Family Concert with local residents	Support of cultural activities of teenagers from neglected families     Support of culture and art activities of local residents
Living	Support of mobile laundry truck for neglected groups     Support of mobile vehicles for the disabled     Support for residential environmental improvement projects	Improvement of quality of life of neglected groups such as the elderly     Support of vehicles to provide the right to move of the disabled     Improvement of the residential environment of the neglected groups who are in the blind spots of welfare
Economy	Fish breed release project in 2017     Job creation for senior people	Support for income of local community     Creation of jobs for senior people by supporting the establishment of insect feed factory
Others	Sponsorship of Pyeongchang Winter Olympics and Paralympics     Donation to help victims of the earthquake in Pohang	Support of Winter Olympics and Paralympics     Support of recovery of Pohang which suffered from the earthquake

### Social Contribution (Local Cooperation) Projects in 2018

	Main Projects	Project Description
Education	KOWEPO Happy Weepy School (learning mentoring for local students)     Dream over Dream Career Mentoring     WP Dream Book Hope Sharing project	Learning, career, and emotional mentoring to local students (520 students)     Support for career design of master high school (80 students)     Improvement of the learning environment of the local children's center and emotional support
Culture	Music festival for Taean residents     WP emotional generation plant     Support of local festivals	Support of culture and art activities of local residents     Support of promotion of culture and art clubs in local schools     Promotion of tourism by supporting locally specialized festivals
Living	Reinforcement of safety facilities on the pine scent tracking course     Distribution of air purifiers to local communities	Reinforcement of safety facilities in Dulle tracking course to promote tourism     Distributed to schools and welfare centers to cope with fine dust
Economy	WP Social Flower (development of sustainable sales channels)     Jobs for senior people as part of cohabitation program     Building of Korean smart farm using warm water from power plants     Support of the production facility to the centers for self-sufficiency of the disabled     Support of opening of flagship sharing cafe	Increase of income and creation of jobs for local floriculture farms     Creation of jobs for local senior people     Increase of income and creation of jobs for local communities     Creation of jobs for the disabled by supporting new production facilities     Creation of jobs and support of self-sufficiency for the disabled
Others	Support of flood victims by a hydraulic power plant in Laos     Support of the neglected groups to withstand the heatwave in the summer of 2018	Support recovery of flooding damage in Laos     Donation for the effort to prepare for the severe hot season of energy neglected group





Small and Medium Enterprises

## Establishing the Culture of Collaboration

### 50

### **Strategy for Shared Growth with Small and Medium Enterprises**

With the vision for shared growth "To lead the change of economic ecosystem through collaboration with small companies." KOWEPO is carrying out various programs such as the expansion of collaboration culture, development of creative technologies, customer communication, and support of sales channels. The Shared Growth Team in the head office collaborates with the power divisions and carries out joint projects with business councils and specialized agencies.

Implementation Strategy Implementation Tasks

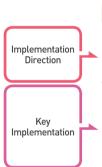
### To lead the Change of Economic Ecosystem through Collaboration with Small Companies

### Building of infrastructure of small

- · Expanded creation of jobs in the private
- · Development and spread of sharing of
- Improvement of fair trade and settlement practice
- Expansion of R&D of new technologies • Expansion of outstanding product
- and satisfaction Diversification of online and offline demonstration
- communication channel • Implementation of the technical support
- Implementation of integrated technology support system

- Improvement of customer communication Development of customized sales channel
- Identification of projects that reflect
- Strengthening internal capability
- Development of models to enter the
- overseas markets jointly
- Support of cooperative sales channels with relevant agencies
- Increased export linked to 0&M

### Mid- to Long-term Roadmap for Spread of Shared Growth



### Establishment Phase (-2017)

Establishment of shared growth culture by building infrastructure

- Active implementation of national projects
- Strengthening the competitiveness of small companies
- Creation of shared outcomes through joint R&D
- Development of export channels linked with overseas power plants
- Development of the foundation for collaborative settlement

### Spread Phase (2018-2021)

Spread of collaboration culture by implementing the shared growth suitable for the government-owned power company

- · Leading implementation of national projects
- Support of business startups in power generation industry Development of profit model for jointly entering the overseas
- I ocalization of crucial parts through R&D
- Promotion of collaborative settlement

### Advancement Phase (2022-2025)

Advancement of the value of collaborative cooperation through economic growth led by small companies

- · Spread of outstanding cases of national projects
- · Cultivation of global small but strong companies
- Cultivation of pioneering companies with new
- technologies 100% achievement of
- technology commercialization Spread of collaborative
- settlement culture

### Performance Index (Measured)

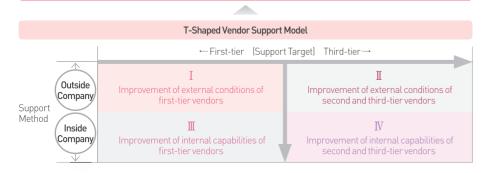


\*Employment through direct payment of labor cost + employment through expanded shared growth business

### T-Shaped Vendor Support Model

KOWEPO is developing new shared growth T-shaped business models (broader and deeper) for practical support to help small vendors to grow to become small but strong companies. In recognition of its efforts, KOWEPO received the President Award for Outstanding Shared Growth among Public Institutions in 2017.

### 2017 President Award for Outstanding Shared Growth among Public Institutions



### **Expansion of Support Targets**

Expanded support of second and third-tier vendors



### Specialization of Support Method

- 1 (Outside) Improvement of business condition - Expansion of sales channel and improvement of
- procurement scheme (Inside) Strengthening of technical capability Increase of productivity and improvement of technical competitiveness
- ③ (Inside) Innovation of employment environment - Improvement of employment condition and working culture

### Establishment of Fair Trade Culture



### Collaborative Settlement System

KOWEPO developed the collaborative settlement system designed for the bank to guarantee the payment so that the second and third-tier vendors could benefit from the low-interest rate that had been available only to large companies for a secured loan of credit sales. It also makes the payment to vendors fast. As a result of introducing the collaborative settlement system, the average time for the second and third-tier vendors to receive the payment decreased from 60 days to 5.9 days, and the collaborative settlement accounted for 62% of total payment. It was recognized as an outstanding case in the inspection of government offices in 2017.

### Spread of Performance Sharing Scheme with Vendors

The performance sharing scheme is the collaborative cooperation system between large and small companies by the contracting company supporting the contracted company to achieve the goal agreed by the contracting and contracted companies and sharing the outcomes. KOWEPO is implementing three performance sharing schemes of multilateral collaboration, demonstration test support, and overseas sales channel support. The multilateral collaboration scheme plays an important role in improving the competitiveness of its vendors by supporting the member companies of KOWEPO Second and Third-tier Vendor Council. The demonstration test support scheme promotes commercialization of outstanding technologies owned by small companies and shares the outcomes. The overseas sales channel support scheme seeks to help the qualitative and quantitative growth of the vendors by supporting the development of customized overseas sales channels for small companies with outstanding products. The number of performance sharing tasks increased by 11%, making it 81, in 2017. A total of 80 companies including 55 new companies are participating in the performance sharing scheme.

### **Customized Bidding Evaluation**

KOWEPO investigated the reason for 16.8% of small companies failing the bidding qualification review. As a result, it raised the scoring for the credit rating to 3 points and extended the approval period from 2 to 7 years and the delivery approval period from 5 to 7 years to enhance the competitiveness in bidding for small companies. We also have improved the evaluation scale of the technical personnel that had been calculated only by the number of employees and assigned 20% extra credit to the companies that have retained long-term technical personnel in employment.

### Improvement of Unfair Contract Condition

KOWEPO has been improving unfair contracting conditions with small companies to establish fair trade practice. In details, we eliminated the double levying of compensation for delay, canceling the imposed compensation for delay if the project is completed within the contract period. We are also discussing with the government to lower the rate of compensation for delay. KOWEPO expects such efforts will reduce the burden of compensation for the delay of its vendors.

### Transparency of Evaluation Committee Member Selection

KOWEPO is discussing with the Public Procurement Service for jointly using the technology evaluation committee member selection system to prevent the objective opinion of the evaluation committee member being involved in the bidding process. Furthermore, KOWEPO reflects automation of selection of evaluation committee members in the company rule and use the IT system to establish a fair and transparent bidding culture.

### **Collaborative Cooperation with Local Companies**

### **Promotion in Gunsan Region**

KOWEPO is striving to promote the economy in the GUsan region which is facing difficulties as more than 5,000 workers lost their job due to 56 vendors going out of business as a result of shipbuilding factories closing down.

### Support for ship material suppliers to enter the power industry

KOWEPO held two purchase workshops in Gunsan Combined Cycle Power Division to help the shipbuilding vendors in Gunsan region to enter the power industry and registered them in the vendor pool to qualify them to participate in biddings. Moreover, it is carrying out various support programs such as the cooperation fund and loan for shared growth.

### Registration of shipbuilding maintenance vendors for the power plant equipment

KOWEPO conducted consulting for the shipbuilding vendors in Gunsan region to switch to the power industry. As a result, six companies successfully registered as the qualified vendor for power generation equipment.

### Signing of MOU for new & renewable business

KOWEPO has launched the task force team to cultivate the Gunsan region in job crisis into the mecca for new & renewable energy. We are trying jointly with Gunsan City and local companies to develop the joint new & renewable energy business using the idle ground.

### Collaborative cooperation projects with small companies in Taean-gun

Since KOWEPO moved its head office to Taean-gun, it has conducted various collaborative cooperation projects for collaborative innovation with small companies located in Taean-gun.

### Targets of collaborative cooperation projects

For the collaborative cooperation projects, KOWEPO selected small companies with fewer than 20 employees and sales of less than KRW 3.0 billion while having good potential for future sales increase, employment, and contribution to local communities.

### **Selection of Participating Companies**

The Project Selection Committee participated by KOWEPO, Taean-gun, and Korea Productivity Center reviewed the documents submitted by the candidates and selected 34 companies.

### Support for small companies

KOWEPO selected four companies for Manufacturing Innovation 3.0 and 20 companies for Industrial Innovation Movement I and II.

### **Outcomes**

The collaborative cooperation projects resulted in the total sales increase of KRW 8.47 billion (KRW 249 million per company), equivalent to 8.4% of average sales increase per company, and creation of 28 new jobs.

# Expansion of sales channels in Korea and other countries for small companies

### Support for the development of overseas sales channel and expansion of export

### Support for overseas sales channels in each step

KOWEPO has recognized the need to develop overseas sales channels to solve the problem of the decreased sales of its vendors due to the domestic market contraction. As such, we established the two-track support strategy that reflects the difference of export capability of vendors and carry out the export support program and overseas business-linked development of export channels.

### Establishment of Base for Export by Starter Company

KOWEPO helps its vendors without export experience to received the Authorized Economic Operator (AEO) certificate to reduce the customs clearance of export item from 5 hours to 1 hour. We also established the import/export support system using the international trading insurance and provided the export insurance and guarantee to six vendors including Cofacs.

### Expansion of Overseas Sales Channels of Intermediate Companies

KOWEPO supports the vendors, which already export their products, to participate in overseas exhibitions. We have supported six vendors including WETEX and consulted 196 vendors for export. KOWEPO has also supported five exporting vendors including INEM to establish overseas units as the base for export.

### Support of Customized Export for Capable Vendors

KOWEPO has reflected the requirements of outstanding small exporters and formed the Overseas Sales Channel Council which supported 16 vendors including Handol Pump to enter the Vietnam and Thailand markets for the first time and supports the foreign legal services such as establishing factories (J/V), claim handling, and lawsuits through KOWEPO's advising law firm.

### Development of Overseas Markets for Vendors

### 0&M Business

KOWEPO held the export workshop related to 0&M projects in the Rabigh Power Plant in Saudi Arabia with the small but strong companies in Gyeonggi region area and small companies in Chungcheong region to link them with foreign buyers. As a result of the export workshop, the vendors such as 0rbis signed the export contract for the amount of USD 310,000 and two vendors were registered as the official vendors of the Rabigh Power Plant.

### Partnership with Large Exporters

KOWEPO signed the MOU for shared growth with large companies such as POSCO Energy, which already had a presence in Indonesia, to help KOWEPO's vendors register their products to the signed large companies. As a result, the vendors signed the purchase contract with four Indonesian companies for the total amount of USD 280,000.

### PR Presentation of Outstanding Products

KOWEPO held the PR presentations of outstanding products from its vendors to provide the opportunity to expand the sales channels to small companies which had the excellent products and technologies but no sales channel or information. The PR presentations were held in each power generation complex of KOWEPO beginning in March 2018 and participated by 51 small vendors that owned the performance certification and technology development certification such as NEP (New Excellent Product) and NET (New Excellent Technology) to exhibit their products and technologies.



### Strengthening the Competitiveness of Small and Medium Enterprises

### Improvement of competitiveness of small vendors

### Projects to strengthen three core competencies

KOWEPO is executing the business competency, management competency, and technology competency strengthening projects to improve the competitiveness of its small vendors.

Туре	Implementation Details	Outcome	
Business Competency	Industrial innovation movement and productivity innovation partnership     Improvement of productivity of second and third-tier vendors through     consulting and equipment investment     Cultivation of small companies for maintenance of power plants	Executed from 2011 (participated by 157 member companies of Vendor Council)     407 tasks for the financial performance of KRW 18.3 billion     Five new companies including Woojin Ntec registered as the maintenance vendor	
Management Competency	Expansion of loan by Shared Growth Cooperation Fund (KRW 10.0 → 50.0 billion)     Encouragement of core personnel to remain with the company with Naeil Chaeum Mutual Aid     Strengthening of safety with disaster liability insurance project	New loan to 192 companies including Sungil Turbine (reduced interest rate of 2.2%)  132 people from 35 companies (30 people to be added each year)  Reduction of occupational accidents at 19 companies including ShinHeung	
Technology Competency	Technology protection service project with the package to prevent leakage of core technology     Business agreement with the technical protection agency of small and medium enterprises (September 29)     Building of the technology infrastructure through the certification support	Selection of 20 companies with the experience of technology leakage such as extortion Development of technology protection service and leakage prevention system 23 companies with NEP certification, Korean and international patent, and ISO certification	

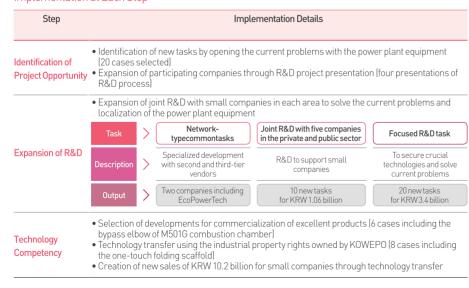
### Expansion of purchase of products from small companies

KOWEPO actively purchase products from small companies and increased the purchase rate of small company products by 2.6%p from 53.5% in 2016 to 55.1% in 2017. KOWEPO is also actively expanding purchase products from companies owned by female and the disabled.

### One-stop support for commercialization of technologies

KOWEPO implemented the one-stop support system for each step of business opportunity identification, R&D, and technology commercialization to help small companies commercialize the outcomes of creative and challenging technology development.

### Implementation at Each Step



### Operation of Programs to Support Small Companies

### Financial support for job creation

KOWEPO carried out the financial support project to create jobs using KRW 10.0 billion from its shared growth fund for small companies in Chungnam and created 105 new jobs as a result.

### Naeil Chaeum Mutual Aid

KOWEPO is carrying out the Naeil Chaeum Mutual Aid project for the employees of small companies in which KOWEPO, employees, and participating vendors jointly deposit KRW 20 million for five years to stabilize the employment and resolve the wage gap. 30 new employees of vendors benefit from the project each year.

### Young People's First Business Startup

KOWEPO is operating the Young People's First Business Startup program jointly with the Ministry of SMEs and Startups to support the emerging companies with the outstanding idea in power generation and energy by providing the one-stop service in all phases of the business from start to product manufacturing and PR. The program selected 10 potential business startup teams in new energy and provided KRW 650 million.



### **STEP 1** Identification of participants

- Competitiveness, sales growth, and employment
- Potential for the job creation and collaborative cooperation

• Item verification and enhancement, prototype manufacturing, and investment education

### **STEP 2** Commercialization

- Funding for commercialization
- Development of sales channels



- Education on patent and trademark registration
- Education on business marketing and attracting



### **Economic Performance Index**

### Consolidated Financial Statements

	Subject	Unit	2015	2016	2017
	Current assets	KRW million	985,330	1,174,859	1,066,099
Asset	Non-current assets	KRW million	8,222,542	8,618,244	8,562,572
	Total assets	KRW million	9,207,872	9,793,103	9,628,671
	Total capital	KRW million	3,882,393	3,923,278	3,485,986
Capital and	Current liabilities	KRW million	1,370,157	1,650,501	1,297,361
Liability	Non-current liabilities	KRW million	4,351,729	4,219,324	4,448,917
	Total liabilities	KRW million	5,721,886	5,869,825	5,746,278

### Consolidate Profit & Loss Statement

Subject	Unit	2015	2016	2017
Sales	KRW million	4,224,674	4,179,782	4,222,449
Cost of sales	KRW million	3,653,430	3,487,049	3,748,802
Selling and administrative expenses	KRW million	82,344	104,072	112,163
Operating income	KRW million	488,900	588,661	361,484
Other income	KRW million	3,689	3,986	4,732
Other expenses	KRW million	443	642	6,123
Other profits	KRW million	1,535	4,815	-9,351
Financial income	KRW million	124,642	62,490	172,248
Cost of financing	KRW million	192,849	134,826	311,071
Equity method income	KRW million	-13,169	-13,170	-63,001
Net profit before tax	KRW million	412,305	511,314	148,918
Corporate tax	KRW million	111,996	118,120	46,089
Net profit	KRW million	300,309	393,194	102,829
Accumulated other comprehensive income	KRW million	2,784	-3,196	25,771
Total comprehensive income	KRW million	303,093	389,998	128,600

### Sales of Each Business

Subject	Unit	2015	2016	2017
Power generation product	KRW million	4,114,488	4,080,385	4,076,435

### Shareholders

Subject	Unit	2015	2016	2017
KEPC0	%	100	100	100

### **Government Subsidy**

Subject	Unit	2015	2016	2017
Subsidy	KRW 100 million	0	0	0

### **Economic Value Distribution**

Subject  Economic value creation		Unit	2015			Remark	
		KRW 100 million	43,886			Sum of sales and other income	
	Vendors	KRW 100 million	36,628	34,268	37,810	Amount of all products and services purchased by KOWEPO for its business	
	Employees	KRW 100 million	1,748	2,056	2,452	Wage, retirement benefit, and welfare expense	
Stakeholders	Shareholders and investors	KRW 100 million	1,068	1,379	1,514	Interest to the creditor	
Distribution	Government	KRW 100 million	1,324	1,408	696	Tax and duties and corporate tax based on the financial statements	
	Reinvestment	KRW 100 million	3,112	3,580	2,107	Source for future reinvestment and retaining of profits	
	Local community	KRW 100 million	4	6	61	Contribution to local communities	
	Total	KRW 100 million	43,884	42,697	44,640		

### Industrial Property Right Application and Registration

S	Subject	Unit	2001~2017 Accumulations
Detente	Applied	Cases	397
Patents	Registered	Cases	279
District and all	Applied	Cases	123
Utility model	Registered	Cases	100
Decima	Applied	Cases	16
Design	Registered	Cases	15
Totaloused	Applied	Cases	4
Trademark	Registered	Cases	5

### Overseas Sales and Portion

Subject	Unit	2015	2016	2017
Overseas sales	KRW 100 million	247	346	872
Portion	%	0.54	0.81	0.93

### Power Plant Operation

Subject	Unit	2015	2016	2017
Sales	GWh	46,131	47,450	44,098
Costofsales	Won/KWh	89.2	86.0	92.3
Failurerate		0.121	0.055	0.074
Unplannedlossrate	%	0.307	0.076	0.066
Operatingrate	%	81.6	89.2	91.4
Utilizationrate	%	59.0	59.2	48.6
Heatefficiency	%	41.09	40.27	40.34
Station power rate	%	4.29	4.51	5;60

### Installed Capacity and Power Generation

	Subject		Unit	2015	2016	2017
Installed Capac	ity		MW	9,322	10,725	11,780
		Coal		32,462	33,023	38,755
_	Ωil	LNG	GWh	11,923	11,778	6,638
Power Generation		Oil		3,578	5,187	1,082
OCTICI attori	New & Re	newable	GWh	129	571	1,461
	Total Ger	neration	GWh	48,092	50,559	47,936

### Average Operating Rate of Each Power Plant

Subject	Unit	2015	2016	2017
Taean Thermal Power	%	92.0	90.3	89.7
Pyeongtaek Thermal Power	%	94.7	75.9	91.4
Pyeongtaek Combined Cycle	%	90.6	95.9	94.5
Seoincheon Combined Cycle	%	96.0	89.5	96.6
Gunsan Combined Cycle	%	74.8	94.9	85.6
Others	%	-	-	-
Total	%	91.6	89.2	91.4



### **Environmental Performance Index**

### Investment in Environmental Facilities

Subject	Unit	2015	2016	2017
Energy industry and new & renewable power generation	KRW 100 million	2,274	1,307	811
New energy industry R&D (R&D Department)	KRW 100 million	8.9	10.9	12.2
Greenhouse gas reduction R&D (R&D Department)	KRW 100 million	2.7	3.7	0.5
Emission right trading cost (Climate Change & Environment Team)	KRW 100 million	18	84	186
RPS mandatory implementation cost (New and Renewable Energy Managing Team)	KRW 100 million	757	1,322	1,754
Total	KRW 100 million	3,060.6	2,727.6	2,763.7

<sup>\*</sup> The education and training cost is included in the operating cost. / \* RPS mandatory implementation cost applied the REC outside purchase amount.

### Greenhouse Gas Emission

Subject	Unit	2015	2016	2017
SCOPE 1 (directemission)	10,000 tCO2eq	3,367	3,642	3,678
SCOPE 2 (indirectemission)	10,000 tCO2eq	18	27	18
Total	10,000 tCO2eq	3,385	3,669	3,696
Basic unit	tCO2eq/GWh	734	758	812

<sup>\*</sup> The greenhouse gas emission applies the greenhouse gas emission calculation standard in "Greenhouse Gas and Energy Target Management Scheme." \* SCOPE 3: Other indirect emission that is not included in indirection emission of HFCs and SF6

### **Emission Rate Trading Scheme**

Subject	Unit 2015		2016	2017
Allocated	10,000 tCO2eq	3,414	3,532	3,795
Emission	10,000 tCO <sub>2</sub> eq	3,385	3,669	3,696

<sup>\*</sup> Allocated: Amount allocated for greenhouse gas energy emission trade

### Greenhouse Gas Emission by Each Energy Source

Subject	Unit	2015	2016	2017		
Solid(coal,etc.)	10,000 tCO2eq	2,666	2,831	3,324		
Liquid(heavyoil,etc.)	10,000 tCO2eq	243	351	78		
Vapor (natural gas)	10,000 tCO2eq	445	447	264		
Others (limestone, purchased power, etc.)	10,000 tCO <sub>2</sub> eq	31	40	30		
Total	10,000 tCO <sub>2</sub> eq	3,385	3,669	3,696		

<sup>\*</sup> The greenhouse gas emission applies the greenhouse gas usage calculation standard in "Greenhouse Gas and Energy Target Management Scheme."

<sup>\*</sup> Greenhouse gas basic unit: Greenhouse gas emitted to produce 1GWh electricity

### Energy usage

Subject	Unit	2015	2016	2017
Fuel	TJ	421,016	443,255	426,960
Electricity (including others)	TJ	19,785	21,340	25,761
Total		440,801	464,595	452,721
Basic unit	TJ/GWh	9.17	9.19	9.44

<sup>\*</sup> Greenhouse gas basic unit: Use amount of greenhouse gas emitted by production of 1GWh electricity

### Energy Production by Each Energy Source

Subject	Unit	2015	2016	2017
Solid (coal, etc.)	TJ	300,335	314,534	369,999
Liquid (heavy oil, etc.)	TJ	33,199	47,842	10,838
Vapor(naturalgas)	TJ	87,519	88,007	51,626
Others		3,746	5,619	3,796
Total		424,799	456,002	436,259

### Fuel Use

Su	bject	Unit	2015	2016	2017
	Bituminous coal	1,000 tons	12,546	12,810	15,567
Heavy oil	Heavy oil	1,000 KL	777.7	1,129.2	243.0
Power Generation	LNG	1,000 tons	1,613.6	1,625.1	962.4
Fuel	Bio heavy oil	1,000 KL	5.0	4.3	-
Org	Organic solid fuel	1,000 tons	71.9	85.2	81.7
	Wood pallets	1,000 tons	188.7	179.5	108.5
Power plant water		1,000 tons	8,409	10,284	9,410
Limestone		1,000 tons	293	282	258
Chemicals		1,000 tons	15	20	19

### Atmospheric Pollutant Emission

Su	bject	Unit	2015	2016	2017
Atmospheric	N0x	1,000 tons	24.7	19.1	12.5
pollutant	S0x	1,000 tons	15.0	11.9	9.1
emission level Dus	Dust	1,000 tons	0.9	0.7	0.7
	N0x	kg/GWh	515	378	261
Basic unit emission level	S0x	kg/GWh	313	235	190
	Dust	kg/GWh	19	14	15



### Water Pollutant Emission

S	ubject	Unit	2015	2016	2017
	COD	ton	16.9	19.1	19.7
Water pollution emission level	SS	ton	2.8	10.3	7.5
	T-N	ton	11.6	16.8	15.1
	T-P	ton	0.073	0.076	0.395
	COD	g/GWh	353	377	412
Basic unit	SS	g/GWh	59	205	156
emission level	T-N	g/GWh	243	331	316
	T-P	g/GWh	2	2	8

### Water Usage by Each Power Plant

Subject	Unit	2015	2016	2017
Taean Thermal Power Complex Division	1,000 tons	6,219	7,732	7,777
Pyeongtaek Thermal Power Complex Division	1,000 tons	1,660	1,919	1,192
Seoincheon Combined Cycle Power Complex Division	1,000 tons	315	351	276
Taean Thermal Power Complex Division	1,000 tons	215	281	165
Total	1,000 tons	8,409	10,284	9,410
Basic unit	₽/MWh	175	204	197

### **Waste Recycling**

Subject	Unit	2015	2016	2017
Generation	1,000 tons	1,320	1,391	1,699
Recycling	1,000 tons	1,350	903	1,715
Recycling rate	%	102	65	101

### Industrial Accident Rate

	Subject	Unit	2015	2016	2017
National oc	cupational accident rate	%	0.50	0.49	0.48
KOWEDO	Industrial Accident Rate	%	0.20	0.11	0.07
KOWEP0	Occupational Accident Rate	%	0.02	0.02	0.01

 $<sup>\</sup>hbox{\it $\times$ Occupational disaster rate of the whole supply chain including the vendors and contractors}\\$ 

### **Employee Safety**

Subject	Unit	2015	2016	2017
Deathper10,000people	%0	0	0	0
Number of safety accidents	Case	2	=	-

### **Social Performance Index**

Employees As of December 31, 2017

	Subject		Unit	2015	2016	2017
Total number	of employees		Persons	2,077	2,177	2,352
Employment Type	Demile	Male	Persons	1,836	1,922	2,069
	Regular	Female	Persons	241	255	283
	Rate of the disabled		%	3.28	3.48	3.43
Minority	Rate of females		%	12.2	12.6	12.8
Status	Female manager (Senior manager or higher)		Persons	27	30	30
	Rate of female managers %		%	4.1	4.4	4.4

### **Employee Hiring and Turnover**

	Subject		Unit	2015	2016	2017
	Office	New graduates	Dancana	7	14	24
	workers	Experienced	Persons	0	2	1
New	Technical	New graduates	Persons	78	106	166.75
Employee Hiring	recrifficat	Experienced		2	1	0
Of	Othoro	New graduates		10	8	7
	Others	Experienced	Persons	0	2	0

### Social Equilibrium Hiring

Talents from regions outside of capital	Persons	54.5	52.5	89
People of national merit	Persons	10	7	20.75
High school graduates	Persons	23	29.25	24.75
Disabled	Persons	6	7.5	4.75
Female	Persons	15	25.5	32.5

### Subjects Applicable to Collective Bargaining and Members of Labor Unit

Applicable employees	Persons	1,455	1,508	1,658
Members of labor union	Persons	1,434	1,475	1,615
Labor union enrollment rate		98.5	97.8	97.4

<sup>\*</sup> Labor union enrollment rate: Rate of labor union members to the total number of employees except those at the senior manager or higher position

### **Employment Stability**

Subject	Unit	2015	2016	2017
Average years of service	Year	14.6	14.5	14.2
Employee turnover rate	%	1.1	1.2	0.8



### Operation Related to Childbirth and Parenting

	Subject	Unit	2015	2016	2017
Maternity leave	Users	Persons	23	18	15
(Female employees)	User rate	%	9.5	7.0	5.3
Spouse	Users	Persons	80	72	72
Maternity leave	User rate	%	4.4	3.7	3.5
Subfertility	Users	Persons	1	-	1
	User rate	%	0.05	-	0.05
	Males	Persons	5	5	7
5	Females	Persons	37	43	50
Parental Leave	Total persons	Persons	42	48	57
	Return after parental leave	%	95.23	100	98.24
	Subject	Unit	2015	2016	2017
Subfertility leaves		Persons	-	-	-
Reduced work for parenting		Persons	-		3

Subject	Unit	2015	2016	2017
Use of long-term leave (5 days or longer)	Persons	283	521	532

### Flexible Working Operation

Subject	Unit	2015	2016	2017
Time selection	Persons	31	38	35
Time lapse commuting	Persons	323	432	688
Working time selection	Persons	245	261	1,442
Concentrated work	Persons	39	44	55
Telecommuting	Persons	66	135	188
Smartwork	Persons	27	43	38

### Support of Overseas Marketing for Small Vendors

Subject	Unit	2015	2016	2017
Counseling outcome	USD million	130,771	545,260	223,171
Contract outcome	USD million	37,407	61,594	38,641
Supported companies	Companies	150	87	92

### **Shared Growth**

Subject	Unit	2015	2016	2017
Funding support for R&D	KRW 100 million	26.5	41.9	45.8
Purchase of outcome of joint R&D with small companies	KRW 100 million	10.7	18.5	10

### **Green Product Purchase Rate**

Subject	Unit	2015	2016	2017
Totalpurchase*	KRW 100 million	25.0	31.1	16.5
Green products	KRW 100 million	24.6	30.3	16.0
Rate	%	98	97	97

 $<sup>\</sup>hbox{\it \%} \ \, {\sf Total} \ \, {\sf purchase} \colon {\sf Purchase} \ \, {\sf of} \ \, {\sf green} \ \, {\sf product} \ \, {\sf items} \ \, {\sf designated} \ \, {\sf by} \ \, {\sf the} \ \, {\sf Ministry} \ \, {\sf of} \ \, {\sf Environment}$ 

### Socially Responsible Purchase

Subject	Unit	2015	2016	2017
Products from small companies	KRW 100 million	1,911	2,075	2,749
R&D products	KRW 100 million	200	257	258
Products from companies owned by females	KRW 100 million	277	289	309
Products from companies owned by the disabled	KRW 100 million	25	14	63

### **Contract Transparency**

Subject	Unit	2015	2016	2017
Total number of contract	Cases	1,193	1,238	1,233
Negotiated contracts	Cases(%)	293(25%)	346(28%)	343(28%)
Competitive bidding	Cases(%)	900(75%)	892(72%)	890(72%)

### **Ethics Management Evaluation**

Subject	Unit	2015	2016	2017
Assessment of integrity (ACRC)	Points	8.45	8.42	8.28
Assessment of policy to prevent corruption (ACRC)	Grade	- II		II



### **Human Resource Development**

Subject	Unit	2015	2016	2017
Average education hours per person	Hours	138	139	143
Education cost per person	1,000 KRW	1,558	1,574	2,255
Education budget	KRW 100 million	51	54	58
Educated personnel	Persons	14,853	15,176	18,340

### **Electronic Bidding**

Subject	Unit	2015	2016	2017
Total number of bidding	Cases	1,193	1,238	1,233
Total number of electronic bidding	Cases	1,189	1,234	1,230
Rate of electronic biddings	%	99.6	99.7	99.7

### Social Responsibility

Subject	Unit	2015	2016	2017
Donation	KRW 100 million	4.4	6.4	61
Funds participated by employees	KRW 100 million	1.2	1.1	1.4
Employees in voluntary services	Hours	1,994	2,024	2,046
Service time	Hours	35,303	36,569	35,710
Average voluntary service hour per person	Hours	17.70	18.07	17.45

<sup>\*\*</sup> Funding of KRW 5.3 billion to the Farming and Fishery Collaborative Cooperation Fund in 2017 under the provisions of the Special Act on Assistance to Farmers, Fishers, Etc. Following the Conclusion of Free Trade Agreements

### Support to Local Communities

Sul	pject	Unit	2015	2016	2017
Support of communities	s around power plants	KRW 100 million	36	30	32
Energy welfare of negle	ected groups	KRW 100 million	1	1.3	1.9
Purchase of Onnuri gift	certificate	KRW 100 million	5.3	6.3	7.4
Purchase of products	Social enterprise	KRW 100 million	37.6	59.2	82.0
from socio-economic companies	Cooperatives	KRW 100 million	0.2	1.9	2.7

### **Awards**

Year	Award Name	Awarding Agency
2015	Selected as the Best Institution at 2015 Safety Korea Disaster Response Exercise	Central Safety Management Committee
2015	Selected as the Outstanding Agency for Government 3.0 Evaluation of Public Institution	Ministry of Interior and Safety
2015	Ranked No. 1 in 2015 Sustainability Index of Korea Sustainability Contest	Ministry of Industry, Commerce, and Energ
2015	Grand Award in 2015 Management Quality of Korea Management Award	Korea Management Association
2015	Presidential Award in 2015 New Technology Commercialization Contest	KATS
2015	Grand Award in Public Institution for two years in a row of 2015 Korea Idea Management Award	Korea Suggestion System Association
2015	Presidential Award and Prime Ministerial Award in the 14th Korea Safety Award	Ministry of Public Safety and Security
2015	Grand Award in Public Institution (two years in a row) of 2015 Korea Idea Management Award	Korea Suggestion System Association
2015	Commercialization of New Technology (Presidential Award) - Institution	Ministry of Industry, Commerce, and Energ
2015	Outstanding Organization for Sharing of Outcomes	Ministry of Industry, Commerce, and Energy
2015	Received Ministerial Award for the purchase of products from the severely disabled	Ministry of Health and Welfare
2015	Presidential Award for job creation and overseas migration of young people	Ministry of Employment and Labor
2015	Outstanding workplace for a voluntary agreement for atmospheric pollutant management	Metropolitan Air Quality Management Office
2016	Received Grand Award at 2016 Management Innovation	KSA
2016	Grand Award in Public Institution (three years in a row) of 2016 Korea Idea Management Award	Korea Suggestion System Association
2016	Outstanding Public Institution for improving productivity	Ministry of Trade, Industry and Energy
2016	Achievement Award (Ministerial Award) for the promotion of AEO	Korea Customs Service
2016	Project of the Year Award	Korea Project Management Association
2017	Social Contribution Award Korea Chamber of Commerce and Forbes	Korea Chamber of Commerce and Forbes
2017	2017 Governor's Award for Sharing Governor of Chungcheongnam Province	Governor of Chungcheongnam Province
2017	Grand Award in Shared Growth Fund Idea Contest for Farming and Fishing Village	Large and Small Enterprise Cooperation Foundation for Farming and Fishery
2017	Job creation in the private sector at 2017 Public Institution Job Contest	Ministry of Strategy and Finance · Presidential Commission on Jobs
2017	Received Grand Award (two years in a row) at 2017 Management Innovation	KSA
2017	Grand Award in Public Institution (four years in a row) at 2017 Korea Idea Management Award	Korea Suggestion System Association
2017	Grand Award in Individual (Korean Suggestion Maestro) at 2017 Korea Idea Management Award	Korea Suggestion System Association
2017	Outstanding Institution for Cooperation of the Private and Public Sectors (Ministerial Award)	Ministry of SMEs and Startups
2017	Best Public Institution for Shared Growth (Presidential Award)	Ministry of Public Administration and Securit
2017	Government Award (Korea Chamber of Commerce Chairman Award) at the 5th Korea's Respected Companies	Ministry of SMEs and Startups
2017	2017 Korea Green Climate Award	Ministry of Trade, Industry and Energy
2017	Presidential Award for proactive administration	Ministry of Personnel Management
2017	Deputy Commissioner's Award for job creation	Presidential Commission on Jobs
2017	Commendation for coping with climate change and reduction of greenhouse gas	Ministry of Trade, Industry and Energy
2017	Commendation for open innovation	Ministry of Trade, Industry and Energy
2017	Grand Award at the 14th Geumgang Environmental Award	Guem River Basin Environmental Office
2018	Social Contribution Award Korea Chamber of Commerce and Forbes	Korea Chamber of Commerce and Forbes
2018	Ministerial Award at "Haengbokdeoham Social Contribution Award"	Ministry of Education
2018	National Industrial Grand Award in Employment-Friendly Section	The Institute for Industrial Policy Studies
2018	2018 Outstanding Company for Job Creation	Ministry of Employment and Labor
2018	Received Grand Award (two years in a row) at 2018 Management Innovation	KSA
2018	12th National Sustainable Management Grand Award (Ministerial Award)	Ministry of Strategy and Finance



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