

국민행복을 창조하는 에너지기업

2016 KOREA WESTERN POWER Sustainability Report





## About this report

### **Purpose of the Report**

Korea Western Power Co., Ltd (KOWEPO) has published sustainability reports biennially since 2006 with the purpose of disclosing our economic, environmental and social performance to our stakeholders in a transparent manner. Through this report, we actively communicate with our stakeholders and reflect their opinions in our business management activities.

### **Characteristics of the Report**

This report contains KOWEPO's value chain analysis, the latest trends of the power industry and our corresponding actions while maintaining the frame of existing reports. It also reports on important issues that were derived from reflecting the opinions of stakeholders through business cases in depth.

### **Preparation and Validation Principles of the Report**

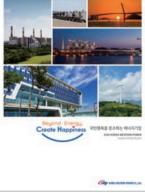
This report has been prepared in accordance with the Sustainability Reporting Guidelines of the GRI (G4 Comprehensive), the GRI Electric Utility Sector Supplement and UNGC, UN SDGs. Financial information contained in this report was prepared via an accounting audit by an independent audit corporation KPMG International Corporative, and the non-financial information was verified by an independent specialized agency the Business Institute for Sustainable Development (BISD). An assurance statement can be found on page 96-97.

### **Reporting Scope and Period**

The reporting scope of this report includes the headquarters and five domestic operation sites and the reporting period covers the year 2014 and 2015. In case of any changes in data collecting methods regarding the data reported in previous reports, data was modified and reported as of 2015. Quantitative data was prepared on the basis of the fiscal years from 2013 to 2015, and for performances regarding material aspects, performances up to August 2016 are presented.



**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.



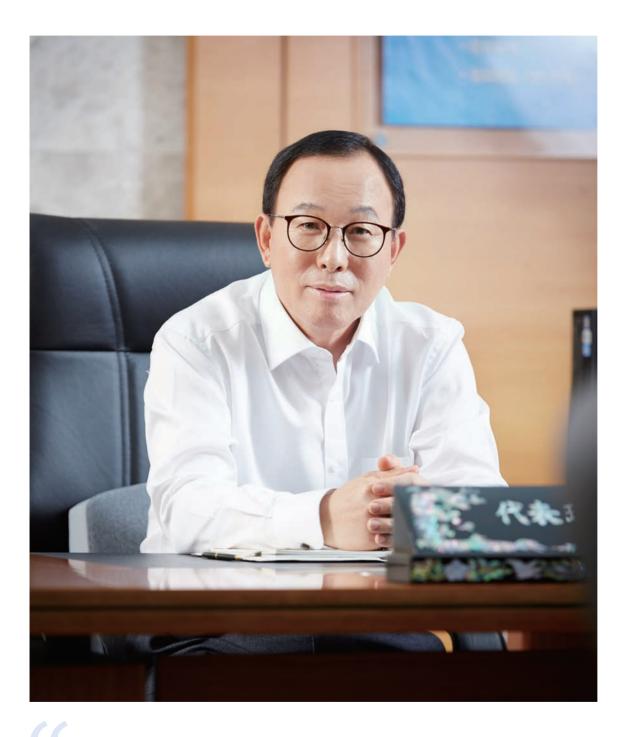
KOWEPO 2016 Download Summary of Sustainability Report

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Awards & Membership in Associations

### **CEO** Message



• We will realize our vision, Beyond Energy, Create Happiness, through transparent management and improvement of the people's trust that are essential to stable power supply as well as sustained growth

### 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 Taean # 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 fore 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

36 31 %

Rabigh O&M, Saudi Arabia

1,204

Egbin O&M, Nigeria

**1,320** 

### **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)

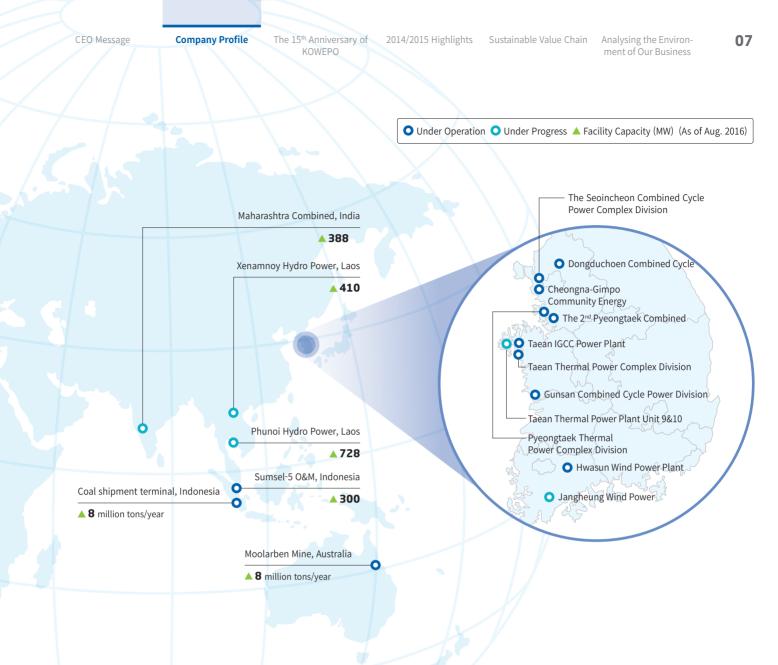
٢ħ	Type of Business	Power Generation, Power Development, Supervision			
	Date of Establishment	April 2 <sup>nd</sup> , 2001			
ໍ່ເດິງ	Number of Employees	2,082			
- <u></u>	Credit Ratings	• Overseas – S&P: AA-, Moody's: Aa2 • Domestic – AAA			
	Main Product	Electricity			
Å	Address of Headquarters	285, Jungang-ro, Taean-eup, Taean-gun, Chungcheongnam-do			
(\$) (\$)	Capital KRW 158.9 billion	Asset KRW 9,207,9 billion Revenues KRW 4,224,7 billion			

### **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).





## **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.



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

The Taean 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 Taean division strives to build ecofriendly 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. Taean contributes to the creation of the future growth engine of KOWEPO such as additional construction of new generators.

Facility Capacity

4,000 MW

No. of Units

8

### 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





No. of Units

16

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.

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 Saemanguem region stretching out to the center of the northeast Asian economy.

**Facility Capacity** 

**718.4** мw

### 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** 

No. of Units

407.3 MW (One unit of IGCC generator, including 346.3MW)

### The 15<sup>th</sup> Anniversary of KOWEPO

On the 15th anniversary of the foundation, KOWEPO will become a global company in the energy sector as an energy corporation that creates happiness.

Korea Western Power Co., Ltd. (KOWEPO) is a public corporation that specializes in the power generation which was established after its separation from the Korea Electric Power Corporation (KEPCO) on April 2nd, 2001 and has achieved remarkable growth year by year.

The company operates facilities with a capacity of 9,674MW(As of Aug. 2016) in four power complexes such as Taean, Pyeongtaek, Seoincheon and Gunsan, accounting for 9.6% of the total power generation in Korea, and strives for the supply stable and economical quality-electricity supply with over two thousand employees.

### 2001

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- **04** Separation from the Korea Electric Power Corporation (KEPCO)
- Establishment of Korea Western Power Co., Ltd.
- **09** Declaration of Corporate Philosophy and CI



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Declaration of Corporate Philosophy and CI

### 2003

- **06** Won the Grand Management A
- 08 Introduction of Innovation Met
- **11** Groundbreakir Won the Presic Awards



Introduction of the Si

On the 15<sup>th</sup> anniversary of its establishment in 2015, KOWEPO carries out investments an important factor in the future power industry by adding large scale facilities with a total capacity of 3,430MW including Taean Thermal Power Plant Unit 9&10, Taean IGCC (integrated gasification combined cycle), and the new Pyeongtaek combined power plant.

KOWEPO will continue to build a healthy corporate ecosystem through a win-win strategy with partner companies and fair trade, as well as becoming a friendly neighbor of isolated communities with various social contribution activities.

### 2002

**09** Completion of Taean Thermal Power Plant No.5 and No.6

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- 10 Declaration of Ethics Management
- 12 ISO 9001 Certification for All Operation Sites Acquired OHSAS18001

Successful issued \$150 million Eurobond (1st)



ISO 9001 Certification for All Operation Sites

# **Beyond Energy**,

### 2005

- l Prize at Environmental wards
- <sup>f</sup> the Six Sigma Management hod
- g Taean Units 7 & 8
- lential Prize at National Quality



x Sigma Management Innovation Method

- **04** Establishment of a corporate anthem 'KOWEPO Anthem'
- **07** Establishment of Cheongna Energy Co., Ltd.
- **10** Won the Grand Prize at Management Innovation Best Preatice Awards

12 Won the Grand Prize at Korea Quality Awards



Establishment of a corporate anthem 'KOWEPO Anthem'

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### 2007

**08** Completion of Taean Thermal Power Plant No.7 and No.8**09** Declaration of Vision 2020

- **11** Won the Prime Minister Prize at the Korea Safety Awards
- **12** Achieved the Highest Sixth Stage of the Government Innovation



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Declaration of Vision 2020

### 2004

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- **08** Foundation of volunteer group
- **10** Won Grand Prize at GWP Korea
- 11 Proclamation of Safety Management Charter
- 12 Company-wide Application of the Six Sigma Management Innovation Method

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Won the Grand Prize at Safety Management



Won Grand Prize at GWP Korea

### 2006

**02** Won the Grand Prize at Transparent Management

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- 06 Joined the UN Global Compact
- Won the beautiful companion prize of the Prime Minister
- 09 Acquired A1 Credit Rating from Moody's
- **12** Won the large & small business cooperation prize at the Prime Minister



Won the beautiful companion prize of the Prime Minister

### 2008

- **01** Won the Grand Prize at the Korea Innovation Management Awards
- **05** Built Mid-to-Long Term HR Cultivation Models
  - Won the Grand Prize at Social Contribution
- **09** Acquired A Credit Rating from S&P
  - Certified as an excellent human resource development company
- **11** Signed the agreement for the construction of hydro power plant 390 MW in Laos



Won the Grand Prize at the Korea Innovation Management Awards

### 2013

2011

### 2009

- **03** Won an O&M business contract of Saudi Arabia's Rabigh Heavy-oil Thermal Power Plant
- 07 Hold a donation event for rare disease
- 10 MOU for the Electricity Safety



MOU for the Electricity Safety

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- **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

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- 02 Signed a c
- 08 Constructe
- 09 Egbin O&M 10 Won a Pre
- Public Inst
  - Won the F 1<sup>st</sup> "The Me
- 12 Signed cor



Signed a contrac SXenamnoy, Lao

### 2010

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**09** Completion ceremony of Gunsan combined cycle power plant

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- **10** Won the Grand Prize at Korea Ethics Management Awards
- 12 Achieved the first P grade of PSM (Process Safety Management) among power corporations
  - Won the Best Company at the Plant Industry-University Collaboration



Completion ceremony of Gunsan combined cycle power plant

### 2012

01 Signed SS-SHA ceremomy of maharashtra p

0

- 04 Leading event for the spread of mutual grow
- **10** MOU for promoting 2nd project of 'Happy Ci Solar Power Generation'
- 11 Groundbreaking Taean Units 9 & 10 Won a Prize in the Public Corporation Categ Management Awards



Signed SS-SHA ceremomy of maharashtra power gener

### 2015

- 04 Pre-Commissioning of Taean Thermal Power Plant Unit 9
  - 08 Relocation of KOWEPO Headquarters to Taean-gun
  - **09** Won the 1<sup>st</sup> 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

0



Relocation of KOWEPO Headquarters to Taean-gun

### 2016

**06** Excellent Institution in Safe Korea Exercises by MPSS for four consecutive years

**08** Completion of Taean IGCC

(Scheduled) Completion of Taean Units 9 & 10



Completion of Taean IGCC



ontract to purchase Hydro Power from SXenamnoy, Laos

- I, Nigeria
- sidential Citation at the Shared Growth Assessment for itutions
- irst Prize in the Public Company Category at the ost Loved Companies Award"
- ntract for Sumsel 5-O&M in Indonesia



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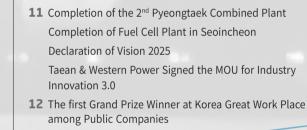
### 2014

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Achieved 1<sup>st</sup> Place in the Shared Growth Assessment for Public Institutions for two consecutive years

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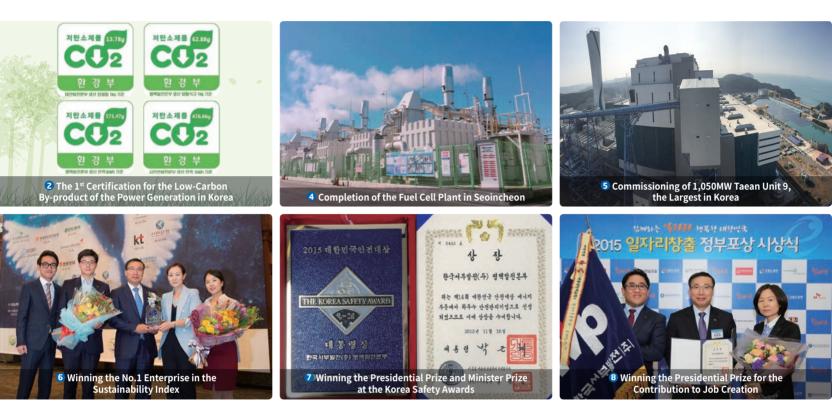
Achieved the P grade of PSM twice in a row among power corporations

Won the Grand Prize at the Korea IDEA Management Awards



Declaration of Vision 2025

### 2014/2015 Highlights



### 1 2014. 02.

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

KOWEPO received the Presidential Prize at the E-People Awards (anticorruption 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 Taean Unit 9, the Largest in Korea

Taean 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.

### **2** 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 Minster 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.

### **3** 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.

15

### 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.



### **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-gas-ification 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 Taean HQ Era

In August 2015, the relocation of KOWEPO headquarters to Taean, 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 Taean-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

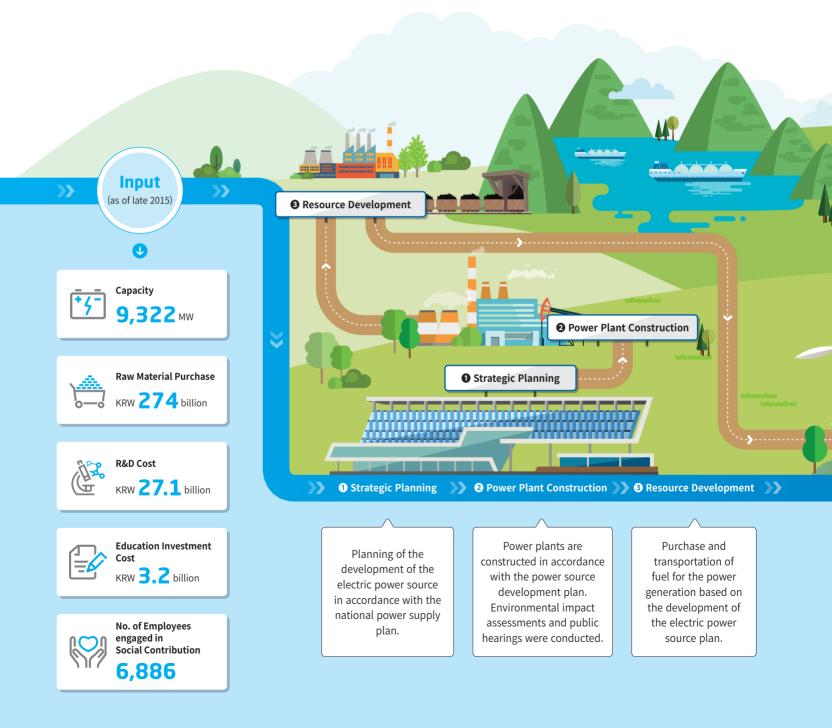
KOWEPO was awarded with the presidential citation at the Korea Safety Awards in recognition of its performance as a leading agency in disaster and safety control while enhancing the integrity as a public institution and reinforcing the capabilities of information security. Moreover, the company achieved 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.

### **Sustainable Value Chain**

### **KOWEPO's Value Chain**

The KOWEPO's value chain activities is to create values suitable for completing Vision 2025, '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.

### **Business Value Chain**



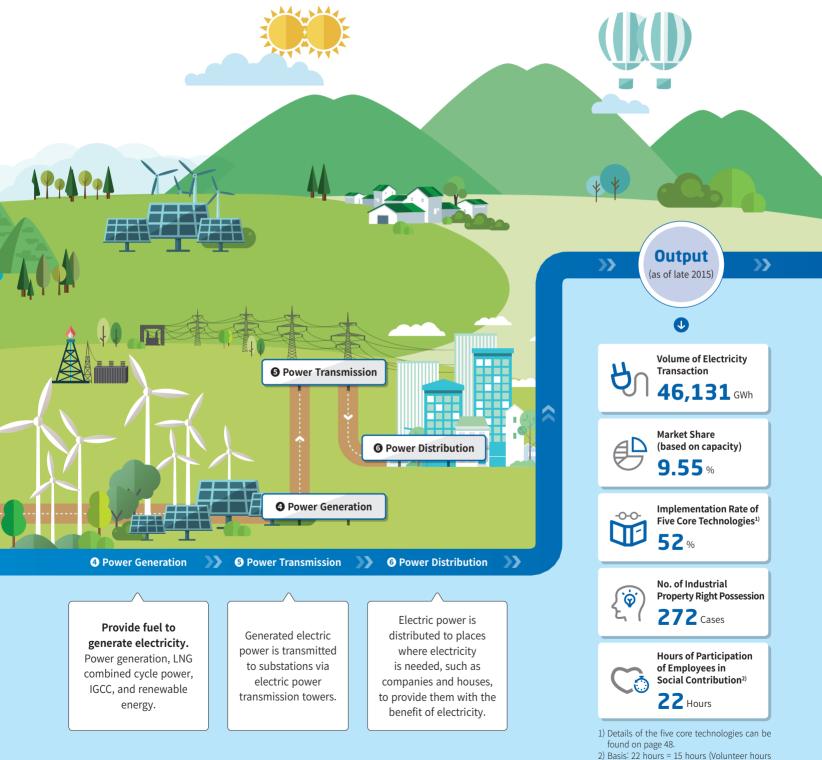


2014/2015 Highlights

Sustainable Value Chain



66 KOWEPO monitors what resources (input) are employed and utilized and what values (output) they create socially and environmentally from the perspective of the sustainable value chain.



basis. 22 hours = 15 hours (Volunteer hours of public institution employees per person In 2014) \* 150%

### **Environment Analysis of the Power Industry**

### Four Trends of the Power Generation Industry

KOWEPO constantly monitors the changing power generation industry and business environment, and analyzes leading trends. Moreover, risks and opportunity factors related to the derived main issues and trends are identified and applied to business activities.



As the domestic power generation sector enters into a stagnant stage, competition between plants has intensified and a paradigm of the sector is changing in accordance with the introduction of the new climate regime. There is a growing demand for the expansion of overseas projects by securing a new growth engine and demand for new and renewable energy in particular, is increasing due to system reforms and the deregulation of the renewable energy market and reduction in needs for the thermal power generation. Technological prowess within the industry, also, has been standardized thanks to an increase in the continuous R&D efforts. The expectations to provide an electric power supply in a more stabilized manner with the strengthened safety of facility operation and response levels for disaster will be realized through the advancement in new technology combined with cutting edge IT.

#### Trend Keywords

1

Power Generation Paradigm Change

Demand for Expanding Overseas Projects via the Expansion of a New Growth Engine

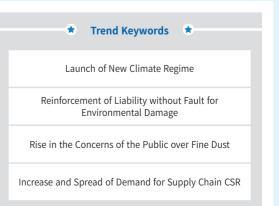
> Increase in the Standardization of Technological Prowess

Technological Advancement Combining Cutting Edge IT

Increasing Demand for Development of New and Renewable Energy

### Environment/Safety Aspect

Greenhouse gas (GHG) reduction has become a global issue since the COP21 in Paris. Furthermore, the 'Framework Act on Low Carbon, Green Growth', 'Chemical Control Act', and 'Act on Liability for Environmental Damage and Relief Thereof' and others are being tightened up as corporate accountabilities for environment/ safety are emphasized. According to an increase from the public in the interest in coal-fired thermal power plants due to the recent issue of worsened fine dust, a plan regarding fine dust at government level has become highly significant. KOW-EPO has set a systematic response system by preparing the practical response manual and special countermeasures for fine dust reduction. The company also requests the actions of partner companies on the environment/safety issues from the view of the entire supply chain.



**66** KOWEPO strives to become the prime mover in the power generation sector by analyzing the changes in trends and devising plans proactively.

### **Policy/Regulation Aspec**

With the beginning of the Gov 3.0 era, the necessity for active disclosure and the share of information by public agencies has been stressed, while the need for sensible management of all public institutions is increasing due to the reckless management of several public corporations. Hence, many public agencies work to set and operate a reasonable and effective system for the management, business operation and working conditions of employees. KOWEPO performs the monitoring of such regulatory and policy changes regularly and operates a system to respond in a timely manner.

#### **Trend Keywords**

Spread of Gov 3.0

-

Normalization of Public Corporations

Pursuit of Management Rationalization and Effectiveness

Function Adjustment of Public Energy Institutions

Regulatory Changes regarding Public Institution Operation

**Social Aspect** 

Due to the characteristics of plants which are close to local communities, the importance of complaints and conflict management for residents is increasing, and the needs for win-win growth with partner companies are also increasing. KOWEPO acknowledges social responsibilities for various stakeholders, such as consolidating relations with local communities, raising customer satisfaction and coexistent cooperation with partner companies, and carrying out activities based on communication and cooperation.

### **Trend Keywords**

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Increase of Importance for Complaints and **Conflict Management** 

Spread of Win-Win Cooperation and Growth

Enhancement of Communication with Stakeholders

Increase of Demands for Social Responsibility

# SUSTAINABILITY MANAGEMENT

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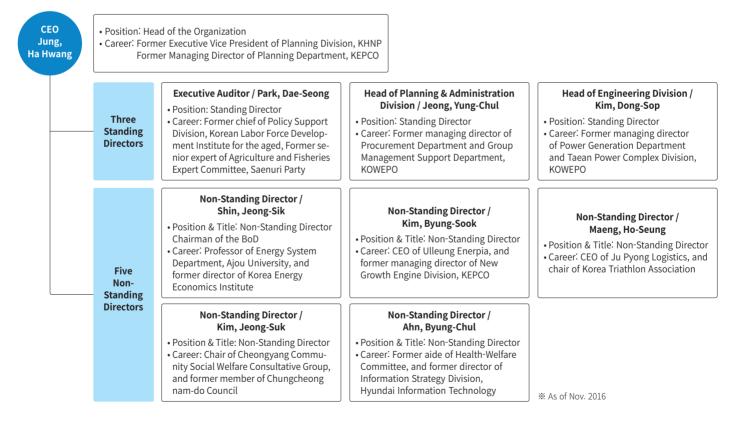
### **Corporate Governance**

### Sustainable Corporate Governance

KOWEPO's board of directors (BOD) is a supreme decision-making body that deliberates and decides on important matters related to company management such as management goals, budgets and investment. KOWEPO strengthened the roles of the Audit Committee and discloses relevant information to enhance management transparency and improve corporate governance.

### **Composition and Operation of the BOD**

The board of directors is composed of four standing directors and five non-standing directors. The CEO and a standing auditor are recommended by the Minister of Trade, Industry and Energy and the Minister of Strategy and Finance, respectively, and appointed by the President after going through the decision-making processes of the Steering Committee of Public Institutions and the general meetings of shareholders based on recommendations by the Nominating Committee. The CEO appoints other standing directors through the decision-making process of the general meetings of shareholders. Non-standing directors are appointed from candidates recommended by the Nominating Committee through the voting process of the Steering Committee of Public Institutions. In order to secure diversity, we are striving to secure highly qualified experts in women and academia as candidates for non-standing directors. We are also running female members as non-standing directors.



### Enhanced Utilization of Non-Standing Directors' Expertise

In order to utilize the expertise of non-standing directors, KOWEPO runs the LSC (Linkage between Suggestion and Consulting) program where corresponding departments visit the non-standing directors regarding the management suggestions of the non-standing directors on agenda items for an additional advisory service.

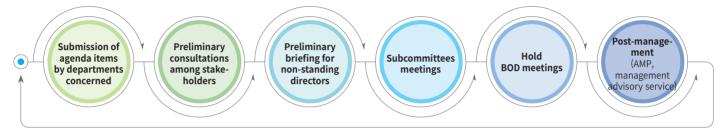
### **BOD Activities**

Classification	Unit	2013	2014	2015
No. of BOD Meetings	Meetings	14	14	11
No. of Agenda Items	Case	55	61	58
Revised · Conditional Decision	Case	-	4	3

**Corporate Governance** 

### **Operational Process**

KOWEPO has expanded the channels for the engagement of internal and external stakeholders who have a great influence on business operations with the BOD by improving the BOD operation process. Regarding topics that interest non-standing directors in agenda items, the function of the BOD as a space of open communication has been reinforced by having a preliminary consultation process for stakeholders.



### **Operation of the BOD and Subcommittees**

KOWEPO operates the BOD and Subcommittees to have objectivity and specialty for management decision-making by field. Each BOD and Subcommittees makes decisions through the reviews and deliberations on the main issues of the agenda to be introduced to the BOD meetings in advance.

BOD and Subcommittees	Composition Purpose and Authority		No. of Meetings in 2015
Creative Economy Expert Committee		<ul> <li>Review of implementation plan and performance to carry out national projects such as Gov 3.0</li> <li>Preliminary review of agenda items regarding management goals, strategies or innovation</li> <li>Preliminary review of separately delegated items during the BOD meetings</li> </ul>	4
Financial Management Expert Committee	<ul> <li>2~3 non-standing directors (including chair),</li> <li>1~2 standing director</li> </ul>	<ul> <li>Preliminary review of budget, funds, mid and long term financial management plans and long-term borrowing</li> <li>Preliminary review of agenda items related to plant construction, investment or contribution</li> <li>Review of debt management such as development of business for sensible management</li> </ul>	8
Ethics Management Expert Committee	-	<ul> <li>Preliminary review of agenda items related to ethics management and shared growth</li> <li>Preliminary review items separately delegated during the BOD meetings</li> </ul>	2

#### **Audit Committee**

The Audit Committee has been operated since 2011 to conduct the performance and accounting audits for major projects. The Audit Committee is composed of a total of three committee members including one chair and two non-standing directors to secure the independence and specialty, and one of the committee members shall be an expert of accounting or finance according to relevant regulations.

### **Evaluation and Compensation of the BOD**

Directors of the board are fairly evaluated and remunerated according to the performance of business operations. The CEO signs management agreements on management goals to be achieved during his or her term and key pending issues with the Minister of Trade, Industry and Energy, and a graded bonus system is applied to the CEO according to the result of management assessment by the government. Standing directors set management goals with the CEO pursuant to the 'Act on the Establishment and Operation of Public Institutions' and signs management agreements, and are remunerated as per regulations on the annual salaries for executives after the evaluation of their performances.

#### Performance of the Audit Committee

Category	Unit	2013	2014	2015
No. of Meetings	Meetings	9	7	6
No. of Deliberations	Case	23	22	19

### Current Status of the Remuneration Payment

(As of late 2015, Unit: KRW 1,000)

Category	Average Remuneration per Person
Standing director	154,759
Non-standing directors	30,000

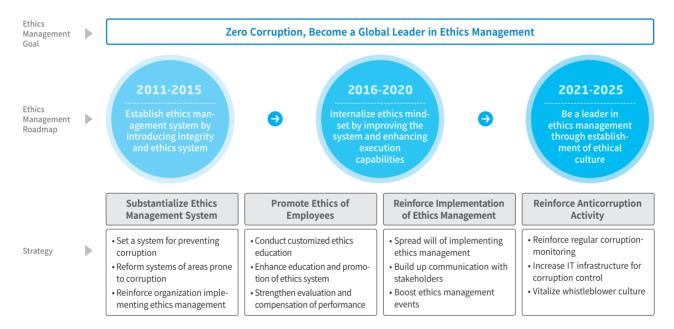
### **Advanced Ethics Management**

### Seeking for Integrity and Ethics

KOWEPO has continuously practiced ethics management since the proclamation of the 'KOWEPO Code of Conduct' that offers standards for the ethical judgement and behavior of its employees in October 2002 to become a global leader in ethics management.

### **Ethics Management Vision**

In order to achieve Vision 2025 of 'Beyond Energy, Create Happiness', KOWEPO established the ethical management vision system on the basis of the company vision and strategies. KOWEPO will move forward to be a global leading ethics management corporation based on the virtuous circle ethics management system.



### **Reinforcement of Ethics Management Implementation System**

Necessity of reinforcing ethics management implementation system has been stressed with the enforcement of the Improper Solicitation and Graft Act and moral hazard events of global enterprises. To this end, KOWEPO selected the 'reinforcing practice of integrity and ethics' for the detailed strategic tasks under the company vision, and states 'integrity' and 'fairness' as the best value for the implementation area of ethics management.

#### Implementation and Evaluation of Ethics Management

Im	plementation System	Evaluation System			
Internal	External		Evaluation		
BOD • Planning Dept.	Partner company integrity & ethics council	State opinions about ethics management	<ul> <li>Evaluate integrity of ACRC (Anti-Corruption &amp; Civil Rights Commission)</li> <li>Evaluate anticorruption policy of ACRC</li> </ul>		
(Ethics Management TF team) • Improve ethics system, estab- lish integrity culture	Integrity ombudsman	Advisory service for integrity & ethics policies	Reflection of Performance Evaluation		
Audit Committee • Audit Team (Audit TF team) • Inspect corruption elimination and internal control	Anticorruption citizen observer group	Report corruption of employees	Reflect rating of organizational assessment, pay graded individual bonus     Conduct cause analysis of minor earthquake index		
	Transparent Society Movement HQ	Education and Campaign	<ul> <li>Conduct cause analysis of minor eartinguake index and establish countermeasures</li> <li>Implement 2016 annual targets and strategic tasks</li> </ul>		

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## Algebra Market Algebra

### KOWEPO's Integrity &

Ethics Center Operating an online service to boost anticorruption and integrity activities such as Sinmungo and the petition registration center

http://www.iwest. co.kr/clean/index.asp

### **Vitalization of Customized Ethics Education**

Ethics goals are assigned to new employees, general employees and executives through the implementation of a lifelong ethics learning system. In addition, ethics education according to the demands of personnel in charge of ethics management and jobs that are prone to corruption are conducted while carrying out real-time learning courses on the current issues of ethics management.

#### System Reform in Areas Vulnerable to Corruption

KOWEPO is implementing the system reform for areas that are prone to corruption in accordance with the anticorruption policy of the government. In 2015, the company set up and examined its implementation tasks for anticorruption. In particular, improvement activities focusing on the four areas vulnerable to corruption, such as improving the unusual practice in human resource affairs; reinforcing the control of budget operations; enhancing the operational transparency of financial institutions; and complete the removal of equipment and material corruption, by discovering additional implementation tasks based on examination results. Moreover, operation guidelines were set for receiving & processing reports on corrupt acts and protecting whistleblowers to guarantee the confidentiality and identities of whistleblowers.

#### Form a Consensus about Integrity and Internalize Ethics

A clean and ethical corporate culture is disseminated throughout the headquarters and each operation site by spreading the standards of ethics and the ethical code of conduct and promoting the improvements of the integrity & ethics system. In addition, the best practices are shared externally to build a base for the continuous advancement of ethics.

### Securing Expertise and Independence of Audit



Integrity & Ethics Resolution Congress



A Special Lecture on Anti-Graft Law

Ethics Management Evaluation by Anti-Corruption & Civil Rights Commission (Integrity Evaluation Result)



In order to strengthen audit capabilities, audit expertise in auditing was gained through the reinforcement of an audit team with external experts. Particularly in 2015, the team completed specialized education including a special lecture on anti-graft law, and an e-learning course by the Audit and Inspection Training Institute.

Category	Performance
Utilization of External Experts	Review of rules for managing overseas employees, conduct integrity education and open forum, evaluate proposal for setting up business continuity plan, conduct tax-related legal advice
Reinforcement of Audit Advisory Committee	One CPA, one engineer, two attorneys
Reinforcement of Specialists	Transfer of experts in cyber threats, dealing with business development issues (Engineer Information Communication), environment (Engineer Air Pollution Environmental)
Support of Other Institutions	Engage in the general audit of the Korea Power Learning Institute,

### **2016 Implementation Activities and Future Plans**

- ♥ Implement integrity education for high ranking officials
- Reform code of ethics reflecting anti-graft law and conduct education
- Examine corruption impact assessment of the existing regulations/revise regulations
- Manage current status of transparent management index and integrity education
- Conduct 'outreach integrity education' by team (including education for personnel in charge of works vulnerable to corruption)

### **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

#### Vision **Create Happiness Beyond Energy** 2025 • Triple A rating in Sustain-• Generating Capacity of • 15% of GHG reduction · Best company for Custom-Management 20,348MW h ability management Goals er's satisfaction • 10% new & renewable • Fostering Global & Techni-• Leading five core CSV-Leading company energy generation capacity cal Talents in 20% technologies\* Management Core Business & Tech h **Public Happiness Eco-Friendly & Safety Company Competency** Strategy Proactive implementation • Expansion of new and reneable • Building high business • Maximization of power generaof national edeavors energy business confidence tion effciency Creating shared value for • Expansion of eco-friendly Fostering talented staffs Expansion of high efficiency mutual benefit • Enhancement of financial projects equipment • Promotion of social contri-• Expansion of global growth engin · Proactive measures anainst soundness bution disasters Increase competitiveness Sterngtheing advanced power Strengthen fulfillment of Reinforce quality management of fuel costs generation technologies and ethics capabilities activities

\* 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
Enc. Education	15% of GHG reductions	GHG reduction rate (to BAU <sup>1</sup> ) <sup>2)</sup>	%	-	-	1.5	2.5
Eco-Friendly & Safety	10% new & renewable energy generation capacity	Achievement of RPS (Renewable Portfolio Standard) target	%	1.96	2.44	2.61	3.2
Company	Triple A rating in Sustainability management	Result of KoBEX SM <sup>3)</sup> survey	Grade	AAA	AAA	AAA	AAA
Competency	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

### "Beyond Energy, Create Happiness"

### 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 discuses 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.

#### **Beyond Energy, Create Happiness** Mid to Long Term **Eco-Friendly & Safety Company Competency Core Business & Tech Public Happiness** Management Goals Areas of **Challenges of KOWEPO Efforts to Create** Creating Win-Win Corporate Sustainability Environmental · Safety Values for Sustained Growth **Ecosystem with Society** Management • Built win-win partnership Acted on new climate regime in advance Increased efficiency in facility operation · Created shared values with the local Minimized environmental impacts • Improved reliability of power generation Observed environmental laws and facilities community Major Activities Advanced ethics management prevented accidents Innovated management Þ of 2014 and 2015 · Recruited talent based on job competency · Reinforced implementation system of • Secured new growth engine disaster and safety control • Nurtured best talent and provided fair Advanced risk management Reinforced disaster response drill Enhanced financial soundness remuneration · Conducted the cyber security national policy • Vitalized corporate culture • No. of global/specialized talent: Forced outage ratio: 0.138% Amount of GHG reduction 438 Increased amount of overseas one million tons Shared growth evaluation level: O&M sales: KRW **62** billion Major Performances • Sales of byproduct: KRW **23** billion of 2014 and 2015 first rate (compared to 2014) · Local community satisfaction Occupational accident rate: 0.15% Commercialization rate of five core technologies: 52% score: 88.5 points

#### 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.

\* 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.

#### Implementation Tasks of Sustainability Management

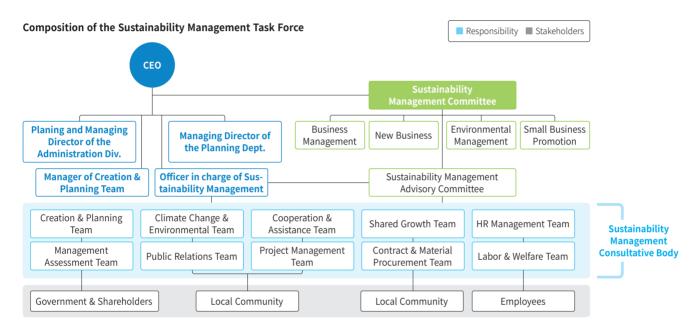


\* SDGs(Sustainable Development Goals): SDGs are the items for sustainable development of the globe to be applied by 2030 by the UN, and include 17 goals and detailed activities, such as no poverty, climate action, economic growth, job creation and sustainable industrialization and etc.

### **KOWEPO Vision 2025**

#### **Sustainability Management Committee**

KOWEPO operates the Sustainability Management Committee with the aim of advancing the sustainability management system. Advisory committee members carry out the consultation and collaboration for the sustainability management consultative body and the CEO, and provide expert opinions for implementing objective and transparent policies. In 2015, 12<sup>th</sup> Sustainability Management Committee implemented a total of 12 advisory services including an agenda item of 'mid and long-term strategy task of quality management'.



The Sustainability Management Council is actively participating in interviews for the publication of sustainability reports, reviewing major issues, and attending internal meetings for sustainable growth.

See the results the Internal Meetings for KOWEPO's Sustainable Growth (p. 32, 33) 📀

### **Corporate Culture**

In order to achieve Vision 2025 and activate 4 core values, we have established and implemented 8 tasks. In particular, we are actively pursuing 8 tasks to secure growth engines in the rapidly changing power generation industry.



See the KOWEPO's of Corporate Culture Activities (p. 72) 📀

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### **Stakeholder Engagement and Materiality Testing**

### **Definition of and Communication with Stakeholders**

Building a foundation for mutual trust with stakeholders is a paramount component that needs to be dealt with to establish a sustainable corporate culture and deliver business objectives. KOWEPO defined the domain of stakeholders who have an influence on the company and is expanding the communication channels for a more active engagement and opinion collection, at the same time. The company listens to and analyzes the voices of fields and reflects them to the sustainability management materiality assessment and business-decision making process by running communication channels with stakeholders.

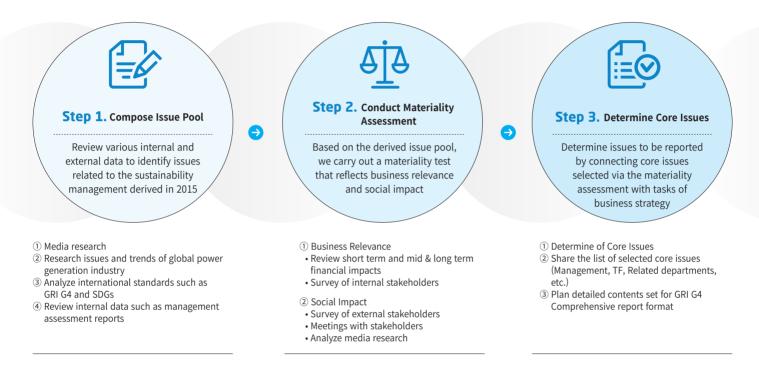
### **Communication Channel**



### **Stakeholder Engagement and Materiality Assessment**

### **Implementation of Materiality Assessment**

KOWEPO has annually conducted the Materiality Assessment in accordance with GRI (Global Reporting Initiative) guidelines to identify the concerns and issues of stakeholders and reflect them in the establishment and activities of business strategies, and has selected core issues according to the assessment results.

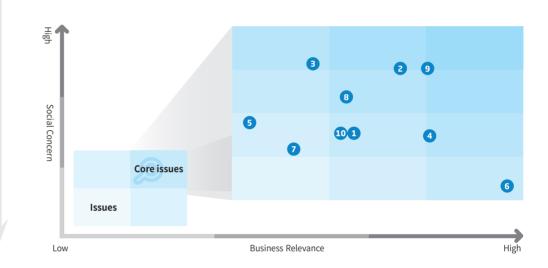


### Step 1. Compose Issue Pool

Media research	A total of 134 news articles by the press and media regarding KOWEPO's sustainability management activities were analyzed. (Jan.1.2015 - Dec.31.2015)
Research issues and trends of global power generation industry	In order to derive the improvements of KOWEPO's sustainability reports, the issues of the sustainability report of domestic and overseas electric power companies and private power generation companies were analyzed.
Analyze domestic and overseas standards	Main issues and requirements were reviewed by analyzing the sustainability management standards including GRI G4, EUSD (Electric Utilities Sector Disclosures), ISO26000, UNGC, DJSI (Dow Jones Sustainability Index) and KoBEX SM.
<b>Review internal data</b>	Issues published in the 2015 business performance report, BOD agenda items, business reports, KPI (Key Performance Indicators) and company newsletter were reviewed and analyzed.

### Step 2. Conduct Materiality Assessment

Based on the 46 issue pools, the survey of stakeholders and internal meetings were held, and a comprehensive analysis centering on business relevance and social impact was conducted.





### Step 3. Determine Core issues

Through the materiality test, ten core issue were selected and they were officially reported to the responsible TF and the top management to be finally confirmed. We are systematically reporting the core issues to help the understanding of stakeholders. (approach methods, risks and opportunities, and major activities and performances, etc.)

		Core issue	GRI Aspect	Stakeholder		
	1	Management innovation	-	🛱 🏛 🖏 🔁 🕅 🌆		
Γ	- 2	Securing new growth engine	Business performance, market position, training & education	萨 🏛 📸 ই 🕅 🖾		
	- 3	Improvement in Reliability of Power Generation Facility	Business performance	🐼 前 😚 🛍 🐃		
	- 4	Reinforcement of Emergency Safety Management Implementation System	Occupational safety and health, customer safety and health, partner companies' safety and health	🚧 🏛 📸 🏦 🏧		
Core issues	5	Developing eco-friendly technology	Economic performance, products and services	iə 🟛 🖏 🔁 iii 🕬		
_	- 6	Minimizing of environmental impact	Energy, emissions	i 🟛 📸 茫 前 🖾		
	7	Preemptive Measures for New Climate Regime	Emissions	ia 🏛 📸 👬 🖾		
	- 8	Fostering the Best Human Resource and Fair Remuneration	-	편 🏛 🕅 군 해 🖾		
	9	Creating Community Shared Value	Local community, indirect economic effect	萨 🏛 📸 弦 前 🐼		
	10	Establishment of Win-Win Partnership	-	ia 🧰 🖄 😳 in 🔊		

#### 🖗 Shareholders & Investors 🟛 Government 📸 Local Community 🤽 Customers 🕷 Employees 🖾 Partner Companies

### Internal Meetings for KOWEPO's Sustainable Growth

The paradigm of the electric power industry is shifting with rapid changes in the internal and external environments. KOWEPO discussed the future direction and sustainable growth engine for active and preemptive responses due to structural changes in the power generation industry. In addition, opinions were shared to make comprehensive and systematic efforts as a corporate citizen for the coexistent cooperation, the vitalization of the regional economy, fostering local talent and job creation.



Agenda 1 Discuss response plan for the paradigm change of the power generation industry

Agenda 2 GHG·Response measures for environmental and safety issues, to which the government pays attention, including fine dust reduction and safety

Agenda 3 Role of KOWEPO as a corporate citizen that coexists with the local community

- Jeong-Su Lee, Deputy Manager of the Business Management Team
- ② Jae-Hong Go, Deputy Manager of the Project Management Team
- ③ Su-Yeon Hwang, Deputy Manager of
- the Climate Change & Environment Team ④ Seoug-hyun Kim, Deputy Manager of
- the Creation & Planning Team
- ⑤ Yong-Taek Kim, Deputy Manager of the R&D Team
- <sup>(6)</sup> Jeong-Han Shin, Deputy Manager of the Creation & Planning Team
- $\widehat{\mathcal{T}}$  Han-Woo Jeong, Deputy Manager of the New Renewable Energy Team



### Agenda 1

Discuss response plan for the paradigm change of the power generation industry

"Low growth and low interest have been continued globally and the domestic power generation industry, in particular, has already reached maturity. In this situation, **it is necessary to reinforce overseas projects by establishing a sound basis for the domestic power generation industry.** Emerging markets including Southeast Asia where KOWEPO takes notice at present have abundant growth potential due to the relatively low electricity supply rate and low technical skills, and have prominent needs for KOWEPO's O&M. However, legal and institutional issues as well as financing issues remain, therefore efforts to address the issues should be accompanied."

"Fundamental concerns about the thermal power generation can't be omitted. To march in step with the introduction of the new climate regime, the low-carbon and high-efficiency clean thermal power generation should be set as the mid to long term growth model, and we should concentrate on systematic and technical maturity by taking the IGCC and IGFC<sup>\*</sup>, which are the clean coal-fired thermal power generation technology, as a key model of the future thermal power generation. As we constructed the Korea's first IGCC and operate commercial service, it is necessary to secure reliability and reinforce competitiveness by putting efforts into the long-term stabilization of the facility operation. "

#maturity of power generation industry #Increasing demand for clean coal-fired thermal power generation #stabilization of the facility operation #reinforcing overseas projects #need to support project financing



#### Agenda 2



GHG·Response measures for environmental and safety issues, to which the government pays attention, including fine dust reduction and safety

" 'Emission' and 'Fine dust reduction' is one of environmental issues that recently draws internal and external concerns. **To this end, KOWEPO set up a reduction target of 75% compared to the emission amount of 2015 by 2030**, and establishes a mid to long term strategy including the supplementation of additional environmental facilities accordingly."

"We set by evaluating disaster-related risks to prepare for disasters due to earthquake and climate changes, and mid and long term plans are established and being implemented."

#establishment Carbon Management Master Plan #fine dust reduction #supplement additional environmental facilities #evaluate risks for disaster

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## **Special Page**





### Agenda 3

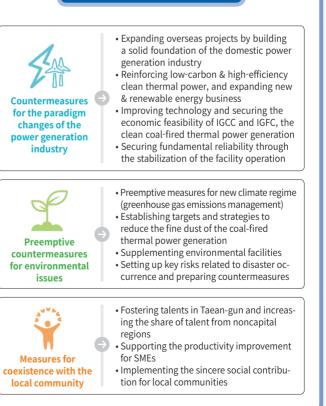
Role of KOWEPO as a corporate citizen that coexists with the local community

"Delivering sincerity for the coexistence of KOWEPO and the local community should be the priority. At present, the focus is on Taean-gun where the HQ is located, although the continuous expansion of the range of activities is one of the main goals. KOWEPO discovers and nurtures talent through its ties with universities in the region, and established a roadmap and strategies to increase the ratio of talent from noncapital regions."

"The company provides assistance in improving the productivity of SMEs in the region by carrying out omnidirectional activities such as supporting equipment and funds, conducting technological development, and training manpower. For social contributions in the local community, local volunteer activities have implemented activities and volunteer groups linked to the characteristics of the industry. In particular, KOWEPO set up a plan to strengthen the interface with the local community and has implemented the plan via the talent donation of employees in 2016."

#fostering regional talents #support SMEs #talent donation – utilizing the capabilities of employees

### **KOWEPO's Response**



# SUSTAINABILITY VALUE APPROACH

### **36** Challenges of KOWEPO for Sustained Growth

Increase in Efficiency of Power Generation Facility Operation

Improvement in Reliability of Power Generation Facility Management Innovation Securing New Growth Engine Advanced Risk Management

Reinforcement of Financial Soundness

### 54 Efforts to Create Environmental·Safety Values

Reinforcement of Eco-Friendly Management System Preemptive Measures for New Climate Regime Minimization of Environmental Impacts Environmental Law Observance and Accident Prevention

Reinforcement of Emergency Safety Management Implementation System Substantializing Disaster Countermeasure Drill

### **70** Creating Win-Win Corporate Ecosystem with Society

Recruiting Job Performance-Oriented Talent Fostering the Best Human Resource and Fair Remuneration Vitalization of Corporate Culture Establishment of Win-Win Partnership Implementation of Fair Trade

Creating Community Shared Value

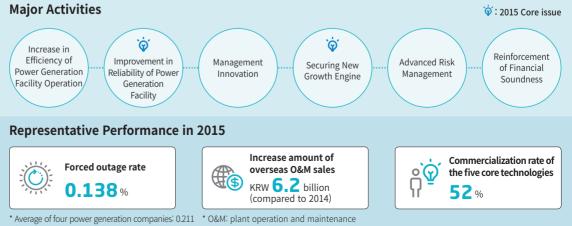
Disclosure on Management Approach





### Challenges of KOWEPO for Sustained Growth

Electric power demand is decreasing with the domestic economic slowdown and a change in the industrial structure to the energy saving method, and the power generation industry paradigm is changing along with the rapid changes of the internal and external environment surrounding companies such as regulatory reforms, as the customer requires change. To this end, KOWEPO focuses on the stable electric power supply and boosting profitability through the continuous expansion of a future growth engine and business diversification. In order to deal with the external environmental change including the acceleration of unconventional fossil energy, such as shale gas, KOWEPO implements the selected five core technologies and also strives to secure talented engineers. Moreover, the company plans to act preemptively by identifying nonfinancial risks in advance and upgrading the response system.



Average of four power generation companies. 0.21
 \* forced outage rate: down time

## **Increase in Efficiency of Power Generation Facility Operation**

KOWEPO implements various new construction projects to prepare for a surge in electricity demand and to address the short supply. In addition, energy management not only raises operational efficiency, but also creates cost savings.



The company aims to reduce the power generation cost and improve thermal efficiency based on strategic facility operation through an increase in profit forms and the operation efficiency of aged power plants, and the implementation of energy management. The phased implementation strategies based on the mid to long term goals are being implemented.

## **Improving Aged Power Plant Operation Related Work**

Stability is obtained and profitability is improved through the strategic facility operation of aged power plants. Under the supervision of the CEO, company-wide T/F teams were organized by field, and they selected target equipment in Pyeongtaek steam power and Seoincheon combined-cycle and derived strategic directions. Monthly performances are monitored and complementary measures are checked and implemented as the main tasks of emergency management by the CEO. KOWEPO plans to invest in plant and equipment including performance improvement and direct LNG imports as a mid to long term task after 2016.

## **Increase in Efficiency of Power Plant**

## Business Case 🖸

The Pyeongtaek thermal power complex division will maximize profits by increasing the profitability linked to the operation outlook as well as securing facility operation stability as the increase in the oil generator is expected due to the low oil price. The Seoincheon Combined Cycle Power Complex Division is also carrying out detailed tasks for cost reduction and operation efficiency on the basis of investment cost minimization to prepare for a decrease in the facility usage rate due to an increase in reserve margins.



**Introduction of KOWEPO** Detailed introduction of our plants and activities to raise eco-friendliness, quality and operational efficiency

https://www.iwest.co.kr/ bsn/Default.asp

## Pyeongtaek thermal power complex division



Pyeongtaek Steam Power Plant endeavors to improve profitability, such as the maximization of the electricity transaction profit by implementing the strategic bidding for an increase in the facility usage rate; and the securement of the renewable energy supply certification through the mixed firing of bio heavy oil, while at the same time obtaining stability by carrying out the intermediate maintenance on holidays to enhance the regular monitoring of facility operation and to gain reliability during peak hours.

Increase in Operating **Reduction in Air** Profit compared to 2014 **Pollution Substance** KRW 47.6 billion 40%

## Seoincheon combined cycle power complex division



Seoincheon Combined-Cycle Power Plant reduces dissipation heat and maintenance costs through the application of new technology and the localization of maintenance technology for key components, respectively, by setting up cost reduction and operation efficiency as the main implementation goals. Furthermore, the existing overhaul of 151 days was improved to 107 days by optimizing the maintenance period with the reflection of the operation forecast and heat supply sales that increased by KRW 1.27 billion with the utilization of district heating.



Category	Taean thermal power complex division	Pyeongtaek thermal power complex division	Seoincheon combined cy- cle power complex division	Gunsan combined cycle power division
Capacity (MW)	4,000	2,749	1,800	718.4
Output (MWh)	32,462,138	9,028,677	3,708,766	2,764,074

#### Current Status of Production by Major Operation Site (2015)

### **Facility Usage Rate**

Category	Unit	2013	2014	2015
Taean Thermal	%	96.7	93.4	92.6
Pyeongtaek Thermal	%	30.0	15.9	29.2
Pyeongtaek Combined Cycle	%	43.1	7.9	0.1
The 2 <sup>nd</sup> Pyeongtaek Combined Cycle	%	_*	100.8	71.6
Seoincheon Combined Cycle	%	80.8	52.5	23.5
Gunsan Combined Cycle	%	85.1	73.4	43.9
Renewable	%	15.7	24.9	33.8
Total	%	76.2	64.8	59.0

\* Completed in 2014

## **Reducing Costs through Energy Management Activities**

Through energy management improvement activities, KOWEPO increases the efficiency of facility operation. By selecting an improvement in performance, upgrade in operation methods and waste element elimination as tasks to be improved, the company strives for a reduction in costs.

## Performance improvements via the development of upcycling' equipment for high voltage motor, Seoincheon

Seoincheon plant achieved a patent application in August 2015 by securing Korea's first 'new technology for high voltage motor recycling structure improvement' order to prevent resource waste and reduce the purchasing cost after replacement with new products due to the failure of the high voltage motor. It also upgraded the motor ventilation opening and changed the structure of the cooling fan into the winding temperature reduction type while increasing efficiency and preventing the occurrence of excessive power consumption due to motor deterioration through the improvement of the power consumption reduction method including core material changes. That improved the efficiency of the high voltage motor up to 2.1% which could save power consumption worth KRW 940 million.

upcycling: a compound of recycling (reuse of parts) and upgrade (extension of service life, improving the efficiency of the motor), making a product that has new value by changing the utilization method of a product.



#### Improving the combustor cooling steam supply method

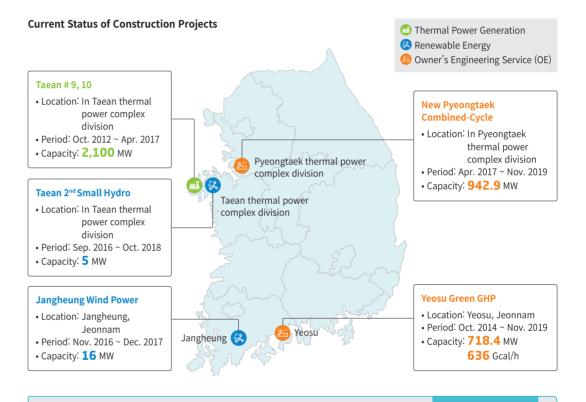
The Gunsan combined-cycle power plant shortened the start-up time by 45 minutes by improving the combustor cooling steam supply method, while improving the operation method and design limits by addressing the capacity deficit with an upgrading cooling steam pressure control valve. This largely reduced fuel costs including saving the annual start-up fuel cost by KRW 430 million and securing an additional KRW 4.9 billion of profit from electric power sales.

#### Establishment of the optimum operation plan for Taean thermal power

The Taean thermal power division operates the plant by setting up implementation focus and tasks by area of manpower and organization, facility improvement and facility operation, and by establishing the optimum operation plan. For the efficient operation of distributed facilities due to construction by unit, environmental and chemical facilities are under integrated operation. In order to eliminate inefficient elements due to different manufacturers, operations and maintenance are integrated with the operation of effective facility management manpower. The division drew 48 tasks by area by eliminating the causes of failures through the improvement of obsolete equipment and securing facility reliability and maintenance quality, through plans phased for implementation by 2020. Increase in Efficiency of Power Generation Facility Operation

## **Construction of New Plants in a Timely Manner**

KOWEPO is to contribute to the stabilization of the national electric power supply with the timely construction of new plants including the high-efficiency coal-fired power plant, clean gas-fired power plant, small hydro power, wind power, solar power and IGCC. Moreover, the construction of Taean IGCC and Taean Unit 9 & 10 were completed in 2016 and they are now under commercial operation. The completion of Hwasun wind power plant and Jangheung wind power plant helped with the stabilization of the electric power supply, and secures a new growth engine such as ESS (Energy Storage System) and renewable energy. Securing an additional period of time for the commissioning of Taean Unit 9 & 10 and IGCC through process reanalysis contributed to the improved reliability of construction quality. Taean Unit 9 & 10, which have the largest capacity of 1,050 MW in Korea, succeeded in the hydraulic test and initial firing, and Taean IGCC achieved 100% of the overall work schedule rate compared to targets by observing the core processes such as the initial firing of the gasifier.



#### Reinforcement of Commissioning Organization and Manpower for New Power Plants

KOWEPO strengthened human resource management by reinforcing organizations in accordance with the strategic task of the 'timely construction of a high-efficiency power plant' and established a system for the timely completion of power plants.

#### Ourrent Status of Commissioning Organization Reinforcement for Taean # 9, 10



It was necessary to reinforce the commissioning organization according to the construction process of Taean # 9, 10 plants. To that end, the structure was reorganized from the previous two-team system to the four-team system and reassigning personnel was implemented through labor-management meetings to redirect the plant's manpower whose utilization rate is declining.

Business Case 🖸

## 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.

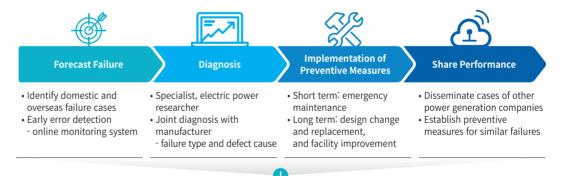
- Able to utilize new technology applied with cutting edge IT · Possess capacity to improve power generation facilities
- Crisis Increase of failure causes due to facility deterioration • Possible for loss factors to occur including draught,
  - cyber intrusion and material procurement

## **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 outrage 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**



"Improving reliability of power generation facility through significant contingency prevention methods"



Prevention activities and training for Electricity Peak

### **Implementing Systematic Failure Prevention Activities** at Electricity Peak Period

To ensure the stabilization of the maximization of the supply capacity and power generation facility during the electricity peak period, KOWEPO carried out failure prevention activities, facility management and the reinforcement of the emergency system. As a result of such efforts, the number of failures declined by 31% compared to the previous year and that contributed to the stabilization of the electricity supply.

 $\mathbf{31}$  % (16 cases  $\rightarrow$  11 cases)



Loss

(hour)

Business Case 🖸

(Gwh)

Forced Outage Time and Unplanned

• Forced Outage Time Unplanned Loss

#### Challenges of KOWEPO for Sustained Growth

Improvement in Reliability of Power Generation Facility Efforts to Create Environmental · Safety Values

Information Security Evaluation Score





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

## **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.

## **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.



1 Quality Technology Exchange Workshop 💈 The Management Grand Awards ョ ICQCC 2015 Korea 🗿 Quality Master Conference

#### 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 <sup>T</sup>Equipment Quality Inspection Manual<sub>J</sub> 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. The company also applied the manual to all operation sites and shared it with partner companies to pursue the enhancement of the quality inspection technical level and overall development of the power industry.

**The publication of a guidebook for Fostering experts in quality improvement** | KOWEPO published a <sup>r</sup>guidebook for fostering experts in quality improvement<sub>j</sub> by integrating quality improvement in expertise and experience gained from working in the field for the first time in the power generation industry. The guidebook describes quality improvement expertise and experience in eight areas including field improvement, nonmanufacturing, win-win cooperation, and safety and quality with the best practices of KOWEPO in the quality improvement method, and contains the seven tools of quality improvements in systematic order. This will be a great help for employees to develop into quality improvement experts who increase the continued growth and value of the company and to enhance capabilities.





Equipment Quality Inspection Manual



Quality Improvement Expert Fostering Guidebook

2015 Key Performance

**Challenges of KOWEPO** for Sustained Growth Improvement in Reliability of Power Generation Facility

Management Innovation

## **Management Innovation**

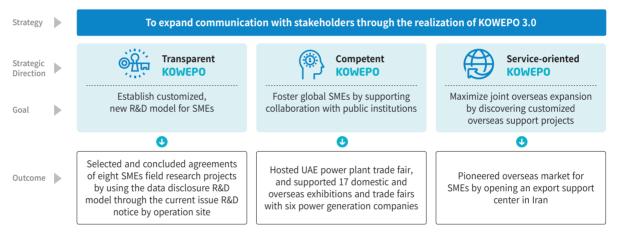
KOWEPO recognizes that addressing the current issues of the stabilization of management and profitability improvements are urgent, and implements corresponding innovative activities. In particular, the company strives to enhance the execution of business strategies by checking the company-wide emergency management performance monthly under the supervision of the CEO.



## **KOWEPO 3.0**

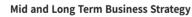
KOWEPO established KOWEPO 3.0 in accordance with Gov 3.0. KOWEPO 3.0 is a total implementation system to set three strategies to be implemented for the focus of the implementation, integrate the government policy agenda and implement them effectively.

## **KOWEPO 3.0 Implementation System**



## Establishing Innovation Strategy based on Mid and Long Term Plan

KOWEPO set up and implements an innovation plan based on "KOWEPO 3.0" mid and long term business strategy.



Four Strategic	Direction	Sixteenth Strategic Goal
Public Happiness	Eco-friendly & Safety	4 items including implement government projects, promote local cooperation continuously 4 items including continuously expand new & renewable business, respond to disaster and safety in advance
Company	47 Core Business	4 items including establish reliable corporate culture, foster and secure talent
Competency	& Tech	4 items including Increasing in the efficiency of the power generation, expansion of global growth engine
Three Innovation Targets	Implementation Area	Task
	HR development     Organizational reform	Fostering experts in power generating technology
्रम् भ्र	Facility operation     New projects	Improving fuel supply facilities
Process	• Work process improvement	Improving routine and consigned processes



BP competition for productivity improvement

## **Establishment of Permanent Innovation Activity Operation Infrastructure**

To carry out permanent innovation activities, an operation infrastructure was established consisting of an innovation promotion group and experts in activity support. By including innovation experts from various areas including the National Quality Masters, proposal masters and six sigma personnel, execution is reinforced with their guidance and advise on tasks.

**Innovation Group Composition** 



## **Current Status of Management Innovation Activities**

KOWEPO links its strategic tasks to internal management evaluation indicators (KPI: Key Performance Indicators) and the results are reflected in personnel evaluation, promotions and the performance compensation system, thereby institutionalizing management innovation activities for practical application.

> Innovation Activity Operation

> > System



• Execute 166 cases of innovation tasks Secure 412 persons of six sigma mannower

#### Suggestion

- Won the Grand Prize at Korea Idea Contest
- Awarded as the best institution at the Productivity Improvement Contest Secured 21 suggestion masters
- (No.2 in Korea)



- Won Quality Management Awards
- 29 National Quality Masters (No.1 in Public Institutions)

## CoP\* (Learning group)

• 27 patent applications Created outcome of KRW 94 million through temporary possession and technology transfer

\* CoP(Community of Practice): a learning group that discusses, shares knowledge and addresses issues together

-0

Idea Management Conference



**Recognition of Productivity** Awards

#### Work Innovation

## Deriving tasks in productivity of capital, labor and knowledge

- Overachieved goals for added value and improving productivity
- Operated T/F improving productivity under supervision of the management

#### Sharing best practice results of quality improvements

- Achieved 'the highest score' at the national and international quality management convention
- · Awarded at quality management awards
- Awarded at the national and international contests (presented 10 cases in total)

### Implementing identification of innovation tasks

- Identified innovation tasks to ease the burden of the people and improve services for the public
- · Achieved additional innovation tasks compared to the previous vear

### Suggestions to address current issues

- Won the grand prize at the Korea Idea Contest for two consecutive years
- Won the best CEO prize (produced 1 suggestion master)

#### Core Manpower Production in Innovation Activities (total)

(Unit: person)

Catagory	P	Personnel with Six Sigma Belt Nation			National	Korea Suggestions	
Category	MBB	BB	GB	FEA	Quality Master	Master	
No. of Produced Personnel	8	82	314	8	29	14	

\* MBB (Master Black Belt): practically lead six sigma activities of a company as a chief six sigma expert

\* BB (Black Belt): expert in addressing issues to carry out six sigma projects

\* GB (Green Belt): working level personnel of six sigma projects who have the capability to address issues by using scientific techniques

\* FEA (Financial Effect Analyst): expert who evaluates and verifies the financial performances of six sigma projects

Performance of Imple-

Activities in 2015

Six Sigma

CoP

Total

mentation of Innovation

Suggestion 1,195

(Unit: cases)

166

60

1.421

## **Establishing a System to Promote Participation in Innovation**

KOWEPO endeavors to promote the voluntary participation of employees in innovation and inspire innovation. The connection and rewards of human resource affairs were provided by establishing an innovation incentive system and evaluating organization and individuals while at the same time enhancing an innovative mind of employees through the year-round exposure of posters for productivity improvement, creativity and a change in thinking, leadership and communication on the company homepage. In order to motivate employees, the company has reinforced rewards for winners including the CEO's awarding top performers who contributed to management innovation, and announcing winners on the homepage.



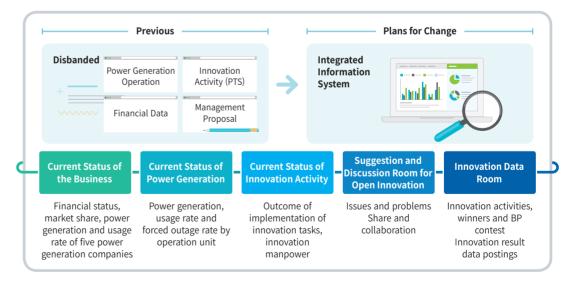
Innovation Participation Post on the Homepage



In February 2016, 2015 BB (Black Belt) certified employees, attended a certification ceremony for a suggestion master and an excellent employee in productivity improvement contest was held and prizes were awarded. Black belt employees will perform as innovation specialists who lead the execution of company-wide innovation activities such as performing innovation tasks and completing training.

## **Establishing Innovation Platform and Contents**

It is to provide and manage the current status data of the business and innovation data that were previously dispersed by establishing an innovation platform to integrate them in one display of the homepage. All stakeholders of KOWEPO can access a series of contents within the company homepage to check for relevant information.



## **Implementation Plan**

## Capital productivity improvement of KRW 28.6 billion by reducing bituminous coal purchas-

ing costs, increasing facility efficiency and reducing construction costs

## Achieve added value worth KRW 32 billion

in the labor sector based on effective manpower operation, business expertise and plant operation capacity

## Create added value worth KRW **4.8** billion

based on possessed intellectual properties such as R&D technology development and innovation awareness

## 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.

## • 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**

Sales (KRW 100 million) Overseas Portion (%) 0.28 0.36 0.54 229 161 173 2013 2014 2015

\* 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.

Efforts to Create Environmental · Safety Values

Expansion of Renewable Energy Source





## 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.

## **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.

### Opening, Sharing, Communication and Cooperation via the Exchange of Renewable Technology

KOWEPO held a technology exchange meeting for the cooperation and communication reinforcement between public institutions and private companies in the renewable energy generation field that meets the Gov 3.0 implementation system. At the meeting, experts from Doosan Heavy Industries & Construction and Doosan Fuel Cell were invited to discuss cooperation for the joint response of three parties to the recent issues in the power generation industry; presentations on the current status of the development of renewable energy generating technology such as IGCC, IGFC, wind power and ESS that the two companies are carrying out were given by experts; discussions on how to respond to the industry issues and the three-party joint technology cooperation plan were held with internal and external experts. Through such courses, the company shared information on the latest technology for the renewable energy source including wind power, ESS and fuel cells that attract attention due to the environmental changes in the industry according to the climate change countermeasures, and the assured direction of the joint cooperation through animated discussions.



Business Case 🖸

## **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.

#### **Direction to Secure Five Future Core Technologies**

	— Short Term (2015~2016) ————————————————————————————————————	— Mid Term (2017~2020) — 🕣	— Long Term (2021~2025)
<ol> <li>Facility Operation Technology</li> </ol>	<ul> <li>Control ICT convergence facility/ safety</li> <li>3D printing utilization technology</li> </ul>	USC fire simulator     Advanced control algorithm	• Field study on extending the service life of the standard coal-fired thermal power plant
<ul> <li>② Gas Turbine</li> <li>Localizing</li> <li>Technology</li> </ul>	<ul> <li>Localize operation technology and components</li> <li>Establish hot component testing facility</li> </ul>	<ul> <li>Achieve combustion tuning technology independence</li> <li>Develop Korean-style gas turbine</li> </ul>	<ul> <li>Localize H-class components</li> <li>Build gas turbine field test complex</li> </ul>
③ IGCC Operation and Connection Technology	<ul> <li>Establish Korean-style IGCC*</li> <li>Develop gasification test-bed</li> </ul>	Upgrade operation technology     Component localization/connection technology	Operation technology/ localization (continued)     Coal gasification fuel cell
④ Renewable Energy Application Technology	<ul> <li>Commercialize bio heavy oil</li> <li>Develop livestock manure- derived fuel</li> </ul>	<ul> <li>Wind power/fuel cell operation technology</li> <li>Commercialize livestock manure- derived fuel</li> </ul>	<ul><li>High-efficiency fuel cell technology</li><li>Bio power generation engineering</li></ul>
<ul> <li>Eco-friendly Resource Recycling Technology</li> </ul>	<ul> <li>0.1MW pre-combustion CCS**</li> <li>Original technology converting CO<sub>2</sub> into fuel</li> </ul>	• 1MW pre-combustion CCS • Pilot facility converting CO <sub>2</sub> into fuel	• 10MW pre-combustion CCS • Field test facility converting CO <sub>2</sub> into fuel

\* IGCC : Integrated Gasification Combined Cycle

\*\* CCS:Carbon Capture & Storage

#### **Technical Cooperation with Specialized Institutions**

Technical cooperation with domestic and overseas institutions that specialize in power generation facilities has been actively implemented. Through this cooperation, KOWEPO derives measures to improve the performance of vulnerable equipment in the plant, reinforces the maintenance capacity via the development of a new concept training program, and spreads the best practices.

#### Improving the Utilization of the Technical Information System

By building a technical information e-library, core technologies through the lifecycle are accumulated, shared and utilized across the company. With continuous efforts for the improvement of the management system, the number of cases that share information and register data almost doubled.





#### "IGCC, the future growth engine of KOWEPO producing clean renewable energy"

For the past ten years, KOWEPO has strived for Korea's first IGCC construction. The IGCC plant project is the clean renewable energy which is the future growth engine of KOWEPO and helps to ease the energy shortage in Korea, and is an important project at the national level. The commissioning team and I tried to implement the optimized process design method rather than adopting entire technologies from the original tech company because the IGCC plant project is being attempted for the first time in Korea, and with such efforts the IGCC was completed in August 2016. I think that the completion is not the end but merely the beginning because the IGCC technology can be expanded to those producing various chemical materials including clean fuel and synthetic gas. Hence, we plan to endeavor to diversify business based on the successful completion of this construction.

> Lee, Jeong-Su, Team Manager of Commissioning Team, Commissioning & Power Generation Department, Taean thermal power complex division



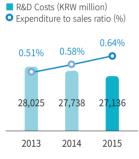


Securing New Growth Engine



IGCC aerial view

#### **R&D** Performance



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. On the other hand, the IGCC technology can be utilized as a technology, which can not only be applied to the power generation system but also produces SNG, CTL and hydrogen using syngas as well as different chemical materials (ammonia and methanol) therefore it is expected to take part in the export of high value added plants in the world energy market.

**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



## **Advanced Risk Management**

KOWEPO implements prevention and response measures with the risk management strategy in order to eliminate and minimize potential risks and to handle risk occurrence effectively. Especially 16 core risk indicators are drawn from nine areas and they are regularly monitored and maintained.



KOWEPO carries out risk-oriented preventive internal monitoring activities. Company-wide management risks are managed by a responsible risk management team with the risk management system as well as permanent and temporary risk management teams. Audit teams quantitatively analyzes the risk level by work and conducts the three-step check by risk level.



## **Core Risk Identification and Action Response**

Risk factors are defined and categorized by reflecting the characteristics of the institution and are reclassified annually by considering work characteristics, internal and external findings and pending business issues. Sixteen core risk indicators were derived in nine areas including the financial related area and the management system was established accordingly.

Risk Management Area	rea Core Risk Indicator		Response	
Finance	Exchange rate, credit rating, debt ratio, etc.		Derive optimal financial performances including debt ratio	
Fuel	Optimal inventory, etc.		Secure stability of fuel price and supply	
Budget	Operating profit to sales ratio	Ð	Enhance profitability via budget (cost) cuts	
Electric Power Exchange	Electricity sales revenue		Increase sales for the improvement of cash flow	
Power Generation Management	Forced outage rate, generation capacity, etc.		Secure stability of facility operation	
New Project	New Project Internal rate of return		Review profitability by project progress	
Environment, etc.	Observance of emission criteria, etc.		Respond to environmental and disaster related risks	

## **Risk Management Organization**

In order to check and respond to risk factors in advance, permanent and temporary management organizations are in operation. Permanent organizations conduct proactive risk forecasts and management whereas the temporary organization acts on the occurrence of risk factors by category under the risk management committee.

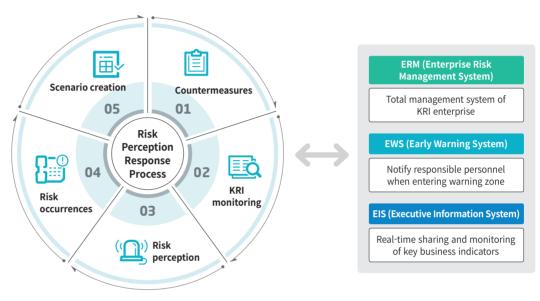


 Core risk indicators drawn From
 Areas and
 Monitored regularly.

## **Enterprise Risk Management System**

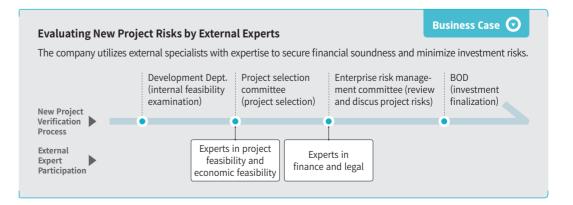
KOWEPO prepares for the occurrence of risk factors by maintaining close relations between the risk management organizations and the system. The occurrences of any risks are checked and dealt with in advance through realtime online risk management and the information is shared with all employees to spread the importance of risk management throughout the company. Experts at working-level from relevant areas analyze countermeasures after identifying the risk factors of each area and quantifying the risk levels while the response plans that have been introduced are deliberated and decided by the company-wide risk management committee consisting of the managing directors of the office (department) with the head of the administration department as a chair for systematic risk management.

### **Risk Perception Response Process**



## Reinforcement of Domestic and Overseas Project through Multilateral Risk Management

KOWEPO not only eliminates the unexpected cost at the operation stage by establishing the business standard model through reflecting the distinct characteristics and operation risks of each overseas project, but also implements the exit strategy of projects besides the core project by reinforcing project values and bargaining power. Furthermore, the company minimizes business financing risks by recruiting new global shareholder companies while seeking the internal stability of domestic and overseas projects through multilateral risk management such as the reinforcement of financial soundness by collaborating with domestic construction companies and electric power companies.



## **Reinforcement of Financial Soundness**

KOWEPO carries out company-wide activities to secure financial soundness including the establishment and execution of the debt management plan for the stabilization of management and the establishment of mid and long term financial stabilization plan. In particular, from the mid and long term perspective, we have established financial plans and implemented related activities to reduce liabilities and stabilize the debt ratio.



## **Implementation System**

Set up a mid and long term

financial budget plan and

provide feedback

The company focuses on the securement of financial soundness under the leadership of the CEO to be able to invest through debt reduction. Various efforts have been made to cut debts and stabilize debt ratio, such as setting up a mid to long term financial plan for more than five years, enhancing financial risk management, effective asset management, and reasonable budget execution and reduction.



#### Establish a sustainable growth base while maintaining a sound financial structure

Strategy

Reinforce financial risk management for a stable financial structure Contribute to the improvement of the financial structure through effective asset management

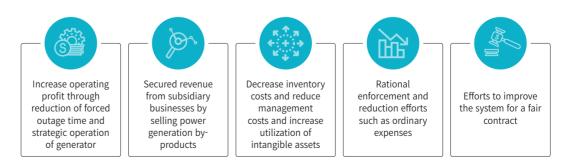
Rationalize budget preparation/execution and post evaluation

## **Create the Mid and Long Term Financial Plan**

KOWEPO created the mid and long term financial plan while setting up debt ratio and the operating profit to sales ratio by 2020 by reflecting the changes of the internal and external business environment. It is expected to see a temporary drop in operating profits due to a forecast of the increase in the emission trading unit price in 2018, while the debt ratio will maintain its declining trend.



## Efforts to reinforcement of financial soundness in 2015



## 53

## Increasing the Virtuous Cycle Investment through Financial Soundness Securement (2016 - 2020)

KOWEPO pursues sustainable growth by increasing domestic and overseas investments based on the financial soundness secured via efforts to build the mid and long term financial plan and accomplish the goals. In order to prepare for the risk of declining profitability due to a slow increase in trends in domestic power demand, investment in aged facilities has been raised while continuing investment in relevant areas along with the expansion of opportunities in the overseas power generation industry. In particular, the company is quickly fulfilling its social responsibilities by additionally securing an investment budget to act on environmental issues such as the recent issues of fine dust in 2016.

Investment	New Thermal	New Renewable	Overseas Project	Aged Facility Reinforcement	Measure for Fine Dust	Others		
Investment Costs (2016~2020)	KRW <b>547.8</b> billion	KRW 623.5 billion	KRW <b>517</b> billion	KRW <b>1,517.9</b> billion	KRW <b>324.6</b> billion	KRW <b>328</b> billion	Ð	Total Investment
Detail	Completion of Taean #9, 10 (2017)	Taean IGCC, Jangheung wind power, South- western offshore wind power	Xenamnoy hydro power in Laos, new thermal plant in Indonesia	Seoincheon combined cycle, Pyeongtaek steam power and combined cycle	Replacement and new installation of environmental equipment in Taean # 1~8	communication		Cost for Five Years KRW 3,858.8 billion

## **Representative Outcome**

KOWEPO makes company-wide efforts to secure financial soundness and as a result it outperformed in numerical indexes such as debt ratio, operating profit to sales ratio and net income to total assets ratio. Moreover, the company accomplished significant results in non-numerical indexes including an improvement in the financial management system and the establishment of a risk management system.



## **Operating Profit to Sales Ratio**



#### Net Income (Unit: KRW 100 million)



Target in 2015 Performance in 2015



Business Case 🖸

Implementing Taxation Strategy based on Honest Tax Payment

Improved profitability

and financial stability

compared to previous year

by exceeding operating

profit margin

KOWEPO contributes to the virtuous cycle creation including an increase in the government's tax revenue and public services, and the maximization of shareholders' profits by fulfilling the liability of taxation as a good corporate citizen both in Korea and overseas. Moreover, the company observes taxation policies in all countries in which KOWEPO operates including Korea; operates a taxation strategy within the boundary of the principle of no taxation without law; and fulfills its obligation to pay transparently and honestly.

Transparent Tax Information Disclosure

• Tax information defined by law are transparently disclosed (http://dart. fss.or.kr/) to perform tax obligations.

• Tax related contents including the current status of tax payment data are disclosed to all stakeholders via an annual business report and audit report and objectivity and transparency are gained through an external audit.

## **Taxation Risk Management**

· Various risks due to tax issues are identified and managed in advance through continuous monitoring on tax related regulations and government policies.

• As the National Tax Service recently encouraged support for international transaction related truthful reports while strictly dealing with offshore tax evasion and tax evasion using international transition, KOWEPO submits reports in accordance with such global policies and pays taxes honestly.

Category	Unit	2013	2014	2015
Corporate Tax Allotment <sup>1)</sup>	KRW	9,929,938,534	31,581,067,783	74,016,801,086
Deferred Corporate Taxes <sup>2)</sup>	KRW	17,567,799,520	(11,403,734,497)	36,583,827,006
Corporate Tax directly applied to Capital	KRW	(168,997,535)	10,745,931,230	402,137,949
Income Tax Expenses <sup>3)</sup>	KRW	(20,972,346,786)*	28,296,576,804	112,299,249,597

\* Cumulative investment in IGCC new and renewable facilities under the Special Taxation Act (09 ~ 12 years)

- 1) Corporate Tax Allotment = Current term corporate tax 2) Deferred Corporate Taxes: the effect of
- expected corporate tax which is from the temporary difference between accounting returns and taxable income
- 3) Income Tax Expenses = current term corporate tax + deferred corporate taxes



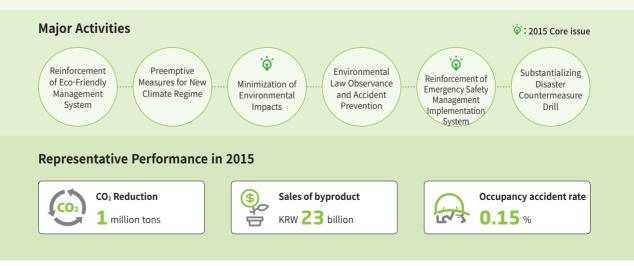




## Efforts to Create Environmental · Safety Values

As creating eco-friendly value continues to draw attention, KOWEPO strengthened its eco-friendly management system to realize the environment vision and established detailed environment targets and strategies. Through such efforts, the company will fulfill it social responsibilities as an energy corporation that realizes eco-friendly sustainable management that creates happiness.

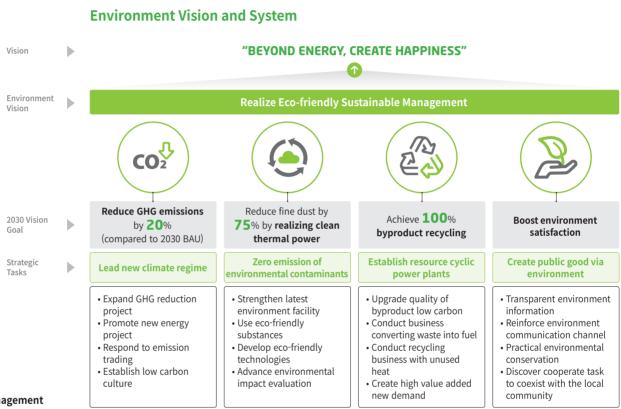
With the rising demand of local communities for safety management due to large safety accidents on operation sites, we established a rigorous disaster and safety system and protects the precious lives of residents and employees from various disasters and accidents.



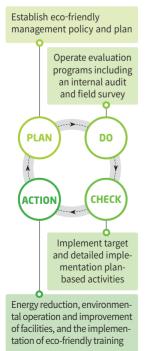
Efforts to Create Environmental · Safety Values Reinforcement of Eco-Friendly Management System

## **Reinforcement of Eco-Friendly Management System**

KOWEPO is to lead eco-friendly management with four strategic tasks of leading a new climate regime, zero emission of environmental contaminants, establishing resource cyclic power plants and creating public values via the environment as 'an energy company creating happiness'.



### Eco-friendly Management Operation System



## **Eco-friendly Management System and Organization**

The eco-friendly management operation system of KOWEPO is systematically operated with the process of Plan, Do, Check and Action under the firm will of the CEO. The responsible teams, such as the climate & environment team, renewable energy team, and environment and chemical team, execute eco-friendly management under the mutual cooperation system of all organizations across the company. As of late 2015, there are 135 employees that work in the environmental field.

## Investment in Eco-friendly Technology Development

KOWEPO conducts industry-university-institute collaboration R&D so it will become an eco-friendly energy company as it recognizes GHG reduction technology for the future growth engine while responding to global environment issues from a long-term perspective. Moreover, it concentrates investment in air quality facilities and the renewable energy field including improving decrepit facilities and the optimal operation of the desulfurizing facility.





 Sewage sludge mixing technology development

Resource

recycle

 Cinder recycling technology development

## **Preemptive Measures for New Climate Regime**

Vision Carbon Managei Mission

Strategy

Direction

Tasks

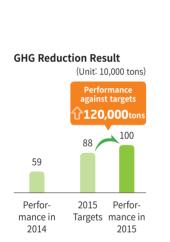
Response to climate change is considered as the new competitiveness of a company and securing ecofriendly technology is becoming a prerequisite for the survival and growth of a company. KOWEPO is taking preemptive actions at the company level, reinforcing governance and creating new climate change-related business opportunities for climate change.



# Establishment and Implementation of Carbon Management System Leading to the New Climate Regime

KOWEPO plans to establish the carbon management master plan, take preemptive responses to the new climate regime and achieve the national CO<sub>2</sub> reduction targets in 2030 by setting up internal reduction goals; and to cut GHG emissions to BAU by about 1.1 million tons by 2030 via the expansion of renewable energy, performance improvement of aged facilities, increase of the high-efficiency power generation and new energy projects.

#### **Carbon Management Implementation System**



#### GHG Integrated Management System (WP-ETS)

#### Allowance Response

- Calculate emission right BAU, forecast allowance
- Financial impact due to allowanceSupport allowance
- application

## Trading Response

- Analyze supply and demand of emission rights
  Analyze reduction marginal
- costs • Analyze market price and support trading

#### **Implementation Support**

- Emission MRV\* system
- Support internal audit system
- Internal and external reduction projects and guidelines
- \* MRV : Monitoring, Reporting, Verification

		Beyond Energy, Create Happiness								
ement	To lead eco-friendly management via carbon management									
y	GHG 2030 Reduce by 20% compared to BAU	Lead new energy business	Specialize in GHG reduction project	Advance in win-win and cooperation type low carbon activity						
on	Reduce GHG emissions	Create future new market	Respond to emission trading	Establish low carbon culture						
	<ul> <li>Expand renewable projects</li> <li>Apply high-efficiency facility</li> <li>Use low carbon fuel</li> <li>Internal and external reduction projects</li> </ul>	New energy business     Develop CCUS*     technology     Overseas reduction     project     Acclimatization     measures	Build IT system     Act on emission     allowance     Manage emission     rights     Foster trading experts	<ul> <li>Produce low carbon products</li> <li>Consume low carbon products</li> <li>Habituate carbon reduction</li> <li>Share low carbon information</li> </ul>						

\* CCUS : Carbon Capture Utilization & Storage

## **Efforts to Reduce GHG Emissions**

KOWEPO strives to reduce GHG emissions by expanding renewable energy including offshore wind power and implementing the optimal operation of Taean IGCC and replacement with high-efficiency facilities. In particular, internal CERS (carbon & energy reduction system) was established to vitalize reduction activities and the performance rewarding system was set.

## Creating the Future Market via the New Energy Business

The company plays a leading role in evaluating risks and creating measures for adoption regarding power generation facilities to prepare for natural disaster damages due to climate change by concluding a business agreement of the adaptation of public institution climate change measures with the Ministry of Environment.

## **Establishment of Climate Change Response Action**

KOWEPO concluded a business agreement regarding the adaptation of public institution climate change measures with the Ministry of Environment, and is initiating risk evaluation for facilities and the establishment of adaptation measures.

## **Emission Trading Response**

KOWEPO established a response system including the GHG integrated management system, internal verification procedures and trading procedures to implement the emission trading scheme which began in 2015, and actively copes with the scheme by discovering and promoting external reduction projects along with internal GHG emission reduction efforts.

Efforts to Create Environmental · Safety Values Preemptive Measures for New Climate Regime

## 'Climate Change Response Committee', Reinforcing Governance for the Preparation of the New Climate Regime

KOWEPO organized and operates a climate change response committee to build a fast decision-making system through consulting and the deliberation of internal and external experts. The committee plans to discuss measures for policy and emission trading, and GHG reduction technology and projects at the first working-level meeting.

## GHG Reduction Model Differentiation (New win-win type, Industry and Non-industry linked reduction model)

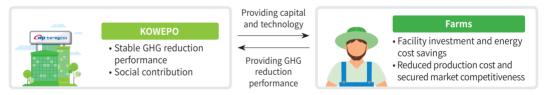
Starting with the energy credit project for SMEs in 2012, KOWEPO has actively engaged in the national GHG emission reduction by creating a unique reduction model in connection with non-industry fields such as agriculture and local communities.

## Shared Growth Reduction Project linked to Industry

**The Energy Reduction Green Credit Project for SMEs** | KOWEPO proposed a practical win-win model that realizes the climate change response policy and shared growth policy with all companies regardless of their sizes by supporting SMEs with energy reduction facilities to reduce the production costs of SMEs, while at the same time KOWEPO utilizes CERs (certified emission reduction), which are derived and transferred as a result of the supporting project, for the emission trading scheme. The supporting system will be expanded by building a cooperation system with other institutions from 2017.

## Establishment of Non-Industry Connected New Win-Win GHG Reduction Model

The Joint GHG Reduction Project between Corporate (KOWEPO) and Farms | New win-win cooperation model was established to allow KOWEPO to use the GHG reduction outcome that resulted from the company's support for farms to lower carbon through cooperation between KOWEPO, Chungcheongnam-do and the Ministry of Agriculture, Food and Rural Affairs (MAFRA). Through this model, KOWEPO can secure GHG reduction performance (expected to total 500,000 tons) while farms can increase returns due to energy reduction and save a huge initial investment cost.



**Reducing GHG using Fishery Waste as a Substitute for Limestone** | Oyster shell, which is the contamination source of the waterfront, was developed as a useful resource that can substitute limestone, which is the base material for the desulfurization of power plants, and it is expected that the substitution can increase fishermen' income by reducing the reclamation costs by cutting about 130,000 tons of CO<sub>2</sub> annually.

## Independent GHG Reduction Model Roadmap

Business Case 💿

KOWEPO built a mid and long term roadmap for its own reduction model to implement the national GHG reduction and corporate reduction duty, and is expanding the application to the agriculture area from the existing SMEs external reduction project. It is planned to expand the application to the marine and fisheries, and construction. Also, the company will share and spread the best practices for the expanded application to other institutions so that it can contribute to the national GHG reduction.



Starting with the first Green Credit completion ceremony in 2012, 10,000 tons of GHG emissions were cut by supporting 13 SMEs up to now that largely contributed to the reduction of SMEs' production costs.





Conclusion of KOWEPO-Chungcheongnam-do-MAFRA Agreement (Nov. 2015)



Carbon Offset Activity 'Carbon minus, forest plus'

## Low Carbon Management to the Future

#### Acquiring Carbon Emission Certification for All Products

KOWEPO acquired the first carbon emission certification in the domestic power sector in 2012 based on its participation in the 'LCI DB (Life Cycle Inventory Database) establishment project' by the government from the initial stage of the CFL (Carbon Footprint Labeling) certification system launch. The company also prepared a certification standard and contributed largely to dissemination by obtaining Korea's first low carbon product certification and carbon neutral product certification for the power generation byproducts in 2014.

\* Amount of GHG emission before manufacturing products: include total amount of GHG emission generated during the production and transfer of raw materials for electricity generation (2015: 1,646,739 tCO<sub>2</sub>eq)

#### Low Carbon Product Certification

(Unit: byproduct gCO<sub>2</sub>e/kg, electricity gCO<sub>2</sub>e/kWh)

Category		Carbon Em	Carbon Emissions Low Carbon Product					
		Taean De- sulfurized Gypsum	Taean Elec- tricity	Taean Refined Ash*	Pyeongtaek Desulfurized Gypsum	Seoincheon Electricity	Gusan Elec- tricity	Pyeongtaek Electricity
	Stage before Production	2.51	12.96	0	6.4~w	84.18	79.72	82.74
Amount Certified	Production Stage	171.04	940.12	13.78	56.48	392.48	371.31	488.73
	Total Amount Certified	173.6	953.1	13.78	62.88	476.7	451	571.4

\* Acquisition of Taean refined ash carbon neutral product certification: carbon offset of 33,558 tCO2e for three years (Dec. 23, 2014-Dec. 22, 2017)

## Activity of Sharing and Spreading Low Carbon Management

KOWEPO as a host of the GHG reduction research group in the power generation and energy business category implements activities to disseminate KOWEPO's expertise on low carbon management, and GHG emission estimation and monitoring to 43 related companies.

## **Major Sharing Activitie**

- Published an expert column for <sup>Г</sup>Climate Change Newsletter (Korea Environmental Industry and Technology Institute) to spread low carbon management (Apr. 2015)
- Presented best KOWEPO's reduction project case at Power Conference (Dec. 2015)
- GHG MRV Infrastructure Advancement project in power and energy business category (Apr.-Nov. 2016)
- Held emission trading experts' forum for power and energy business category (Aug. 2016)
- Participated in Asia Power Week, US-Korea EIWG (energy industry working group) presentation (Sep. 2016)
- Published and distributed climate change glossary (Oct. 2016) and etc.

#### Creating environmental and social values via the acquisition of carbon emission certifications for all products

KOWEPO is leading low carbon management by conducting an evaluation on the entire GHG processes for produced electricity and power generation byproducts for the first time in Korea and acquiring CFP certification.

#### A Low Carbon product, 'Invisible Electricity'

KOWEPO obtained low carbon product certification for all three; Seoincheon combined cycle, Gunsan combined cycle and Pyeongtaek combined cycle that have a lower electricity carbon emission standard level than the domestic level. Low carbon product certification is the key resources for the GHG reduction of companies, and based on objective measurements KOWEPO puts its utmost efforts to decrease carbon emissions with the belief that electricity is a product by measuring carbon emissions via the certified standard and method and disclosing the measurement to consumers, and the public.

#### Reducing GHG by recycling wastes and byproducts

The company recycles waste and byproducts discharged from plants and sells them. In addition, it obtained the carbon emission certification (Nov. 2013, the first, recertified in 2016) and low carbon product certification (Apr. 2014) for refined ash and desulfurized gypsum for the first time in Korea to improve product value.



Business Case 🖸



#### Carbon Offsetting Activity, 'Minus Carbon Plus Forest'

The refined ash of Taean thermal power, which acquired low carbon product certification, was certified as Korea's first carbon neutral product (Dec. 2014) and the carbon offsetting activity was taken in April 2015. Taean's refined ash offset 3,400 tons of carbon emissions for three years through creating a forest and settling the emission permit purchase and allows the company to supply the eco-friendliest carbon zero product to consumers.



**Emission Trading Experts Forum** 

(Aug. 2016)

Goal

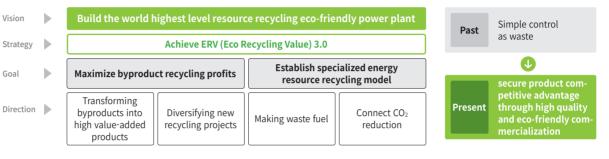
2015년 01월 12일 월요일

## **Build the Resource Recycling Eco-friendly Power Plant**

## Implementing the Differentiation Strategy for Power Generation Byproducts

In order to respond to changes of the byproduct recycling market and to foster clean water around power plants, KOWEPO established and implements the byproduct differentiation strategy. In particular, power plants are reforming into eco-friendly resource recycling plants by drawing improvement tasks under four implementation directions such as adding high values to byproducts and making bio waste-based fuel.

#### Mid and Long Term Byproduct Recycling Strategy



#### **Develop Recycling Technology**

In order to manage waste including fly ashes generated inevitably from the power generation process, KOWEPO prepared resource recovery technology that can increase the mixing ratio of fly ashes such as eco-concrete development, road excavation restoring material and asphalt filling material while creating new demand.

Recycling Usage	Cooperating Institution and Technology
Eco-concrete	Korea Institute of Construction Technology, academia, etc. / technology to increase the mixing ratio of fly ashes of concrete
Asphalt filling material	Chungcheongnam-do-KOWEPO-F1 Tech. / substitute asphalt filling material for cinder

#### **Power Generation Byproduct Eco Marketing**

KOWEPO is implementing product differentiation and branding for byproducts through proactive Eco Marketing for the first time among power plants deviating from passive sales. In 2015, the company implemented improvement on the perception that byproducts were low quality by promoting product excellence (distributed brochures and meetings (3 times) while setting up and implementing the peak and low season sales measures by considering the characteristics of the demand for fly ashes, which is affected greatly by seasonal conditions and construction business.

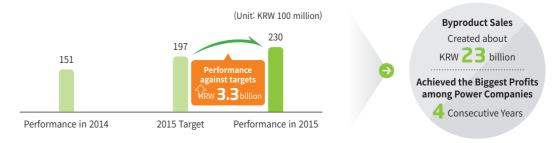
#### Acquisition of Byproduct Carbon Certification

KOWEPO is reinforcing the recycling competitiveness through the eco-friendly commercialization of byproducts. Taean's refined ash and Pyeontaek's desulfurized gypsum were certified as Korea's first CFP 'low carbon product' in April 2014 and carbon neutral product certification was obtained for fly ashes in December 2014.

Low Carbon Certification Mark on Carrying Out Vehicle

### **Byproduct Recycling Result**

KOWEPO recycled 1.81 million tons (1.34 million tons of fly ashes and 470,000 tons of desulfurized gypsum) of byproducts and created KRW 23 billion in sales profits (KRW 16.5 billion of fly ashes and KRW 6.5 billion of desulfurized gypsum) in 2015. The company plans to set up and carry out the recycling expansion plan including new demand for development and exports with the five power generation companies to proactively respond to the further excessive supply of desulfurized gypsum due to the completion of the coal-fired thermal power plant in 2016.





뒷생다



Conferment of Carbon Neutral Product Certification

## 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.

- Opportunity Boost corporate value and expand business opportunities through the acquisition of various environmental certification
  - Prevent economic losses including damage compensation when accidents occur by purchasing environmental impairment liability insurance



- Environment related corporate activity information disclosure request and expansion scope
  - Reinforcement of environment related regulations including act on registration, evaluation, etc. of chemicals and chemicals control act

## **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.

### 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

## Long Term Plan (2020~2030)

**Complete replacement of environment facility** Reduce by 45% by replacing envi-

ronment 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,

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 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.





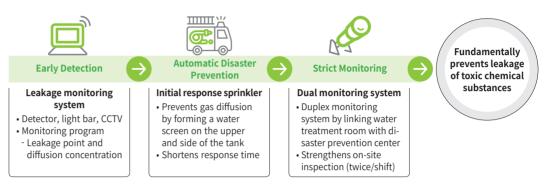
Signboard Hanging Ceremony as an Exemplary Operation Site of Voluntary Agreement for Total Air Pollutant Load Management

## 61

## **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.



## Spread of Chemical Control Culture

Due to recent chemical leakage in other companies, damage to the environment and human life and property has been continuously caused. To this end, KOWEPO has implemented various activities to raise awareness such as consigned education by specialized institutions for the handlers and mangers of toxic chemicals, safety training and private and a public joint disaster drill for all employees.

## **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.

**Toxic Substance Inspection Plan** | Implement triple cross check by toxic substance manager, personnel in charge of the facility and field workers who completed toxic substance safety training, and special safety checks (twice/ year) by external experts through operation sites.

**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 capabili- ties for actual situations by establishing a field action manual including initial measures in case of toxic chemical leakage acci- dents, operation of disaster control head office and evacuation of residents, and by conducting internal training and joint control drills with external institu- tions (over twice/year) by operation site	Install leakage detectors, CCTVs and light bars in tox- ic substance handling facil- ities to monitor real-time toxic substance leakages	Organize a team that specializes in controlling chemical substance leak- ages and contamination with professional license holders who majored in relevant studies (environ- ment, chemistry, chemical engineering) and complet- ed specialized training to perform special emergency activities including con- taminant elimination when leakage accident occurs

## Law Observation

Act on registration, evaluation, etc. of chemicals and the chemicals control act that was enacted from 2015 requires the tighter chemical substance control of companies. KOWEPO preemptively responds to environment regulation reinforcement by establishing a total response plan for the enterprise chemical substance control based on diagnosis by external expert agencies.



Private and Public Joint Mock Training

## **Implement Environmental Impact Survey**

The degree of the environmental impact of power plant construction and operation on surrounding areas is reported to the Ministry of Environment after a periodical study and analysis and the results are reflected to the environmental management of divisions and the related establishment of countermeasures.

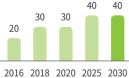
Category	Survey Cycle	Survey Area	Survey Item
Air Quality	Quarterly	14 locations in surrounding areas	8 items including PM-10, SO <sub>2</sub>
Soil	Quarterly	7 locations in surrounding	8 items including pH, Cd, As
Noise, Vibration	Quarterly	4 locations in surrounding	Noise and vibration
Water Quality	Quarterly	13 peaks in surrounding waters	18 items including pH, COD, DO
Marine Ecosystem	Quarterly	19 peaks in surrounding waters	5 items of animal and plant plankton
Marine Physics	Quarterly	35 locations in waters off 10km radius from power station	5 items including water temperature, salinity, tide level
Land Ecosystem	Quarterly	12 locations within a 20km radius from the power station	Land flora and fauna



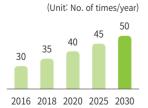
#### Information Disclosure Target

Implementation of Environmental Information Disclosure Activity

(Unit: No. of times/year)



Win-Win Cooperation Low Carbon 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.

#### Notice Details

- Name, address and main telephone number of an operation site
- Solution: Toxic chemical handling information: type, maleficence, accident risk
- Response information for the occurrence of accidents: range of influence, control equipment possession status, warning transfer method, action tips, emergency contact institution and contact numbers, etc.

## 2015 Key Performance



Number of Violations of Environmental Regulations



Number of Communication Meetings held

**12** meetings

**Beyond Legal Standards** 

**Compliance with** 

and Implementation of Environmental Regulations Efforts to Create Environmental · Safety Values

Minimization of Environmental Impacts Environmental Law Observance and Accident Prevention

## **Environmental Law Observance and Accident Prevention**



KOWEPO implements eco-friendly management by applying proactive and comprehensive environmental standards rather than observing the minimum regulations.

## **Observing Environmental Regulations**

KOWEPO set up and complies with control standards for air and water quality contaminants (30% to legal standards) and waste (75% of fly ashes recycled) through voluntary environment control efforts. Major power generation divisions such as Taean and Pyeongtaek are fully prepared for minimizing environmental contamination by concluding environment agreements with local governments. In addition, the company strives for the stabilization of handling chemical substances by setting up outside impact evaluation and hazard control plans for toxic chemical substances handled at power plants for preemptive response to the reinforcement of environmental regulations including the <sup>[</sup>Toxic Chemicals Control Act].

Category	SOx	NOx	Dust
Effluent Quality Standard <sup>1)</sup>	100	140	25
Agreed Environment Standard <sup>2)</sup>	50	100	25
Internal Standard <sup>3)</sup>	30	90	7.5

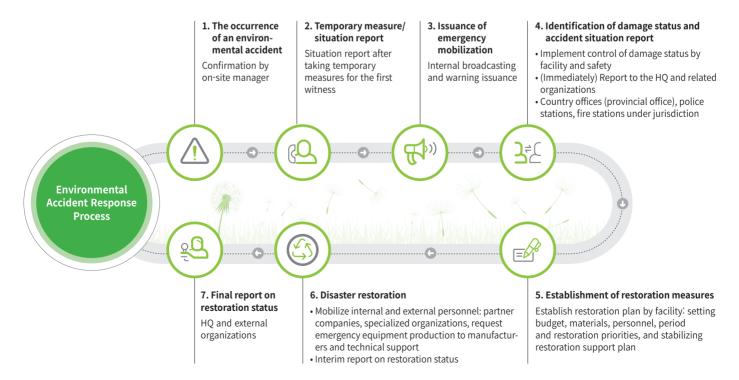
1) Effluent Quality Standard: enforcement regulations of the Clean Air Conservation Act

2) Agreed Standard: environment agreement between Taean-gun ↔ KOWEPO (May 30, 2014) – agreement with Taean-gun to minimize environmental contamination in advance by extension and the operation of Taean thermal power to foster an ideal and eco-friendly living environment and increase the health of residents

3) Internal Standard: challenging goals (S/G) to be achieved via the optimal operation of the environment facility

## **Reinforcing the Environment Accident Response System**

With the principle of zero environment accidents, possible accident types are classified and defined and the integrated emergency response organization was created and is operated for a swift response. The company also purchased environment impairment liability insurance for effective aid for victims in case of environmental contamination damage due to an environment accident.



# **Reinforcement of Emergency Safety Management Core Issue Implementation System**

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 set a vision of 'Safety Together, create Future' to create the future of KOWEPO with safety management, and 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.



% Main implementation tasks of 2015: 1, 2, 3, 6, 7, 1, 12

## **Upgrade Safety Control Implementation System**

## Safety Control Governance Operation

With the Safety Officer System led by the CEO and head of the Engineering Division and the operation of the quarterly safety management committee consisting of internal and external experts, KOWEPO implements specialized safety control through communication and cooperation.

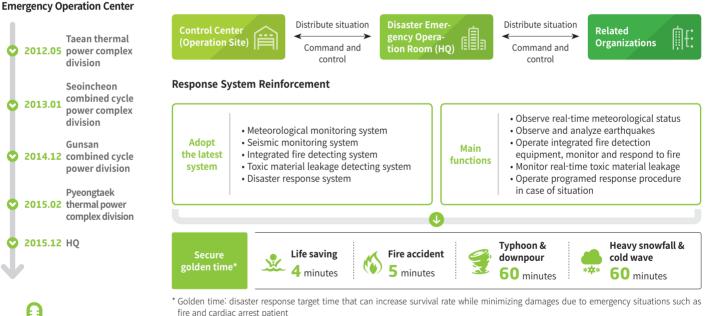
#### **Executing Organization**



## **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.

#### **Enterprise Disaster Response Process**





Voice of Stakeholders

Status of Establishment of

division

division

Gunsan

Pyeongtaek

Seoincheon

C

2013.01

2015.12 HQ

## "Thorough prevention education is the foundation of KOWEPO's safety management"

Pyeongtaek thermal power complex division obtained the highest level of P from the process safety management (PSM) evaluation on the control system in 2014 followed by in 2010 to prevent accidents including the social issues of explosion, fire or leakage. This is a remarkable result that the Pyeongtaek thermal power complex division is the only one that achieved P level within KOWEPO and also among domestic power plants. The secret to the acquisition of the P level is thorough safety training, which includes regular division-wide training by the managing director of the division, and two or more hours of monthly training by the team as well as the education of the external expert agency, and that raises safety awareness. In addition, safety culture is spread through the real-time sharing of work risks and risk elements via the intranet.

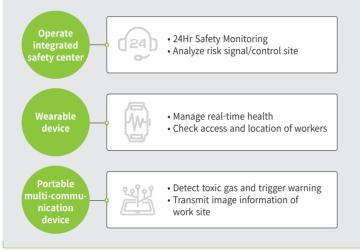
Byeong-sun Cho, Deputy Manager of Safety & Quality Team, Pyeongtaek thermal power complex division

## Establishment of ICT-based Integrated Safety Management System of Korea's First Taean IGCC

## Business Case 🖸

For the establishment of the preemptive safety management system, KOWEPO created a customized, real-time integrated safety control system by applying Korea's first new ICT technology to establish the preemptive safety management system of Taean IGCC. Moreover, the IGCC special safety committee was held prior to the full-scale commissioning to conduct special IGCC safety inspections. At the same time, the company established the protection system (22 sites including gasification, oxygen facilities) for access control and emergency response by risk level; discovered risk factors by process in advance via safety construction supervision by residing chemical engineers (940 cases); and set up and operates guidelines. KOWEPO plans to put continual efforts to prepare the foundation for the safety-first operation site through regular safety inspections.

#### Preemptive Safety Management System of Taean IGCC



#### Held Special Safety Committee

In April 2015, the special safety inspection for IGCC was conducted prior to full-scale commissioning. The special safety committee consists of eight internal members and external expert members in chemical engineering, gas, fire protection and PSM fields, and inspected KOW-EPO-construction companies <sup>¬</sup>preliminary risk assessment<sub>J</sub> method for safety securement. In addition, each construction company gave a presentation on safety design by plant including gasification facility, combined facility and oxygen facility, and then they discussed the plans for establishing the IGCC safety system.



## 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-OHSMS18001, OHSAS18001

2015 Key Performance





Certification

\* 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) Efforts to Create Environmental · Safety Values Reinforcement of Emergency Safety Management Implementation System Substantializing Disaster Countermeasure Drill Creating Win-Win Corporate Ecosystem with Society

## Substantializing Disaster Countermeasure Drill

KOWEPO strengthens its disaster response capabilities by implementing regular disaster response drills and setting up on-site action manuals with experts.



# 2015 Disaster Response Drill (Expanded by 30% compared to 2014) 257



Conducted private and a public joint drill for marine pollution control

## **Expansion of Disaster Response Drill**

The company carried out 257 times of disaster response drills in 2015 which increased by 30% from 2014, and increased the number of random message training by the management from twice per year to frequent implementation. By examining scenarios with experts twice per quarter and evaluating training, each responsible personnel are learning their duties. The CEO conducts evaluation meetings twice a month to carry out regular improvements on any insufficient items in the drills.

## Seoincheon combined cycle power complex division: earthquake preparation



Seoincheon thermal power in line with eight related organizations including Seoincheon fire station implemented the '2016 disaster response safety Korea drill'. It was to prepare for fire and hydrochloric acid leakage due to earthquakes and carried out reality based repeated training with the organic cooperation of related organizations.

## Taean thermal power complex division: toxic material leakage preparation



Taean thermal power complex division conducted the emergency control drill for ammonia leakage due to earthquakes. A swift restoration drill was carried out with the quick reaction of high-performance fire engines and ambulances, and initial responses and the identification of facility damage conditions by ten control agents of the company.

## **Improvement of On-site Action Manual**

The manual is regularly updated by reflecting the evaluation results of the disaster response drills. KOWEPO produces portable handbooks and implements continuous improvement activities such as simplifying the manual for the convenience of employees.

## **Reinforcement of Earthquake Prevention Activity**

KOWEPO increased the company-wide seismic resistance rate by reinforcing the seismic-resistance of plants, and regularly operates auto analysis on damage occurrence and the situation dissemination system for over a 3.0 magnitude earthquake. At the same time, earthquake safety labeling is operated in 20 buildings including the Pyeongtaek general office building. These efforts resulted in achieving success at the external awards of disaster and accident safety.



67

## National Safety Diagnosis, Implementation of Joint Inspection

KOWEPO implemented the national safety diagnosis to eliminate the risk factors of electric power facilities, raise safety culture awareness and lay the groundwork for the stable power supply in March 2015. The National safety diagnosis is a national diagnostic activity to check all facilities that pose threats to the safety and to devise special countermeasures for fundamental corrective actions of risk factors from the diagnosis results. KOWEPO, for the first time in the power generation sector, organized their own safety inspection unit consisting of 47 personnel including private experts and advisors and conducted inspections for all operation sites unlike the existing safety inspection. In particular, the inspection unit focused on activities to improve safety culture awareness and on-site inspection to eliminate safety obstructions.



## Make a Safe and healthy workplace

## **Operation of Occupational Safety and Health Committee**

KOWEPO complies with the occupational safety and health act. According to related regulations and organization agreements, the meeting of the occupational safety health committee consisting of nine members from both the labor and management is held at five operation sites, and issues unresolved at each site or enterprise issues are discussed at the enterprise occupational safety and health committee meeting which is held semiannually. The safety of all employees is guaranteed by the collective agreement and program stated by the occupational safety and health committee. Health managers are also appointed to the headquarters and all sites for improving the health of employees. Honorary occupational safety supervisors are appointed for each site for occupational safety.

#### Create a Safe and Healthy Management via Labor-Management Cooperation

KOWEPO strengthened disaster safety management and health management systems with labor-management cooperation. As a result, the company awarded with both 'the Presidential prize at the Korea Safety Award' and the Minister prize from the Ministry of Public Safety and Security at the same time, and received the highest grade on the Korea disaster response safety exercise by the Ministry of Trade, Industry and Energy for four consecutive years.

## The 14<sup>th</sup> Korea Safety Award (the Presidential Prize)

......

e 24



The 14th Korea Safety Award

#### Strengthen Disaster Safety Management



- Introduced safety mileage system for the first time in power generation sector
- Expanded labor-management joint disaster and safety response system
- Solely established emergency operation centers for all operation sites in the power generation sector and increased the number of disaster response exercises

#### Strengthen Health Management

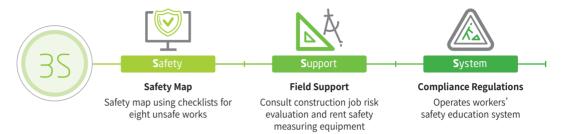


- Established own emergency response plan for MERS and distributed manuals quickly across the company
- Specialized health management, recruited health managers and installed medical service office

## Spread of Supply Chain Safety Culture

## Win-Win 3S Safety Cooperation System

Safety and disaster accidents are prevented through the establishment of 'win-win 3S safety cooperation system' with partner companies.



## Support Safety Management of Partner Company

In 2015, potential risk elements in the field are actively discovered with joint inspections and work risk assessment for concerned locations regarding accidents, and safety training and rental equipment are also implemented to raise the safety awareness level throughout the company.





Implementation of Safety Education for Partner Companies Sa

Safety Training

**Focused Inspection of Win-Win Consortium** | KOWEPO implements focused the inspection of the win-win consortium for operation sites with concerns over accidents including falls and stenosis. In 2015, inspections were conducted 44 times and a total of 1,434 measures were taken.

**Safety and Health Management Certification of Partner Company** | In order to improve the safety and health awareness of partner companies, the compulsory safety and health management certification system is applied to partner companies. OHSAS 18001 and KOSHA must be acquired and six companies have obtained corresponding certifications at present.

### Safety Cooperation System Result

KOWEPO is strengthening its safety management activities based on its vision, 'Safety Together, Create Future'. Since 2011, safety budgets have been steadily increasing while the level of safety awareness has increased from the previous year to 83.2.





#### 'safety sinmungo' application (safepeople.go.kr)

App wwhich allows users to report the safety threats of their lives whenever they find the threats regardless of their locations, can be utilized and promoted by all employees. (Ministry of Public Safety and Security Developed)



Win-Win Consortium Joint Inspection





## Creating Win-Win Corporate Ecosystem with Society

KOWEPO strives to realize an organizational culture in which discrimination based on personal characteristics is strictly prohibited and employees are recognized based on job competencies. To this end, the company aims to recruit talent based on work performances and reinforce the individual capacities of employees with a talent nurturing program while improving employees' satisfaction through fair performance evaluation and rewards, and welfare. Meanwhile, as the competition structure of the company is expanded to the range of the company supply chain including partner companies, KOWEPO is building a virtuous cycle symbiosis relationship by supporting social responsibilities and the capability reinforcement of partner companies beyond a simple business partnership. Moreover, the company as a corporate citizen maintains a positive partnership with local communities in which power plants are located by actively engaging in addressing social issues with substantial support.



Efforts to Create Environmental · Safety Values

#### Creating Win-Win Corporate Ecosystem with Society Recruiting Job Performance-Oriented Talent

## **Recruiting Job Performance-Oriented Talent**

KOWEPO seeks talent who lead changes with passion and a challenging spirit based on differentiated global capabilities and expertise, and who cooperate with each other based on trust. In addition, it pursues open recruitment for the socially disadvantaged by providing fair employment opportunities via the NCS (National Competency Standard)-based recruiting method.

## **Job Competency-Oriented Recruitment**

KOWEPO strictly prohibits discrimination based on academic background, gender, age and religion in the recruiting process by implementing the NCS-oriented job competency evaluation system beyond specification. Evaluation results regardless of job competency are not regarded and talent with competencies are selected through work-oriented interviews. As a result, work satisfaction and the organizational commitment of new employees rose and that led to an increase in work efficiency, and a halfway resign rate was largely reduced from 8% in 2014 to 2% in 2015.



New employees of entering ceremony

## Securing and Nurturing Talent for Taean where the HQ relocated

The company continues to secure and foster excellent talent in the region where the HQ is located. Internship programs, job fairs and a mentoring system are implemented in conjunction with local universities to foster excellent talent, and over 10% of the total employment is from regional talent recruitment through recruitment allocation and additional point systems.

#### **Current Status of Recruitment**

**Respect for Rights and Diversity** 

Category	2013	2014	2015
Permanent Employees	210	160	97
Female	41	33	15
Handicapped	6	1	6
Talent from non-metropolitan areas	106	80	54
Talent from Taean	15	13	12
High-school graduates	65	50	23
Flextime	0	9	5

#### KOWEPO Code of Conduct

https://www.iwest.co.kr/ clean/wpem/wpem.006. asp?mcd=CE004005#004



KOWEPO sternly forbids discrimination by the characteristics of individuals, such as age, gender, academic background, religion. In addition, it complies with ten principles in four sectors of human rights, labor, environment and anticorruption that are suggested by the UNGC, and supports the Universal Declaration of Human Rights adopted at the UN General Assembly and labor standard suggested by the International Labor Organization. In case of conflict between the company's policy and legislation of the district, we apply the higher level human rights standard while complying with the standards of labor, human rights and working conditions of all nations and regions in which the businesses are conducted. KOWEPO's human rights policy was established on the basis of <sup>Г</sup>KOWEPO Code of Conduct\*J, and is applied equally to all stakeholders including employees, customers, partner companies and local communities.

Read more on the human rights policy of KOWEPO (p. 95). 📀



(Unit: persons)

Business Case 💿

## **Fostering the Best Human Resource and Fair Remuneration**

To enhance the individual capability of employees, KOWEPO operates specialized education programs. With this, a systematic program is carried out that can boost the individual values of the employees and goes together toward the company's vision and goals.



## **2015 Talent Fostering Direction**

Adopt the government policy	Enhance capability of main projects	Educate internal capability reinforcement
<ul> <li>Build an education system for</li></ul>	<ul> <li>Foster engineers</li> <li>Implement education customized</li></ul>	<ul> <li>Educate to improve changes in</li></ul>
high-school graduates <li>Continue systematic education</li>	for overseas projects <li>Improve response capabilities for</li>	management capabilities <li>Cultivate practical work skills of</li>
for female talent	climate change conventions	information security manpower <li>Foster internal lecturers</li>

## **Business Conditions considered Staffing**

The competitiveness of the main businesses is reinforced through core business-related staffing including domestic renewable businesses, such as Hwasun wind power and Seoincheon fuel cells, and safety and quality. Moreover, the company is leading the core business by implementing customized education through projects and jobs while strengthening the capabilities of internal experts.

## **Staffing in Four Sectors**



**Domestic Renewable** Operating temporary organization and staffing by reflecting project characteristics

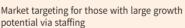


## Fuel Supply and Demand

Strategic purchase of fuel and the reinforcement of risk management via staffing



Overseas Project





#### Safety and Quality

Disposition switch of civil/architecture employees to safety management after specialized training

## Securing Advanced Education and Training Infrastructure

KOWEPO operates an advanced HR development system to enable it to become a global power generation company. Employees set individual goals through discussions with their bosses and carry out capacity development activities based on the capacity development plan. In the course, bosses provide coaching and support for employees and share expertise through counseling on the capacity development path.

## **Implementation of Tailored Specialized Education**

In order to strengthen the leading capacity for the main businesses, such as engineer cultivation, overseas project professional capacity and the response capacity for the new climate regime, customized specialized education is implemented. Particularly, backup manpower pools are arranged to prepare for an increase in manpower needs consumed by overseas projects, and completing an overseas project education course is required. The course is composed of the common education of language and negotiations, job training of development/construction and financing, and expertise is shared based on team system by field.

Foster Engineers	Reinforce Overseas Project Professional Capacity	Reinforce New Climate Regime Response Capability
<ul> <li>Develop exercise-oriented maintenance training course</li> <li>Establish a certification system of power generation engineers</li> </ul>	<ul> <li>Secure excellent talent via the improvement of the operation system</li> <li>Vitalize education and expertise sharing system</li> </ul>	<ul> <li>Establish manpower training roadmap for climate and environment field</li> <li>Reinforce capacities via education and study groups</li> </ul>

Efforts to Create Environmental · Safety Values Creating Win-Win Corporate Ecosystem with Society Fostering the Best Human Resource and Fair Remuneration



Training for Internal Capacity Reinforcement

#### **Training for Internal Capacity Reinforcement**

KOWEPO plans to respond to current issues faced by strengthening its internal capacities regarding the communication culture and information security within the organization. The communication culture between employees is created through education on leadership and management change by level, and that helps with the sharing of internal information and addressing conflicts. Moreover, IT and information security training is conducted for experts in information security to eliminate the potential threats and prepare for various cyber-attacks while at the same time building a work expertise sharing system and fostering a field-oriented self-learning culture through the establishment of an internal lecturer cultivation system due to the relocation of the HQ.

#### **Cultivation of Female Managers**

As female employees of KOWEPO have increased greatly to 264 persons in 2015 from 222 persons in 2013, the 'Women's empowerment' program to cultivate female talent is conducted to improve organizational productivity. The program is consisted of two parts; the expansion of networking and people-to-people exchange as female mangers, and establishing a strategy to become successful female leaders, and motivate female employees to be female leaders.

#### **Training Status**

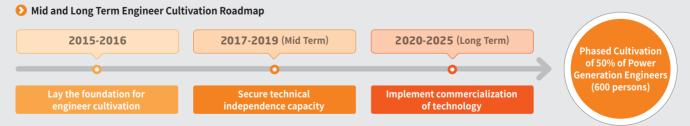
Category	Unit	2013	2014	2015
Training Expenses per Employee*	KRW 1,000/Person	3,038	1,446	1,476
Average Training Hours per Employee	Hours/Person	197	127	138

\* The training expenses per employee was decreased compared to 2013 due to the utilization of online training instead of in-house training due to the relocation of the headquarters. The online training enabled KOWEPO to minimize the training expenses including rents and transportation costs and also increased accessibility of employees to the training with utilization of PCs and smartphones.

#### Systematic Cultivation of Engineers for Improving the Competitiveness of Power Generation Technology

#### Business Case 💽

It is to strengthen the competitiveness of power generation technology by cultivating manpower who have professional skills, which enables the independent performance of operations, diagnosis and the maintenance of facilities, and the ability to manage and any oversights. KOWEPO will become a global energy company that achieves competitiveness by fostering phased power generation engineers by 2025.



#### **Power Generation Engineers Cultivation**

Our pursuit is to secure prevention diagnostic experts with strategies such as recruiting new experts and training internal manpower. In 2015, 250 persons were trained to be experts in power generation technology to prepare a base of technology commercialization. Stable facility operation reduced the number of failures by 53% compared to the previous year.



**Annual Training Performance** 

No. of Training Sessions

2013 2014 2015

#### **Operating Rational Welfare Program**

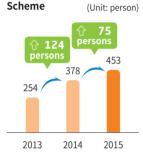
#### Welfare Program for All Employees

Multilateral information including the details of the implementation of internal labor welfare funds is disclosed transparently for employees. At the same time, the process of the labor-management joint welfare issue communication, in which the management participates, such as the labor-management council and CEO Hot-Line are frequently operated, and customized on-site communication is also conducted by working conditions and levels.

#### **Expansion of the Welfare System**

In 2015, the number of MOU hospitals, which offer discounts on medical treatment for employees, increased from five to nine, and employees' participation and harmony with residents by inviting and supporting local government cultural programs such as concerts and lectures. Efforts to boost internal and external communications are made by encouraging club activities and supporting external meetings and company-wide contests. Moreover, 'outplacement' programs for the preparation of retirement is offered to support prospective retirees to explore an optimal career search and redesign their lives through self-diagnosis and analysis.

#### Users of Flexible Work



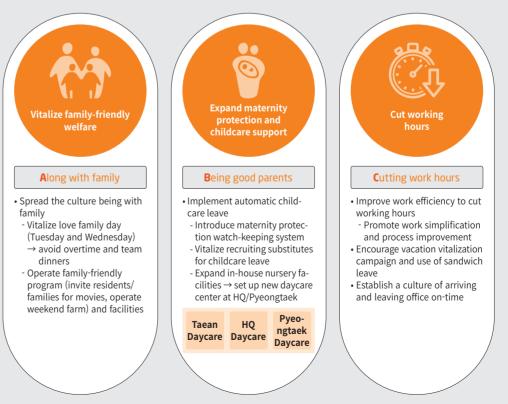
#### **Operation of the Flexible Work Scheme**

KOWEPO operates the flexible working hour scheme to build a culture of balance between work and family and to improve work productivity. The scheme consists of a flexible working hour system in which employees can adjust their working hours and a distance working system such as working from home. In order to identify how much the scheme is used practically and the areas for improvement, the company conducted an employee satisfaction survey after the introduction of the scheme.

#### Implementation of Family-friendly ABC Management

Business Case 🖸

KOWEPO is implementing a family-friendly ABC management including family-friendly welfare vitalization, maternity protection/childcare support expansion and cutting working hours, and is reinforcing support for a balanced family-work culture.





Taean Daycare in the company housing complex



Pyeongtaek Daycare

# **Expansion of Performance and Compensation Fairness**

KOWEPO set up the performance management system linked to the management strategy and performance index system for boosting strategy execution. With this, the connectivity between team KPI and the individual goal setting is reinforced and management by individual performance is differentiated. The company also aims to strengthen connection with promotion by operating a reasonable compensation system and to grade and expand performance compensation. The company doesn't apply discrimination by race, gender, age and religion to performance evaluation and compensation.

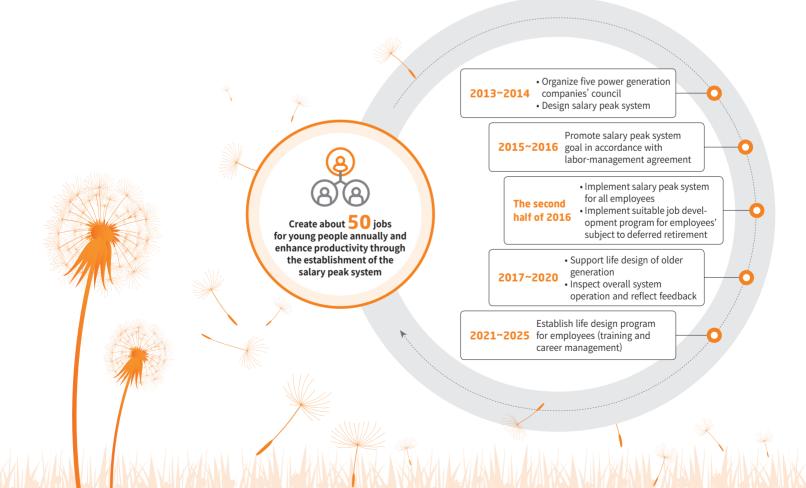
#### Current Status of Performance-based Salary System

Category	Level 1~3	Level 4
No. of Target	685 persons	1,327 persons
Graded Basic Annual Salary	±1.5%	No Difference in Grade
Proportion of Bonus	33%	22.7%
Range of Performance-based Salary Grade	Double	Double

## Introduce and Become a Leading Organization of Salary Peak System

KOWEPO is the first public institution which introduced the salary peak system by the agreement of labor and management, and the system contributes to the employment stability of the older generation and employment expansion for the younger generation. In 2014, we were able to have the highest level of acceptability in the power generation sector thanks to the groundwork for preemptive introduction, which was laid out through five power generation companies' council and system design consulting, and a consensus formed through negotiations and discussions led by the CEO. KOWEPO plans to become a leading public institution which creates new jobs and prepares for the aging era with financial resources saved through the salary peak system.

#### Vision and Roadmap



# **Vitalization of Corporate Culture**

Corporate culture is the identity of an organization and the origin of competitiveness. Socially, demand for a balance between life and work is increasing presently, and a great work place helps form the creative and dynamic thinking of employees and directly connects to the performance of a company. Hence, establishing a people-oriented corporate culture and realizing human resource management are essential factors for a company to secure competitiveness in the market.



#### **Challenging & Creative Corporate Culture**

KOWEPO has implemented Y&D\* corporate culture activity to respond to the rapid expansion of facility manpower due to large scale construction projects and to pursue young and dynamic culture from July 2012. In order to respond to rapidly changing business environment, such as the launch of the new climate regime and stagnant midto-long term growth engine, and accomplish the Vision 2025 successfully, 'Challenging & Creative' corporate culture has been set up and implemented to boost individual organizational competitiveness in 2016. \* Y&D: Young & Dynamic





#### Challenging & Creative Corporate Culture



## **Establishment of Advanced Labor-Management Culture**

KOWEPO established a strategy to advance labor-management relations by considering the company vision of 'a global company creating the value of labor-management coexistence based on trust and respect', and internal and external conditions, and implements strategic tasks. Specific goals by strategic direction are set to suggest a communal directing point for labor and management.

#### Setting a Mid and Long Term Roadmap linked to the Vision

#### "A global company creating value of the coexistence of labor-management based on trust and respect"

Direction	2014~2017 Short term	2018-2021 Mid term	2022~2025 Long term
Creating public value through coexistence	Lead stabilization of management in the public sector	Become the best customer satisfaction company	Sustainable management via USR*
Rational labor-management culture based on trust	Settle field completion type labor management	Win the grand prize at Best Labor- Management Culture Enterprise	Become a global leader in labor-management relations
Strengthen management issue cooperation for growth	Operate power generation facilities at the best level	Create new growth engine of power industry	Participate in management at OCED level /share responsibilities
Upgrade labor-management man- agement system through changes	Reinforce job performance-oriented compensation system	Stabilize labor-management joint innovation organization	Stabilize no-dispute free agreement

\* USR(Union Social Responsibility) : CSR is an expanded concept that corporations and unions cooperate with social responsibility



A happy moment of KOWEPO's family

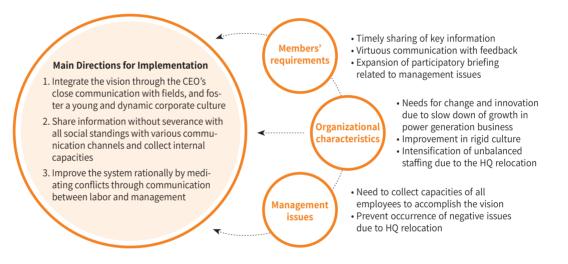
Efforts to Create Environmental · Safety Values Creating Win-Win Corporate Ecosystem with Society Vitalization of Corporate Culture



Vitalization of Organizational Culture

# Vitalization of Communication between Labor and Management

A consensus on improving the desirable innovation awareness is forming between labor and management through the vitalization of a virtuous cycle communication. By considering the requirements of members, the characteristics of the organization and management issues, main direction for implementation was set and are carried out systematically.



#### **CEO's Close Communication with the Field**

Necessity of innovating the corporate culture and the working method has been shared and the participation of all employees to achieve Vision 2025 goals is encouraged through the 'CEO's outreach briefing'. Ten tasks for the internal capacity collection are selected including the communication manner of respect and listening attentively, and the movement to share gratitude and compliments, and the execution is enhanced by establishing self-improvement plans through operation sites. The corporate culture of change and innovation is also being created through securing innovation experts, quality improvement and suggestions, and the reinforcement of study groups.

#### Improvement and Expansion of Communication Channels

Various communication channels are operated online and offline, and increases the accessibility of all employees. Representative communication channels are as follows.

Category	<b>Communication Channel</b>	Main Contents	2015 Performance
	Survey	Labor-management index, welfare satisfaction score, communication index, satisfaction on HR affairs	27 times
Online	Suggestion System	Power generation facility improvement, working environment improvement	10, 204 cases
Untine	KOWEPO Messenger	Work between employees, daily life, data exchange	Permanent
	SNS Group	Share schedule between labor and management, exchange pending issue information of the labor world	Permanent
	Complaint Settlement System	Transfer to different site, company housing assignment, admission into daycare center	11 cases
Offline	Briefing	Internal evaluation system, salary peak system	72 cases
Untine	CEO Mailbox	Install mailboxes at all operation sites to listen to opinions of employees	Permanent
	Mentor-Mentee System	Management-New Employee mentoring matching	97 employees

\* Other 12 communication channels are in operation



No Complication between Labor and Management

For **o** consecutive years

0 0 0

Agenda of Labor-Management Council

# **Establishment of Win-Win Partnership**

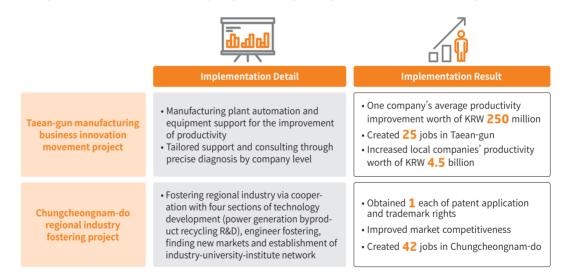
As the business competition structure, has recently escalated into competition between company supply chains including partner companies, the importance of the fulfillment of social responsibilities is growing from the supply chain perspective. To that end, KOWEPO is fostering a win-win culture with local communities and SMEs based on the shared growth vision of 'beyond collaboration, Create WP'.





#### **Reinforce Shared Growth with the Taean Region**

KOWEPO takes the lead in fostering a healthy corporate ecosystem. In particular, it established a plan for win-win cooperation with Taean-gun and substantializing SMEs' businesses in the region due to the change in location of the HQ in 2015. The company contributes to job creation and the productivity improvement of companies in the region through the expansion of the support target region including Taean-gun and cooperation with local governments.



#### **Reinforcement of SME's Capacity**

#### Supporting the Training of SMEs' Employees

KOWEPO implements training for employees of SMEs by utilizing its capacities. An innovation activity session by internal innovation experts and tailored training and meetings by tax accounting experts have been implemented. It also supports a 1:1 mentoring agreement for female experts of SMEs and KOWEPO female mangers.

#### Joint Project of Fostering SMEs between Public Energy Companies

KOWEPO concluded a business agreement for nurturing global energy SMEs with the Korea Gas Corporation. Omnidirectional support for energy SMEs located in the joint business areas of both public corporations is being strengthened. Also, an increase in sales by creating the synergy of supporting SMEs and expanding the markets of partner companies is expected due to the shared growth policy through the agreement.



Excellent SMEs' Products Demonstration



KOWEPO and Partner companies Employees

#### Naeilchaeum (filling tomorrow) Multi-Aid Project

In cooperation with the Small and Medium Business Corporation, the Naeilchaeum multi-aid project is implemented to encourage the long service of SMEs' employees and the flow of excellent talent into SMEs. This is a project that pays compensation to employees who work five or more years in incentive form by saving a something like installment savings by the owners of SMEs and their workers.

KOWEPO supports an additional KRW 100,000 on top of the individual saved money of SMEs' owners and workers, and offered benefits for a total of 102 persons by supporting KRW 600 million for five years.

#### Achieving Obligational Purchase Rate of SMEs' Products

The involvement of new SMEs through a competitive contract rather than a private contract with existing specific companies for the core maintenance work of power plants contributes to fostering the technology of the new companies. At the same time, company-wide discussions between the management and working-level was held to prepare short and long term measures for the improvement in SMEs' product purchase, and entry barrio for new companies are lowered by improving the restrictions of the contract system. With these efforts, KOWEPO exceeded the targeted obligation purchase rate of SMEs' products.

## **Finding Various Markets**

#### **Support Pioneering New Markets**

The company supports the new market discovery of SMEs through the joint purchase session, market pioneering group (roadshow) and participation in projects of the Small and medium Business Corporation. In 2015, we promoted 17 domestic and overseas market support projects. We also conducted satisfaction survey for partner companies participating in the project to listen to their opinions on the activities and reflect them in the future activity planning. In 2016, there are plans to share R&D case discovery and development challenges.

#### The first Korean public institution that opened an export supporting center in Iran

#### Business Case 🖸

KOWEPO opened the export supporting center in Iran for the first time among Korean public institutions as it sensed the atmosphere of the lifting of economic sanctions of Iran in advance. Due to the forecast that the growth potential of the Iranian electricity market is huge, we entered the market starting with marketing activities with the Iranian Electricity Corporation in August 2015 through the phased preliminary process.

#### Project Implementation Process

2015.04	Iran market monitoring/analysis
	<ul> <li>Iran market monitoring/analysis</li> <li>No. 1 electricity market in the middle east</li> <li>4.4% of expected economic growth rate in 2016</li> </ul>
2015.05	Establishment of strategy for joint expansion with partner SMEs to the Iranian market
<b>V</b>	
2015.07	Build a network with interested parties of Iran electricity corporation
	<ul> <li>Search/discover business partners</li> <li>Invite Iran buyers and demonstrate excellence of SMEs' product</li> </ul>
2015.08	Full-scale entry into Iranian market
2013.00	2

#### Implementation Result



# Reached USD 6.5 million of exports by five

companies including FIME UNICHEM

#### Other outcomes



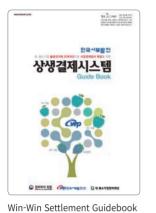
Promoted establishment of HaeGang Alloy's local manufacturing plant





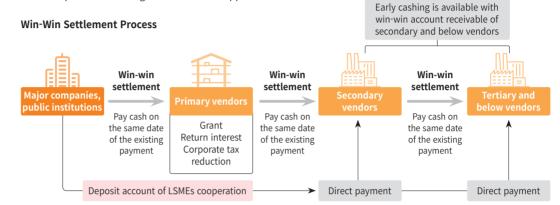


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#### Introduction of Win-Win Settlement System

KOWEPO added the win-win settlement system to the ERP system for the first time in the public sector and this allows partner SMEs to cash delivery payments at the same low level commission as KOWEPO. Unlike the previous method that has a large chain bankruptcy risk of secondary and tertiary partners in case of primary partner's bankruptcy, it is to secure the SME's ability to survive independently by reinforcing the liquidity funds of small businesses. In July 2016, the win-win settlement system was extended to secondary and tertiary partner companies to expand the coverage of substantial support.



# **Shared Growth Implementation Results**

KOWEPO implemented the adequate and differentiated shared growth activities to strengthen the substantial support for partner companies. As a result, the company achieved excellent performance including being named as the best institution for benefit sharing and the council for secondary and tertiary suppliers.



# Voice of Stakeholders



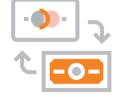
# "Send out applause for the various support and efforts of KOWEPO to growth together with partner companies"

Global Soil Construction Co. Ltd. (GSCO) was established as a power generation facility R&D company in 2011 and has continued its partnership with KOWEPO since late 2014. KOWEPO operates various systems for shared growth with partner companies, and GSCO acquired the national new technology certification with the 'cleaning system for rotary regenerative heat exchanger by using dry ice and steam' in 2016 based on financial, administrative and technical support from KOWEPO. This technology is expected to be exported to China and I believe that it will help to pioneer new overseas markets. As the entire power industry is undergoing difficult times, I would like to send out applause for the efforts of KOWEPO, which constantly considers the win-win partnership and shared growth and implements activities in better ways. I hope that the win-win, shared growth activities will continue based on the strengthened system that allows the sharing of the infrastructure and system through which the domestic power industry related SMEs can enter the overseas markets based on the global brand awareness of KOWEPO.

Efforts to Create Environmental · Safety Values Creating Win-Win Corporate Ecosystem with Society Establishment of Win-Win Partnership Implementation of Fair Trade

# **Implementation of Fair Trade**

In order to continue the partnership with partner companies, KOWEPO takes the lead in spreading the fair-trade culture voluntarily. In particular, the company endeavors to find target SMEs in the region due to the HQ's relocation to Taean, and strives to have transparency in its contracts.

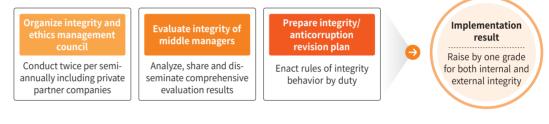


# Contract law revision laws regulations monitoring

# Reinforcing Internal Stability of Integrity Culture

The groundwork for fostering the fair-trade culture within the organizational culture is being prepared by improving the internal stability of integrity and the work process. Monitoring the system for revisions of contract regulations was newly installed and is implemented twice per month, and workshops for the responsible personnel of contracts are held to share revisions and have discussions on cases.

#### Improving the Climate of the Organizational Culture



# **Increase in Contract Transparency**

Prior to the actual bidding and contracting, the comments of the desire of companies to bid are collected and reflected by posting technical specifications and requirements for participating in a tender regarding the objective of a contract. Furthermore, KOWEPO plays a leading role in spreading the fair competition culture by protecting the socially disadvantaged through the expansion of 'SMEs collective supply compulsory contract system', which requires the composition of a consortium with local SMEs for entering construction bidding in the power generation facility category.

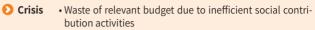
# **Improving Fuel Purchasing System**

KOWEPO improves the transparency of procedures for fuel purchases related to power plant operation. Moreover, it introduced and implements a system for fairness by providing opportunities for various partner companies by expanding competition.

———— Cate	egory	Before	<b>Ə</b> After
Improving transparency of	Improving registering method of biomass bidding documents	Register via post and visit	Register exclusive, secured bidding e-mail
purchase procedure	Introducing estimated price	Set up random target price con- sidering market conditions and declare void when exceeded	Determine estimated price within 10% margin from checked price
Reducing purchasing cost & securing	Lift quantity limit of new biomass supplier	Quantity allowed for new supplier: up to 5,000 tons	Abolition of the upper limit of supplying the quantity of new suppliers
transparency through completion expansion	Abolish negotiated contract	Conduct 1:1 negotiations with long-term contract supplier	Evaluate bid proposal of long- term contract supplier upon the request of mailing supply proposal

# Creating Community Shared Value Core Issue

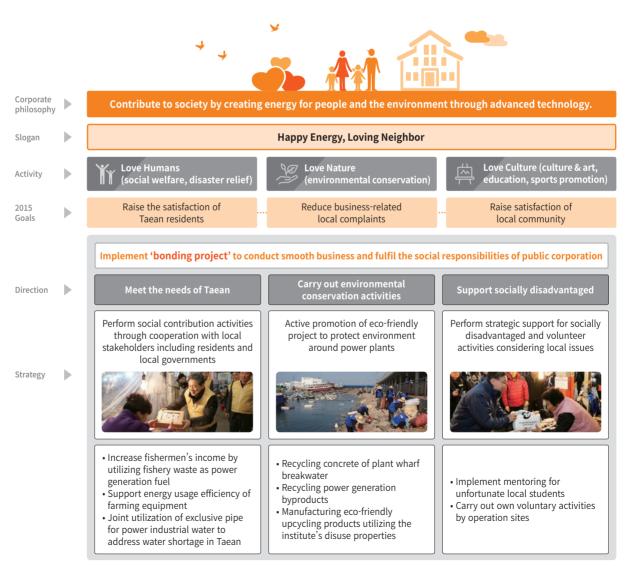
The operation sites of KOWEPO are located close to local communities and have a large impact on local economies, hence the coexistence with residents is significant. In 2015, KOWEPO, that opened the new Taean era in 2015, strived to become a beloved and trusted company by the residents.



- Distrust of local community due to temporary and one time social contribution activities
- 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

## **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.



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## 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 Taean 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 Taean, 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.



# A Real Social Contribution Activity

#### Please take care Taean

KOWEPO and global volunteer group of Seoul National University jointly carried out a supporting program to address the education gap between regions and boost local residents' capacities. We contributed to the vitalization of Taean's education and economy by implementing the education and mentoring camp targeting middle schoolers of Taean-gun and supporting the local cooperative association.

#### Seed Bank Account

'Seed Bank Account' is a uniquely specialized social contribution program of KOWEPO that sponsors savings to foster children and youths in vulnerable social groups in the surrounding areas of power plants into healthy members of society. The company donates a total of KRW 48 million annually by providing KRW 10,000 monthly for 400 children and youths through a partnership with the Korea National Council on Social Welfare.



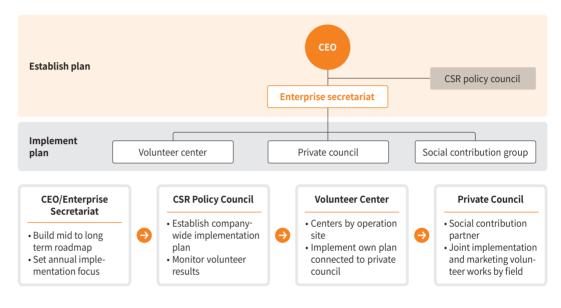


Size of Total Expenditure

KRW 260 million in total (Feb. 2011 ~ Jul. 2016)

#### **Execution Organization and Implementation System**

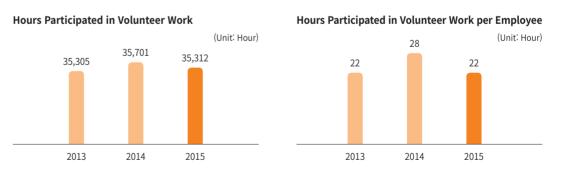
The social contributions of KOWEPO is led by the CEO, enterprise secretariat and CSR policy council, and the company established mid to long term and annual plans while volunteer centers by operation site and private council subsequently implement the plans. In particular, the CSR policy council was organized as a labor-management joint group under the immediate control of the CEO to seek the desirable directions and policies of social contribution activities from 2012, and the council shares the operation and activities guarterly.



#### **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. Employees of KOWEPO, which starts the first day of New Year with 'tteokguk (rice-cake soup)', who are promoted and have newly joined the company celebrate the occasion by participating in volunteer work rather than having dinners with coworkers. The love sharing fund, which is raised voluntarily by KOWEPO employees, is also used for volunteer work transparently and systematically. Under the slogan of 'happy energy, loving neighbor', KOWEPO will persistently strive to build a bright and healthy society while helping the disadvantaged.





#### 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 Taean was implemented with various field stakeholders including the global volunteer group of Seoul National University and the child center in the Taean region.

#### Love Sharing Fund KOWEPO raises funds for

volunteer activity expenses via the 'love sharing fund' and 'matching grant'. The love sharing fund consists of 'love salary Woosuri' and the 'social volunteer activity fund'.



#### Amount Collected for 2015 Love Sharing Fund

KRW 85.8 million

Love Salary, Woosuri Deduct leftover money under KRW 1,000 from monthly salary

Social Volunteer Activity Fund

Deduct KRW 1,000 per account according to the number of accounts opened voluntarily

## **Future Plan for Social Contribution Project**

KOWEPO plans to promote the win-win partnership project to improve the quality of lives in farming and fishing communities through the support of culture & art events and cooperative farm operation. Talent donation of employees for community vitalization with local communities will provide career experience programs for students, and concert sharing and sports club coaching will also be implemented.



\rm 1 Promoter volunteer activities 💈 New employee volunteer activities 🤋 Sharing new year's rice cake soup 4 Supporting 'Happiness Sharing Dinner'

# Voice of Stakeholders



#### "Look forward to continued social contribution activities that create social values while growing together with the local community"

The partnership between the Taean-gun seniors' welfare center and KOWEPO started at an event for 'the Month of Respect for the Aged' in 2010, and it has lasted up to the present date. 'Gimjang (kimchi-making for the winter) Communication' which is conducted every winter season is carried out for seniors who are welfare is complicated and has a great deal of significance.

On the other hand, many senior citizens who can contribute to local communities live in Taean. I think that utilizing the talent of the aged for future energy saving programs and campaigns targeting youth is a way of coexistence with the local community.

Please keep in mind that the social contribution activities of KOWEPO involves diverse stakeholders. It is considered that sharing a common vision through interactive communication rather than one-way will create social values that enables mutual growth with the local community beyond a simple social contribution activity.

Myeong-suk Cho, General Manager of Seniors Welfare Center, Taean-gun

2015 **Key Performance** 



Amount of Contributions for the Local Community\* KRW **400** million



Number of Participants in Volunteer Work

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

# **Social Contribution Activity**



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

## Taean 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 relationv ship 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 Taean, Seobu Market and purchased goods including daily necessaries 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. Challenges of KOWEPO for Sustained Growth

Efforts to Create Environmental · Safety Values



O Visiting traditional markets for New Year's Day
 Event of Sharing 'Rice for Warm Winter'
 Taean Community Child Center Joint Sports Festival
 Blood Donations of Love
 Rice Bucket Challenge

#### Seoincheon combined cycle power complex division

No.

# 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



# Volunteer Work for 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

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# **Sustainability Data**

# **Economic Data**

# Consolidated statements of financial position

Classification		Unit	2013	2014	2015
	Current assets		1,342,744	994,384	985,330
Assets	Non-current assets		5,811,194	7,226,002	8,222,542
То	Total assets		7,153,937	8,220,386	9,207,872
Equity and Liabilities	Total Equity	KRW million	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

# **Revenue by Major Business**

Business Divisions	Unit	2013	2014	2015
Power Generation Products	KRW million	5,746,450	4,830,497	4,210,718

# **Current Status of Shareholders**

Classification	Unit	2013	2014	2015
Korea's Electric Power Industry	%	100	100	100

# **Government subsidies**

Classification	Unit	2013	2014	2015
Government Subsidy	KRW 100 million	203,692	421,465	51,110

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# **Sustainability Data**

# **Economic Data**

# **Distribution of Economic Value**

Classification	n	Unit	2013	2014	2015	Remarks
Creation of Ed	conomic Value		58,496	50,090	43,886	Sum of sales and profits of other areas
	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
Distribution of	Government	KRW 100 million	(133)	419	1,324	Corporate tax, etc.
stakeholders	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	-

# **Intellectual Property Rights Status**

(From 2001 to June 2016)

Pat	ents	Utilitymodel Design Trademark		Total					
Application	Registration	Application	Registration	Application	Registration	Application	Registration	Application	Registration
295	235	123	99	16	15	5	5	439	354

## **Overseas Revenue and portions**

Classification	Unit	2013	2014	2015
Revenue	KRW 100 million	161	173	229
Revenue portion	%	0.28	0.36	0.54

# Facility capacity by electricity source

Classificati	on	Unit	2013	2014	2015
	Steam power		5,400	5,400	5,400
	Combined-cycle		3,482	3,867	3,867
	Solar power		25	25	25
Facility capacity	Small hydro power	MW	2	2	2
	Others(Fuel Cell, Wind Power)		8	21	1,753*
	Total		8,917	9,315	11,047
	Steam power		37,561	34,659	36,040
	Combined-cycle		20,480	15,648	11,923
	Solar power		28	32	32
Power generation output	Small hydro power	GMh	4	4	4
	Fuel Cell		-	29	82
	Wind Power		-	-	11
	Total		58,073	50,372	48,092

\* Include 1,176MW of Dongducheon combined-cycle project

# **Power generation Operation Status**

Classification	Unit	2013	2014	2015
Power transmission output	GMh	55,915	48,424	46,138
Forced outage rate	_ % .	0.286	0.083	0.138
Thermal efficiency	- %	41.39	41.18	41.08

# Power generation efficiency by electricity source

Classification	Unit	2013	2014	2015
Steam power	- % -	38.83	38.68	38.95
Combined-cycle	- % -	47.09	48.10	49.34
Small hydro power	-	-	-	-
Total	%	41.39	41.18	41.08

# Average operation rate by facility

Classification	Unit	2013	2014	2015
Taean Thermal		94.25	91.79	91.96
Pyeongtaek Thermal		89.81	90.57	94.72
Pyeongtaek Combined-Cycle		94.08	94.06	99.17
Seoincheon Combined-Cycle	%	93.01	94.58	95.97
Gunsan Combined-Cycle		89.71	94.04	74.76
Others		-	-	-
Total		92.85	92.51	91.64

Global Initiative Support The 3rd Party Assurance

GRI Index

# **Environmental Data**

# Investment in environmental facilities

Classification	Unit	2013	2014	2015
Environmental facility investment expenses		891	673	333
Environment sector operating expenses	KRW 100	1,198	626	700
Environmental sector R&D expenses*	million	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		39,048	34,640	33,667
Scope 2	1,000tCO2e	57	80	182
Total		39,105	34,720	33,849
GHG Emissions Intensity	tCO₂e/GWh	698	717	734

# **Energy consumption**

Unit	2013	2014	2015
	509,012	442,363	421,011
TJ	1,175	1,700	3,878
_	510,187	444,063	424,799
TJ/GWh	9.11	9.17	9.21
	 	TJ 510,187	TJ 509,012 442,363 TJ 1,175 1,700 510,187 444,063

# Greenhouse gas emissions by energy source

Classification	Unit	2013	2014	2015
Solid (Coal, etc)			27 222	
		28,386	27,222	26,657
Liquid (Heavy oil, etc)		2,545	1,357	2,434
Gas (natural gas)	1,000 ton <sup>-</sup> . CO <sub>2</sub> -eg .	7,982	5,956	4,450
Others	002.04	192	185	307
Total		39,105	34,720	33,849

# Energy consumption by energy source

Classification	Unit	2013	2014	2015
Solid (Coal, etc)		316,147	306,055	300,335
Liquid (Heavy oil, etc)		34,558	18,461	33,069
Gas (natural gas)	TJ	158,308	117,848	87,516
Others		1,175	1,700	3,878
Total		510,187	444,063	424,799

# **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		2,894	2,159	1,614
Biofuels		71	219	266
Power generation water	1,000 tons	8,683	8,268	8,409
Limestone	tons	299	247	293
Chemicals		19	15	15

# Air pollutant emissions

Classificat	ion	Unit	2013	2014	2015
SOx		14.4	15.0	15.0	
Emissions	Dusts	1,000 - tons	0.9	1.0	0.9
	NOx		29.1	25.6	24.7

# **Sustainability Data**

# **Environmental Data**

## **Waste Water Generation**

Classification		Unit	2013	2014	2015
	Generation	1 000 to as	944	894	955
Wastewater Recycling 1,000 tons	709	737	862		
	Recycling Rate	%	43	45	47
	COD		5,224	4,047	8,137
Wastewater discharge	SS	/g	1,010	1,793	631
amount	T-N	kg	5,068	2,911	7,308
	T-P		23	19	4
	COD		90	94	191
Wastewater discharge amount relative to basic	SS		17.4	42	15
	T-N	g/GWh	87.3	154	172
Т-Р			0.4	1.0	0.1

# Water consumption by supply source (power plant)

Classification	Unit	2013		2014		2015	
Classification	Unit	Amount used	Basic unit	Amount used	Basic unit	Amount used	Basic unit
Boryeong Dam (Taean)		6,441		6,480		6,219	
Namyang Lake (Pyeongtaek)	-	1,805		1,247		1,660	
Paldang Dam (Seoincheon)	<ul> <li>1,000 tons,</li> <li>L/MWH</li> </ul>	314	150	363	166	315	175
Oksan (Gunsan)	- =	123		179		215	
Total	-	8,683	-	8,268		8,409	

# Waste Management

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

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

## **Occupational accident rate**

Classification	Unit	2013	2014	2015
National occupational accident rate	0/	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

# 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

Global Initiative Support

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# **Social Data**

## **Employee status**

Classification		Unit	2013	2014	2015
Permanent	Male		1,763	1,805	1,836
employees	Female		211	236	241
Temporary	Male		0	0	3
employees	Female	<sup>−</sup> Number of <sup>−</sup> _ person <sub>-</sub>	1	0	2
Dugondor	Male	- peison -	1,763	1,805	1,839
By gender	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	%0	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

# Social responsibility through product purchase

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

\* Count number of maternity users among female employees

# **Overseas Marketing Support for SMEs**

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

# **Electronic bidding Performance**

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

## **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)

## **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.

# **Global Initiative Support**

#### Support SDGs

KOWEPO seeks to develop solutions to achieve and implement UN declared the Sustainable Development Goals (SDGs) to be attained by the international community following the Millennium Development Goals (MDGs).

#### **KOWEPO's Priority Goals and Related Activities**

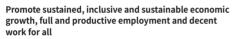
KOWEPO seeks to develop solutions to achieve and implement UN SDGs to seek new growth opportunities, thus discovering new growth opportunities and initiating sustainable growth as the UN declared the Sustainable Development Goals (SDGs).



**R** DECENT WORK A

# Ensure healthy lives and promote well-being for all at all ages

Establish response plan for diseases such as MERSC
Specialize health management and recruit health managers
Install dispensaries



• Create local jobs and improve the system related to job creation

Prepare various types of jobs including flexible hour job
Invest in infrastructure and carry out support service



#### Conserve and sustainably use the oceans, seas and marine resources for sustainable development • Assess environmental impacts on water quality, physical

environment and ecosystem of the ocean during the business operation

 $\bullet$  Reduce  $\text{CO}_2$  and cut landfill cost by recycling marine wastes including oyster shells



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

Build housing energy efficiency for energy poor households
Check energy state and share tips for energy saving

Replace briquette boilers and support briquette

# Take urgent action to combat climate change and its impacts

- Set up climate change response plan and strengthen governance
- Establish integrated GHG management system
   Carry out reduction activities including GHG reduction model operation



#### Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

 Assess environmental impacts on land ecosystem and soil during the business operation

Carry out environmental cleanup activities for neighborhood of power plants

The UN SDGs are the development agenda to be applied from this year up to 2030 by the UN. It covers 17 goals and specific targets including end extreme poverty, and fix climate change, as well as economic growth, job creation and sustainable industrialization, etc.

#### 17 Agenda of the UN SDGs

1 ‱ <b>#:**</b>	2 7EBO HIMBER	3 ADDRELATIN 	4 CONTINUE		6 CLEAN WATER AND SAME TO THE	7 ELEMENTER	8 EEENTINESKAN EEENKIMELEEENTIN	9 INCENTY INVANI AND INFLASTRACTION	10 INFORMATES	11 AND COMMANDES	12 ESPENSIES CONSUMPTION ADDRECCEDEN	13 :::::: ••••	14 HELDARANTER	15 88.000 		17 PARTHEESSAPS FORTHEESSAMS	
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Goal1	End poverty in all its forms everywhere	Goal10	Reduce inequality within and among countries
Goal2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Goal11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal3	Ensure healthy lives and promote well-being for all at all ages	Goal12	Ensure sustainable consumption and production patterns
Goal4	Ensure inclusive and equitable quality education and promote	Goal13	Take urgent action to combat climate change and its impacts
ooutri	lifelong learning opportunities for all	Goal14	Conserve and sustainably use the oceans, seas and marine resources
Goal5	Achieve gender equality and empower all women and girls	Goal14	for sustainable development
Goal6	Establish access to and sustainable maintenance system for drinking		Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and
C 17	Ensure access to affordable, reliable, sustainable and modern energy		reverse land degradation and halt biodiversity loss
Goal7	for all		Promote peaceful and inclusive societies for sustainable development.
Goal8	Promoto sustained inclusive and sustainable economic growth full		provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation		Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

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# **Declaration of Human Rights**

Korea Western Power Co., Ltd. (KOWEPO) complies with ten principles in four sectors of human rights, labor, environment and anticorruption proposed by the UNGC, and supports the labor standard suggested by the International Labor Organization along with the Universal Declaration of Human Rights adopted at the UN General Assembly. In case of conflict between the company's policy and the legislation of the district, we apply the higher level human rights standard while complying with the standards of labor, human rights and the working conditions of all nations and regions in which the businesses are conducted. KOWEPO's human rights policy was established on the basis of <code>FKOWEPO</code> Code of Conduct\*J, and is applied equally to all stakeholders including employees, customers, partner companies and local communities.

\* KOWEPO Code of Conduct: https://www.iwest.co.kr/clean/wpem/wpem.006.asp?mcd=CE004005#004

#### **Human Rights Approach**

#### **KOWEPO**

One, Establish a human rights policy to prevent human rights violations in business operations;

- **One,** Identifies and manages the concerns and expectations of stakeholders over human rights related issues, and makes efforts to reflect them to business operations; and
- One, Discloses human rights related activities and performances through a Sustainability Report.

## Principles of Human Rights

Human Rights Management toward Employees	<ul> <li>Observe regulations on working hours and paid leave stipulated by a country and region in which the head-quarters and plants are located</li> <li>Prohibit any discrimination on the grounds of gender, race, religion, handicap and background, etc.</li> <li>Prohibit wrong labor practices such as forced labor, child labor and hiring illegal aliens</li> <li>Comply with labor principles stipulated and recommended by the ILO and all labor principles ratified by the nation: safety, health, working hours, and freedom of assembly and association</li> </ul>
Human Rights Management toward Partner Companies	<ul> <li>Implement activities for mutual coexistence on equal position by respecting partner companies as partners</li> <li>Collect integrity pledge to prevent corruption from partner companies when concluding contracts</li> <li>Continue to strive for spreading human rights management to the employees of KOWEPO and of partner companies who work on operation sites (plants)</li> <li>Take proactive measures when identifying human rights related issues (legal, regulated salary, working hours, working conditions, etc.) in the supply chain, and conduct future case management</li> </ul>
Social Responsibility as a Member of the Local Community	<ul> <li>Prevent and manage elements that can violate the basic right to life and the human rights of residents of regions where power plants are located (operated)</li> <li>Operate channels to regularly collect and listen to the opinions and grievances of local residents</li> <li>Guarantee rights of residents through the continuous implementation of 'support project for the surrounding areas of power plants'</li> </ul>
Environmental Conservation and Safety Accident Prevention	<ul> <li>Pursue sustainable development that minimized environmental impacts accompanied by business operation</li> <li>Support preventive approach for environmental issues and implement projects from preventive perspective</li> <li>Report and disclose main environment data including energy, GHG, waste and water resources</li> <li>Provide safe and pleasant working environment, implement training regarding safety accident prevention, reinforce specialized capacity related to power generation facilities, and operate safety management manual</li> </ul>

# **The 3rd Party Assurance Statement**

The Business Institute for Sustainable Development (BISD), led by the Korea Chamber of Commerce & Industry, was requested by Korea Western Power Co., Ltd.(KOWEPO) to serve as an independent 'third-party assurance institute' for the '2015 KOWEPO Sustainable Management Report' (hereinafter 'Report'), and submits the assurance statement as follows.

#### **Purpose**

The purpose of this assurance report is to identify any major errors or biases in the Report, to conduct independent assurance procedures to determine whether the sustainable management issues of KOWEPO were appropriately reported, and to present an assurance opinion.

#### **Responsibilities and Independence**

This Report contains matters on KOWEPO's sustainable management efforts, achievements and future plans in 2014 and 2015. All responsibility regarding the drafting of the Report lies with KOWEPO.

In conducting assurance procedures on the Report and providing assurance opinions to the board of directors, BISD has no management-related interests in profits with KOWEPO, aside from carrying out third-party assurance, in order to maintain independence and autonomy.

#### **Assurance Standards and Restrictions**

BISD performed the assurance evaluation in consideration of the three accountability principles (inclusivity, materiality and responsiveness) of AA1000AS (2008) and the principles for defining report content and report quality of the Global Reporting Initiative G4 guidelines.

Physical inspections were conducted at the headquarters of KOWEPO located in Taean. The scope of the assurance evaluation was limited to only those performances stated in the Report and excludes data from previous years and data reported online. Furthermore, greenhouse gas data that has already been verified from another third-party organization was not subjected to the assurance evaluation.

#### **Major Assurance Procedures**

For the assurance process, KOWEPO's employees were engaged in interviews. Results from the interviews and other relevant documents provided by KOWEPO were examined. Major assurance procedures undertaken are as follows:

- Review of application of company's internal sustainability report standards
- Review of the Report contents and the information collection process
- Review of the materiality test process, core issues and company policies
- Performance of physical inspections and interviews with employees.

#### Opinions

BISD performed the assurance evaluation in accordance with the procedures identified above, and the Report was modified by KOWEPO if and when deemed necessary. Based on the assurance evaluation, BISD is not aware of any significant errors in the Report and confirmed that the Report was written in accordance with GRI G4 guidelines (comprehensive option).

The opinions of BISD produced as a result of its assurance evaluation and in consideration of the AA1000APS accountability standards are explained below.

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## Inclusivity

Does KOWEPO adhere to the principle of stakeholder engagement in order to ensure a responsible and strategic response in advancing sustainability management?

- KOWEPO gathered major concerns and opinions from core stakeholders, including its shareholders and investors, invested companies, government, NGO and international cooperating agency, local communities, customers, employees and partners.
- BISD is not aware of any significant stakeholder groups that were omitted from the process of gathering sustainability management issues through KOWEPO's stakeholder communication channels.

#### Materiality

Does KOWEPO include material issues that affect stakeholders in the entire spectrum of sustainability management in the Report?

- KOWEPO identified major issues through the materiality test and compiled opinions through a survey from each stakeholder group in the process of the materiality test process.
- BISD is not aware of any significant issues that were omitted from the process.

#### Responsiveness

Does KOWEPO respond appropriately to stakeholder issues?

- KOWEPO has acknowledged the impact of its business decisions on stakeholders and responded properly with coherent actions. The Report presents related performances during the reporting period.
- BISD is not aware of any violations of the principle of responsiveness in KOWEPO's response to major sustainability management issues or performances that are described in the Report from the perspective of materiality.

#### **Recommendations**

BISD makes the following recommendations within a scope that does not affect the assurance results:

- KOWEPO selected 10 key issues by conducting surveys and meetings to reflect various stakeholders' opinions and reported related major activities. BISD recommends KOWEPO continually identify stakeholders' interested topics, systematically manage the key issues selected and report the improved results.
- KOWEPO is expanding the entrance to foreign markets under the strategic direction of 'Jumping up to a global company with 1.5 trillion of overseas sales by 2025'. As the KOWEPO's sphere of influence expands, BISD suggests promoting meaningful social contribution activities in local communities abroad and reporting the results and outcomes.
- KOWEPO makes various efforts to advance the supply chain's safety culture such as the establishment of safety cooperation system, obligation of the health and safety management certification etc. BISD recommends KOWEPO support and manage the supply chain applying not only for safety but also diverse sustainability management aspects such as labor, environment and ethics.



October 2016 President **Park, Dong Min** 

# **GRI Index**

lacet Reported lacet Partially reported  $\bigcirc$  Not reported

GRI G4		ISO 26000	Level	Page
1. Gen	eral Standard Disclosures			
a. Stra	tegy and Analysis			
G4-1	Statement from the most senior decision maker of the organization about the relevance of sustainability to the organization and its strategy.	4.7, 6.2,	٠	4-5
G4-2	Description of key impacts, risks, and opportunities	- 7.4.2		18-19, 50-52
b. Orga	anizational Profile			
G4-3	Name of the organization	_	٠	6
G4-4	Primary brands, products, and/or services			6
G4-5	Location of organization's headquarters.	_		6
G4-6	Number of countries where the organization operates, and names of countries with either major operations or that are specifically relevant to the sustainability issues covered in the report		•	6
G4-7	Nature of ownership and legal form	-	٠	22-23, 89
G4-8	Markets served (including geographic breakdown, sectors served, and types of customers/beneficiaries).	-	•	6-7, 16-17
G4-9	Scale of the reporting organization	6.3.10,	•	6, 89, 93
G4-10	Total number of employees	- 6.4.1-6.4.5, _ 6.8.5, 7.8	•	93
G4-11	The percentage of total employees covered by collective bargaining agreements			98 💽
G4-12	The organization's supply chain	-	•	16-17, 78-8
G4-13	Any significant changes during the reporting period regarding the organization's size, structure, ownership, or its supply chain	-	•	15
G4-14	Explanation of whether and how the precautionary approach or principle is addressed by the organization	-	•	50-51
G4-15	Externally developed economic, environmental and social charters, principles, or other initiatives to which the organization subscribes or which it endorses	-	•	94-95
G4-16	Memberships of associations	-	•	105
EU1	Installed capacity, broken down by primary energy source and by regulatory regime		•	90
EU2	Net energy output broken down by primary energy source and by regulatory regime	-	•	90
EU3	Number of residential, industrial, institutional and commercial customer accounts	-	N/A	-
EU4	Length of above and underground transmission and distribution lines by regulatory regime	-	N/A	-
EU5	Allocation of CO2 emissions allowances or equivalent, broken down by carbon trading framework	-	•	56, 57
c. Iden	tified Material Aspects and Boundaries			
G4-17	<ul><li>a. All entities included in the organization's consolidated financial statements or equivalent documents</li><li>b. Explanation of whether any entity included in the organization's consolidated financial statements or equivalent documents is not covered by the report.</li></ul>	_	•	6-7
G4-18	a. Process for defining the report content and the Aspect Boundaries b. How the organization has implemented the Reporting Principles for Defining Report Content	-	٠	30-33
G4-19	All the material Aspects identified in the process for defining report content	5.2, 7.3.2-	•	31
G4-20	The Aspect Boundary within the organization for each material Aspect	7.3.4	•	30-33
G4-21	The Aspect Boundary outside the organization for each material Aspect	-	٠	30-33
G4-22	The effect of any restatements of information provided in previous reports, and the reasons for such restatements.	-	•	Marking the data
G4-23	Significant changes from previous reporting periods	-	•	No change
d. Stak	seholder Engagement			
G4-24	A list of stakeholder groups engaged by the organization		•	29
G4-25	The basis for identification and selection of stakeholders with whom to engage			29
G4-26	The organization's approach to stakeholder engagement, including frequency of engagement by type and by stakeholder group, and an indication of whether any of the engagement was undertaken	- 5.3	•	30-33
G4-27	Key topics and concerns that have been raised through stakeholder engagement, and how the organization has responded to those key topics and concerns including through its reporting. (Key topics and concerns by stakeholder)		•	30-33
e. Rep	ort Profile			
G4-28	Reporting period(fiscal year or calendar year)			2
G4-29	Date of most recent previous report (if any)	7.5.3, 7.6.2		2
G4-30	Reporting cycle(every year, every other year)	-	•	2

Public institution management information site Alio (http://www.alio.go.kr/home.do) - Confirmation of 'status of participation information of trade unions'

Sustainability Data	Global Initiative Support	The 3rd Party Assurance	GRI Index	Awards & Membership in	99
		Statement		Associations	

lacet Reported lacet Partially reported  $\bigcirc$  Not reported

GRI G4		ISO 26000	Level	Page
1. Gen	eral Standard Disclosures			
G4-31	The contact point for questions regarding the report or its contents the contact point for questions regarding the report or its contents	7.5.3, 7.6.2	٠	2
G4-32	GRI Index and 'conformity' method selected by the organization		•	2
G4-33	External assurance for the report	-	•	96-97
f. Gove	rnance			
G4-34	The governance structure of the organization, including committees of the highest governance body; Any committees responsible for decision-making on economic, environmental and social impacts.		٠	23, 28
G4-35	The process for delegating authority for economic, environmental and social topics from the highest governance body to senior executives and other employees		•	22-23, 28
G4-36	Explanation of whether the organization has appointed an executive-level position or positions with responsibility for economic, environmental and social topics, and whether post holders report directly to the highest governance body		•	22-23, 28
G4-37	Processes for consultation between stakeholders and the highest governance body on economic, environmental and social topics		•	22-23
G4-38	The composition of the highest governance body and its committees		•	22-23
G4-39	Report whether the Chair of the highest governance body is also an executive office		•	22
G4-40	The nomination and selection processes for the highest governance body and its committees		•	22-23
G4-41	Processes for the highest governance body to ensure conflicts of interest are avoided and managed.		•	22-23
G4-42	The highest governance body's and senior executives' roles in the development, approval, and updating of the organization's purpose, value or mission statements, strategies, policies, and goals related to economic, environmental and social impacts		•	22-23, 27
G4-43	The measures taken to develop and enhance the highest governance body's collective knowledge of economic, environmental and social topics.		•	22-23, 27
G4-44	<ul> <li>a. The processes for evaluation of the highest governance body's performance with respect to governance of economic, environmental and social topic</li> <li>b. Actions taken in response to evaluation of the highest governance body's performance</li> </ul>	6.2, 7.4.3	0	23
G4-45	<ul> <li>a. The highest governance body's role in the identification and management of economic, environmental and social impacts, risks, and opportunities. (The highest governance body's role in the implementation of due diligence processes included)</li> <li>b. Explanation of whether stakeholder consultation is used to support the highest governance body's identification and management of economic, environmental and social impacts, risks, and opportunities.</li> </ul>	,	•	27
G4-46	The highest governance body's role in reviewing the effectiveness of the organization's risk management processes for economic, environmental and social topics		•	22-23
G4-47	The frequency of the highest governance body's review of economic, environmental and social impacts, risks, and opportunities		0	23
G4-48	The highest committee or position that formally reviews and approves the organization's sustainability report and ensures that all material Aspects are covered		•	27-28
54-49	The process for communicating critical concerns to the highest governance body		•	23
G4-50	The nature and total number of critical concerns that were communicated to the highest governance body and the mechanism(s) used to address and resolve them		•	23
G4-51	<ul> <li>a. The remuneration policies for the highest governance body and senior executives</li> <li>b. Explanation of how performance criteria in the remuneration policy relate to the highest governance body's and senior executives' economic, environmental and social objectives</li> </ul>		•	23
G4-52	The process for determining remuneration			23
G4-53	Explanation of how stakeholders' views are sought and taken into account regarding remuneration, including the results of votes on remuneration policies and proposals)		•	23
G4-54	The ratio of the annual total compensation for the organization's highest-paid individual in each country of significant operations to the median annual total compensation for all employees	62742	•	99 😒
G4-55	The ratio of percentage increase in annual total compensation for the organization's highestpaid individual in each country of significant operations to the median percentage increase in annual total compensation for all employees in the same country	6.2, 7.4.3	•	99 😒
g. Ethi	cs and Integrity			
G4-56	The organization's values, principles, standards and norms of behavior such as codes of conduct and codes of ethics		•	71
G4-57	The internal and external mechanisms for seeking advice on ethical and lawful behavior, and matters related to organizational integrity, such as helplines or advice lines	7.7.5, 4.4,	•	24-25
G4-58	The internal and external mechanisms for reporting concerns about unethical or unlawful behavior, and matters related to organizational integrity, such as escalation through line management,	0.010	•	25

Public institution management information site Allio (http://www.alio.go.kr/home.do) - Confirmation of 'average salary of staff' and 'salary of officers'

# **GRI Index**

● Reported ● Partially reported ○ Not reported

GRI G4		ISO 26000	Level	Page	External
2. Specif	ic Standard Disclosures				
Economi	c				
Economi	c Performance				
G4-EC1	Direct economic value generated and distributed	_		89	0
G4-EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change	_ 5.3	•	56-58	•
G4-EC3	Coverage of the organization's defined benefit plan obligations	_		Anuual Report p.196	0
G4-EC4	Financial assistance received from government		•	89	0
Market P	resence				
G4-EC5	Ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation	6.3.7, 6.3.10 6.4.3-6.4.46. 8.1-6.8.2	٠	100 💽	⊘
G4-EC6	Proportion of senior management hired from the local community	6.4.3, 6.8.1-6.8.2, 6.8.5, 6.8.7	0	-	
Indirect	Economic Impact				
G4-EC7	Infrastructure investments and services supported	6.3.9, 6.8.1-6.8.2, 6.8.7, 6.8.9	•	82-87	•
G4-EC8	Significant indirect economic impacts	6.3.9, 6.6.6-6.6.7, 6.7.8, 6.8.1-6.8.2, 6.8.5, 6.8.7, 6.8.9	٠	82-87	Ø
Procurer	nent Practices				
G4-EC9	Proportion of spending on local supplier	6.4.3, 6.6.6, 6.8.1-6.8.2, 6.8.7	•	90, 93	Ø
Availabil	ity and Reliability				
EU10	Planned capacity against projected electricity demand over the long term, broken down by energy source and regulatory regime		٠	37, 39	0
R&D					
EU8	Research and development activity and expenditure aimed at providing reliable electricity and promoting sustainable development		٠	49	•
System E	fficiency				
EU11	Average generation efficiency of thermal plants by energy source and by regulatory regime		٠	37-38, 90	•
EU12	Transmission and distribution losses as a percentage of total energy		O	40	
Environr					
Material		_			
G4-EN1	Materials used by weight or volume	- 6.5.4	-	91	<u> </u>
G4-EN2	Percentage of materials used that are recycled input materials		•	92	0
Energy				01	
G4-EN3	Energy consumption within the organization		-	91	0
G4-EN4	Energy consumption within the organization	6.5.4	-	58	0
G4-EN5	Energy intensity		•	91	0
G4-EN6	Reduction of energy consumption	- 6.5.4-5	-	91	0
G4-EN7	Reductions in energy requirements of products and services		•	57-58	0
Water	Total water with drawal by course			02	
G4-EN8	Total water withdrawal by source		-	92	0
G4-EN9	Water sources significantly affected by withdrawal of water	6.5.4	-	92	<u> </u>
G4-EN10	Percentage and total volume of water recycled and reused		•	92	0

Public institution management information site Alio (http://www.alio.go.kr/home.do) - Confirmation of 'average salary of staff'

Sustainability Data	Global Initiative Support	The 3rd Party Assurance	GRI Index	Awards & Membership in	101
		Statement		Associations	

• Reported • Partially reported  $\bigcirc$  Not reported

GRI G4		ISO 26000	Level	Page	External
2. Specifi	c Standard Disclosures				
Environm	nental				
Biodivers	ity				
G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas		•	62	◙
G4-EN12	Description of significant impacts of activities products and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas		٠	No significant impact	Ø
G4-EN13	Habitats protected or restored	6.5.6	٠	No related cases	0
G4-EN14	Total number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk		N/A	-	Ø
EU13	Biodiversity of offset habitats compared to the biodiversity of the affected areas			62	0
Emission	s				
G4-EN15	Direct greenhouse gas (GHG) emissions		٠	91	0
G4-EN16	Indirect greenhouse gas (GHG) emissions			91	0
G4-EN17	Other indirect greenhouse gas (GHG) emissions	6.5.5	•	58	0
G4-EN18	Greenhouse gas (GHG) emissions intensity			91	•
G4-EN19	Reduction of greenhouse gas (GHG) emissions			91	•
G4-EN20	Emissions of ozone-depleting substances	6.5.3, 6.5.5	N/A	-	0
G4-EN21	NOx,SOx and other significant air emissions	6.5.3	•	91	0
Effluents	and Waste				
G4-EN22	Total water discharge by quality and destination	6.5.3-4	•	92	•
G4-EN23	Total weight of waste by type and disposal method		٠	58-59, 92	•
G4-EN24	Total number and volume of significant spills			No significant spills	Ø
G4-EN25	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention 2 Annex I, II, III, and VII and percentage of transported waste shipped internationally	6.5.3	N/A	-	ø
G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharge of water and runoff		0	62	
Products	and Services				
G4-EN27	Extent of impact mitigation of environmental impacts of products and services		٠	58-59	0
G4-EN28	Percentage of products sold and their packaging materials that are reclaimed by category	6.5.3-6.5.5, 6.7.5	N/A	-	0
Complian	ice				
G4-EN29	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	4.6	٠	63	0
Transpor	t				
G4-EN30	Significant environmental impacts of transporting products and other goods and materials for the organizations' operations and transporting members of the workplace	6.5.4, 6.6.6	٠	58	•
Overall					
G4-EN31	Total environmental protection expenditures and investments by type	6.5.1-6.5.2	٠	91	0
Environm	nental Grievance Mechanisms				
G4-EN34	Number of grievances about environmental impacts field, addressed and resolved through formal grievance mechanisms	06.3.6	O	62 (held 12 grievance committee meetings)	
Social					
Employm					
EU15	Percentage of employees eligible to retire in the next 5 and 10 years broken down by job category and by region		•	93	0
G4-LA1	Total number and rates of new employee hires and employee turnover	6.4.3	٠	71, 93	0
G4-LA2	Benefits provided only to full-time employees	6.4.4, 6.8.7	٠	74-75	0
G4-LA3	Return to work and retention rates after parental leave by gender	6.4.4		93	0

● Reported ● Partially reported ○ Not reported

# **GRI Index**

			•		Not reported
GRI G4		ISO 26000	Level	Page	External
2. Specifi	c Standard Disclosures				
Social					
Employm					
EU17	Days worked by contractor and subcontractor employees involved in construction, operation & maintenance activities		0	-	
EU18	Percentage of contractor and subcontractor employees that have undergone relevant health and safety training		O	69	
Labor-Ma	nagement Relations				-
G4-LA4	Minimum notice periods regarding operational changes	6.4.3, 6.4.5	•	102 🔽	0
Occupatio	onal Health and Safety				
G4-LA5	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on occupational health and safety	6.4.6	٠	68	٢
G4-LA6	Type of injury and rates of injury occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	6.4.6, 6.8.8	O	92	
G4-LA7	Workers with high incidence or high risk of diseases related to their occupation	6.4.6, 6.8.8	•	69	0
G4-LA8	Health and safety topics covered in formal agreements with trade unions	6.4.6	•	64-68	0
Training a	and Education				
G4-LA9	Average hours of training per year per employee by gender, and by employee category	6.4.7	•	73	0
G4-LA10	Programs for skills management and lifelong learning that support continued employability of employees and assist them in managing career endings	6.4.7, 6.8.5	٠	72-73	0
G4-LA11	Percentage of employees receiving regular performance and career development reviews by gender and by employee category	6.4.7	٠	72-73	Ø
Diversity	and Equal Opportunity				-
G4-LA12	Composition of governance bodies and breakdown of employees by employee category according to gender, age group, minority group membership, and other indicators of diversity	6.2.3, 6.3.7, 6.3.10, 6.4.3	٠	71, 93	Ø
Equal Ren	nuneration for Women and Men				_
G4-LA13	Ratio of basic salary and remuneration of women to men by employee category	6.3.7, 6.3.10, 6.4.3, 6.4.4	٠	75	0
Labor Pra	nctices Grievance Mechanisms				
G4-LA16	Number of grievances about labor practices filed, addressed, and resolved through formal grievance mechanisms	6.3.6	٠	76-77	0
Human Ri	ights				
Investme	nt				
G4-HR1	Total number and percentage of significant investment agreements and contracts that include human rights clauses or underwent human rights screening	6.3.3, 6.3.5, 6.6	.6 ●	No related cases	
G4-HR2	Total hours of employee training on human rights policies or procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained	6.3.5	٠	95	
Nondiscri	imination				
G4-HR3	Total number of incidents of discrimination and corrective actions taken	6.3.6, 6.3.7, 6.3.10, 6.4.3	•	No related cases	Ø
Freedom	of Association and Collective Bargaining				
G4-HR4	Operations and suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk and measures taken to support these rights	6.3.3-6.3.5, 6.3.8, 6.3.10, 6.4.5, 6.6.6	٠	95	⊘
Child Lab	or				
G4-HR5	Operations and suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	6.3.3-6.3.5, 6.3.7, 6.3.10, 6.6.6, 6.8.4	٠	N/A	
Forced or	Compulsory Labor	0.0.0, 0.0.4			
	Operations and suppliers identified as having significant risk for incidents of forced or	6.3.3-6.3.5,			

Sustainability Data	Global Initiative Support	The 3rd Party Assurance	GRI Index	Awards & Membership in	103
		Statement		Associations	

● Reported ● Partially reported ○ Not reported

GRI G4		ISO 26000	Level	Page	External
2. Specifi	c Standard Disclosures				
Security I	Practices				
G4-HR7	Percentage of security personnel trained in the organization's human rights policies or procedures that are relevant to operations	6.3.4, 6.3.5, 6.6.6	0	-	
Indigeno	us Rights				
G4-HR8	Total number of incidents of violations involving rights of indigenous people and actions taken	6.3.4, 6.3.6, 6.3.7, 6.3.8, 6.6.7, 6.8.3	•	No related cases	٢
Assessme	ent				
G4-HR9	Total number and percentage of operations that have been subject to human rights reviews or impact assessments	6.3.3, 6.3.4, 6.3.5	O	95	
Human R	ights Grievance Mechanisms				
G4-HR12	Number of grievances about human rights filed, addresses, and resolved through formal grievance mechanisms	6.3.6	•	77	Ø
Society					
Local Cor	nmunities				
G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	6.3.9, 6.5.1-6.5.3, 6.8	٠	82-87	0
G4-SO2	Operations with significant actual and potential negative impacts on local communities	6.3.9, 6.5.3, 6.8	•	82-87	0
EU22	Number of people physically or economically displaced and compensation, broken down by type of project		N/A	-	0
Anticorru	iption				
G4-SO3	Total number and percentage of operations assessed for risks related to corruption and the significant risks identified	6.6.1-6.6.3	O	25	
G4-SO4	Communication and training on anti-corruption policies and procedures	6.6.1-6.6.3, 6.6.6	٠	25	•
G4-SO5	Confirmed incidents of corruption and actions taken	6.6.1-6.6.3	•	103	One related case (dismissal)
Public Po	licy				
G4-SO6	Total value of political contributions by country and recipient/ beneficiary	6.6.1-6.6.2, 6.6.4	٠	No related cases	•
Anticomp	petitive Behavior				
G4-SO7	Total number of legal actions for anti-competitive behavior, anti-trust and monopoly practices and their outcomes	6.6.1-6.6.2, 6.6.5, 6.6.7	•	Anuual Report P.271, 272	Ø
Complian	nce				
G4-SO8	Monetary value of significant fines and total number of non-monetary sanctions for noncomliance with laws and regulations	4.6	•	Anuual Report P.271, 272	0
Product F	Responsibility				
Custome	r Health and Safety				
G4-PR1	Percentage of significant product and service categories for which health and safety impacts are assessed for improvement	6.7.1-6.7.2, 6.7.4-6.7.5, 6.8.8	N/A	-	0
G4-PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impacts of products and services during their life cycle by type of outcomes	4.6, 6.7.1-6.7.2, 6.7.4-6.7.5, 6.8.8	•	No related cases	0
EU25	Number of injuries and fatalities to the public involving company assets, including legal judgments, settlements and pending legal cases of diseases		•	No related cases	0
Product a	and Service Labeling				
	Type of product and service information required by the organization's procedures for product and service information and labeling, and percentage of significant product and	6.7.1-6.7.5, 6.7.9	N/A	-	0
G4-PR3	service categories subject to such information requirements				
G4-PR3 G4-PR4		4.6, 6.7.1-6.7.5, 6.7.9	N/A	-	0

# **GRI Index**

		• Re	eported (	) Partially reported ()	Not reported
		-	-p		
GRI G4		ISO 26000	Level	Page	External
2. Specif	ic Standard Disclosures				
Marketin	g Communication				
G4-PR6	Sale of banned or disputed products	-	N/A	-	0
G4-PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship, by type of out- comes	4.6, 6.7.1-6.7.3	N/A	-	Ø
Product	Responsibility				
Custome	r Privacy				
G4-PR8	Total number of substantiated complaints received concerning breaches of customer privacy and losses of customer data	6.7.1-6.7.2, 6.7.7	٠	41 (No related cases)	0
Complia	nce				
G4-PR9	Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	4.6, 6.7.1-6.7.2, 6.7.6	٠	No violations	Ø
Accessib	ility				
EU26	Percentage of population unserved in licensed distribution or service areas		0	-	
EU27	Number of residential disconnections for non-payment, broken down by duration of disconnection and by regulatory regime		0	-	
EU28	Power outage frequency		•	36	0
EU29	Average power outage duration		•	36	0
EU30	Average plant availability factor by energy source and by regulatory regime		•	38	0

# **UN Global Compact**

Category		Principle	GRI	Page
Uuman Diakta	Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights;	G4-HR2, G4-HR7,G4-HR8, G4-HR9, G4-HR12, G4-S01, G4-S02	71, 95
Human Rights	Principle 2	make sure that they are not complicit in human rights abuses.	G4-HR1, G4-HR10, G4-HR11	71, 95
	Principle 3	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	G4-11, G4-HR4, G4-LA4	103
	Principle 4	the elimination of all forms of forced and compulsory labour;	G4-HR6	95, 103
Labour Standards	Principle 5	the effective abolition of child labour; and	G4-HR5	95, 103
	Principle 6	the elimination of discrimination in respect of employment and occupation.	G4-10, G4-EC5, G4-EC6, G4-LA1, G4-LA3, G4-LA9, G4-LA11, G4-LA12, G4-LA13, G4-HR3	71, 95, 103
	Principle <b>7</b>	Businesses should support a precautionary approach to environmental challenges;	G4-E2, G4-EN1, G4-EN3, G4-EN8, G4-EN15, G4-EN16, G4-EN17, G4-EN20, G4-EN21, G4-EN27, G4-EN31	56, 60, 94,95
Environment	Principle 8	undertake initiatives to promote greater environmental responsibility; and	G4-EN1, G4-EN2, G4-EN3, G4-EN4, G4-EN5, G4-EN6, G4-EN7, G4-EN8, G4-EN9, G4-EN10, G4-EN11, G4-EN12, G4-EN13, G4-EN14, G4-EN15, G4-EN16, G4-EN17, G4-EN18, G4-EN19, G4-EN20, G4-EN21, G4-EN22, G4-EN23, G4-EN24, G4-EN24, G4-EN25, G4-EN26, G4-EN27, G4-EN28	55, 63
	Principle 9	encourage the development and diffusion of environmentally friendly technologies.	G4-EN29, G4-EN30, G4-EN31, G4-EN32, G4-EN33, G4-EN34	48,49,59
Anti-Corruption	Principle 10	Businesses should work against corruption in all its forms, including extortion and bribery.	G4-EN6, G4-EN7, G4-EN19, G4-EN27, G4-EN31	24,25,95

**GRI Index** 

# **Awards & Membership in Associations**

#### **Awards**

	Award	Organization
	The best institution at 2015 Safety Korea Exercise	Central Safety Management Committee
	Excellent institution at the public institution evaluation of Gov 3.0	Ministry of Government Administration and Home Affairs
	Ranked No. 1 in sustainability index at Korea Sustainability Conference 2015	Ministry of Trade, Industry and Energy
2015	Grand Prize in management quality category at The Management Grand Awards 2015	Korea Management Association
2013	Presidential Citation at Promote Technology Commercialization Award 2015	Korean Agency for Technology and Standards
	Grand Prize in public company category at Korea Idea Management Conference 2015 for two consecutive years	Korea Suggestion System Association
	Presidential Prize and Prime Minister Prize at the 14 <sup>th</sup> Korea Safety Awards	Ministry of Public Safety and Security
	Received the Presidential prize at the E-People Award (corruption prevention category)	Anti-Corruption and Civil Rights Commission
2014	Acquired Personal Information Protection Level (PIPL) certification	Ministry of Government Administration and Home Affairs
2014	The best institute in supporting the power plant region	Ministry of Trade, Industry and Energy
	Awarded at National Quality Management Convention (gold 3 / silver 3 / bronze 1)	Korea Standards Association

# Membership

Area	Name of Association	Area	Name of Association			
	The Korean Association of Ethics		Korean Nurses Association			
	Korea Six Sigma Association	C. (. ).	Korea Industrial Safety Association			
Quality innovation	Korea Suggestion System Association	Safety	MaeKyung Safety & environment Institute			
innovation	Korea Management Association		Korea Institute for Safety Certification			
	Korean Society for Quality Management		Korean Welding Society			
	Korea Smart Grid Association	Construction	Korean Society of Civil Engineers			
New & Renewable Energy	Korean Society for New Renewable Energy	Construction	Korea Construction Consulting Engineers Association			
Lifergy	Korea Carbon Capture & Storage Association		Korea Project Management Association			
	Korea Society of Mechanical Engineers		Business Institute for Sustainable Development of the Korea Chamber of Commerce and Industry			
	Korean Institute of Electrical Engineers	Business	Future Energy Forum			
	Korea Electric Association	management/	Korea Employers Federation			
Power generation	Korea Electric Engineers Association	Economy				
technology	Korea Plant Industries Association		Korean Association of Small Business Studies			
	Korea Energy Foundation					
	Korea Engineering Asset Management Association					

# 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 Man	ager of T/F Team	Jong-Gyun Kim, General Manager of Creation & Planning Team		
	Report preparation	Seong-Heon Kim (Deputy GM) and Seung-Bum Jang (Assistant Manager) of Creation & Planning Team		
Members of	Economic performance	Seven including Nam-Hee Gu (Deputy GM of Power Generation Planning Team) and Han-Jin Na (Deputy GM of Project Management Team)		
T/F 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**

Sustainability Report

# Inquires

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