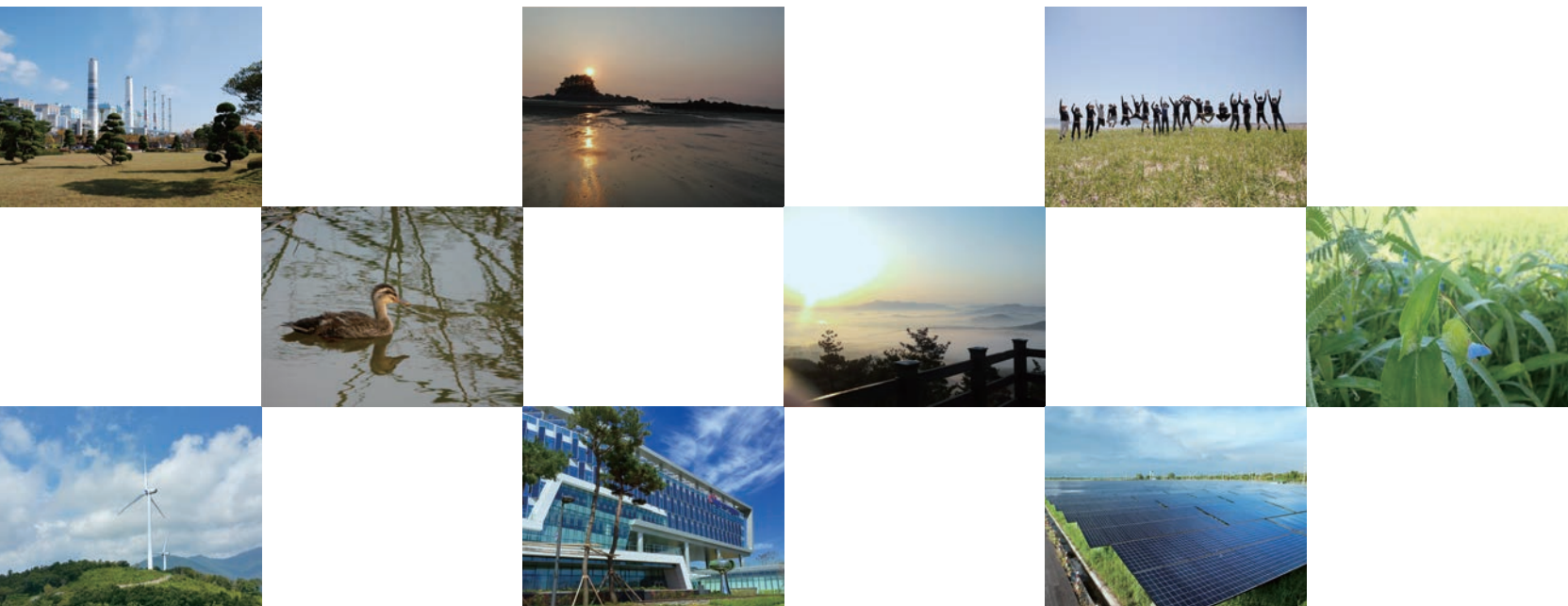




Beyond Energy,  
Create Happiness

국민행복을 창조하는 에너지기업

2016 KOREA WESTERN POWER  
Summary of Sustainability Report



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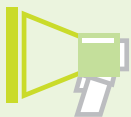
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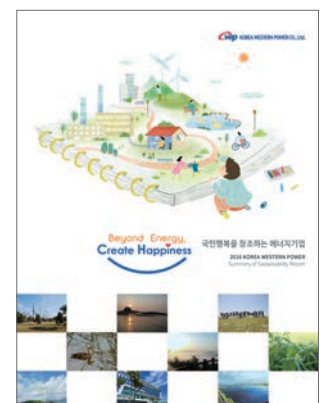
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KOWEPO 2016  
Download of  
Sustainability Report

### Cover story



The cover includes the panoramic perspective of KOWEPO's operation sites and images captured by our employees. These images express the directions and will of sustainable management that KOWEPO pursues through people, advanced technology and the environment coming together in harmony which creates greater happiness.

# CEO Message

Dear Stakeholders,

**I would like to express my gratitude for your interest and support for Korea Western Power.**

Korea Western Power (KOWEPO) has strived for supplying electricity stably and securing a new growth engine with construction of Taeon # 9, 10 and IGCC power plant, renewable power development and promotion of developing country-focused overseas projects while at the same time fulfilling its responsibilities as a public power company by initiatively introducing salary peak system based on understanding and concession of the labor and management. This was possible with the support and trust of our stakeholders.

KOWEPO, however, has confronted a difficulty to preemptively respond to the rapidly changing structure of the electric power industry. That is, growth capacity of power generation industry is reaching the limit due to the slow down in increase rate of continued domestic electricity demand, and especially it is expected that the launch of the new climate regime to address climate change will bring huge impact on overall facility composition and capacity and financial structure of KOWEPO.

Hence, I would like to present the challenges to be addressed and our commitments to accomplish the goals for a successful future to our stakeholders.

**First,** KOWEPO will expand a mid-to-long term growth engine switching to low-carbon-high-efficiency clean power generation system by taking internal and external business environmental factors as progressive driving forces to prepare for the future. We will also bear that the company can only grow with the people trust when the facilities are safe in mind, and put top priority on safety with the utmost effort.

**Second,** KOWEPO will reinforce technology capacity and develop human resources that support overcoming crisis and sustained growth. We promise to provide quality electricity to the people with higher quality and service by making the utmost efforts of all our executives and employees to develop latent capacities.

**Last but not the least,** KOWEPO will actively implement transparent management and management by communication for boosting public trust. We will build a world living together by swiftly disclosing information of the company for smooth communication with local residents and developing and supporting various win-win programs while keeping in mind that transparent management is the only means to guarantee the existence of the company.

A series of activities mentioned above is a steppingstone to sustainable future of KOWEPO and KOWEPO's commitment to contribute to the society as a reliable partner of local community and an energy company that pursues happiness of the people.

I look forward to your continued support and interest in the healthy and bright future of KOWEPO.

Thank you.



November 2016

**Jung, Ha Hwang**

President & CEO of Korea Western Power Company







# Company Profile

## Beyond Energy, Create Happiness, Korea Western Power Co., Ltd.

Korea Western Power Co., Ltd. (KOWEPO) is a public corporation that specializes in power generation and strives to create values that raise people's happiness beyond the values that a normal energy company provides. At the time of KOWEPO's establishment, the corporate asset and sales were merely at KRW 2.9 trillion and KRW 1.5 trillion, respectively. Through low carbon · high efficient power generating system-oriented plant operation, renewable power development and promoting developing country-focused overseas projects, KOWEPO's net profit has reached KRW 300.3 billion, which is the largest amount since its foundation. As of late 2015, the company operates facilities with a total capacity of 9,322MW, accounting for about 9.55% of the domestic market share.

### General Status

(As of late 2015, based on the consolidated financial statement)

	<b>Type of Business</b>	Power Generation, Power Development, Supervision
	<b>Date of Establishment</b>	April 2 <sup>nd</sup> , 2001
	<b>Number of Employees</b>	2,082
	<b>Credit Ratings</b>	<ul style="list-style-type: none"> <li>• Overseas – S&amp;P: AA-, Moody's: Aa2</li> <li>• Domestic – AAA</li> </ul>
	<b>Main Product</b>	Electricity
	<b>Address of Headquarters</b>	285, Jungang-ro, Taeon-eup, Taeon-gun, Chungcheongnam-do

 **Capital**  
KRW  
**158.9** billion

 **Asset**  
KRW  
**9,207.9** billion

 **Revenues**  
KRW  
**4,224.7** billion

Rabigh O&M, Saudi Arabia

▲ 1,204

Egbin O&M, Nigeria

▲ 1,320

## Current Status of Business

### Domestic Projects

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 to prevent any setbacks in power supply-and-demand. Moreover, KOWEPO strives to explore new sites that are suitable for power generation facilities in advance. We comply with the National energy policies and to implement the Renewable Portfolio Standards (RPS).



Headquarter (Taeon)



Hwasun Wind Power



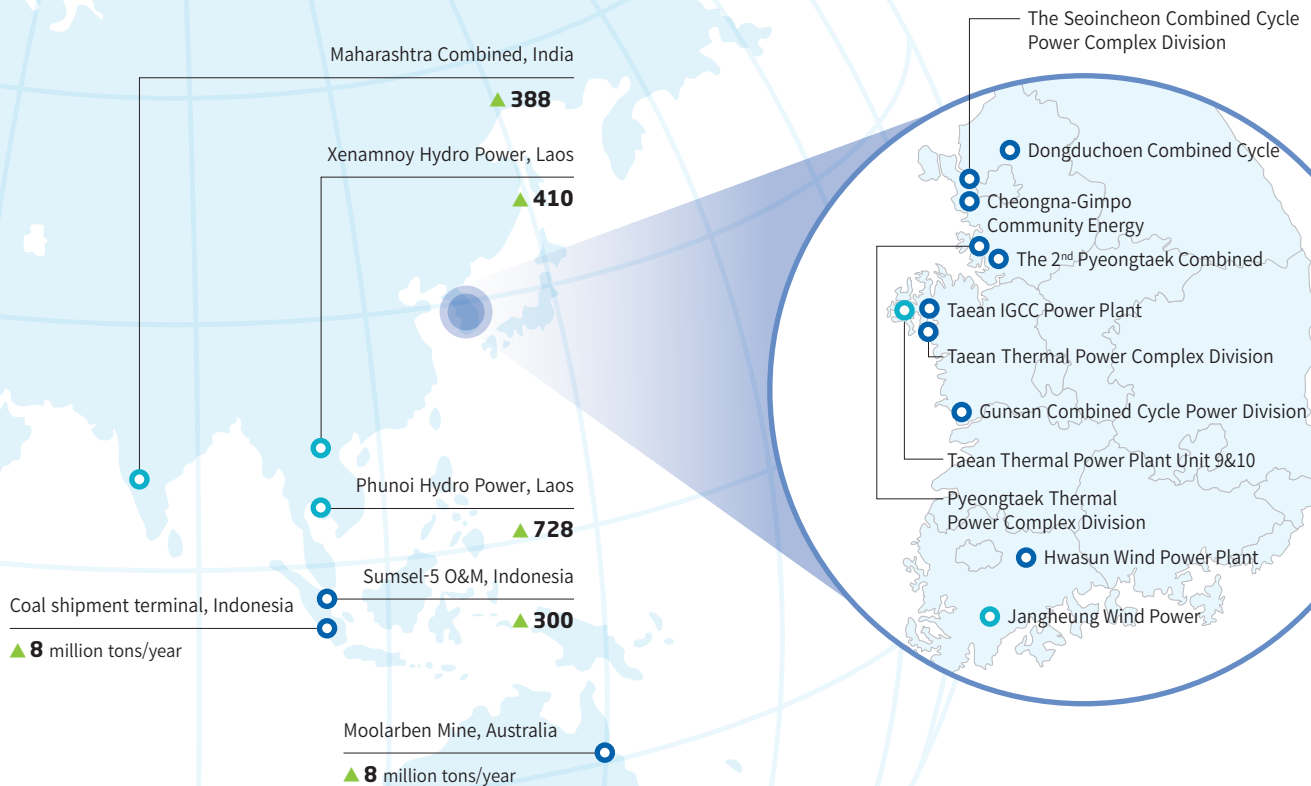
Taeon IGCC Demonstration Plant



Sumsel-5 O&M, Indonesia



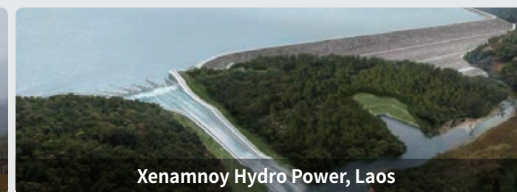
● Under Operation ● Under Progress ▲ Facility Capacity (MW) (As of Aug. 2016)



## Beyond Energy, Create Happiness

### Overseas Projects

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 manpower. In particular, by pursuing the overseas operation, KOWEPO is able to focus on coal and gas power generation projects that displays patterns of the steady increase of consumption through the analysis of global energy consumption trends and the hydraulic power generation. This is expected to generate stable profits, and O&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.





(Facility Capacity : As of Aug. 2016)

## A Model of the Korean Standard Thermal Power Plant, Taeon Thermal Power Complex Division

The Taeon thermal power complex division is the core power generation complex of KOWEPO, which operates thermal power plants that take approximately 45% of the company's generation facility capacity and are equipped with cutting edge automatic control facilities.

The Taeon division strives to build eco-friendly power plants by equipping them with the latest flue gas desulfurization facilities, continuous coal handling machines to prevent coal fugitive dust, and wastewater treatment facilities for all generators. Taeon contributes to the creation of the future growth engine of KOWEPO such as additional construction of new generators.

No. of Units

**8**

Facility Capacity

**4,000** MW



## The Largest Eco-friendly Hub Power Plant in the Metropolitan Area, Pyeongtaek Thermal Power Complex Division

The Pyeongtaek thermal power complex division contributes to the development of the national power industry with stable electric-power production as the largest hub power plant in the metropolitan area. Quality electricity produced in Pyeongtaek is supplied mostly to the capital region and is utilized for a stable power supply and system frequency maintenance.

The Pyeongtaek thermal power complex division, which endeavors to contribute to society by creating the best energy through the harmony of humankind, technology and the environment, will play a key role in the rising 21st century west coast era based on stable power production and eco-friendly facility operation, such as the securement of reliability for the facilities and cost reduction.

No. of Units

**12**

Facility Capacity

**2,749** MW







## Eco-friendly Power Plant Using Clean Fuel, Natural Gas, 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, that generate almost no air pollution. By using the clean fuel LNG (Liquefied Natural Gas) for the main fuel, this means it rarely causes environmental 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.

No. of Units

**16**

Facility Capacity

**1,800** MW



## The Urban Power Plant that Coexists with Local Communities, Gunsan Combined Cycle Power Division

The Gunsan combined cycle power division is an eco-friendly combined-cycle power plant that uses LNG for fuel, and is in charge of over 30% of electricity demand in the Jeonbuk region. It was built in a densely populated area within a city however, and contributes to the regional economy while completely addressing environmental issues with thorough environmental management and the use of clean fuel. In particular, Gunsan power plant has the highest generating efficiency domestically by applying the latest G-class gas turbine for the first time in Korea. The Gunsan power will be a prop for the economic growth of the Saemangeum region stretching out to the center of the northeast Asian economy.

No. of Units

**3**

Facility Capacity

**718.4** MW



## Future Growth Engine of Eco-friendly KOWEPO, New & Renewable Energy

KOWEPO supplies new energy and renewable energy to satisfy the national energy policies and proactively respond to the emission trading system due to the international convention on climate change. The company is securing the mid-to-long term competitiveness including dominating the future energy technology through photovoltaic power, small hydro power, fuel cell and wind power, and constructing the first domestic IGCC.

Facility Capacity

**407.3** MW

(One unit of IGCC generator, including 346.3MW)



# 2014/2015 Highlights



**2** The 1<sup>st</sup> Certification for the Low-Carbon By-product of the Power Generation in Korea



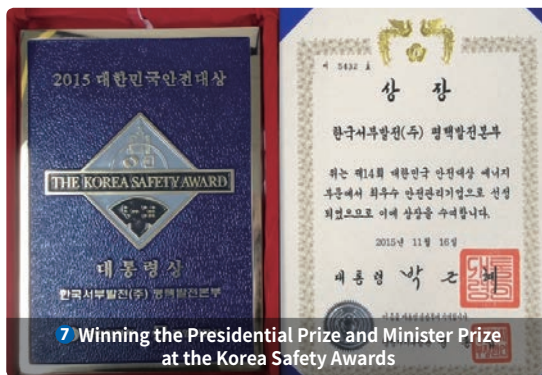
**4** Completion of the Fuel Cell Plant in Seoincheon



**5** Commissioning of 1,050MW Tae'an Unit 9, the Largest in Korea



**6** Winning the No.1 Enterprise in the Sustainability Index



**7** Winning the Presidential Prize and Minister Prize at the Korea Safety Awards



**8** Winning the Presidential Prize for the Contribution to Job Creation

## 1 2014. 02.

### Winning the Presidential Prize at E-People Awards

KOWEPO received the Presidential Prize at the E-People Awards (anti-corruption category) in recognition of its contribution towards anticorruption by playing a leading role in establishing a culture of integrity and cooperation with the private sector.

## 2 2014. 05.

### The 1<sup>st</sup> Certification for the Low-Carbon By-product of the Power Generation in Korea

KOWEPO acquired a carbon emission certification for power generation by-products for the first time among power corporations. Fine fly ash, which is the Korea's first low-carbon certified product, will be used as a ready-mixed concrete compound after refining cinder emitted from power plants.

## 3 2014. 09.

### Winning Gold Medal at the Asian Power Awards

An improvement in the facility operating ability of KOWEPO was recognized through the combination of the power generation and heat supply project.

## 4 2014. 10.

### Completion of the Fuel Cell Plant in Seoincheon

Seoincheon Combined Cycle Power Complex Division announced the beginning of the fuel cell business, which is the future growth business, in earnest by holding the completion ceremony of the fuel cell plant.

## 5 2015. 04.

### Commissioning of 1,050MW Tae'an Unit 9, the Largest in Korea

Tae'an Unit 9 which has the largest capacity in Korea started in full scale and contributes to the stable power generation.

## 6 2015. 09.

### Winning the No.1 Enterprise in the Sustainability Index

KOWEPO was awarded the No.1 Enterprise in the Sustainability Index(power generation sector). Especially stable power supply, win-win management were recognized for its contribution to the quality of life of the people.

## 7 2015. 11.

### Winning the Presidential Prize and Minister Prize at the Korea Safety Awards

Pyeongtaek thermal power complex division and Gunsan Combined Cycle Power Division were awarded with the Presidential Prize in the energy category and Minister Prize from the Ministry of Public Safety and Security, respectively at 'the 14<sup>th</sup> Korea Safety Awards' for their strong will towards safety management.

## 8 2015. 12.

### Winning the Presidential Prize for the Contribution to Job Creation

KOWEPO was awarded the Presidential Prize in recognition of job creation performance, job system improvement, job quality improvement, caring jobs for vulnerable social groups and the ripple effect that comes from job creation.



## 2014/2015 Main Performances

As the low oil price continues with the launch of a new climate regime, radical changes in the power industry structure such as the decline of coal-fired power, the breakthrough of a renewable energy source and a switch to a low-carbon and high-efficiency power generating system are foreseen. In order to take actions proactively in such an environment, KOWEPO is focused on the reorganization of company-wide new growth which can support the securement of the growth engine based on the low carbon power generation to actively respond to the structural changes in the power industry.



Headquarter(Taejeon)

### Securing the Future Growth Engine

The company is devising mid and long term plans for the switch to the 'low carbon technology-based clean power generation' structure from the thermal power business structure based on high carbon emissions. It not only carries out domestic energy source development and performance improvements which includes the expansion of new and renewable energy sources but also seeks new business opportunities in the distributed energy source development. KOWEPO concentrates on securing core technologies for greenhouse gas reductions such as bio fuel, carbon capture and storage (CCS) technology, IGCC (integrated coal-gasification combined-cycle) linked fuel cells and carbon recycling. In addition, efforts to develop overseas projects and secure fuel resources have been made from a strategic perspective. The company also seeks opportunities in equity investment for overseas projects and overseas renewable energy projects, and pursues cost competitiveness in electric power production through direct LNG imports and the strategic securement of fuel resources to gain the competitive edge in business competition.

### Successful Stabilization of the Taejeon HQ Era

In August 2015, the relocation of KOWEPO headquarters to Taejeon, Chungcheongnam-do was completed and the company has made its best efforts to settle in quickly. Since the launch of the HQ relocation team in 2013, the stabilization-related collaboration assignment was carried out with Taejeon-gun through diligent preparation by the team and that contributed to the reinforcement of regional unity and the energetic organizational culture such as job creation for the local community and building a healthy leisure system.

### Fulfilling Responsibilities as a Corporate Citizen

KOWEPO was awarded with the presidential citation at the Korea Safety Awards in recognition of its performance as a leading agency in disaster and safety control while enhancing the integrity as a public institution and reinforcing the capabilities of information security. Moreover, the company achieved USD 6.5 million of exports as a result of establishing an export center in Iran and inviting Iranian buyers to support SMEs' PR for the first time among public institutions. By introducing the salary peak system in advance as well as contributing to job creation for the young, the company has taken the lead in the transparent disclosure of information through the implementation of Gov 3.0.

# KOWEPO Vision 2025

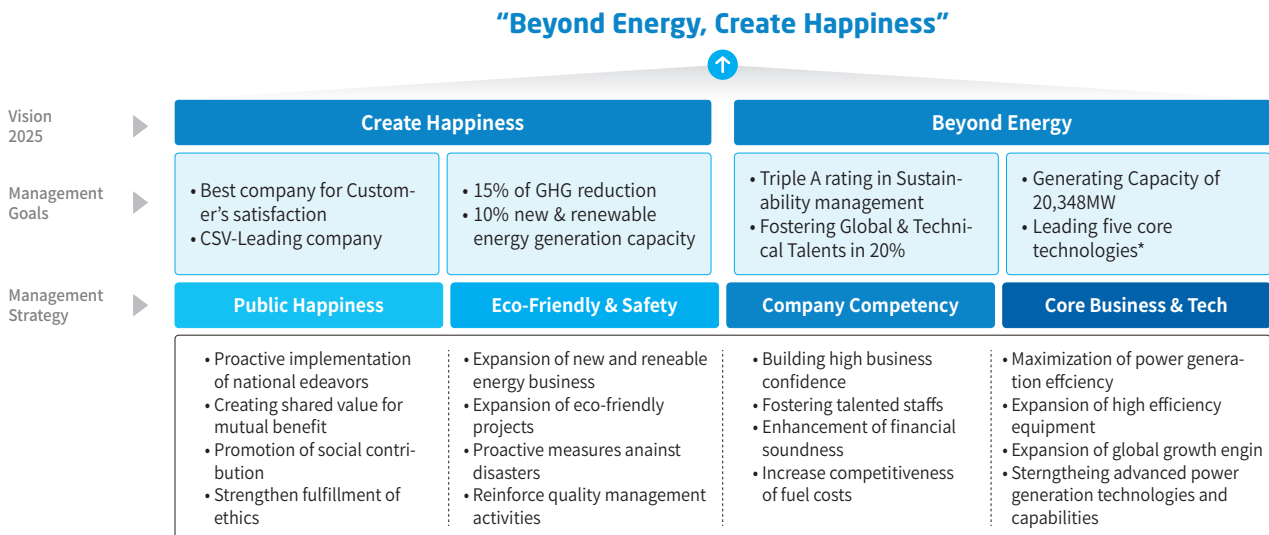
## Beyond Energy, Create Happiness

KOWEPO established Vision 2025, a mid- to long-term business strategy system, to fulfill the social responsibilities of a public enterprise by enhancing our public services and eco-friendly management as well as boosting the competitiveness of the national energy industry through efficient management and stabilization. The company concentrates its capabilities on reinforcing performances by setting up 16 strategic tasks according to the four business strategies; such as public happiness; eco-friendly & safety; company competency; core business & tech.

### Establishment of Mid to Long Term Management Goals

In 2016, we reestablished the strategy system by reflecting domestic and overseas environmental changes, such as the response to the new climate regime, safety system reinforcement request as well as the main management issues.

#### Mid to Long Term Management Goals



\* Operating technology of power generation facilities, gas turbine localization technology, IGCC operating & connecting technology, new & renewable energy application technology, eco-friendly resources and recycling technology

### Main Performances by Mid to Long Term Management Goals

Four Strategic Targets		KPI		2013	2014	2015	2016 Plan
Public Happiness	Best company for Customer's satisfaction	Satisfaction of local community	Point	83.6	86.3	88.5	90
	CSV-Leading company	Evaluation level of shared growth performance	Level	Great	Good	Great	Great
Eco-Friendly & Safety	15% of GHG reductions	GHG reduction rate (to BAU <sup>1)</sup> ) <sup>2)</sup>	%	-	-	1.5	2.5
	10% new & renewable energy generation capacity	Achievement of RPS (Renewable Portfolio Standard) target	%	1.96	2.44	2.61	3.2
Company Competency	Triple A rating in Sustainability management	Result of KoBEX SM <sup>3)</sup> survey	Grade	AAA	AAA	AAA	AAA
	Fostering Global & Technical Talents in 20%	No. of global/professional talents	Person	100	286	438	560
Core Business & Tech	Generating Capacity of 20,348MW	Total facility capacity	MW	8,917	9,315	11,047	13,920
	Leading five core technologies	Implementation rate of developing five core technologies <sup>4)</sup>	%	30	43	52	60

1) BAU (Business As Usual) : Estimated amount of emission that are expected to normal execution of business unless special measures are taken

2) In June 2015, following the launch of the new climate regime, KOWEPO operates GHG target management that reflects government guidelines

3) KoBEX SM (Korea Business Ethics index-Sustainability Management) : AAA is highest level of sustainability management survey (Sponsored Ministry of Trade, Industry and Energy)

4) Implementation rate of R&D assignments for 56 detailed technologies in five core technologies including power generation facility operating technology



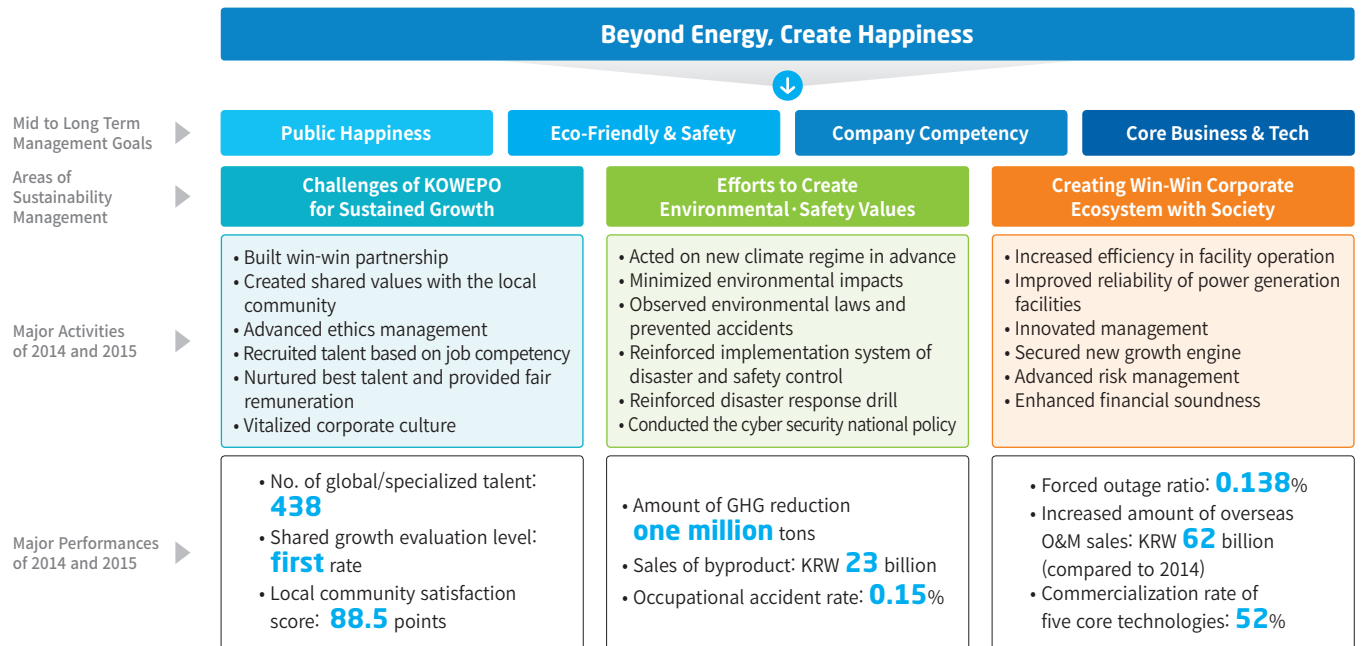
## Alignment with business strategy in a sustainability management activity

The sustainability management slogan of KOWEPO which focuses on people, society and environment is connected to the company-wide vision and management goals of 'Beyond Energy, Create Happiness'. The sustainability management body that discusses the company-wide direction of sustainability management selects the areas to be handled by priority in terms of sustainability for achieving the four goals of the management strategy, and carries out relevant activities.

## Sustainability Management Operation Process

Sustainability Management Committee, which discusses the direction of corporate sustainability, focuses on the areas of sustainability management that are important for achieving the four goals of management strategy. We implement regular checks and monitoring of performance.

### Implementation System of Sustainability Management



## Establishment of Sustainability Management Tasks

We have selected four task for sustainability management in 2016. We will implement them and be monitored from a mid to long term perspective.

### Implementation Tasks of Sustainability Management

<b>Task 1</b> Climate · Environment Management Reinforcement <ul style="list-style-type: none"> <li>Reduction of greenhouse gas emissions and Sophisticated data management</li> <li>Strict implementation of national GHG reduction targets</li> <li>Establishing and budgeting for Fine Dust Reduction Plan</li> <li>Replacement and new installation of environmental facilities in power plant</li> </ul>	<b>Task 2</b> Global Social Contribution Activities <ul style="list-style-type: none"> <li>Check agenda to accomplish SDGs and establish implementation strategy</li> <li>Search and implement social contribution activities specialized for supporting local communities of overseas projects and raising awareness</li> <li>Control activity performance by overseas operation site</li> </ul>	<b>Task 3</b> Spread of Supply Chain Safety Management <ul style="list-style-type: none"> <li>Regularize safety training of employees of partner companies</li> <li>Regularize safety inspection and monitoring of suppliers</li> <li>Share cases of KOWEPO'S safety inspection results</li> <li>Enhance operation of communication channels to collect safety and health related opinions</li> </ul>	<b>Task 4</b> Establish and Monitor Human Rights Management <ul style="list-style-type: none"> <li>Establish human rights management policies</li> <li>Announce human rights management policies</li> <li>Apply human rights management guidelines to domestic and overseas operation sites</li> <li>Check and monitor the current status of human rights</li> </ul>
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\* The implementation of sustainability management tasks in the areas of business and economy are streamlined at the level of the company-wide mid to long term management goals, hence tasks should be drawn and implemented within the areas of the environment and society.

\* SDGs(Sustainable Development Goals): SDGs are the items for sustainable development of the globe to be applied by 2030 by the UN, and include 17 goals and detailed activities, such as no poverty, climate action, economic growth, job creation and sustainable industrialization and etc.

# SUSTAINABILITY VALUE APPROACH

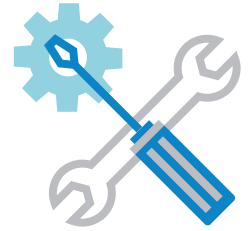
A low-angle shot of a dandelion seed head in the bottom left corner, with several seeds floating in the air against a clear blue sky. The seeds are captured in motion, creating a sense of lightness and dispersal.

- 13** Improvement in Reliability of Power Generation Facility
- 15** Securing New Growth Engine
- 18** Minimization of Environmental Impacts
- 20** Reinforcement of Emergency Safety Management Implementation System
- 22** Creating Community Shared Value



## Improvement in Reliability of Power Generation Facility Core Issue

By recognizing that electricity is essential for the national economy development, KOWEPO puts its utmost efforts into the stable operation and enhancement in the efficiency of power generation facilities including the response for the electric power supply crisis to guarantee convenience for the people. Also, the company strives to secure a stable supply capacity in recognition of the importance of energy security.



- **Opportunity**
- Able to utilize new technology applied with cutting edge IT
  - Possess capacity to improve power generation facilities

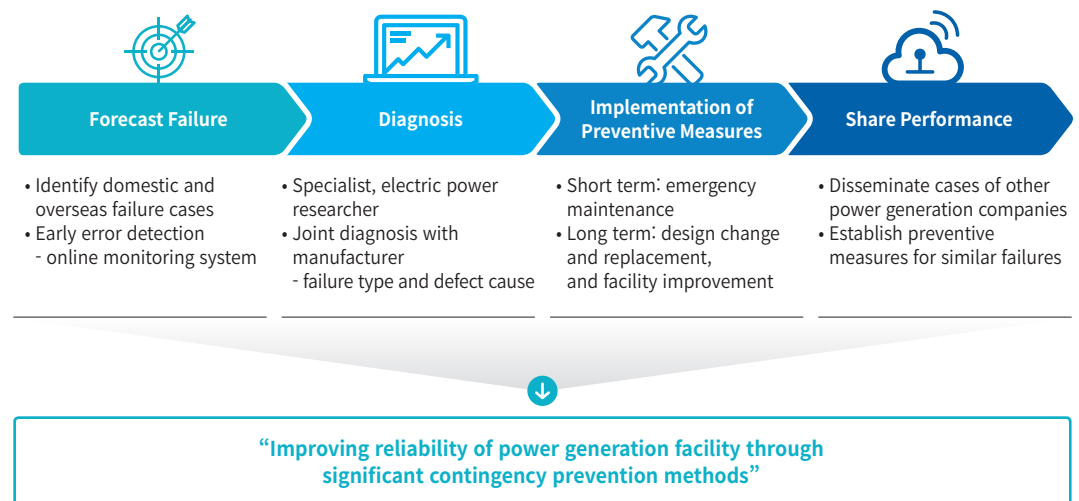
- **Crisis**
- Increase of failure causes due to facility deterioration
  - Possible for loss factors to occur including draught, cyber intrusion and material procurement

### Optimum Management of Significant Contingency

**Intensive management of the significant contingency core facility reflects the lifecycle of the power generation facilities.**

The intensive management of the significant contingency core facility reflects the lifecycle of the power generation facility. In order to enhance the facility reliability, especially for power generation facilities, the forced outage rate is being minimized. The component ratio and failure methods are analyzed by a period of in-service, and the forced outage rate is minimized through the expanded operation of the early warning response system, which starts at the abnormal operation of the facility, and the ICT-based mobile facility inspection. In 2015, a significant contingency rate was prevented by operating the failure response procedure.

#### Failure Response Process



### Minimizing Power Generation Loss with Preemptive Response

#### Securing Safety at Plant Operation Process

Social concern is growing with the recent rise in plant safety accidents hence, KOWEPO realized that the focus for construction projects should be safety and applied an onsite-based safety management system. It also conducted the quantification of a safe state through big data analysis including natural environment, working conditions and risk levels by work process for the first time among power generation companies.



Information Security  
Evaluation Score

84.2



Power generation control system  
emergency recovery training  
(preparing for cyber terrorism)

Quality Vision ▶

Mid to Long  
Term Quality  
Target ▶

Strategy ▶

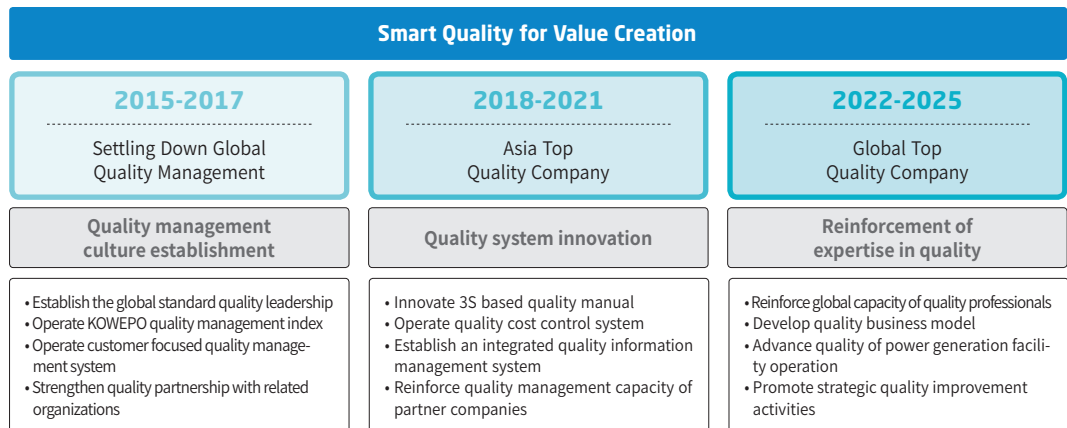
Strategic Tasks ▶

### Reinforcing Information Security

In order to prevent the infringement of personal information due to IT advancement, KOWEPO established and operates a procedure and a guideline to protect personal data that complies with the security policy of the National Intelligence Service (NIS) and the Ministry of Trade, Industry and Energy while being equipped with an organizational system for the protection of internal information and customer information. In particular, the information protection system that completed the security conformance check was introduced for the thorough prevention of information leakage. In addition, the company established the emergency response system for the cyber intrusion of the power generation control system and is implementing the response drill regularly. As a result of such efforts, KOWEPO ranked fourth in the evaluation on the management status of the information security of public corporations (61) by the NIS in 2015, and raised any complaints regarding customer information protection and customer data losses.

### Securing Global Top Quality Competitiveness

KOWEPO runs the KOWEPO style quality management system to enhance global quality competitiveness to become a top quality global corporation.



Quality management diagnosis  
result presentation

### Advancing Quality Management

**Build quality management strategic system** | The company conducted the diagnosis of the quality management system through a specialized institute in 2015 to reflect changes in the business environment and to secure global quality competitiveness, and rebuilt a quality management strategic system. In addition, 12 strategic tasks in three strategies were derived to achieve quality management vision goals. In the field quality area, the causes and improvement measures necessary for a fall in quality competitiveness are identified and derived, respectively, through the quality control process by each process of design, operation and maintenance. Unnecessary quality restrictions were eliminated while reinforcing the quality control process related to safety and facility reliability. By standardizing quality inspection standards to enhance the quality check procedures of routine maintenance and planned maintenance for generating facilities, obstructions in quality control were removed and facility reliability was secured. A presentation was held to share the diagnostic results throughout the company.

### Spreading Smart Quality Management Culture

**The Development of the quality inspection manual for power plant equipment** | Special management to maintain quality is required due to the recent enlargement of coal-fired thermal power generating units and an increase in the number of new technology components. To this end, KOWEPO self-developed a comprehensive 「Equipment Quality Inspection Manual」 containing the latest technical data, fabrication and inspection standards, fabrication process, quality inspection plans and procedures, and quality inspection experience data on 63 main power generation facilities and equipment by collecting accumulated quality inspection technology in coal-fired thermal power and the combined-cycle thermal power fields in a set of three volumes for the first time in Korea.



Equipment Quality Inspection  
Manual

### 2015 Key Performance



Forced Outage Time

218 hours



Low Quality Cost\*

5 % reduction



Unplanned Loss Rate

0.15 %

\* Costs incurred due to improper business practices



## Securing New Growth Engine Core Issue

KOWEPO selected five core technologies to prepare for business environmental changes such as the launch of a new climate regime and the reinforcement of RPS and strives toward becoming an 'eco-friendly resource recycling' power generation company. The company also plans to secure a foundation for the new overseas market and will expand the existing base for growth.

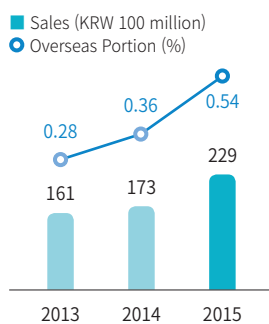


- Opportunity**
- Expand the market share and base by securing the future core technologies in advance
  - Able to target strategic area investment
  - Secure business operation stability by expanding the facility capacity

- Crisis**
- Electricity supply crisis
  - Request to reinforce the safety and quality system by the government
  - Enter into stagnation and intensify the competition of the domestic power generation industry

## Reinforcing Overseas Projects

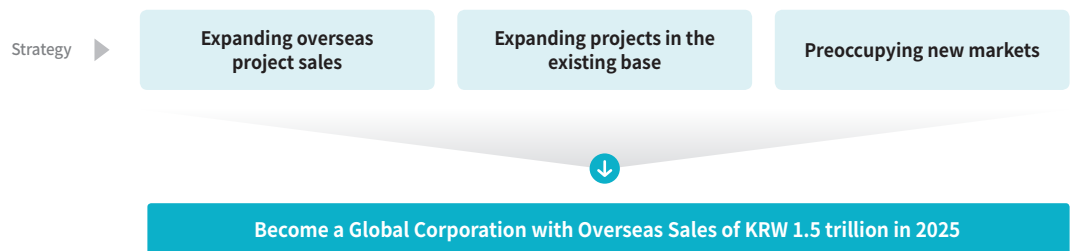
### Overseas Sales



\* Increased by about KRW 5.6 billion compared to 2014

### Direction of the Implementation of the Overseas Project

The company aims to secure a foothold for the new overseas market and will expand the existing base for growth. By analyzing the global energy consumption trend based on the experience from operating the world's top class plant, KOWEPO concentrates on the coal- and gas-fired power generations which are expected to experience a continuous increase in consumption, and the hydro power generation which is expected to create stable profits and plant the O&M projects which can maximize profits with minimum investment by using core capabilities.



### Overseas Project Sales Expansion

KOWEPO, which operates and develops 12 overseas projects in nine countries including Saudi Arabia, Laos and Indonesia, enhances the capacity utilization rate and prevents forced outage by implementing the domestic training of local manpower and conducting a regular field survey to prepare for overseas project sales reduction factors. In the second half of 2016, an increase in additional revenue and net profits due to the expansion of overseas projects including the completion of the Indian combined power plant are expected.

### Expansion of Projects in the Existing Position

Hazardous and opportunity factors are analyzed through the multidisciplinary risk management and efforts to expand the market share in a growth base that has a great deal of potential for development are made. The company aims to maximize the converging effect of investment and the O&M project. To this end, KOWEPO selected Indonesia as the first target base and expands the receiving project orders of the plant O&M by utilizing the maintenance manpower and maintenance equipment for the existing base of Sumsel-5 O&M.

### Preoccupying the New Market

KOWEPO calculated the optimal O&M cost by applying the standard model based on the capacities and experiences of overseas O&M including Rabigh, Saudi Arabia; Egbin, Nigeria; and Sumsel, Indonesia to win the contract for the first IPP (Independent Power Producer) in Kazakhstan. Moreover, it could successfully secure the CIS (the Commonwealth of Independent States) new base through multidirectional efforts such as active communication with the Kazakhstan government, the proposal of the changed plan for the contracting system and financing.

\* ROMM (Rehabilitation Operation Maintenance Management) : A project creating profits through facility operation and maintenance for a certain period of time after restoring the performance of decrepit power plants.



IGCC aerial view

## Improving the Facility Capacity Management Goal

In conjunction with the Vision 2025 management strategy, the 'facility capacity management goal' was improved and changed. KOWEPO reset the facility capacity and the power generation capacity of thermal, renewable and overseas projects, and will implement the replacement and early abandonment of obsolete equipment and review on holding the sale of shares. The company will accomplish its long-term vision and prepare a foundation of sustained growth through the materialization of business and development plans.



Expansion of Renewable Energy Source

8



Achievement Rate of 2015 RPS Target (2.6%)

100 %

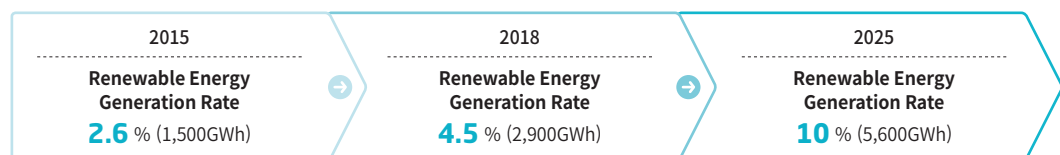
## Developing Renewable Energy

We are carrying out the RPS (Renewable Portfolio Standards) faithfully by selecting renewable energy applied technology as one of the five future core technologies, and reestablished the mid and long term roadmap by 2025. Based on the existing implementation system, renewable fuel diversification and energy storage technology were reflected by applying the business conditions in which the renewable energy generation facility lacks, thus allowing the RPS targets to continue to grow.

## Implementing the On-land Wind Power Belt Establishment

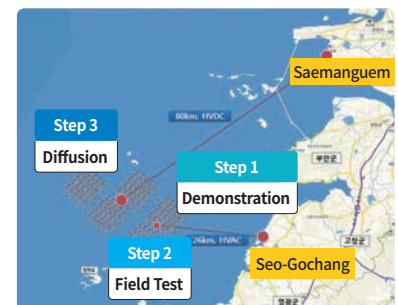
To develop various renewable power sources for achieving the renewable roadmap, the company aims to create a renewable complex by establishing an on-land wind power belt. In 2015, operation costs were cut by KRW 13.5 billion with the establishment of the on-land wind power belt and the system stability policy of the government was fulfilled with the ESS connection to the on-land wind power belt.

## Roadmap to achieve RPS



## Southwestern Offshore Wind Power

Global competition to advance the offshore wind power market is becoming fierce due to the rapid growth of the market with the danger of energy depletion and the GHG reduction requirements. To this end, KEPCO and six power generation companies including KOWEPO are to gather the domestic offshore wind power related capabilities of the companies by developing the Southwestern offshore wind power plant and to create a national new growth engine project. The expectations are that the planned southwestern offshore wind power plant project will generate the annual capacity of 6,680GWh in 2023 from the final diffusion stage. In particular, the company puts continuous efforts to improve social and environmental values such as increasing the portion of localized core components and minimizing environmental impacts on the surrounding sea area.





## Future Core Technology Securement

### Securing the Five Core Technologies

KOWEPO reestablished the mid and long term roadmap (March 2016) by selecting the five core technologies and reflecting the secured direction through the domestic and international environment analysis of the new growth project to secure the future growth engine. It plans to develop 56 detailed technologies step by step to capture the future core technologies. The development rate of the five core technologies were 52% in 2015.



#### Current Status of the Five Core Technology Development Rate

Compared to 2014  
**9** p increase

\* IGCC : Integrated Gasification  
Combined Cycle

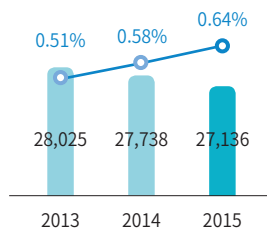
\*\* CCS : Carbon Capture & Storage

#### Direction to Secure Five Future Core Technologies

	Short Term (2015~2016)	Mid Term (2017~2020)	Long Term (2021~2025)
① Facility Operation Technology	<ul style="list-style-type: none"> <li>Control ICT convergence facility/safety</li> <li>3D printing utilization technology</li> </ul>	<ul style="list-style-type: none"> <li>USC fire simulator</li> <li>Advanced control algorithm</li> </ul>	<ul style="list-style-type: none"> <li>Field study on extending the service life of the standard coal-fired thermal power plant</li> </ul>
② Gas Turbine Localizing Technology	<ul style="list-style-type: none"> <li>Localize operation technology and components</li> <li>Establish hot component testing facility</li> </ul>	<ul style="list-style-type: none"> <li>Achieve combustion tuning technology independence</li> <li>Develop Korean-style gas turbine</li> </ul>	<ul style="list-style-type: none"> <li>Localize H-class components</li> <li>Build gas turbine field test complex</li> </ul>
③ IGCC* Operation and Connection Technology	<ul style="list-style-type: none"> <li>Establish Korean-style IGCC*</li> <li>Develop gasification test-bed</li> </ul>	<ul style="list-style-type: none"> <li>Upgrade operation technology</li> <li>Component localization/connection technology</li> </ul>	<ul style="list-style-type: none"> <li>Operation technology/localization (continued)</li> <li>Coal gasification fuel cell</li> </ul>
④ Renewable Energy Application Technology	<ul style="list-style-type: none"> <li>Commercialize bio heavy oil</li> <li>Develop livestock manure-derived fuel</li> </ul>	<ul style="list-style-type: none"> <li>Wind power/fuel cell operation technology</li> <li>Commercialize livestock manure-derived fuel</li> </ul>	<ul style="list-style-type: none"> <li>High-efficiency fuel cell technology</li> <li>Bio power generation engineering</li> </ul>
⑤ Eco-friendly Resource Recycling Technology	<ul style="list-style-type: none"> <li>0.1MW pre-combustion CCS**</li> <li>Original technology converting CO<sub>2</sub> into fuel</li> </ul>	<ul style="list-style-type: none"> <li>1MW pre-combustion CCS</li> <li>Pilot facility converting CO<sub>2</sub> into fuel</li> </ul>	<ul style="list-style-type: none"> <li>10MW pre-combustion CCS</li> <li>Field test facility converting CO<sub>2</sub> into fuel</li> </ul>

#### R&D Performance

■ R&D Costs (KRW million)  
● Expenditure to sales ratio (%)



\* Excludes investment costs for the IGCC field test plant

#### R&D Performance and Presentative Core Technology

As of late 2015, R&D expenditure to net sales was 0.64%, and these figures have steadily increased since 2013. The total number of R&D tasks completed is 262 since the establishment of the company and 57 R&D cases are ongoing.

**IGCC Technology** | IGCC technology is rapidly emerging as an eco-friendly power generation facility since the launch of the new climate regime due to its capabilities to reduce the main contaminants of coal-fired thermal power, such as sulfur oxides, NOx and dust, to natural gas levels; and to capture CO<sub>2</sub> by connecting to the CO<sub>2</sub> capture facility with low costs compared to the existing coal-fired thermal power. KOWEPO succeeded in the initial commencement of the power generation of Taean IGCC in June 2016 and plans to complete the development of the Korean-style IGCC standardized model after a thorough field operation following the completion of construction.

**Korea-style Gas Turbine Technology** | For Korea-style gas turbine which is to gain technological independence, the company plans to achieve 71% of the localization rate and over 1,800 localized items for gas turbine components in 2016 to build a field test complex after 2019.

#### Implementation of the Owner's Technical Support Project

KOWEPO considers the owner's technical support project as the new growth engine and continues development, and the representative projects are the new Pyeongtaek combined cycle and Yeosu green energy.

##### New Pyeongtaek Combined Cycle

- Plan to secure competitiveness by implementing direct fuel imports through a joint investment business
- Expect synergy by sharing the common facilities with the 2<sup>nd</sup> Pyeongtaek combined cycle

##### Yeosu Green Energy

- Implement owner's technical support services through the first non-investment among power generation companies
- Contribute to secure the competitive advantage of and win-win cooperation with private operators

## 2015 Key Performance



#### Current Status of Industrial Property Right Possession

**272** cases



#### R&D Costs

KRW **27.136** billion

## Minimization of Environmental Impacts Core Issue

KOWEPO strives to minimize environmental pollution and impacts on the surrounding areas of operation sites due to the characteristics of the power generation business which uses coal and LNG as its main raw materials. With the recent categorization of the coal-fired thermal power plant as a cause of fine dust, the company aims to implement a lasting business and coexist with local communities by establishing a fine dust reduction plan and carrying out activities to prevent harmful chemical substance leakages.



- |  |  |
|--|--|
| <p><span style="color: #4CAF50;">➤</span> <b>Opportunity</b></p> <ul style="list-style-type: none"> <li>• Boost corporate value and expand business opportunities through the acquisition of various environmental certification</li> <li>• Prevent economic losses including damage compensation when accidents occur by purchasing environmental impairment liability insurance</li> </ul> | <p><span style="color: #4CAF50;">➤</span> <b>Crisis</b></p> <ul style="list-style-type: none"> <li>• Environment related corporate activity information disclosure request and expansion scope</li> <li>• Reinforcement of environment related regulations including act on registration, evaluation, etc. of chemicals and chemicals control act</li> </ul> |
|--|--|

### Preemptive Air Pollution Control

#### Control of Air Pollutant Generation

Among thermal power plants, those using coal and oil emit sulfur oxides, NOx and dust while those using natural gas discharge NOx. In order to minimize the air pollutant generation, the Taean coal-fired thermal power division and Pyeongtaek heavy oil thermal power division installed and operates prevention facilities such as desulfurization from exhaust gas equipment that uses the latest wet limestone gypsum process, and exhaust gas denitration equipment and high-efficiency electric precipitator of SCR (Selective Catalytic Reduction), which is the best in nitrogen oxide reduction technology.

#### Fine Dust Reduction Plan Establishment

KOWEPO engages actively in fine dust reduction which is becoming the latest social issue, through the establishment of the 'fine dust reduction plan' (July 6, 2016) and implements proactively. Cause substances (dust, sulfur oxide, NOx) of currently operating Taean unit 1~8 are planned to be reduced by 75% compared to 2015 through two steps by 2030. In particular, the company strives to improve the lives of people via investment in cutting edge environmental facilities and the development of technology for fine dust reduction.



Investment amount for  
fine dust reduction  
(~ 2020)

KRW **324.6** billion



Signboard Hanging Ceremony  
as an Exemplary Operation  
Site of Voluntary Agreement  
for Total Air Pollutant Load  
Management

#### Short Term Plan (2016~2019)

##### Reinforce environment facility

Improving operation for environment facility (desulfurizing equipment, denitrifying equipment, electric precipitator) of Taean Thermal Power Unit 1~8

→ Invest KRW 80 billion, plan to reduce total emissions by 28% compared to 2015 by mainly reinforcing the environment facility during the overhaul

**2016~2019**

#### Long Term Plan (2020~2030)

##### Complete replacement of environment facility

Reduce by 45% by replacing environment facilities of unit 1~4 by 2022 and of unit 5~8 by 2030

→ Invest KRW 800 billion by combining performance improvement work of power generation facility by 2030, plans to reduce by 75% compared to 2015 through complete replacement with the latest environment facilities for Taean Unit 1~8

**2020~2030**

Plan to lower the level  
by about 40% from  
the regulated level of  
the metropolitan area,  
Yeongheung coal-fired  
thermal power that are  
applied with the strictest  
regulations in Korea

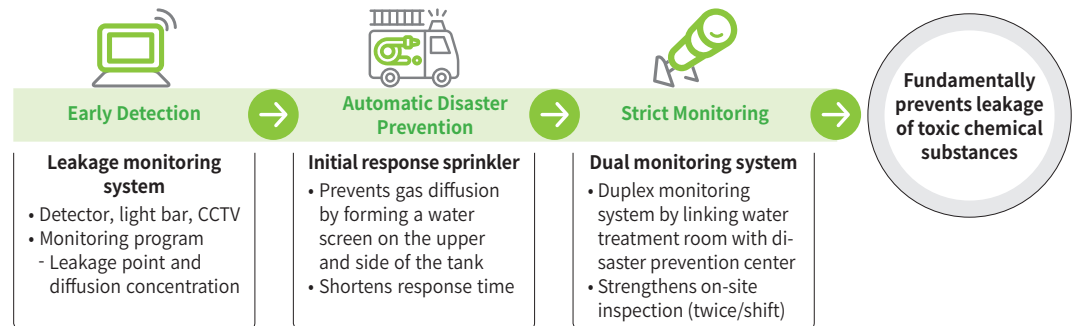
**Development of wasted denitrification catalyst recycling technology** | KOWEPO aims to commercialize wasted denitrification catalyst recycling technology to reduce the fine dust emissions of thermal power plants. In July 2016, an MOU was concluded with the R&D Center for the Valuable Recycling (V-Recycle) of the Ministry of Environment to develop organic metal recovery technology in the wasted denitrification catalyst, and the entire quantity of the wasted denitrification catalyst will be provided for three years under the agreement and the V-Recycle plans to develop the commercialization technique. 'Wasted denitrification catalyst recycling technology' is a high value-added valuable recycling technology that re-uses organic metals such as tungsten and vanadium that are included in the previously landfilled and wasted denitrification catalyst as base materials, and the technology will contribute to fine dust reduction.



## Upgrade Chemical Control

### Operate Chemical Leakage Monitoring System

KOWEPO as a power generation company operates a systematic control system to minimize environment pollution due to chemical leakages. The system enables early detection and shortens the initial response time, and the dual monitoring system was established for chemical handling equipment for enhanced surveillance.



Private and Public Joint Mock Training

### Implement Prevention-oriented Control Activity

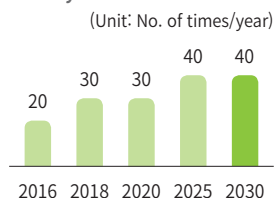
KOWEPO implements regular special inspections by external experts from the prevention perspective due to great risks of toxic chemical leakage to local communities around power plants, and performs immediate corrective actions toward inspection results. Moreover, information on chemical substances and accident response tips are notified to residents and private and public joint mock training is carried out to make safe plants without chemical accidents.

**Safety Measure for Toxic Substance** | Carry out activities for the operation of control equipment, emergency response drills and real-time monitoring and continue to foster personnel specialized in chemical control.

Control Equipment	Emergency Response	Monitoring	Specialized Manpower
Install and operation dike for preventing leakage outside of toxic substance storage, sump pit, washing equipment and safety equipment storage rack for waste water transfer	Foster response capabilities for actual situations by establishing a field action manual including initial measures in case of toxic chemical leakage accidents, operation of disaster control head office and evacuation of residents, and by conducting internal training and joint control drills with external institutions (over twice/year) by operation site	Install leakage detectors, CCTVs and light bars in toxic substance handling facilities to monitor real-time toxic substance leakages	Organize a team that specializes in controlling chemical substance leakages and contamination with professional license holders who majored in relevant studies (environment, chemistry, chemical engineering) and completed specialized training to perform special emergency activities including contaminant elimination when leakage accident occurs

### Information Disclosure Target

Implementation of Environmental Information Disclosure Activity



### Provide Transparent Environmental Information

KOWEPO discloses transparent environmental information due to plant operation without any adjustment for residents. By providing information on chemical substances and how to act in case of chemical accidents to residents, environmental and safe operation sites are established. Moreover, KOWEPO draws a plan for win-win cooperation with local communities by organizing private-public-academia consultative groups in the power station surrounding area, and collects opinions for improvements. In 2015, 12 communication meetings were held. We plan to disclose transparent environmental information and communicate with the civil petitioner to resolve complaints.

### 2015 Key Performance



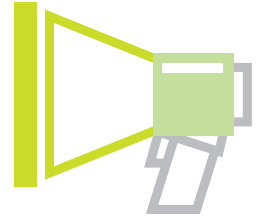
Number of Violations of Environmental Regulations  
**0** case



Number of Communication Meetings held  
**12** meetings

## Reinforcement of Emergency Safety Management Implementation System Core Issue

KOWEPO has established a leading disaster and safety management system and applies rigorous safety standards for plant operation. In order to prevent accidents such as toxic material leakage due to the recent, frequent earthquakes, a proactive and specialized safety management system is reinforced through communication and cooperation under TOP Safety 3.0 strategy composed of three areas, such as disaster response, operation of the safety system and control capacity reinforcement.

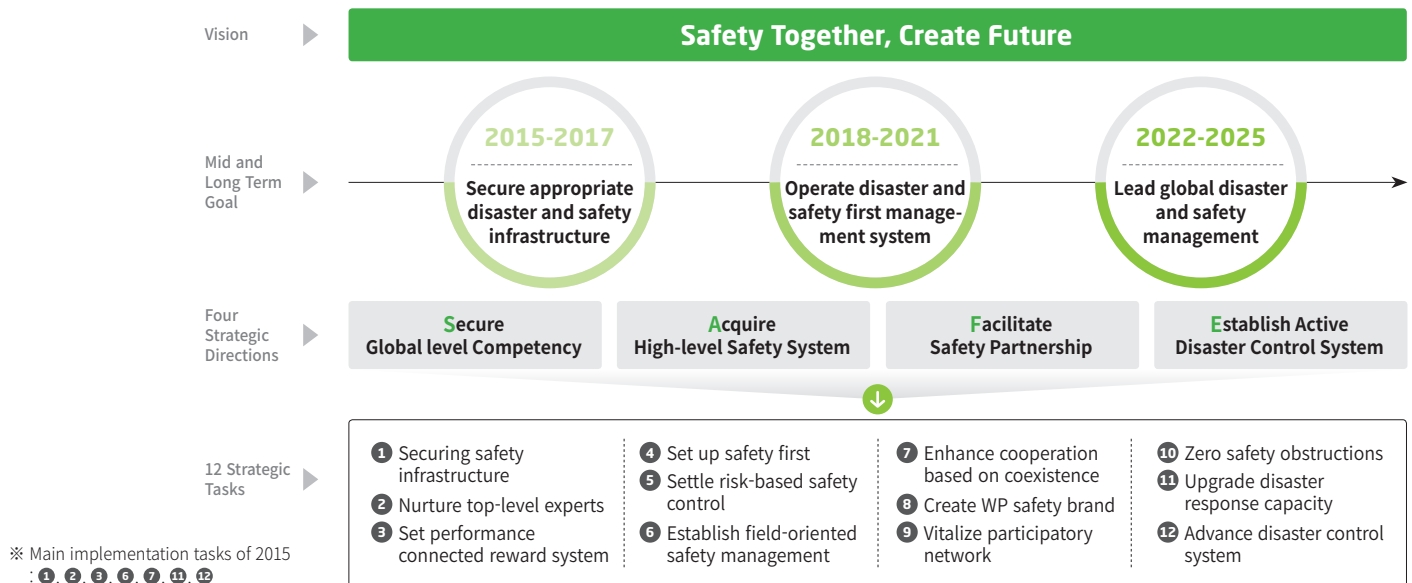


- ▶ Opportunity**
- Raise positive corporate value via preemptive safety control
  - Prevent economic losses by reinforcing disaster and safety control capacity

- ▶ Crisis**
- Safety system reinforcement request by the government
  - Economic losses and damage on corporate reputation if it fails to respond to disaster and safety accidents

### Establish Safety Management Mid and Long Term Master Plan (WP-SAFE)

KOWEPO established a masterplan to achieve the vision by 2025. The master plan is composed of 12 tasks that coincide with four strategic directions and seven key tasks were implemented in 2015.



### Upgrade Safety Control Implementation System

#### Safety Control Governance Operation

KOWEPO implements specialized safety control through Safety Officer System led by the CEO and head of the Engineering Division, etc.

#### Executing Organization

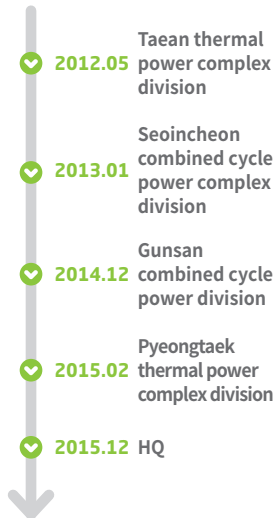




### Establishment of Emergency Operation Center

KOWEPO is the only domestic power generation company that has emergency operation centers in all operation sites and built a company-wide unitary disaster response command system. In addition, the company is equipped with a system for immediate response to casualties by residing four emergency rescue service providers in the centers.

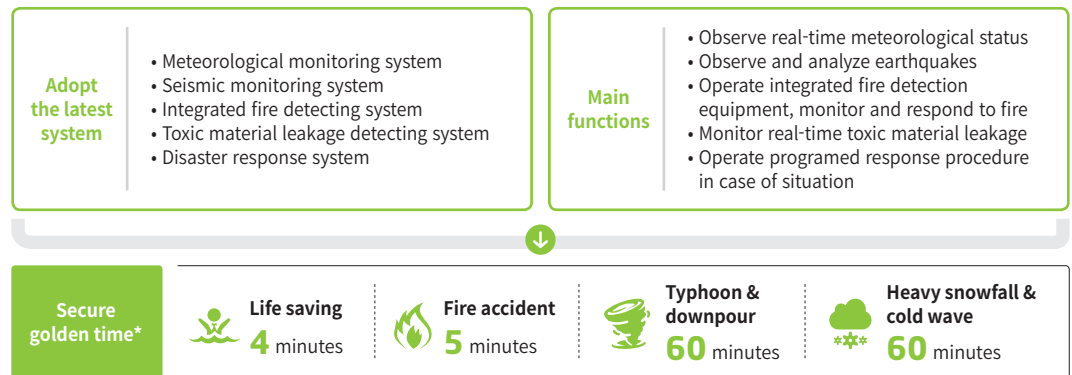
#### Status of Establishment of Emergency Operation Center



#### Enterprise Disaster Response Process



#### Response System Reinforcement



\* Golden time: disaster response target time that can increase survival rate while minimizing damages due to emergency situations such as fire and cardiac arrest patient

### Establishment of BCM (Business Continuity Management) for All Operation Sites

BCM is a business system that enables the core business system to be maintained during large disasters. KOWEPO expanded the implementation of BCM to all operation sites after test operation in 2015, and upgraded power generation facilities and the IT system restoration system for disaster occurrence. Potential risk factors were eliminated, and internal and external reliability on the disaster response capabilities was secured by selecting and standardizing priority risk management targets.

### Safety Management System

In 2003, KOWEPO established the first safety and health management system in the public power generation sector and obtained related certifications such as OHSAS 18001 and KOSHA18001. It retains the certifications through ex post facto evaluation.



Safety and Health  
International  
Certificate

K-OHSMS  
Certification

K-OHSMS18001,  
OHSAS18001

### 2015 Key Performance



#### Industrial Accident Rate of KOWEPO

**0.15** %



#### 2015 Safety Management Cost

KRW **392.3** billion

※ National Industrial Accident Rate: 0.50%

※ Industrial Accident Rate of KOWEPO was calculated by including the accident rate of the workers of partner companies (including subcontractors)

## Creating Community Shared Value Core Issue

The operation sites of KOWEPO are located close to local communities and have a large impact on local economies, hence the coexistence with residents is significant. In 2015, KOWEPO, that opened the new Taeon era in 2015, strived to become a beloved and trusted company by the residents.



- **Opportunity**
- Create shared values due to win-win development with local community
  - Smooth business operation through the improvement of residents' satisfaction in the surrounding areas of operation sites
  - Improve corporate image by fulfilling social responsibilities of the company

- **Crisis**
- Waste of relevant budget due to inefficient social contribution activities
  - Distrust of local community due to temporary and one time social contribution activities

### Implementation Strategy of Social Contributions

Implementation Strategy of Social Contributions is align with our corporate philosophy. We will be a good neighbor of the community who fulfill our corporate social responsibilities and share warmth.



## Social Contribution Activities linked to the Power Generation Business

KOWEPO promotes the 'bonding project' on the enhancement of energy welfare based on its business centered around Taejeon where the HQ is located. The project refers to the customized social contribution activities for the region that provides 'tailored services to one in need' for the service.

### Happy Energy Bonding Project

KOWEPO carries out the 'happy energy bonding project' on the basis of the corporate philosophy to 'contribute to society by creating energy for people and the environment through advanced technology.'. It will put its utmost efforts including satisfying the needs of Taejeon, deploying environmental conservation activities and supporting the socially disadvantaged to create a warm world where we live together as the people's public company.

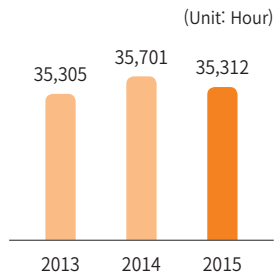
### Energy Welfare Program Project

The energy welfare program project has been carried out for low income households and the merchants of traditional markets until now from 2013. For those obstructed in energy welfare, KOWEPO provokes warm sympathy by performing what the company does best, such as actual energy usage checks, energy efficiency consulting and repairing houses for energy efficiency for low income households.



## Execution Organization and Implementation System

### Hours Participated in Volunteer Work



The social contributions of KOWEPO is led by the CEO, enterprise secretariat and CSR policy council, and the company established mid to long term and annual plans while volunteer centers by operation site and private council subsequently implement the plans.

### KOWEPO Social Volunteer Group

It was founded in August 2004 to systematically and continuously support the social volunteer work of employees as a corporate citizen. The love sharing fund, which is raised voluntarily by KOWEPO employees, is also used for volunteer work transparently and systematically.



### Hope Power Plant, KOWEPO Collegiate Volunteer Group

KOWEPO composed the first collegiate volunteer group among electricity companies, and implements customized local volunteer activities such as house repairs, improving the residential environment, eco-friendly energy campaign and mentoring. It is a representative social contribution activity that is continued up to date from the 1<sup>st</sup> group founded in 2011. In 2015, mutual cooperation for education, economy and the welfare of Taejeon was implemented with various field stakeholders including the global volunteer group of Seoul National University and the child center in the Taejeon region.

## 2015 Key Performance



Amount of Contributions for  
the Local Community\*

KRW **400** million



Number of Participants  
in Volunteer Work

**6,886** persons

\* Excluding the regional development support project cost : 3.6 billion won



## Social Contribution Activity



① Support goods for 'Love House' ② Sponsoring by Seoul National University Children's Hospital ③ Love Briquette Sharing by Labor-Management  
④ Environment Clean Up Event ⑤ Kimchi sharing event ⑥ Delivering Anabada Donated Items ⑦ New employee volunteer activities

### Taeon thermal power complex division



#### Re-Sync Upcycling Project with Touch 4 Good

Recyclable waste resources are transformed into upcycling products and used for contribution in cooperation with social enterprise, Touch 4 Good. It is to derive economic and environmental values by recycling wasted resources.



#### Dream over Dream Career Mentoring Project

Career mentoring by internal quality masters is implemented to support the dreams of students of Meister high schools. It is to support the creation of a long-term relationship for the sincere communication and career search through mentor and mentee matching between students and masters.



#### Love Food Truck

"Love Food Truck" visiting child welfare center of farming and fishing communities in eight towns in the district carried out voluntary activities such as health checkup, beauty treatment and providing launch for senior citizens with no one to rely on and who live alone.



#### Love Gimjang Sharing Event

About 4,000 heads of Gimjang kimchi were delivered to local residents who are in need of caring such as senior citizens live alone, beneficiaries of the national basic living security, disabled, those living in the social welfare facilities.



#### Visiting traditional markets for New Year's Day

We visited the traditional market of Taeon, Seobu Market and purchased goods including daily necessities and sacrificial foods to be delivered to the local welfare facilities.

### Pyeongtaek thermal power complex division



#### 'Doorae Volunteer Group', Love Briquette Sharing

Members of the 'Doorae volunteer group', of the Pyeongtaek thermal power complex division and employees of the combined cycle power generation team delivered 2,000 briquettes to celebrate New Year's.



#### Agreement to Revive Traditional Market

For the vitalization of the regional economy, a sisterhood agreement was signed with a traditional market, and a periodic traditional market vitalization program is planned to be carried out in accordance with the future agreement between labor and management.



#### Support Relocation of Child Center

employees of Pyeongtaek thermal power complex division and partner companies provided joint support the relocation of the community child center.



#### Delivering Anabada Donated Items

All employees of the Pyeongtaek thermal power complex division donated and delivered items for the anabada movement linked to 'beautiful store', a social organization.



#### Talent Donation for Community Child Center

Spent time with elementary schoolers of low income and multicultural households for providing study guides and having honest conversations over their dreams.



#### Happiness Sharing Electricity Volunteer Work

For vulnerable social groups including elderly households and disadvantaged living in villages nearby the plant, inspection and replacement of decrepit electricity equipment as well as electricity safety education were implemented.



8 Visiting traditional markets for New Year's Day 9 Event of Sharing 'Rice for Warm Winter' 10 Taeon Community Child Center Joint Sports Festival  
11 Blood Donations of Love 12 Rice Bucket Challenge

### Seoincheon combined cycle power complex division



#### Sponsoring Dosshouse via Rice Bucket Challenge

An event to sponsor the 'rice bucket challenge' was conducted to support the residents of dosshouse across the country



#### Self-support joint workplace of dosshouse

Visited self-support joint workplace in which the seniors of dosshouse work, and spent an enjoyable time by working together and having a service lunch



#### Global Culture Mentoring with Four Power companies in the Western Region

For the youth of the venerable social group, the global field experience program was implemented with the regional office of education. 36 middle school students that were selected had the opportunity to tour cultural heritage sites and exchange with local students in Taipei



#### Day for Traditional market and Grocery Shopping Event

For New Year's Day, day for traditional market and grocery shopping event were held, and purchased items were delivered to senior citizens living alone.



#### Contributing Books to 'Cheongna Lake International Library'

Four power companies in the western region donated over KRW 40 billion for book purchase to the Cheongna lake international library.



#### Talent Donation of Labor and Management, 'Love Electricity Volunteer'

Love electricity volunteer service was conducted with partner companies' employees and removing worn out wires, rewiring and lamp replacement were carried out for child centers.

### Gunsan combined cycle power division



#### Event of Sharing 'Rice for Warm Winter'

Rice produced in the Gunsan region was purchased with the voluntary salary deduction of employees and delivered to 500 households including beneficiaries of basic living costs and senior citizens living alone.



#### Delivering donations to an employee of a partner company suffering from a rare disease

Voluntarily funded contribution was delivered for medical expenses to a partner company's employee who is having hard time due to an abrupt disease.



#### Cleaning Seaside

Collected waterfront waste by participating in a cleaning event for the surrounding area of Saemangeum dike.



#### Park Environment Clean Up Event

Weeding and removing garbage in front of the plant entrance was conducted by 40 employees



#### Happiness Sharing, Delivering 'items for winter'

Electric blankets and items for winter were delivered to disadvantaged groups including senior citizens living alone and handicapped households.



#### Labor-Management Joint Agreement with Senior Welfare Center

An agreement was signed to promote joint social contribution activities and to build mutual support partnerships.

# APPENDIX

**27** Economic Data

**28** Environmental Data

**29** Social Data



# Economic Data

## Consolidated statements of financial position

Classification	Unit	2013	2014	2015
Assets	Current assets	1,342,744	994,384	985,330
	Non-current assets	5,811,194	7,226,002	8,222,542
	Total assets	7,153,937	8,220,386	9,207,872
Equity and Liabilities	Total Equity	3,140,555	3,208,711	3,485,986
	Current liabilities	684,285	924,341	1,370,158
	Non-current liabilities	3,329,097	4,087,333	4,351,729
	Total liabilities	4,013,382	5,011,675	5,721,887

## Consolidated Statements of Income

Classification	Unit	2013	2014	2015
Revenue		5,760,877	4,844,478	4,224,675
Cost of sales		5,576,361	4,558,053	3,653,430
Selling and administrative expenses		64,672	77,728	82,344
Operating profit		119,843	208,697	488,900
Other non-operating income		3,196	3,532	3,689
Other non-operating expense		1,355	413	443
Other non-operating profit		10,385	3,667	1,534
Financial income	KRW million	34,956	89,206	124,642
Financial expense		93,677	150,779	192,849
Share of profit (loss) of equity-accounted investees, net		1,384	8,855	(13,169)
Profit before income tax		74,730	162,765	412,305
Income tax expense		(20,030)	29,537	111,996
Profit for the year		94,760	133,228	300,309
Other comprehensive loss		1,080	(29,977)	2,784
Total comprehensive loss for the year		95,840	103,250	303,093

## Distribution of Economic Value

Classification	Unit	2013	2014	2015	Remarks
Creation of Economic Value		58,496	50,090	43,886	Sum of sales and profits of other areas
Distribution of stakeholders	Partner companies	55,064	45,631	36,628	Products and services purchased during business activities
	Employees	1,540	1,442	1,748	Wages, retirement pay, welfare benefits, etc.
	Shareholders & Investors	996	896	1,068	Dividends and interests
	Government	(133)	419	1,324	Corporate tax, etc.
	Re-investment	1,016	1,697	3,113	Retained earnings excluded from paying dividends for the purpose of securing financial resources for re-investment
	Local communities	14	4	4	Social contribution cost and donations, etc.
	Total	58,496	50,090	43,886	-

# Environmental Data

## Investment in environmental facilities

Classification	Unit	2013	2014	2015
Environmental facility investment expenses	KRW 100 million	891	673	333
Environment sector operating expenses		1,198	626	700
Environmental sector R&D expenses*		3	17	12
Total		2,092	1,317	1,046

\* Education and training expenses included in operating expenses

## Greenhouse gas emissions

Classification	Unit	2013	2014	2015
Scope 1	1,000tCO <sub>2</sub> e	39,048	34,640	33,667
Scope 2		57	80	182
Total		39,105	34,720	33,849
GHG Emissions Intensity	tCO <sub>2</sub> e/GWh	698	717	734

## Raw material consumption

Classification	Unit	2013	2014	2015
Bituminous coal	1,000 tons	13,261	12,722	12,546
Heavy oil	1,000 kl	816	432	778
LNG	1,000 tons	2,894	2,159	1,614
Biofuels		71	219	266
Power generation water		8,683	8,268	8,409
Limestone		299	247	293
Chemicals		19	15	15

## Water consumption

Classification	Unit	2013		2014		2015	
		Amount used	Basic unit	Amount used	Basic unit	Amount used	Basic unit
Consumption	1,000 tons, L/MWH	8,683	150	8,268	166	8,409	175

## Frequency rate of injury

Classification	Unit	2013	2014	2015
Working Hours	Hours	4,171,200	4,262,913	4,430,762
Number of accident	Cases	0	0	2
Frequency rate of injury	%	0	0	0.46

## Air pollutant emissions

Classification	Unit	2013	2014	2015
Emissions	SOx	1,000 tons	14.4	15.0
	Dusts		0.9	1.0
	NOx		29.1	25.6

## Energy consumption

Classification	Unit	2013	2014	2015
Fuel	TJ	509,012	442,363	421,011
Electricity (others)		1,175	1,700	3,878
Total		510,187	444,063	424,799
Energy intensity	TJ/GWh	9.11	9.17	9.21

## Waste Water Generation

Classification	Unit	2013	2014	2015
Wastewater	Generation	1,000 tons	944	894
	Recycling		709	737
	Recycling Rate		43	45
Waste-water discharge amount	COD	kg	5,224	4,047
	SS		1,010	1,793
	T-N		5,068	2,911
	T-P		23	19

## Occupational accident rate

Classification	Unit	2013	2014	2015
National occupational accident rate	%	0.59	0.53	0.50
KOWEPO occupational accident rate		0.04	0.12	0.15

\* Occupational accident rate across the supply chain, including suppliers and subcontractors

## Waste Management

Classification	Unit	2013	2014	2015
Generation	1,000 tons	20.3	19	15
Recycling		6	9	4
Recycling Rate	%	30	49	29

\* If it is not recycled, it will be landfilled.

# Social Data

## Employee status

Classification	Unit	2013	2014	2015
Permanent employees	Male	1,763	1,805	1,836
	Female	211	236	241
Temporary employees	Male	0	0	3
	Female	1	0	2
By gender	Male	1,763	1,805	1,839
	Female	212	236	243
Total		1,975	2,042	2,082

Classification	Unit	2013	2014	2015
Female managers*	Number of person	20	24	27
Average years of service	Year	14.4	14.8	14.6
Turnover rate	%	0.008	0.011	0.012

\* Female manger: deputy manager level and above

## Percentage of employees scheduled to retire within 5 to 10 years\*

Classification	Unit	2013	2014	2015
Male	%	22	22	25
Female		2	2	2

\* Estimate with employees aged 50 or over as of every year-end.

## Use of maternity/childcare leave

Classification	Unit	2013	2014	2015
Maternity leave users	Number of person	17	19	25
Maternity leave rate	%	100	100	100
Paternity leave users	Number of person	61	78	80
Paternity leave rate	%	100	100	100
Childcare leave users	Number of person	13	23	27
Reinstatement rate after childcare leave	%	100	100	100

\* Count number of maternity users among female employees

## Social responsibility through product purchase

Classification	Unit	2013	2014	2015
SME products		1,930.7	1,681.3	1,911.3
Technology development products	KRW 100 million	207.3	195.0	200.0
Women's enterprise products		202.7	259.1	277.2
Disabled products		9.4	24.4	24.8

## Overseas Marketing Support for SMEs

Classification	Unit	2013	2014	2015
Consulting	Million dollar	77,791	95,671	130,771
Contract		16,388	24,261	37,407
Supporting	Companies	330	291	399

## Enhancement of contract transparency

Classification	Unit	2013	2014	2015
Whole contract	Cases	1,499	1,186	1,227
Private contract	Cases	326(22.5)	289(24.4)	298(24.3)
competitive bid	(%)	1,123(72.1)	897(75.6)	929(75.7)

## Electronic bidding Performance

Classification	Unit	2013	2014	2015
Whole contract	Cases	1,449	1,186	1,227
Private contract		1,436	1,178	1,218
Competitive bid	%	99.1	99.3	99.3

## Community Investment

Classification	Unit	2013	2014	2015
Social Contribution Cost*	KRW million	1,355	413	443
Regional development support project cost	KRW 100 million	31	32	36

\* In 2013, social contribution cost increased due to the overseas sponsorship due to the expansion of overseas business. However, it was decreased due to public sector debt reduction policy in 2014.



## Organization preparing the report and Epilogue

As we published the seventh report, we utilized knowhow accumulated through the publishment of the previous six reports and strived to include advancements compared to those included in the previously published reports.

In order to prepare the report, a T/F team for the preparation of the report is organized with head of planning department, which is in charge of the sustainability management, as the chief, general manager of creation & planning team and working-level staff in each area of the sustainability management. By conducting the sustainability management program and workshop for the report preparation for the T/F team members, the members' understanding and engagement have been raised. Moreover, on the basis of the purpose that the sustainability report should be the tool for communication with the stakeholders, opinions of the stakeholders were reflected during the preparation of the report by interviewing the stakeholders from in economics, environment and social science and conducting a survey via an external homepage, and the report was assured through the review by external experts.

In addition, we made the effort for closer communication with the stakeholders by publishing the first 'Summary' edition of the sustainability report this year. We always appreciate your supports and will strive to issue a better report.

### T/F Team, Publisher of the Sustainability Report

Category		Member
Chief		Yeong-Su Mun, Managing Director of Planning Department
General Manager of T/F Team		Jong-Gyun Kim, General Manager of Creation & Planning Team
Members of T/F Team	Report preparation	Seong-Heon Kim (Deputy GM) and Seung-Bum Jang (Assistant Manager) of Creation & Planning Team
	Economic performance	Seven including Nam-Hee Gu (Deputy GM of Power Generation Planning Team) and Han-Jin Na (Deputy GM of Project Management Team)
	Environment and safety performance	Five including Su-Yeon Hwang (Deputy GM of Climate Change & Environment Team) and Hyuk Park (Deputy GM of Industrial Safety Team)
	Social performance	Six including Mun-Seong Uhm (Deputy GM of Public Relations Team) and Jong-Rae Park (Deputy GM of Shared Growth Team)
Consult, preparation, design and printing of the report		Tae-Ho Park, PM of KPC (Korea Productivity Center)
Verification		Business Institute for Sustainable Development (BISD) of the Korea Chamber of Commerce & Industry

**2016 KOREA WESTERN POWER**  
Summary of Sustainability Report

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