Purpose of Report

This report has been published by EWP to disclose transparently its economic, social and environmental performance as an ethical corporate citizen to all stakeholders.

Reporting Guidelines

This report has been prepared based on the GRI (Global Reporting Initiative) G3 Guidelines and BEST Sustainability Reporting Guideline.

Reporting Scope

This report has been prepared for the corporate head office in Seoul and five plant sites.

Reporting Cycle

Korea East-West Power (EWP) has published its Sustainability Report each year since its first issue published in May 2007.

Reporting Period

This report outlines the company's sustainability management activities from January 1, 2012 to December 31, 2012; and also includes some of the activities carried on in 2013. For qualitative performance, the data from 2010 to 2012 have also been included to enable time series trend analysis.

Base Unit of Data Used in the Report

The units used in this report include KRW(South Korean won) as the currency unit, MW(generation facilities capacity), GWh(amount of power generated), TOE(amount of energy used), tCO_2(emission of greenhouse gas) and tCO_2/MWh(basic unit of greenhouse gas emission).

GRI G3 Guideline Application Level

Korea East-West Power Co, Ltd. (EWP) declares that its Sustainability Report has been prepared to satisfy all the requirements for Level 'A' under the GRI Application Levels Guidelines.

Additional Information

For additional information, please visit the corporate Website or the department indicated below:

Website : http://www.ewp.co.kr
Green Environment Team, Power Generation Division
Tel. : +82-2-3456-8533
e-mail : entro@ewp.co.kr

GRI G3 Guideline Application Level

Korea East-West Power Co, Ltd. (EWP) declares that its Sustainability Report has been prepared to satisfy all the requirements for Level 'A' under the GRI Application Levels Guidelines.

CEO's Message

It has been 7 years ever since the first publication of the sustainability report of Korea East–West Power Co., Ltd. (EWP) in 2007. I believe it is a very meaningful opportunity for us to present our economic, social and environmental improvement effort and achievement for strengthening sustainability in 2012 to all of you.

As a public enterprise, which produces about 11.6% of national electricity supply, EWP has been making an effort to sincerely follow its fundamental mission – providing inexpensive, stable and eco–friendly power supply – despite several domestic and overseas management environment changes since the spinoff from KEPCO in 2001. With this, we are also very proud of contributing to the improvement of the quality of life.

In 2012, EWP achieved its largest power sales ever with 54,839GWh, which was 7.3% increase compared to 2011, due to the increased electricity demand. In fact, one of the causes of this sales increase is insufficient expansion of power plants. Moreover, this year's power supply situation is worse than last year, and to deal with such electric power shortage, EWP started operating the new gas turbine in Ulsan natural gas plant unit #4 in June, 2013, which is planned to be completed in July, 2014. Also, Dangjin power plant units #9 and #10, which will be completed by 2016, are well being built according to their construction plans. EWP also makes an utmost effort to prevent its currently operating plants from breakdown and to operate with maximum capacity, and we operate an emergency operation system during the peak period of power demand

In addition, as a public enterprise owned by the public, EWP has done various activities for taking care of our surroundings and for fulfilling our social responsibility. For example, we are currently supporting multi–cultural families, the energy poor, educational works, traditional markets and cultural events of local communities, and the support range is becoming bigger every year. We have also actively participated in projects for win–win growth with SMEs, such as the expansion of SME product purchasing and domestic & international market development for SME product sales.

Lastly, EWP has performed precautional environment and safety management activities for minimizing environmental impacts. We have tried to respond to climate changes, reducing GHG emissions and developing new renewable energy sources, and actively expanded the recycling range of coal ash and waste water. Moreover, we have built the disaster safety management system to minimize the risk of negligent accidents that can be incurred during plant operation.

With the attitude of 'limitless responsibility', Korea East–West Power will listen to all stakeholders' opinion with open mind, and make an effort to reflect the opinions into our management to fulfill our social responsibility to give better happiness to all our customers. We sincerely ask for your continued interest and support to EWP. Thank you.

September, 2013

President & CEO

KoreaEast–West Power

Chang, Joo–Ok

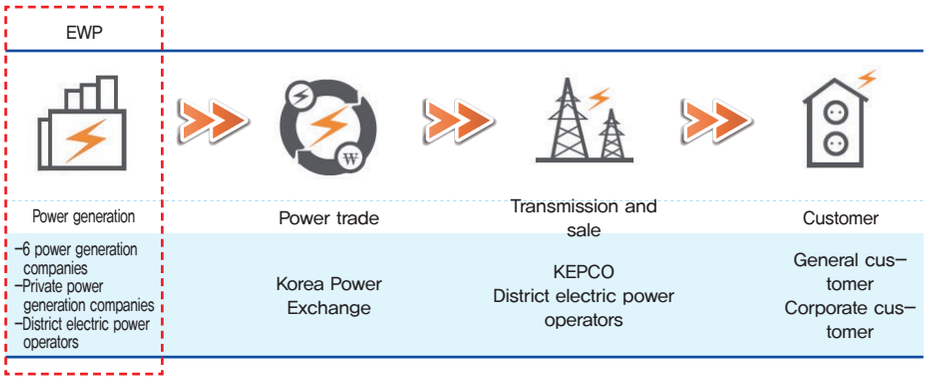
About EWP

Characteristics of Power Industry

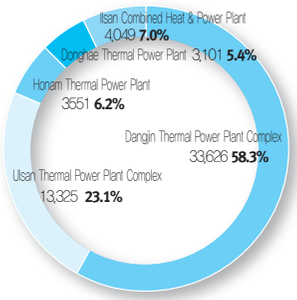
Electric power is an essential source of energy to almost all industrial activities and the basic life of people in the modern world. EWP, one of KEPCO's 6 power generation subsidiaries, produces power in conjunction with private power generation companies and district electric power operators. EWP sells power to KEPCO through Korea Power Exchange, and then KEPCO sells power to general customers through its nationwide power transmission and distribution networks.

Corporate Overview (as of Dec. 2012)

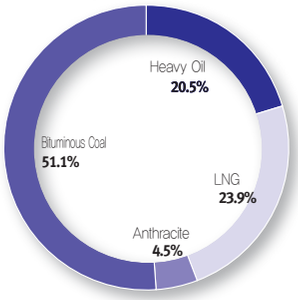
Head Office	512 Yeongdong Blvd, Gangnam-gu, Seoul
Date of establishment	April 2, 2001
Capital	3,478.9 billion won
Total Assets	6,476 billion won
Sales	5,943.3 billion won
Net Profit	266.8 billion won
Number of Employees	2,080(as of Mar. 2013)
Major business	Development of power resource, power generation, etc.
Total Power Output	57,653GWh
Sales Volume	54,839GWh
Composition of shareholders	KEPCO 100%



Share of power generation



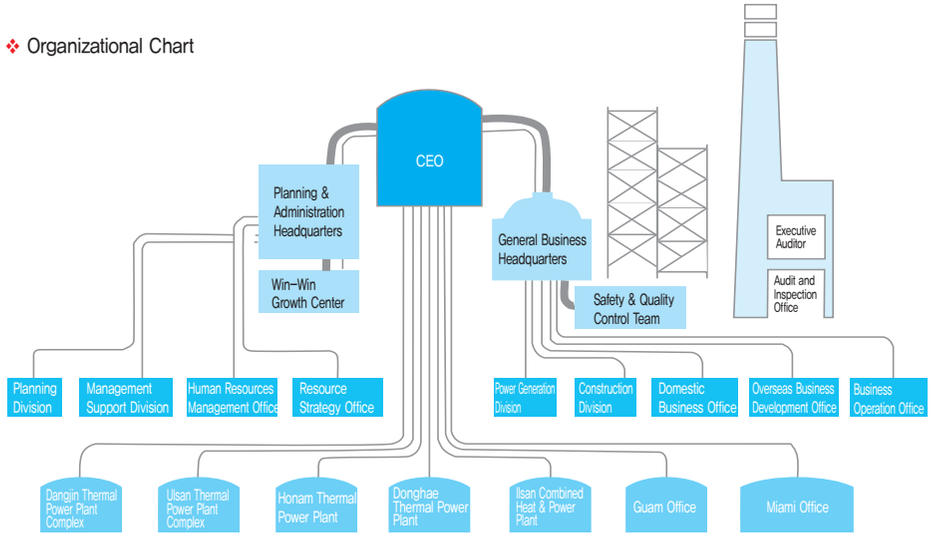
Percentage of fuels at EWP



Pursuing Sustainable Growth

EWP successfully completed the construction of ultra super critical (USC) 500MW-class Dangjin Thermal Power Plant Units #5 to #8, and began construction of USC 1,020MW-class Dangjin Thermal Power Plant Units #9 and #10, the largest in Korea as a single facility, with a goal to complete them by 2016. The company is also constructing Ulsan New Combined Heat and Power Plant (948MW) to expand low carbon power supply and stabilize electricity supply with the closure of Ulsan Power Plant Units #1~#3 (600MW) scheduled in 2014 according to their end of operation longevity. In addition, we are accelerating the advancement into overseas projects and development of new and renewable energy to actively respond to the changes in the environment of future power industry.

Organizational Chart



Business Areas

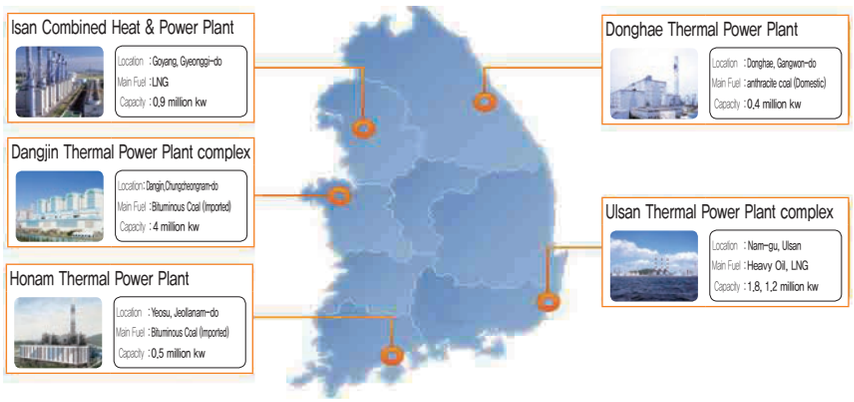
The major businesses of EWP can be divided into its current main business of the construction and operation of thermal power plants and the overseas projects and new & renewable energy business in which much of the new investment is being made. A sustainable growth will be attained through the diversification of its businesses including new businesses in Korea, development of new & renewable energy, and advancement into overseas power plant projects.

Power Generation Business

■ Thermal Power Plant Business
- The main business of EWP
  Occupying 99.8% of the company's facility capacity (8,800MW)

❖ Power Plants

Dangjin Thermal Power Plant Complex	4,000MW(Bituminous Coal)
Ulsan Thermal Power Plant Complex	3,000MW(Heavy Oil, LNG)
Honam Thermal Power Plant	500MW(Bituminous Coal)
Donghae Thermal Power Plant	400MW(Domestic Coal, Imported Coal)
Ilsan Combined Heat & Power Plant	900MW(LNG)



■ Power Plant Construction

Dangjin Thermal Power Plant Units #9 and #10

Capacity : 2,040MW (1,020MW×2)
Fuel : Bituminous Coal
Construction Period : June, 2011 ~ June, 2016

Ulsan Combined Heat and Power Plant Unit #4

Capacity : 948MW
Fuel : LNG
Construction Period : May, 2012 ~ July, 2014

Donghae Biomass Power Plant

Capacity : 30MW
Fuel : Wood-chip
Construction Period : December, 2011 ~ July, 2013

■ New & Renewable Energy Business
- New business of EWP to lead future green market
- Promote development of new & renewable energy to meet Renewable Portfolio Standard (RPS)
- Projects underway
  - In operation : 15MW (Solar energy in Donghae and Dangjin, fuel cell in Ilsan, etc.)
  - Under construction: 89MW (Wind power in Gyeongju, Bio-gas turbine, biomass in Donghae, etc.)

Domestic new energy development

■ Joint investment with private power generation companies

– Promote development of new energy to contribute to the stable energy supply in Korea and achieve sustainable growth of the company.

Aerial view of the Private-investment Donghae Power Plant

	Construction of private-investment Donghae Power Plant	Construction of private-investment Dangjin Power Plant
	Construction of the first private-investment coal power plant in Korea	Construction of a coal power plant through a consortium with a private company
Facility Capacity	500MW×2units (2 trillion won)	500MW×2units (2 trillion won)
Construction Period	2012~Dec. 2014/ Apr. 2015	2012~Jun. 2015
Composition of SPC	STXEnergy + EWP	Dongbu Construction + EWP
Location	Donghae, Gangwon-do	Dangjin, Chungcheongnam-do

■ Collective Energy Projects

Category	Daesan Collective Energy Project	Seokmun National Industrial Complex Collective Energy	Chuncheon Combined Cycle Project
Facility Capacity	140MW	38MW	500MW
Construction Period	Feb. 2014~May 2016	Apr. 2014~Dec. 2015	Unsettled
Consortium	Daesan Combined Heat & Power + EWP	Kyungdong + Kolon Global + EWP	Posco E&C + KEPID + EWP
Location	Daesan-eup, Seosan,Chungcheongnam-do	Seongmun-myeon, Dangjin, Chungcheongnam-do	Chuncheon, Gangwon-do

Overseas Projects

Coal-fired Power Plant in Cebu, the Philippines

■ Advancement into Overseas Projects

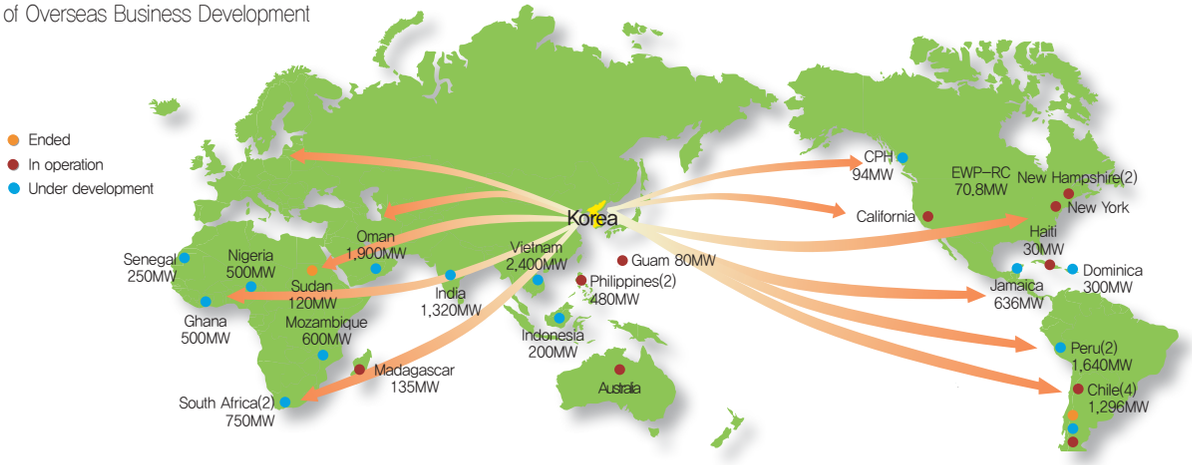
– A new growth engine for leaping forward to be a world-class energy company

– Promote various projects including construction of overseas power plants, O&M, and natural resources developments using the company's expertise of the construction and operation of power plants in Korea.

– Major Achievements

- Power Plant Projects : Jamaica Public Service, Marubeni in the U.S., Guam, Wind Power Generation in the Philippines, Diesel Power Generation Project in Haiti, etc.
- Service Projects: O&M of CFBC in Cebu, Test Operation of a Thermal Power Plant in Chile, A Project in Madagascar, etc.

■ Status of Overseas Business Development



Transparent Corporate Governance

EWP has enhanced the transparency of its corporate governance and decision-making processes by strengthening the operating system of the BOD and activating the participation of non-executive directors in the managerial activities.

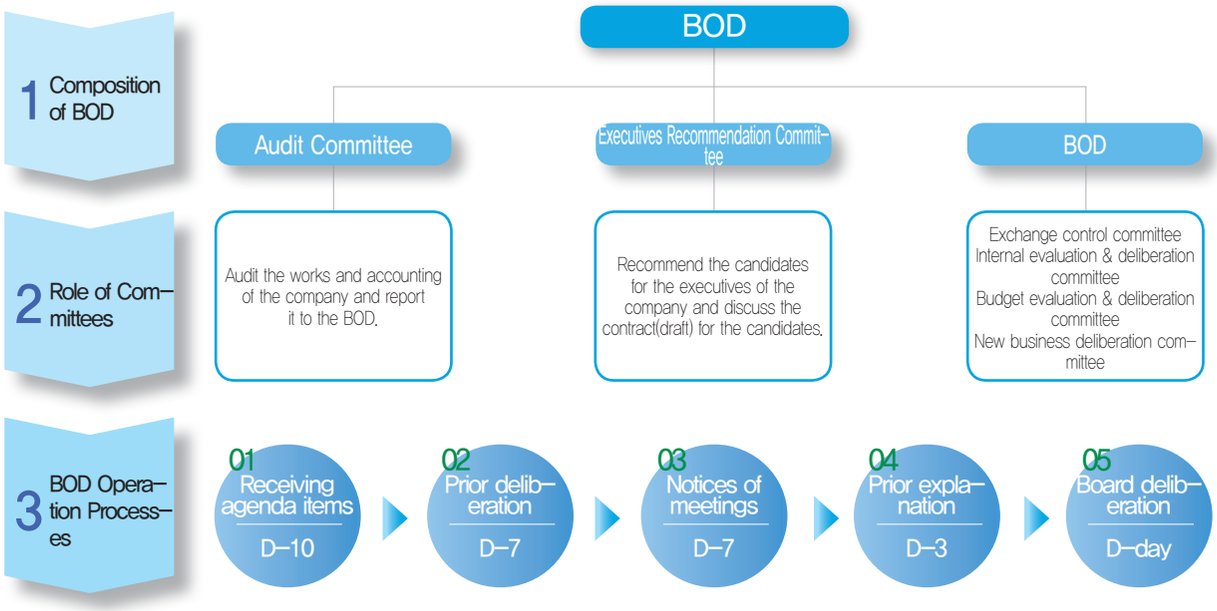
Composition of the stake-holders and capital

EWP is wholly owned by KEPCO since it was founded as a spin-off from KEPCO on April 2, 2001, for power generation on the basis of the Law on the Restructuring of the Electricity Industry.

Composition of the Board of Directors

The board of Directors consists of 4 executive directors and 5 external directors. To guarantee the independence of the BOD, the senior external director presides over the board meetings as its chairperson. To establish a responsible management system by the executive directors, the CEO has signed a management contracts with the Ministry of Strategy and Finance. The CEO and executive directors have signed internal management contracts on the evaluation of management performance and compensation. External directors are appointed among those with professional knowledge and distinguished careers, and are paid according to the BOD regulations.

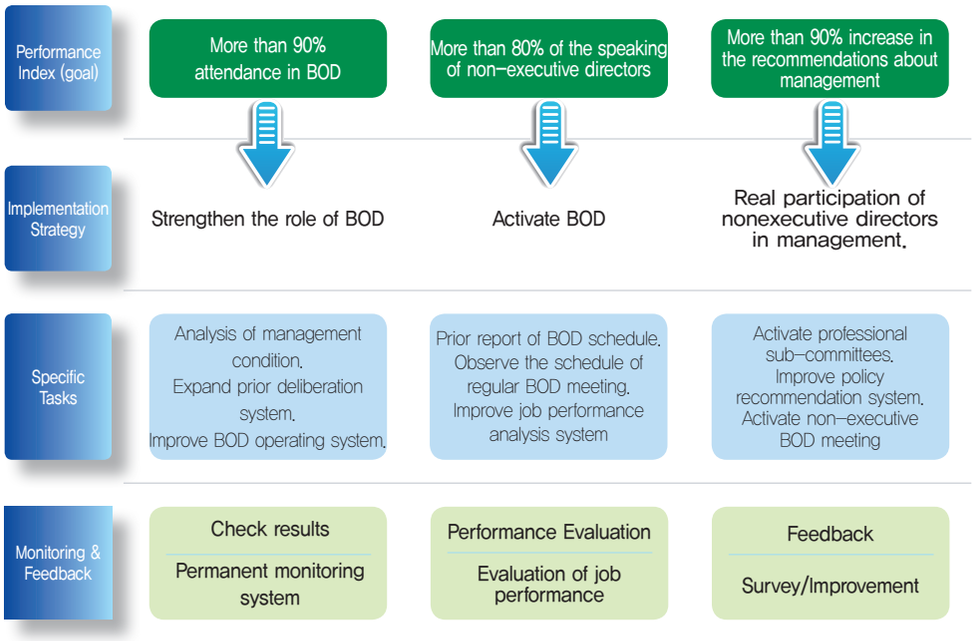
❖ Structure of BOD



❖ The work performance and sub-committees in BOD

Sub-committees	Composition (Participants)	Performance and achievements in 2012
Audit Committee	Standing auditor + Non-executive directors (2)	Auditings, etc. (9 times)
Executives Recommendation Committee	Non-executive directors (5) + External members (2)	Recommending candidates for the CEO
BOD	Non-executive directors	Consulting (Exchange control committee, etc.)

❖ The management goal and system of the BOD



❖ Efforts to strengthen the role of BOD

EWP has improved the operating system of BOD to secure the independence and professionalism of non-executive directors for efficient fulfillment of their decision-making. EWP has established a separate homepage for the BOD to improve non-executive directors' access to managerial information. Also, a system of prior deliberation for the agenda was introduced for practical deliberation of the agenda and the active reflection of the advices of non-executive directors on mid- and long-term core strategies and managerial policies. Especially, the professionalism of non-executive directors is sufficiently utilized when making decisions on businesses with high risks so that conflicts of interest in the BOD can be prevented through active discussions.

❖ Work performance of BOD

Work performance of BOD	2010 Performance	2011 Performance	2012 Performance	Year-on-year
BOD meetings (no.)	9 times	12 times	12 times	-
Resolved agenda (no.)	30 cases	49 cases	36 cases	27% ↓ *
Percentage of prior deliberation (%)	100%	100%	100%	-
Agenda resolved after revision (no., %)	2 cases (6.7%)	2 cases (4.4%)	2 cases (6%)	36% ↑
Reported agenda (no.)	6 cases	14 cases	16 cases	14% ↑
Attendance in the BOD meeting (%)	97%	85.00%	92.00%	8% ↑
Attendance of non-executive directors (%)	100%	73.20%	90.00%	23% ↑
Proportion of the speaking of non-executive directors (%)	64.20%	71.10%	82.60%	16% ↑

Sustainability Management

Based on the management strategy system that consists of EWP's mission and vision, shared core value, CEO's management policy, vision management goal and strategy direction, EWP has been sharing future value with all stakeholders and practicing sustainable management for win–win growth in economic, social and environmental aspects through accumulated experience and capacity.

❖ Strategies for Sustainability Management

Mission

Enrich man's life by providing electricity in a stable, economic and eco-friendly way.

Vision

Global Top 10 Energy Company

❖ Strategies for Sustainability Management

To accomplish the vision management goal and the economic, social and environmental responsibilities, EWP has decided 4 major strategic goals: leading the power generation industry in Korea, expanding businesses of new growth engine, strengthening core competency, and realizing sustainability management. We also has set up 12 strategic tasks to reinforce their progress.

Management Goal

- Total sales: 12 trillion won / Net Profit: 1 trillion won
- Capacity ratio: 94.5%
- New business capacity 7,800MW
- KoBEX SM AAA

Strategy Direction

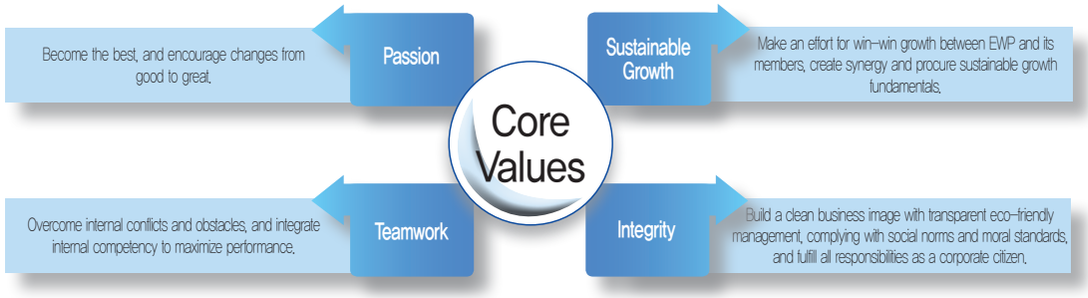
- Lead the power generation industry in Korea
- Expand businesses of new growth engine
- Strengthen core competency
- Realize sustainability management

Tasks

Construction	Proper procurement of high efficiency & capacity generation facilities	Overseas business	Increasing overseas con–tracts and profitability	Technology	Obtaining best technology of the generating industry	Win–win	Promoting win–win growth with SMEs
Generation operation	Stable operation and improving efficiency	New renewable energy	Expanding the development of new renewable energy resources	Manpower	Fostering global core man–power	Responsibility	Strengthen socially re–sponsible management
Fuel	Increasing fuel supply competitiveness	New business	Diversifying new generation development business	System	Advancement of the man–agement system	Safety	Establishment of overall safe management system

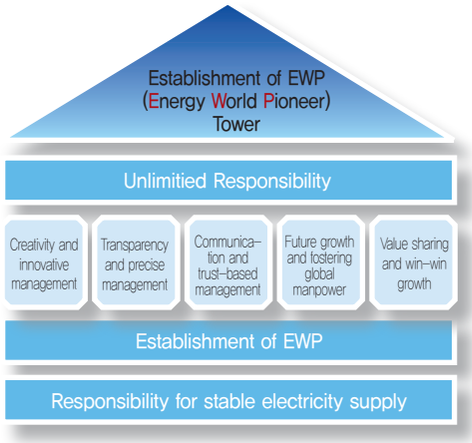
Shared Core Values

EWP's core values, which are Passion for the best, Teamwork for the pursuit of the shared goal, Sustainable Growth for fruitful continuing growth and Integrity for the fulfillment of responsibility, lead overall consensus and spontaneous behavioral changes to motivate all EWP members for the achievement of the vision.



CEO's management policy

"Achieve the nation's trust via transparent, precise management, and establish solid and sound 'EWP Tower' via fulfilling management!"



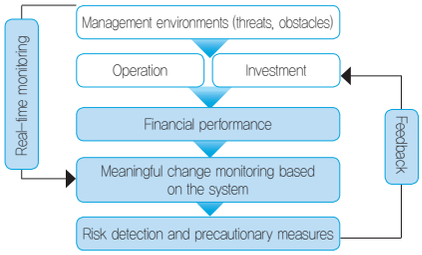
Creativity and innovative management	Pursue 'creativity' along with new approaches, and constant changes and innovations.
Transparency and precise management	Open management information transparently to all stakeholders, and honest business without unjust expedients for immediate gains.
Communication and trust-based management	Break down walls between strata with communication and trust, reflect various opinions, and form a social consensus.
Future growth and fos-tering global manpower	Create future value through fruitful business development, global manpower fostering and technology capacity development, and grow sustainably.
Value sharing and win-win growth	Fulfill social responsibility as the Energy World Pioneer, and share values for win-win growth.

To become the Energy World Pioneer, beyond the purpose of EWP's establishment, via unlimited responsibility for all stakeholders, we have set up [Creativity and innovative management, Transparency and precise management, Communication and trust-based management, Future growth and fostering global manpower, and Value sharing and win-win growth] as 'CEO's management policy.' With the policy, EWP arranges its strategy, builds the strategy system and pursues sustainable growth.

Risk Management

EWP has established the RMS (Risk Management System) on the basis of ERP (Enterprise Resource Planning) in preparation for the risks caused by the uncertainty of the domestic and overseas management environment, and the entire company is managing the risks in each area of finance & accounting, operation of power plants, fuel supply, safety from disasters, etc.

❖ Overall Risk Management System



Feedback

To maintain the integration and consistency of information, EWP is running the RMS (Risk Management System) in connection with the ERP (Enterprise Resource Planning) system which provides real-time information. Through this, continuous monitoring is being conducted for the 20 KRIs in 5 management areas. In addition, the monitor has been designed in the same way as the EIS (Executive Information System) to operate the action plan according to the change of risks.

Integrated Disaster Management System

To forestall and actively manage disaster risks, such as power plant fire, explosion or pollutant leakage, EWP has established the disaster safety management system that is directly linked to NDMS (National Disaster Management System). This system provides rapid alarming (via SMS) and auto notice for behavior procedures in an actual emergency situation.

Financial Risk

To manage financial risks according to the changes in exchange rate, interest rate and fuel prices, EWP is the first domestic power company which operats an active risk management system by combining LMS (Liability Management System), a foreign exchange and debt management system, with PCN (Prime Coal NET), a system for the demand and supply of coal and the management of distribution lines. In 2009, the company introduced VaR-based EaR (Earnings-at-Risk) method to reduce the volatility of fuel prices, establish the optimum portfolio of debts, and manage risks against the fluctuation of foreign exchange thus laying the groundwork for an advanced risk management.

❖ Financial Risk Management System and Operation Methods

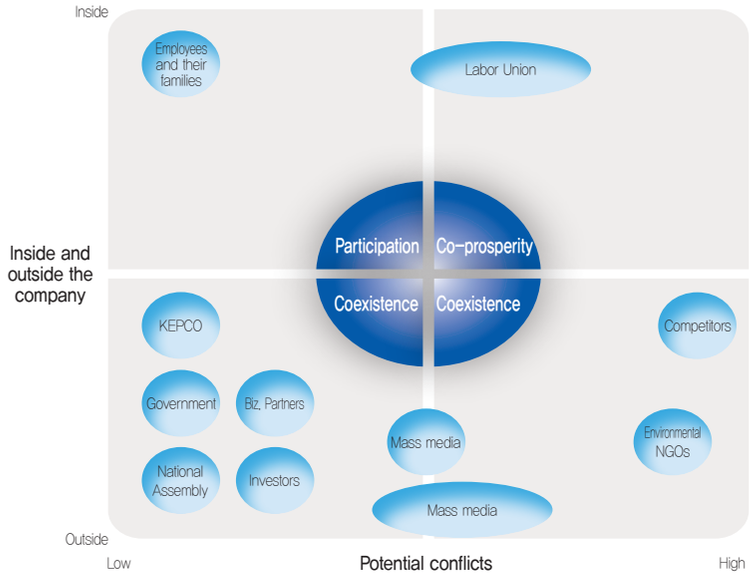
Core Financial Risks	Risk Management System	Monitoring	Operation Method
Price	• Cost Evaluation Committee	Modification factor management	• Maintaining financial balance among GENCOs
Foreign Exchange	• Cost Evaluation Committee In-house Research	International fuel cost Fluctuation monitoring	• Procedures for fuel supply & demand risks • Real-time acquisition of market information
	• Foreign Exchange Risk Management Committee	Financial market monitoring	• Hedging for minimizing exchange risk • Hedging ratio setting for long- and short-term positioning
Interest Rate	• Annual Meeting with credit rating agencies • Investor Relations (IR)	Credit rating management	• Management of superior credit rating • Expanding investors
Liquidity	• Optimal capital structure system • Cost analysis	Debt management Liquidity management	• Establishment of target capital structure for minimizing capital costs • Increasing profits and reducing costs

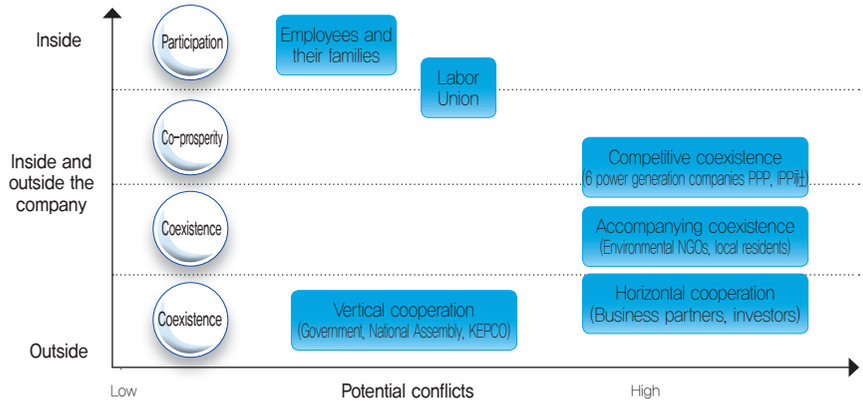
Stakeholders

There are many stakeholders who have direct and indirect influences on the managerial activities of EWP. According to the industrial characteristics and managerial environment of the company, EWP classifies its stakeholders into various categories including investors, employees, business partners, power generation companies, government agencies, local communities and environmental NGOs. EWP collects all stakeholder concerns through various communication channels for win–win growth with them and reflect them in its business activities to realize sustainability.

Customized approach for each category of stakeholder

Stakeholders have been classified into the 4 categories of participation, co–prosperity, cooperation and coexistence according to their positions – inside or outside of the company – and potential conflicts. Then efforts are made to improve the relationship with stakeholders through communication activities appropriate for each category of the stakeholders.





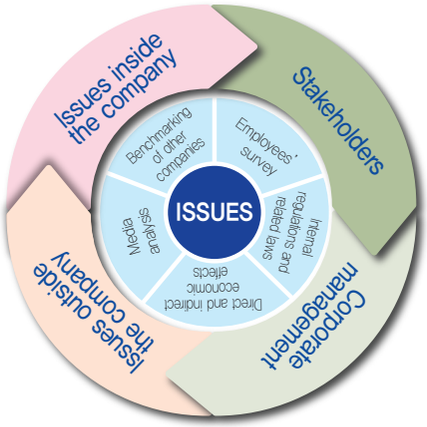
Materiality Test

In preparing the sustainability management report, it is very important to grasp stakeholders' concerns and the issues that have much influence on the management of the company. EWP has conducted the materiality test to reflect the opinions of various stakeholders on sustainability. The materiality test has found out important issues through internal regulations, government policies and laws, direct and indirect economic effects, surveys of stakeholders, benchmarking of major companies, media analysis, etc.

❖ Materiality Test Procedure

Collect stakeholders' opinions	Review and analyze issues	Draw issues	Reflect the issues to the report
Collect opinions from 2011 report. Analyze stakeholders' concerns and survey employees	Analyze major assessment items, such as GRI, ISO26000	Compare with EWP's vision and long-term strategies and draw issues	Systematically reflect the impor-tant drawn issues to the report

Collect stakeholders' opinions	Review and analyze issues	Draw issues	Report planning and reflect to the report	Report verification
• Collect opinions about 2012 sustainable manage-ment report (Sharing TFT consisting of workers in each division) • Analyze stakeholders' concerns and survey employees	• Analyze major items of internal/external assess-ment data, such as GRI, ISO26000, SA 8000 and KORAIL	• Comparison with KORAIL's vision and mid and long-term management strategies and draw issues	• Confirm report system and items	• Acquire the accuracy and credibility of the report via verification by a third party



Materiality Test Results

The followings are the major issues selected through materiality test of the issues of each stakeholder. This report made efforts to include the detailed performance of EWP regarding those major issues.

Economy	Development of overseas markets, new & renewable energy, new domestic businesses
Environment	Counter measures against Climate change, environment protection
Employees	Welfare, human-resources and safety
Business partners	Win-Win Growth
Local community	Coexistence with local communities

We will take the right path by open management.

We will listen carefully to the precious opinion of each person by taking the right path of open management and pursue true communication on the basis of wider participation of people. We will be a steppingstone to create a happy society with trust.

Smart Communicator

Responsible & Ethical management
Management of Employees' Value
Manpower Training
Welfare System
Labor Relations
Safety & Health

Responsible & Ethical Management

EWP has put priority in ethical management as the core element necessary to achieve the sustainability management of the company, and the code of ethics has become a criteria for the performance of all works and managerial activities of employees. EWP continues implementing a variety of practices to internalize transparent and rational business culture.

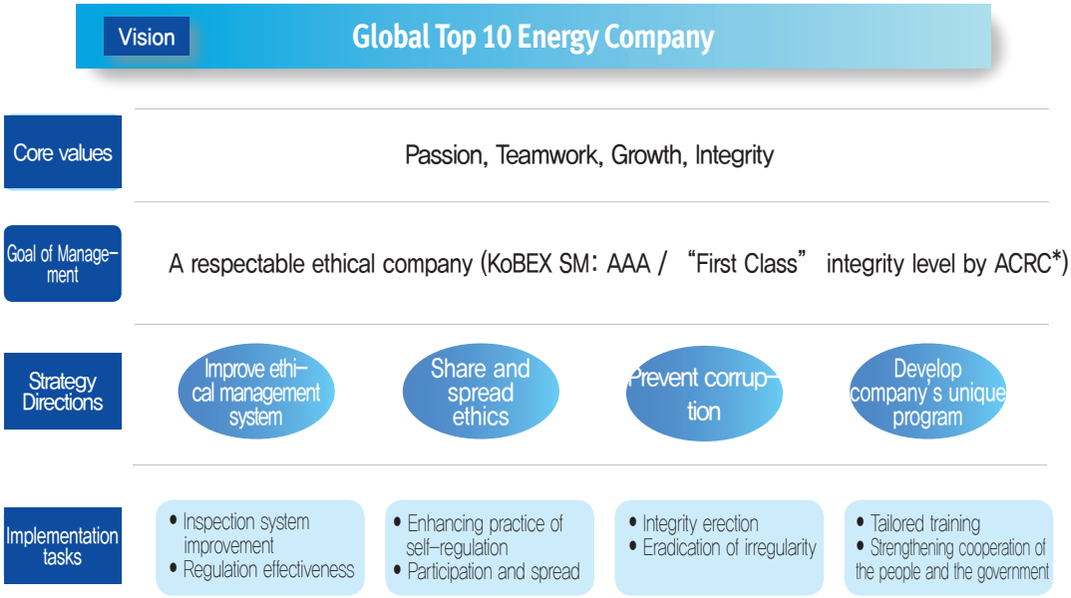
Organization in Charge of Ethical Management

EWP has a department directly under the CEO exclusive for the implementation of ethical management. The department is in charge of ethical management plans and operates the strategies for the company-wide implementation of ethical management, and the deliberation and resolution of major policies related to ethical management are done by the Green Management Committee. The auditor's office is running a system for the investigation of violation of ethics and prevention of corruption. Ethical management is being practiced across the company through the persons in charge of code of ethics at the head office and each workplace.

Ethical Management Implementation System

To become a global energy company, EWP is performing all managerial activities on the basis of ethical management with the principle of taking the right path. We will achieve our corporate vision by promoting common interests with all stakeholders through transparent and ethical managerial activities.

❖ Ethical Management Implementation System



Programs for Ethical Practice

Ethical Standards

The ethical standards, which stipulate the standards for employees' behaviors and value judgment, are composed of Charter of Ethics, Code of ethics, Code of Conduct and the instructions for people concerned with a job. Ethical standards are periodically revised according to social expectations in order to reflect the requirements of stakeholders, and they are posted in the company's intranet and the homepage of ethical management for easy understanding and practice of all employees.

Self-inspection of Ethics and Education on Ethics

For the reinforcement of the ethics and law-abiding mind of all employees, a weekly self-inspection of ethics is done using a real case that may cause ethical dilemma and make it available in the company's intranet to improve ethics and will of autonomous practice. Also, various systematic educational courses are offered to employees so that they can agree with the ethical management and join it. New recruits and the employees in the promotion list must complete the education on ethics compulsorily, and the online education on ethical management, education by external trainers, and circuit education at workplaces are being offered for all employees.

Preventive Report System

Both internal employees and external stakeholders may report a case through the homepage of ethical management, and there is an Online Ethics Counseling Office. The 'Cyber Sinmungo' is being operated for report of unethical behaviors or corruption cases. At the same time, the 'Help Line System' is being operated in which a professional external agency, which has no interest with the company, handles the cases of internal reports to activate the internal report system by guaranteeing the anonymity of internal reporters. We have also improved the implementation of the Internal Law-abiding Monitoring System, Clean Mileage System, The System of Report of Acquaintances by Business Partners, etc.

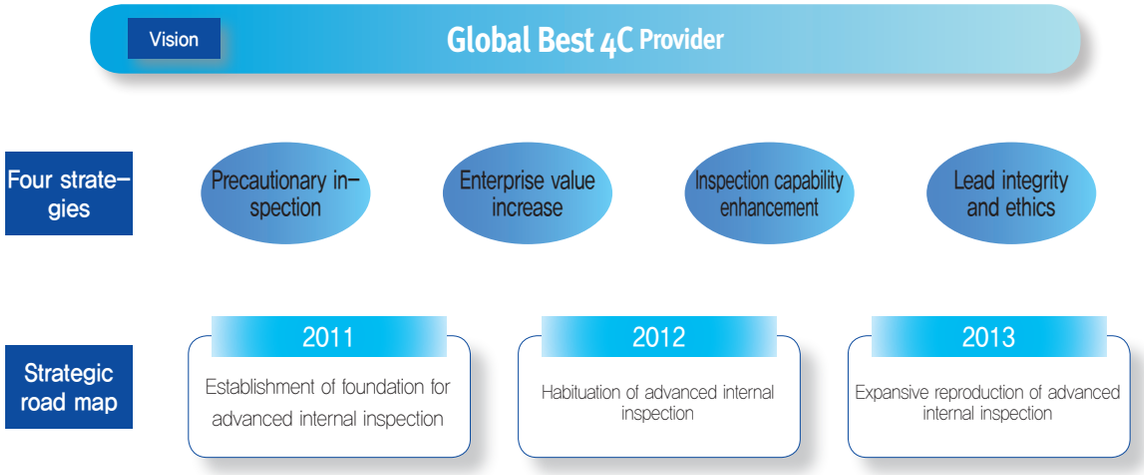
Ethics Program for External Stakeholders

EWP is actively conducting ethics programs for external stakeholders such as ombudsman system for business partners and meetings with business partners to carefully listen to what must be improved in the ethical matter from the standpoint of business partners.

Enhancement of the Independence of the Internal Inspection System

For a better systematic, independent internal inspection, the previous inspection division has expanded into the audit team and the inspection team, along with the establishment of a mid- and long-term road map. In addition, we practice a auditor preferential system to secure excellent inspection manpower, and carry out manpower training courses to increase professionality of inspection.

❖ Inspection activity system



Systematic Disclosure of Corporate Information

EWP continues to enhance the convenience of information users and the scope of information disclosure to increase the transparency of the disclosure of corporate information through examination and analysis of customers' needs. EWP responds to information disclosure requests within 10 days according to business guidelines for handling information disclosure, and reveals the management information specifically through the ALIO.

Improve Customer-oriented Management by 'SMART' Disclosure of Corporate Information

EWP has established customer-oriented "Friendly and SMART EWP Disclosure of Corporate Information (EWP KS Disclosure)" system for customers to be able to have access to the information about EWP anytime, anywhere with smart phones.

❖ Accomplishments of Ethical Management

Integrity ranking by ACRC*	Anti-corruption competitiveness by ACRC*	KoBEX SM
2nd out of 26 public enterprises	1st class competitiveness	AAA (5 years in a row)

Management of Employees' Value

EWP is actively improving its employees' value with a goal to foster professional global manpower who will lead the power industry balancing work and life as well. A welfare system is being operated to realize the balance between work and life with fair personnel management and compensation system, continuous education and training for capability reinforcement and mid– and long–term master plan according to the capability and performance of each employee.

Human Resources Management Balancing Efficiency and Equity

Present Condition of Employees

The number of EWP's employees was 2,080 as of the end of Dec., 2012. The number of employees reduced according to the government's policy for restructuring public enterprises in 2009 and there was no new recruit until 2010. Also, the job opening rate decreased as a result of the 5 times' implementation of 'desired retirement'. However, EWP is doing its best to fulfill its social responsibility to increase job opportunity and the employment rate through actively recruiting new employees and young interns in 2011 and 2012.

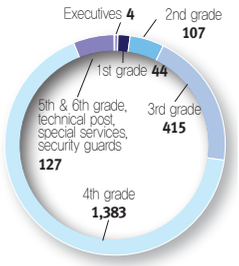
❖ Composition of Employees

Classification	2010	2011	2012
No. of Employees	2,006	1,977	2,080
Regular Position	2,006	1,977	2,080
Temporary Position	0	2	7
Average Service Year	17.3	16.3	15.7
Job–opening Rate (%)	–2.85	–1.44	5.36
Rate of leaving job(%)	0.74	0.8	0.67

*job opening rate is the increase in the number of employees compared to the previous year.
*rate of leaving job is the rate of voluntary resignation excluding regular retirement.

❖ Number of Employees at Workplaces (Dec. 2012)

Workplace	Number of Employees
Head Office	312
Dangjin Thermal Power Plant complex	647
Ulsan Thermal Power Plant complex	589
Honam Thermal Power Plant	171
Donghae Thermal Power Plant	193
Ilsan Combined Heat & Power Plant	161
Overseas offices	7



Lead Open Recruitment by Hiring High School Graduates

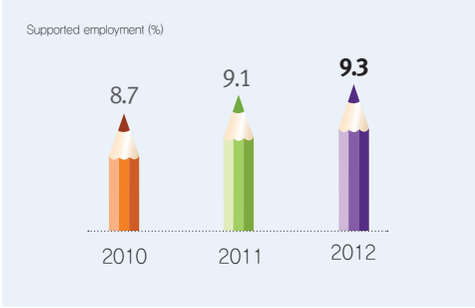
Since 2001, EWP has hired a total of 828 new recruits through 13 times of open recruitment. No restrictions are imposed on the application for employment according to gender, age or educational background. Recruitment is decided only by one's ability and personality. Complaints about any discrimination in the recruitment procedures can be handled by the internal system including the direct report to the CEO and the 'Sinmungo' system. Especially, since 2011, EWP implemented the 30% employment quota system for high school graduates to foster the open recruitment, and EWP hired 53 'Meister' high school graduates for the last two years. In addition, an internship program ('Global Dreamalizer Program') at EWP's overseas power plant was implemented to boost the global competitiveness of the students in Meister High Schools, which received favorable responses and an award from the Minister of Education, Science & Technology in two consecutive years.

Expand the Employment Opportunity for the Socially Underprivileged (the handicapped and patriots & veterans)

The employment of the handicapped has continued to increase with the implementation of employment quota system and additional points granted to them at time of recruitment. As a result, the percentage of the employment of the handicapped is now over 3% which is the compulsory legal requirement. Discrimination is ruled out by equal personnel management for handicapped workers and all the employees receive education to improve their recognition of the handicapped.

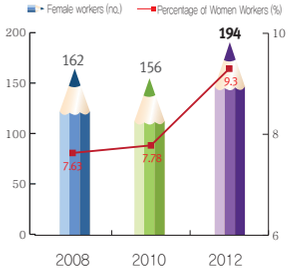
Individuals of national merit also benefit from positive discrimination through the employment quota system and the grant of additional points. Approximately 9.3% of EWP's employees are filled with patriots & veterans and their children as a result of active implementation of socially fair employment.

❖ Results of Employment Expansion for the Socially Underprivileged



Gender Equality

There are 166 women workers in EWP, taking 8.4% of its employees. A fair standard is applied to women workers at EWP with no discrimination in employment, promotion, compensation, etc. To fully recognize gender equality, EWP is making continuous efforts to expand the employment of women gradually.



Overlapping support for both work and family

Establishing a life-cycle welfare system and a flexible workplace model, EWP promotes policies that practically support both work and family by creating an advantageous infrastructure for child-rearing.

Moreover, EWP operates innovative family-friendly programs, such as the after-school reading camp, the electricity camp, the on-line child education center, father's field experience programs and family couple education.

❖ Life-cycle welfare system

Category	Pregnancy	Childbirth	Child-care	Education	Retirement
Institutional support	• Baby shower • Pregnant women's day event • Prenatal diagnosis leave	• Maternity leave (90 days' paid leave) • Baby break (for less than 8-year-old children) • Lactation rooms	• Flexible hour system • Childcare center in EWP	• Systematic family programs via MOUs with specialized agencies	• Outplacement training (IT, health, economic knowledge)
Financial support	• Prenatal tests (200,000 won/child)	• Family allowance • Childbirth allowance	• Educational expense for children	• Tuition fee support • Loan for college tuition fee	• Commissioned education for outplacement (1 million won)

Manpower Training

Educational needs for the company and its employees

The company's educational needs for strategic human resource development are confirmed through external management environments, government policy analysis, EWP's value system and strategic management plans. Various educational needs for the company and its employees are established via employees' competency analysis based on the competency model, company surveys, self-directed competency development planning, etc.

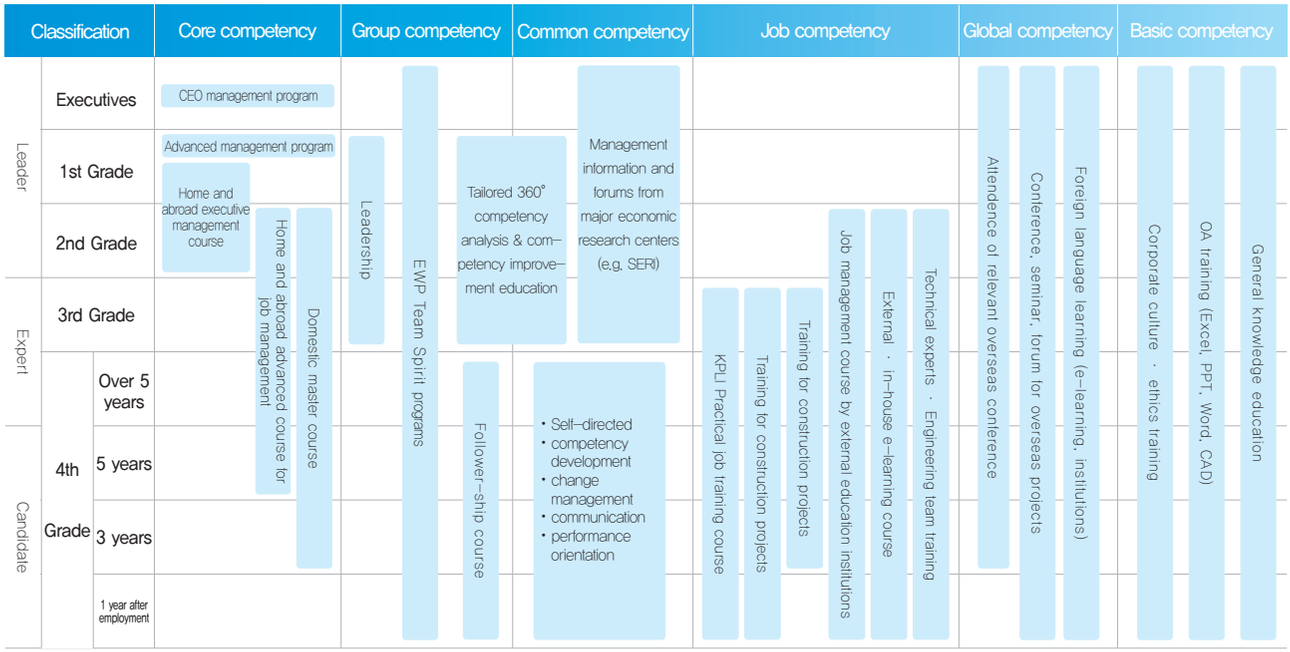
❖ Human resource development process based on needs from the company and its employees

Establishment and implement of the mid- and long-term education plan

EWP has set a goal for fostering next generation leaders and experts in each field according to EWP's strategic direction and educational needs, and has established and been implementing the mid- and long-term education plan to constantly foster essential human resources for domestic and overseas energy industries. Also, the competency improvement system for self-directed competency development is now available to help employees establish and carry out an individual self-development plan.

Various Competency Improvement Programs

EWP is operating various educational programs to foster workers' diverse competency and career development. The system of education and training classified into many programs for each position and duty is as follows:



Long-term consigned educational program for fostering next generation leaders

EWP develops and implements various industry-academic long-term consigned educational programs for employees' management administration and professional job competency development. With various degree courses, such as public enterprise policy making programs that are linked to prestigious national or international universities, CEO management programs, MBA programs, generating unit design courses and maintenance professional courses, EWP makes an effort to secure human resources for future growth.

In-house college programs for new employees from high school

EWP has been leading 'open employment,' in which individuals' capacity is more important than specification. Not only new recruits for high school graduates, but also educational and competency development needs of current employees who have secondary educational background, EWP sufficiently reflects the needs, making contracts with universities near EWP plants to establish in-house college (department of contract), and the in-house college program is beginning in earnest from 2014.

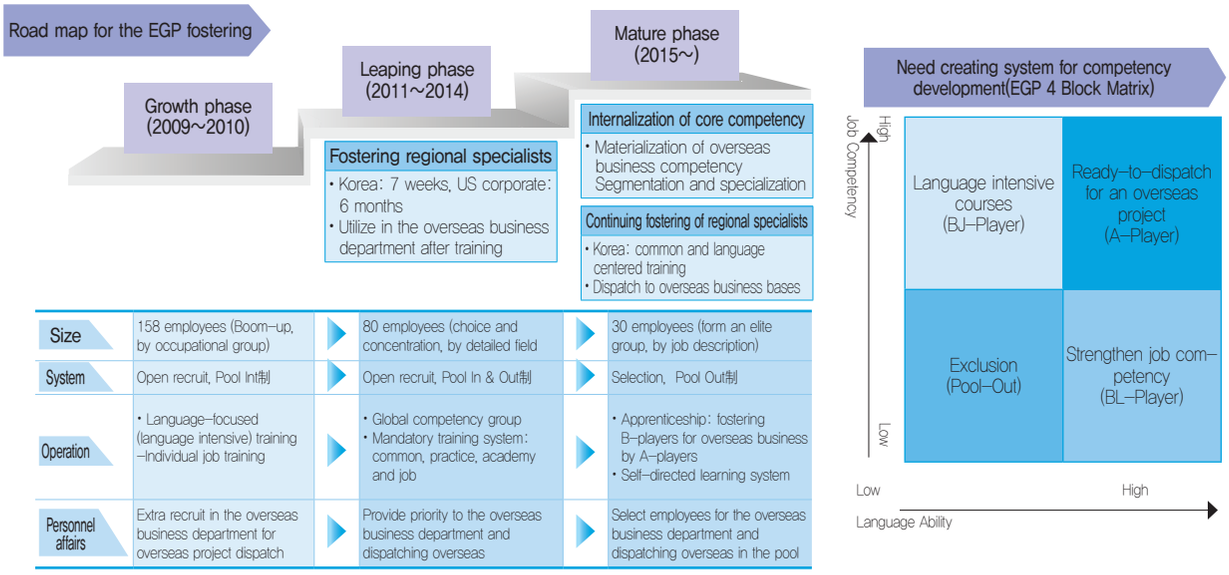
Fostering generating unit design and maintenance experts

Basic job competency of EWP' s technicians is acquired through KPLI(Korea Power Learning Institute)' s basic and advanced training courses for power generating facilities, and practical operation skills of domestic standard coal-fired power are trained in educational facilities at the simulation center of Dangjin Thermal Power Plant. EWP also operates the technical expert system to obtain core technology for continuing power generation, and in order to acquire core operation technology, EWP utilizes national and international organizations specialized in designing, constructing and maintenance of generating facilities. Also, via an apprenticeship, EWP hands down and reinforces the core technology.

Fostering global manpower for overseas expansion

According to EWP's overseas business strategy, EWP selects Global Pioneers specialized in overseas business expansion and operates intensive language courses to strengthen Global Pioneers' foreign language competency. In addition, global human resources are fostered with systematic, special language and job trainings, utilizing consigned courses in national, international professional agencies for job competency.

❖ [EWP Global Pioneer (EGP) fostering system]



Self-directed smart learning with the ubiquitous mobile environment

To build a proper and constant learning environment, EWP operates mobile learning with smart devices. Regardless of when and where, employees can participate various educational programs, such as leadership, foreign language, humanity and self-development courses, or well-known lectures, through wireless internet.

Vitalization programs for organization culture

There are many programs that vitalize the organization culture of EWP. With the manager leadership competency programs, such as leadership coaching, the refreshing program for managing employees' changes, the team spirit strengthening program for team-work building and "book reading company" for convergence competency, EWP makes an effort to build creative and communicative organization culture.

Team spirit strengthening program

Continuing Education Program

The education for those who are soon to retire is being conducted to help their psychological stability and fulfill the company's social responsibility according to the extension of the average lifespan. Through the education, the people will be able to lead a successful life after retirement. The contents of the educational course include the skills on management of personal assets and health, launching a business, re-employment, stress management, etc.

Free skill trainings for external workers

With EWP's excellent technicians, EWP provides training for increasing generation technology understanding for SME workers, realizing win-win growth with SMEs. In addition, EWP also operates basic generation courses at the simulation center of Dangjin Thermal Power Plant for local college students and specialized high school students, who will become leaders in the power generation field in the future. Especially, the global field training for specialized high school students unprecedentedly received an award in two consecutive years (2012 and 2013) from the Minister of Education, Science & Technology.

Education Investment

❖ Education Expenses and Hours

Classification	2009	2010	2011	2012
Training expense (1,000 won/person)	2,190	2,828	3,310	3,367
Training expenses in the total budget (%)	0.57	0.63	0.97	0.94
Annual education and training (hour/per person)	88	98	110	96

❖ Number of Participants

Classification	2009	2010	2011	2012
Training at in-house training center	857	996	6,486	5,049
Domestic Consigned Training	9,381	11,767	10,380	10,622
Overseas Consigned Training	25	10	27	69
Total	10,263	12,733	16,893	15,740

* After 2011 training at in-house training center includes self-developed programs and field training.

Welfare System for happy workplace

EWP is implementing various welfare programs to increase employees' satisfaction by expanding work–family compatibility culture and realizing family–friendly policies. Various programs are provided to contribute to the solution of low fertility, which is one of core national challenges, by creating an environment friendly to childbirth: a baby shower system which presents gifts of books for prenatal education, support for prenatal medical check–up expenses, remodeling the lactation room at the company, childbirth grant, Pregnant Women's Day on the 10th of October, and operation of a consigned day–care center at the company. In June, 2011, the 'Pineville Day–care Center' was opened in the company housing at Dangjin Thermal Power Plant Headquarters to actively support childcare. The center increased its capacity by 20 children, currently caring 45 children, previously planned 21 children. Also, EWP is actively participating in the government's low–birth rate measures, providing nursery facilities that accommodate 80 children in the long term, and carrying out family–friendly policies via agreements with the Korean Institute for Healthy Family, the Planned Population Federation of Korea, etc.

Expand Childcare and Maternity Protection to Overcome Low Fertility

To form a family–friendly company culture, EWP continuously designates every Wednesday as a Day for Family Love. And, since April, 2013, after the CEO sent a message about turning off the lights and PCs in offices, EWP made energy saving compulsory in all workplaces of EWP. In addition, EWP strongly encourages employees not to work late and to leave work on time every Friday. In September, 2012, both of the labor and the management of EWP announced together family–friendly management and vision for better family–friendly management in EWP, and in April, 2013, EWP made the family–friendly department for the first time among public enterprises to operate welfare, personnel management, member and family friendly social contribution to accelerate EWP's family–friendly management. EWP continuously encourages employees to spend enough time with their families. In cooperation with the Korean Institute for Healthy Family located near each workplace, differentiated family education programs are being operated for each type of family including children, spouses and parents. There are also, various systems for the family of employees: invitation from mom's and dad's workplace, child vacation programs about English or national security and resort facilities during summer vacation.

Better incentives for work–family compatibility and improvement of female employees' status

Women's BOD in EWP directly communicates with the CEO and actively suggests suggestions for work–family compatibility. As a result, special incentives for multichild(3 children or more), priority over company housing, working hour decrease during pregnancy period(from 8 to 6 hours a day) and 2 feeding times for a baby younger than 1 year is now guaranteed. In addition, both of the labor and the management have agreed to modify maternity leave requirements from currently 8 or less to 3 graders of elementary schools. Moreover, the sabbatical leave system is now more enhancing work–family compatibility.

Family–friendly program

Family event on Children's Day

Implementation of Welfare System by Finding out Various Needs of Employees

To promote health of its employees, EWP is supporting operation of in-house physical training facilities and physical examination. Other various welfare programs for employees and their families include residential support with company housing and dormitory, school expenses for children, optional welfare points, collective accident insurance and support of family events. To reflect employees' opinions to the operation of the welfare system, the summer resort spots are selected after surveying employees' preferences, and the satisfaction of employees with the welfare system is surveyed every year to monitor employees' opinions and use the results for the improvement of the system. As a result of the support for various welfare systems, employees' satisfaction has increased and, externally, EWP received an award from the Minister of Gender Equality & Family in July, 2011 for its contribution to the promotion of gender equality and the improvement in the status of women. The company was also awarded by the Minister of Health & Welfare by being selected as a superior organization for childbirth and childcare in the 2nd contest for 'A Movement to Make a World Good for Childbirth' in August, 2011.

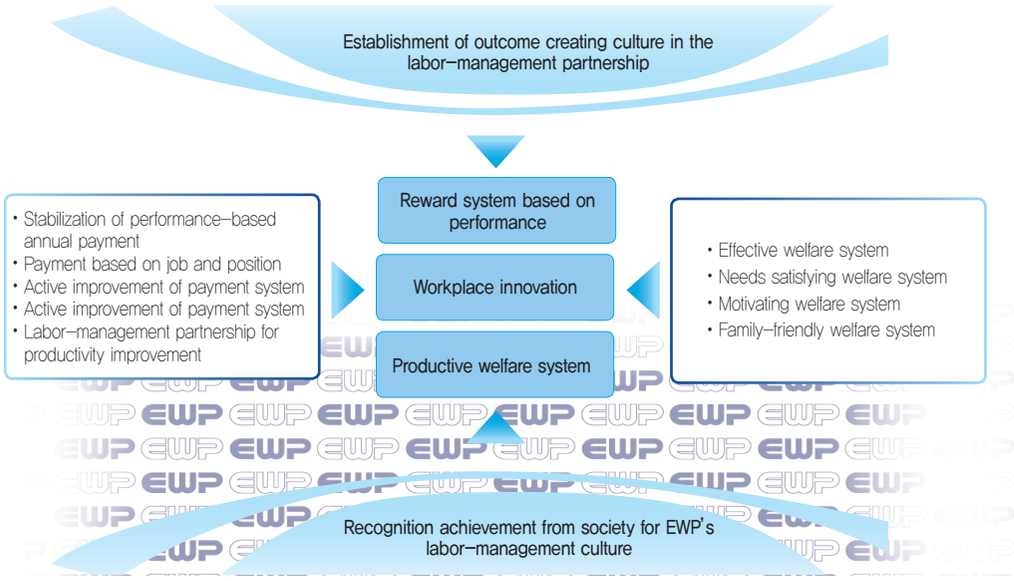
❖ Welfare Programs in Operation

Classification	Programs	Details
Create a better environment for childbirth and child-care	Baby Shower System	Presents gifts of books for prenatal education
	Prenatal Medical Check-up	Support pregnant employees for a part of the expense for prenatal medical check-up
	Childbirth Grant	Give congratulatory incentive for childbirth (0.5~2 million won)
	Support consigned day-care center at the company	Support the consigned day-care centers (Up to 50% of the expenses set by the government for 5-or-less-year-old children)
	Install and operate a day-care center in the company	Company's day-care centers located in the head office and Dangjin Power Plant
	Support children's education	Subsidy for the education of infants (0 ~ 5 year old children)
		Support tuition for children attending middle & high school and university
		Support with dormitory for offspring attending universities located in the metropolitan area
Support for employees and their families	Optional welfare programs	Support with self-help programs, family anniversary dates, etc.
	Employee Assistance Program	Implement education for employees' family and financial counseling
	Support for family events	Vacation for family event and payment for congratulations and condolences
	Support at time of natural disasters	Grant aid in case of complete or partial burning down and breaking down and flooding in natural disasters
	Support family-unit event programs	Support with weekend family experiencing event and the experience of dad's workplace
Support for stability of residence and living	Loan money for house	Give loan for purchase or rent of a house
	Loan money for stability of life	Give loan at low interest rates for employees who have been working for more than 1 year
	Support for accommodation	Provide a company housing for the employees working at local power plants. Dormitory is provided for those who are working in the metropolitan area.
Support for leisure culture	Operation of living training center	Rooms in living training center in Sokcho, Suanbo, Muju, etc. are provided.
	Support for resort facilities during summer vacation	The resort facilities near the power plant are provided during summer vacation season
	Discounts with agreements related to leisure activities	Transportation: train and airplane (3 companies) Accommodation: Hotels and motels nationwide (10 companies) Travel: Domestic and overseas travel package (2 companies)
Support for healthy life	Support for collective insurance for protection	Seven items are guaranteed including death by disaster, death by disease, disability by disaster and cancer diagnosis
	Assist medical check-up	Legal physical exam and special check-up are conducted once a year
	Discounts at hospitals	Discounts are granted for a comprehensive medical testing and treatments at dental clinics, eye clinics, etc. by signing agreements with 17 hospitals and clinics located near the company's workplaces nationwide
	Physical Training Center	Support with the installation of exercising facilities within the workplaces (fitness center, soccer field, etc.)
Incentives	Incentive training for meritorious workers	Support with training for meritorious workers and their family
Support after retirement	Keeping retiring allowance reserve	84.9 billion won as of 2011 (Lump sum payment at time of retirement or receiving as a pension is possible) The pension program was adopted in 2011 to give a choice between the lump sum payment of retirement pay and a pension)

Healthy Labor Relations

In January, 2012, a procedure for a single bargaining channel, one part of a multiple labor union system, was conducted in EWP, and the enterprise labor union, EWP Labor union, which was the single participant of the procedure, acquired the position of the labor union of bargaining representative, and made a collective agreement with the management about payment. The right for bargaining representative remains until the 31st of December, 2013. On the other hand, the industry union, Power Plant Industry Labor Union, did not participate in the single bargaining channel procedure and was maintaining a separate collective agreement. And, as their agreement was expired in March, 2013, the single bargaining channel in EWP has been finally formed. According to the multiple labor union system of EWP, the management respects the status of the single bargaining channel, and makes an effort to build the labor–management relationship of communication, cooperation and discussion, preventing unreasonable discrimination and maintaining neutrality not taking side with any of the two labor unions.

❖ Realization of social responsibility in the labor–management relationship as a public enterprise



동서발전,'행복나눔인'보건복지부 장관상 수상

Launching 'Social Contribution Committee' and adopting 'Social contribution statement of harmonized labor–management,' the labor and the management did a lot of social activities as the action agenda, such as supports for next generation, senior citizens without support, the disabled, multicultural families, families damaged by electricity accidents, and other activities related to 1–company–1–village sisterhood relationship, traditional markets, the energy poor, environment conservation, culture & arts, family voluntary service and sports events. Also, in 2012, EWP donated a total of 780 million won, 530 million won from the company budget, and 250 million won from the employees' spontaneous donation. Moreover, the labor and the management actively support the government's policies related to 'maternity protection', 'work and family compatibility' and 'childbirth encouragement' in accordance with a joint statement of the labor and the management, WLB (Work Life Balance) family–friendly management. As a result, EWP achieved recognition about practicing social responsibility, receiving 'Happiness sharing voluntary service' award from the Minister of Health & Welfare, 'Good company for childbirth & excellent work and family compatibility' award from the prime minister, and being designated as the vice–chairman of 'Seoul CEO forum of work–life balance.'

Joint programs for better labor–management harmony

All the power plants, under the trust between the labor and the management, have been performing joint programs that suit well in their local communities to build the relationship of cooperation and communication with the local communities. Also, before the relationship of the labor–management, all employees of EWP realize that they are all bound by a common destiny and do their best to make better workplace for their own happiness and work–family compatibility.

Workplace	Joint Labor–Management Program	Goal & Achievements	Remarks
Dangjin Complex	• Foot volleyball event for labor–management harmony • Joint power–saving campaign with the labor–management, local community and the government	• Form a sound labor–management culture and productivity improvement • Spread energy saving culture with the labor–management, local community and the government	
Ulsan Complex	• Labor–management joint workshop for productivity improvement • Joint social contribution service team	• Create productive labor–management culture • Practice labor–management cooperation via social contribution	
Honam Thermal Power Plant	• Summer camp for orphans by the executives of the labor–management • Joint voluntary activity at Yeosu Expo	• Practice labor–management cooperation via social contribution	
Donghae Thermal Power Plant	• Joint announcement of CSR and discussion • Joint campaign for the vitalization of traditional markets	• Spread social responsibility of the labor–management • Labor and management cooperation and contribution to local communities	
Ilsan Combined Heat & Power Plant	• Goyang Flower Exhibition inviting families of employees and local residents • Invitation to Happy Power Plant for employees and their families	• Build fellowship among families of labor–management and local residents • Build sympathy among the labor and the management and their families	

Reasonable joint agreement in the era of plural labor unions

During the collective bargaining with the representative union of bargaining, the labor and the management achieved a collective agreement about reasonable modification of excessive violation articles about management rights and stable settlement of the plural union system via fair representation assignment. Especially, the labor–management agreed on the detailed management standards, such as arrangement of terms about the exemption limit of working hours, the determination of total working hour exemption limit, proportional allocation based on the number of union member and adjustment when a new union is established or the number of union members changes, to developed the rationality of the time–off system.

Considering culture for realizing fair society

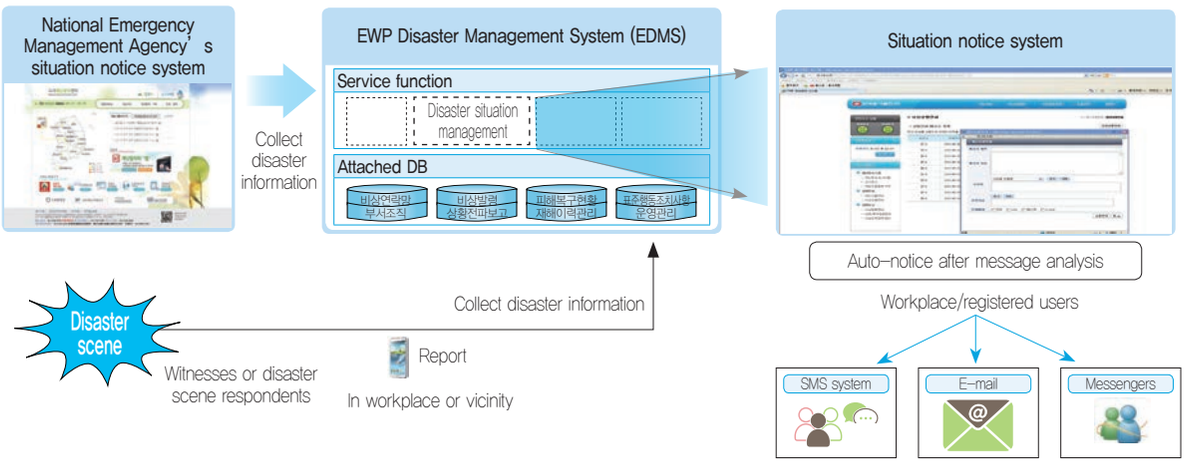
By listening to and solve difficulties of partner companies and service providing workers through communication workshops with partners and meetings with workers in the service providing partners, the labor and the management of EWP try to encourage the weak in the workplaces, to form a sympathy and to make happy workplaces for all.

Safety & Health

EWP regards the safety and health of its employees as a matter of the highest priority, and is making continuous efforts to improve the working environment through practical support for safety and health programs.

❖ Integrated Disaster Management System

To forestall and actively manage disaster risks, such as power plant fire, explosion or environmental pollutant leakage, EWP has established the disaster safety management system that is directly linked to NDMS (National Disaster Management System). This system provides rapid alarming (via SMS) and auto notice for behavior procedures in an actual emergency situation.



❖ Establishment of safety management committee

EWP has established the safety management committee to comply with the government's policy for establishing safety management governance and improve capacity of disaster safety management. The committee consists of safety experts in academic and industry fields and company members.

Labor-management joint safety examination in Dangjin Complex

❖ Thorough Safety diagnosis of Dangerous Equipment

Along with serious negligent accidents in other power plants, such as fire or scaffold collapse in a boiler system, dangerous materials and equipment such as explosives or devices that deal with harmful materials are checked and diagnosed to find out and eliminate on-site dangerous elements for the protection of all the employees of EWP and its business partners. Also, through such safety management, the credibility of equipment can be enhanced for better supply of electricity in a stable manner.

❖ Efforts to Improve Working Environment

The use of asbestos, which is known to be a carcinogen, is completely prohibited in the workplace, and all the equipment that uses asbestos is examined to prevent industrial accidents and diseases thoroughly. In addition, the Industrial Safety & Health Committee and the Labor–Management Council have discussion on the matters of safety and health to prevent industrial accidents and improve working environment.

❖ Work–related Accidents

EWP conducts risk assessment for all the elements for safety management in the workplace through objective certification processes of domestic and overseas safety & health management systems to prevent the development of harmful and dangerous elements in advance. As a result, EWP has achieved the record of no accident for 5 consecutive years in all workplaces.

Classification	2009	2010	2011
Absence (Industrial Accident %)	0.00	0.00	0.00
Accident Classifications (employees)	Death 0, In jury 0	Death 0, In jury 0	Death 0, In jury 0
Electricity · Gas · Water Work Average (%)	0.21	0.19	0.19

(Source: Ministry of Employment & Labor. The accident rates of 2011 is announced in August, 2012.)

❖ Current health promoting programs and Introduction of high–tech systems

Health experts are placed in all workplaces to conduct health management procedures including hearing preservation, prevention of musculoskeletal diseases, health promotion and job–related stress. Various policies on health management have been established including the discount for a general medical check–up of the employees and their families by agreement with hospitals, and a precise examination of physical strength.

Especially, the latest body composition measurement and analysis program that can precisely diagnose the health condition of each person has been placed in every workplace so that those who have some health problems can check up their health regularly.

Communication and cooperation are pursuing.

We consider others before us. Everyone can pursue happiness,
and we are not alone but living together with others.
EWP will stretch out its arm for sharing and love.
The source of EWP' s growth is the power of love.

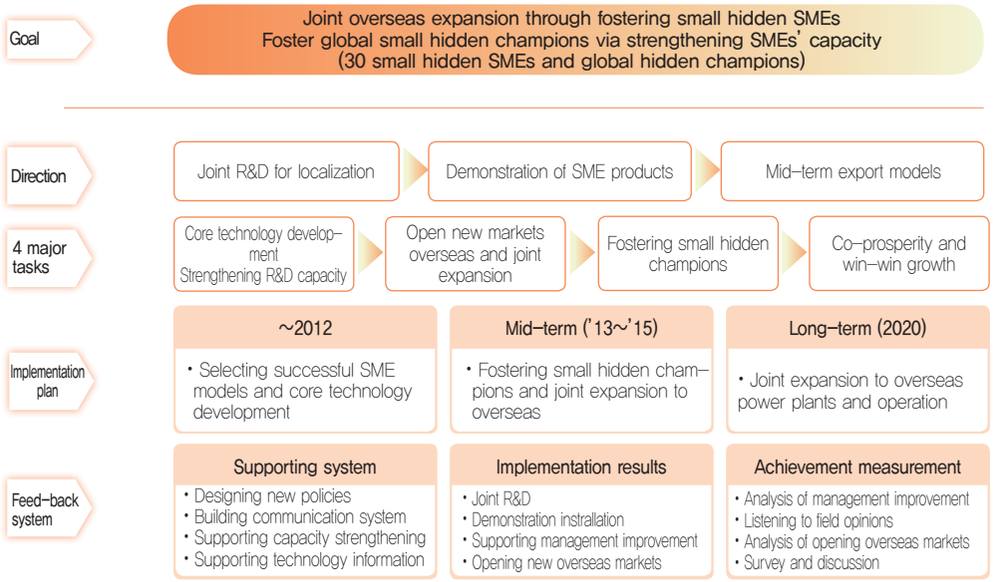
Happiness **Partner**

Win–Win Growth
Partnership and Sharing

Win–Win Growth

Establishing the vision and plan for win–win growth with SMEs

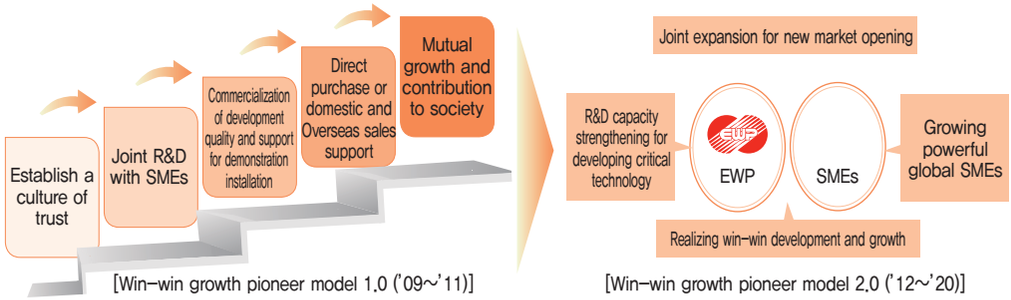
EWP has prepared the ground for building small hidden small and medium–sized enterprises (SMEs) with the yearly customized supporting plan, mid– and long–term supporting philosophy and the shared vision for win–win growth. Especially, providing the supporting system for the protection of technology and reliability validation of joint R&D products, EWP strengthens competitiveness as well as new market opening, designating and supporting 30 small hidden SMEs.



Announcement of EWP win–win growth model 2.0

Upgraded 'EWP win–win growth model 2.0' was announced in January, 2013 to fulfill new needs from SMEs and overcome the limitations of domestic markets. This new model is devised to foster global hidden champions from companies which have self–growing ability and are in growth phase with the previous 'win–win growth pioneer model.'

EWP has a plan to support SMEs' core technology development and to directly discover special agencies for opening overseas markets to constantly make new markets. In the long term, EWP aims to realized win–win development with 30 strong SMEs, after joint expansion to overseas power plants that EWP operates.



[Win–win growth pioneer model 1.0 ('09~'11)] [Win–win growth pioneer model 2.0 ('12~'20)]

Fostering 30 win–win growth models and CEO's field management

Since 2010, EWP is designating 30 successful SME models from EWP's SME partners (total 97 SMEs) to foster global hidden champions, and providing customized programs. And the CEO directly communicates with SMEs to listen to difficulties from the designated SMEs at their workplaces in order to offer practical supports.

Mid– and long–term plan for localization R&D

Operating the academic–industrial cooperated technical research committee for localization R&D, EWP supports SMEs with technologies. Also, implementing '1:1 Tech–Friend system' between EWP plant managers and SMEs, we continuously offer technology information and support acquirements of patents or overseas certificates for business vitalization to improve SMEs' competitiveness.

❖ Joint R&D cases for the development of excellent capital goods (2004~2012)

Classification	Joint researches	Government tasks	Option to purchase	Field tasks	Total
건Cases (no.)	173	90	76	45	384
Research funds (100 million won)	470.3	653	238.8	125	1,487.10

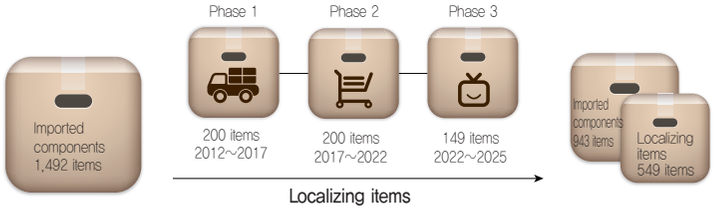
In order to strengthen SMEs' technology competency, imported components that have been in use in EWP's thermal power plants and combined thermal power plants for the last three years are analyzed for their localization, and EWP gives the opportunity and information about the components to SMEs for component localization.

❖ Analysis of 1,492 imported components for the last three years for localization

Classification	Thermal power plants				Combined power plants				Total
	Machines	Electricity	Control	Sub–total	Machines	Electricity	Control	Sub–total	
Components (no.)	441	81	328	850	411	122	109	642	1,492
Prices (100 million won)	155.2	25.1	93.6	273.9	707.9	7.6	10.1	725.6	999.5

❖ Mid– and long–term plan for developing component localization

After designating 549 items for localization, EWP operates the technical research committee for joint researches with SMEs and recruits SMEs that supply equipments to EWP or have new technologies through newspaper advertisements. As a result, EWP has largely contributed to strengthening technology competency of Korea's SMEs and handed over 15 technologies of EWP for free to SMEs.



Task selecting procedure	Process of technical research committee for task selecting
Pre–examination of technol–ogy	1:1 matching between EWP plant man–agers and SMEs
Pre–examination of technol–ogy	Analyze items for localization and pur–chase quantity
In–house R&D	Item selecting with less than 2 years' replacement period
Full–scale R&D	Research item collecting with more than 3 years' replacement period

❖ Free or paid handover of EWP patents to SMEs

Previous record	No. of patents		No. of technologies handed over to SMEs		
	Patent applied	Patent registered (a)	Free	Paid	Total (b)
Before 2012	206	144	17	15	32
2012	8	13	12	3	15
Total	214	157	29	18	47

Demonstrating installation of SME products in EWP plants for the first time in public enterprises

In order to prove reliability of SME products, EWP has made agreements on demonstrating installation of SME products in the plants with SMEs since June, 2011, and so far products from 22 SMES have been installed in 5 EWP plants to prove their reliability, and after that, those products with the value of 31.98 billion won have been sold, increasing sales of SMEs via this market opening support.

To help SMEs explore overseas markets, EWP supported the participation of 11 SMEs in 2 international exhibitions including Dubai WETEX Exhibition and achieved business consultation for 90.67 million dollars and received order for 5 million dollars. To increase exports by SMEs, EWP invited 13 foreign buyers of Japan, India and the Middle East to register them at 135 SMEs. The results of the meetings for export were business consultation for 373.35 million dollars and order receipt for 61.71 million dollars.

Expanding Purchase of SMEs' Products

EWP has purchased products developed by the technologies of SMEs worth 15 billion won actively responding to the system of public purchase of SMEs' products, and also purchased products produced by woman CEOs worth 9.3 billion won to assist the brisk social activities of women, totaling the purchase amount of the products produced by SMEs 155 billion won. Also, a T/F directly under the CEO has been established with 31 persons from 26 departments to work exclusively for purchasing. The team is making efforts to establish a basis for the expansion of purchase by tracing and controlling purchase performance.

Support for the Exploration of Domestic and Overseas Markets by SMEs

To help SMEs' domestic marketing, EWP supported 142 companies in 5 exhibitions including the Global Automated Precision Equipment Exhibition to have business consultation for 4.08 billion dollars and receive order for 163.52 million dollars, and also, EWP supported promotional materials for excellent SME products and an advertisement about electricity was placed in 15 newspapers to maximize marketing effects.

To help SMEs explore overseas markets, EWP supported the participation of 74 SMEs in 4 international exhibitions including Dubai WETEX Exhibition and achieved business consultation for 456.39 million dollars and received order for 91.69 million dollars. To increase exports by SMEs, EWP invited foreign buyers from China, India and the Middle East to have importing consultings and register 299 SMEs as their venders. The results of the meetings for export were 60 vender registrations and order receipt for 81.30 million dollars.

❖ Performance of SMEs' Exploration of Domestic and Overseas markets

(Unit: million dollars)

Classification	2011			2012		
	No. of participating companies	Amount for Business Consultation	Amount of Order	No. of participating companies	Amount for Business Consultation	Amount of Order
Domestic Exhibition	95	488	77	142	408,846	16,352
International Exhibition	11	9,067	500	98	45,639	9,169
Vender Registration and Meetings for Export	135	37,335	6,171	299	104,346	8,130

Direct payment system for SMEs and payment checking system

EWP's direct payment system, which used to be implemented for contracts of less than 30 billion won in constructions, equipments and services, improved and expanded in December, 2011 to all contracts. As an effort of EWP to improve convenience for its partners, the second and third partners can now check their payments in real-time via 'Clean-pay checking system', which started in January, 2013, and can search relevant documents when requiring payment on-line. Also, subcontractors and related workers receive payment checking SMS.

Clean-pay checking system

Full social restoration of shared benefit with SMEs

Along with the donation of 45 million won to the social programs for the vulnerable social group in 2012, EWP has also donated all of its shared benefit produced by the benefit sharing agreement with SMEs, 46.30 million won, to three social service agencies including the briquette bank and supported welfare increase for SMEs.

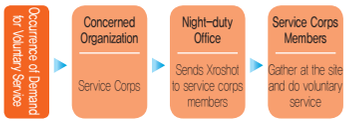
☞ Benefit sharing agreement: donating 1% of cost reduction benefit produced by joint R&D with SMEs for component localization.

Partnership and Sharing

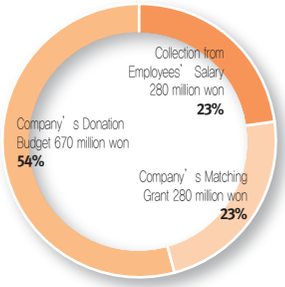
As a public enterprise which produces the public goods, electricity, EWP not only creates economic value which is the intrinsic managerial activity of a company but also, under the mission that EWP makes our lives enriched with eco-friendly, economical and stable power supply, does various social contribution activities to make a society for coexistence fulfilling its social responsibilities and roles as a corporate citizen. Above all, the operation of a power plant is closely related with the local community, and mutual understanding and cooperation is increasingly important. Thus communication and cooperation in many aspects are being pursued to form a partnership for co-prosperity in which the power plant makes efforts for the development of the community and the community welcomes the power plant.

❖ Hope Connection Emergency On-site Service Corps

- Prepared for the demand for urgent voluntary service including natural disasters.
- Composed of 124 members in total at the head office and each workplace.
- Signed agreements with the fire stations in each area.



❖ 2012 Finances for Social Contribution



Implementation System and Finances for Social Contribution Activities

Implementation system

With the slogan of "A Hand of Love, A Light of Hope", EWP organized a voluntary service corps in Feb. 2004, which now has 2,088 members and 103 teams in total as of 2012. The Social Contribution Committee works for the implementation of systematic voluntary service activities, and the "Hope Connection Emergency On-site Service Corps" is ready for the demand for urgent voluntary services in connection with the fire stations in each area.

Finances

The source of revenue for the voluntary service activity is made by deducting a certain amount of money from the salary of employees and the company's donation of the same amount of the money as is collected by employees in a matching grant system. The voluntary service teams are conducting services every year with the funds.

Apart from the finances inside the company, the budget for the projects intended to support the local community is spent for the education and cultural activities in the area adjacent to the power plant according to the Law on the Support for the Areas near the power plants.

❖ 2012 Budget for local community support

((Unit: million won)

Classification	Dangjin	Ulsan	Honam	Donghae	Ilsan	Total
Support Fund	2,218	406	125	253	135	3,137

Reflection of the Opinions of the Local Community

Surveys are annually conducted in the areas of 5 workplaces to reflect the opinions of the local community about the social contribution activities, and committees are organized with the concerned people in the local community to continue exchanging mutual opinions. The collected opinions of the local communities are reflected as much as possible to the establishment of the plans for social contribution activities so that the activities necessary for a community can be planned and performed.

❖ Survey of Local Communities

Respondents	344 people in 5 workplaces
Period	June 29, 2012 ~ July 12
Results	Satisfaction with Social Contribution Activities 4.06 (Full marks: 5)
	Reflection of the Opinions of Local Community 3.94 (Full marks: 5)
	Urgent Matter: Support for Neglected Social Groups (35%)
	Matters that needs improvement: PR (28%)

Promotion of Consensus about Power Generation Business

Support for Energy-vulnerable Social Groups

Through 'Sunshine sharing happy electricity project,' EWP provided fundamental and permanent solutions for electricity poor issues, supporting eco-friendly, permanent photovoltaic power generation systems for energy-vulnerable residents in the vicinity of the power plants. Also EWP contributes to environmentally-friendly energy distribution for low-carbon green growth. Moreover, subsidies for electric charges are granted to the households that have difficulty in paying the bills though they are living near a power plant. Also, obsolete electric devices are examined and replaced for the safe usage of electricity by the vulnerable social groups living near the power plant, and old light fixtures are being replaced with new, high-efficiency ones. In addition, heating items such as long underwear, blanket and jumper As well as heating fuels such as briquette and heating oil have been supplied for energy-vulnerable social groups to spend a warm winter while contributing to the resolution of the peak of electric consumption during winter.

■ Checking and Replacing Electric Device

Workplace	Beneficiary	Date
Dangjin	Installation of photovoltaic power generation systems	'12.05
Dangjin	Tongpyeong Childcare Center	'12.06
Honam	1-company-1-village sisterhood villages	'12.04
Donghae	Bukpyeong-dong area	'12.09
Ilsan	Hope sharing school	'12.01

Sunshine sharing happy electricity project

Joint voluntary service of the labor-management

Support for the Households Damaged by Electric Disasters

As a company which conducts power generation business producing electricity, EWP is supporting those were damaged by electric disasters such as electric shock. The company has provided caregivers for those who were burned by electric shock. EWP is also granting scholarships to the students of the households which were damaged by electric disasters.

Provision of caregivers for the people damaged by electric disasters : 1 handicapped patient, 1 patient injured by electric shock

Granting scholarships for the children of damaged households (per half a year) : 400,000 won each for 2 high school students, 600,000 won to 1 university student

Voluntary Services Linked with Promotion of Overseas Businesses

EWP is doing social contribution activities not only in Korea but also in overseas areas where new businesses are being developed, and in result a favorable atmosphere for the promotion of the new businesses have been formed. In Haiti where a diesel power plant is being operated and developed, the company has built a new house and supported tuition for a girl who lost a leg and the house in an earthquake in 2010 by collecting donations from all EWP members, and in 2012, EWP supported medical services for children who were suffering from diseases and disasters. In Cebu, the Philippines, where an O&M business is being performed, 350 sets of toothpaste and toothbrush have been distributed to the elementary students in schools near the business site and began to distribute free breakfast to about 200 students who used to skip breakfast. In addition, EWP is assisting multi-cultural households in Korea with a family member from the country where the company is trying to launch a new business. Voluntary service activities help women in the multicultural families for self-support training and the family members experience Korean culture during traditional Korean holidays and the children are given scholarships.

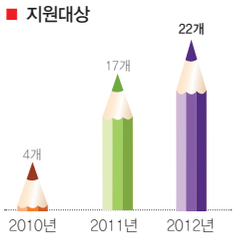
Scholarship Awarding Ceremony

Sponsoring educational, cultural and athletic activities

Implementation of Educational Projects

어린이 학습 시설 지원

Above all, EWP is making much effort for the education and training of human resources near its power plants. To improve the educational environment near the power plants which lags behind urban areas, learning apparatuses such as video presenter and lockers and storage closets are donated every year to improve the learning environment. As a result, the students at schools near the power plant now enjoy a learning environment comparable to that of the schools in other areas. Tuitions are supported for the students from elementary school to university living in the neighborhood of the power plants to relieve their burdens and encourage learning so as to foster local talents. Also, to provide the opportunity for special learning in addition to regular classes, native English teachers are provided to become friendly with English in this global era, and the opportunities for the tour of the national museum and historical and cultural sites are provided for live learning through experience. Furthermore EWP has joined the 'Love Fence' movement of the government to break the vicious cycle of poverty for children of needy class to be able to have proper education. A total of 22 local children's centers are supported to give enough opportunity for the children to be able to ascend the ladder of class.



(Unit: 100 million won)

Area	Educational Apparatus	Scholarship	Special Learning	Others	Local Children's Centers	Total
Supported Amount	3	11	1	6	1	22

Support for Community's Cultural Events and Athletic Activities

EWP is supporting various cultural events of the communities near its power plants such as Oemok Sunrise Festival in Dangjin, Sangnok Cultural Festival and Ulsan Literary Award to satisfy the cultural needs of the communities and contribute to the development of the local culture. Also, the company sponsors sports teams including the youth soccer team in Dangjin, the athletic club in Seokmun Middle School and a Judo club in Ulsan Yaeum Middle School to foster future athletes and encourage sports activities of the local residents to lead healthy life.

Area	Culture & Arts	Sports Promotion	Total
활동횟수	33 times	57 times	90 times
활동인원	307 person	79 person	386 person
지원금액	500 million won	400 million won	900 million won

Support Oemok Sunrise Festival

Partnership for Co-prosperity with Communities

Support for Development of the Infrastructure of Communities

The areas near power plants are supported by law for their development. The subsidy is calculated every year on the basis of the quantity of power generation and is paid to the concerned local governments. In 2011, a total of 14.6 billion won was paid to local governments to be spent for the projects aimed to increase the income of the residents and expand public facilities.

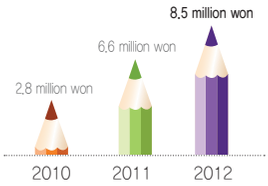
❖ Amount Allocated for Community Support by Each workplace in 2012

Workplace	Dangjin	Ulsan	Honam	Donghae	Ilsan	Total
Supported Amount	12,459 million won	919 million won	292 million won	591 million won	315 million won	**14,576 million won**

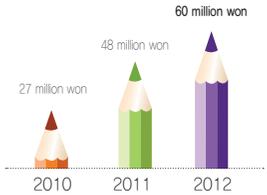
Movement to Revive Traditional Markets and Direct Transaction of Agricultural Products

EWP is making efforts to activate local economy for co-prosperity with the community fulfilling its responsibility as a corporate citizen. Each power plant signed for a sister relationship agreement with a traditional market near it. In 2012, employees of EWP bought gift certificates of traditional markets worth 850 million won, and EWP is encouraging its employees to use traditional markets by holding events to visit the markets once every month. In addition, there is a homepage for direct transaction of agricultural products being operated in EWP's homepage to purchase the agricultural products produced near the power plants. It provides the farmers with a stable sales route at reasonable prices and enables the employees to buy good agricultural products in trust achieving win-win relationship beneficial to both parties. In 2012, 119 items worth about 59 million won were purchases, which is 20% increase from the previous year.

– Also, to contribute to the local economy by supporting local specialty products with sufficient potentiality, local specialty products worth more than 28 million won were purchased in 2012, which is the most among 23 public institutions participating in the 'Win-Win for Knowledge Products & Local Economy' campaign.



Purchasing 'Onnuri' Gift Certificates and Going day to the Traditional market



Homepage for Direct Transaction of Agricultural Products at EWP and Amount of Purchase

Environmental Protection Activities in the Areas near Power Plants

EWP is minimizing the impact on environment with an eco-friendly management, and furthermore taking lead in the preservation of the natural environment in the areas near power plants to leave a clean environment to posterity. Each power plant is conducting regular environment conservation activities through '1 company 1 mountain' and '1 company 1 stream' movement, and environmental campaigns including the drawing contest for environmental painting are regularly held to promote awareness of the importance of environment among children.

Classification	Sister Relationship	Number of Activities	Number of Participants	Supported Amount (thousand won)
Cultivating Green Mountains and Streams	12 mountains and streams	22	430	15,550
Environment Protection Activities		37	760	807

Sharing Voluntary Service Activities

Sisterhood Relationship with Child Heads of Household and the Elderly with No Place to Turn to, and Support by Providing Caregivers

The voluntary service teams at each EWP power plant made sisterhood relationship with the child heads of household and the elderly who have no place to turn to living near the power plant to support with daily necessities, preparing learning materials, cleaning the house and keeping company with them.

In addition, to take care of those who have difficulty in moving among the extremely poor class in the neighborhood of the power plant, caregivers are hired to help the patients lead at least the minimal human life.

❖ Support for Vulnerable Social Groups in 2012

Classification	Sisterhood Relationship (person)	Number of Activities	Number of Participants	Supported Amount (thousand won)
Helping Child Heads of Household	98	709	975	139,906
Helping Child Heads of Household	82	495	704	78,743
Providing Caregivers	7	–	–	51,962
Total	327	1,204	1,679	340,177

❖ Support of Welfare Facilities in 2012

Area	Number of Activities	Number of Participants	Supported Amount (thousand won)
Composite Welfare Facilities	156	770	103,166
Children's Facilities	213	840	141,340
Children's Facilities	74	505	51,314
Facilities for the Handicapped	56	326	31,240
Total	499	2,441	327,060

Wedding support for the vulnerable

Other Voluntary Service Activities including 'Love Blood Donation Relay'

In every May since 2004, EWP circulates its workplaces beginning with the head office in the shape of a heart to have a blood donation campaign. 191 employees participated in the 9th blood donation relay held in 2012 to practice their share of love and as of 2012, a total of 2,397 employees have been participating in the relay.

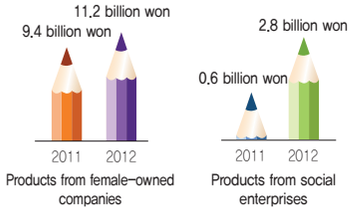
Also, EWP has been doing various voluntary activities, supporting rice for free feeding – worth 20 million won – since 2004 for Holy Family Welfare Hospital in Seoul, which is a free hospital for those who have no place to turn to, and participating in 'Kim Man Deok Rice Sharing Manseom Pile' campaign.

Happiness sharing awards

Supporting for the Self-reliance of Socially Vulnerable Group by Sponsoring Social Enterprises and Female-owned Businesses with Purchasing Their Products

What is needed for poor people is not mere kindness but creating jobs for their self-reliance. EWP supported for the investment in facilities at social enterprises by forming co-prosperity fund for win-win growth in order to assist the job creation for socially vulnerable groups. Also, in 2012, EWP has purchased the products of social enterprises worth 2.8 billion won, and the products of female-owned companies worth 11.2 billion won.

Classification	2011	2012
Products from female-owned companies	9.4 billion won	11.2 billion won
Products from social enterprises	0.6 billion won	2.8 billion won



Supporting for Holy Family Welfare Hospital Kim Man Deok Rice Sharing Manseom Pile

We think of the preciousness of nature which embraces the world.

We think not only the convenience of today but also the life of the next generation.
As our life today has been enriched by the gift of nature,
we will cultivate the earth to prepare for the better future.
EWP promises for a cleaner nature and happier mankind.

Eco - Friend

Green Management System
Efforts to Minimize Environmental Pollutant Emission
Coping with Environmental Risks
Protection of Biodiversity
Transparent Environmental Information Disclosure

Green Management System

❖ EWP Green Management Cycle

Implementation System for Green Management

Recognizing the importance of coping with climatic change for sustainable growth of the company, the top management of EWP is implementing systematic low-carbon green management by organizing a department exclusive for green management both at the head office and each workplace. Also, the Green Management Committee has been installed to secure the development possibility of the overall company including low-carbon green management. The committee is holding a meeting periodically for the consultation and debating of internal and external experts.

❖ Responsibilities

CEO(President)	• Establish the policies for green management
Green Environment Team (Dept. in Charge)	• Supervise green management. Set up implementation strategies and master plan. • Reward superior staff. Support green life activities. Monitoring.
Dept. in Charge of Green Management at Workplaces	• Practice green management of the workplace. Promote practice of green life. • Spread good examples inside and outside the company. Support the activities of the department in charge

Vision of Green Management

A Global Leader in Power Generation Industry for Low-carbon Green Management

Reduce 10% from BAU(Business as Usual) GHG emissions by 2020 (Invest 4 trillion won in green energy.)

Carbon Management G^3

GHG Reduction
Improve power generation efficiency / Save energy
Develop technologies for reduction of GHG

Green Growth
Expand new & renewable energy
Establish green infra-structure.

Green Culture
Create a green workplace
Practice green life

Top-Tier Green Management System

Top-Tier Green Management System

EWP has acquired the integrated ISO 14001/9001 certification for competitive and differentiated implementation of environmental management, and its workplaces have been designated as green enterprises by the Ministry of Environment with its efforts to minimize the discharge of pollutants and wastes and save energy continuously. In 2012, Ilsan Combined Heat & Power Plant and Ulsan Thermal Power Plant complex were re-designated as green enterprises. Especially, Ilsan plant's re-designation is the first 5-year-in-a-row one, being recognized from its achievement in reduction of nitrogen oxide with the DLN (Dry Low Nox) facility and GHG reduction with fuel cells.

Active Purchase of Green Products

Meeting the government's recommendation on the purchase of green products, EWP is implementing the system of compulsory purchase of green products. A green product means a product which can save resources or reduce environmental pollution which has been certified for environmental mark or good recycling (GR) by the Ministry of Environment. In 2011, the company achieved 98% purchase of green products worth 3 billion won.

Fostering Experts for Green Growth

EWP continues to conduct professional education in each area to implement low-carbon green management such as coping with climate change and the development of new & renewable energy and related businesses. In-depth educational courses are provided to foster experts in related fields and at the same time on-line educations are offered to all employees to form a consensus on green management. Especially, in 2012, EWP prepared carbon emission broker trainings to deal with GHG emission trading markets, and three workers acquired carbon emission broker certificates.

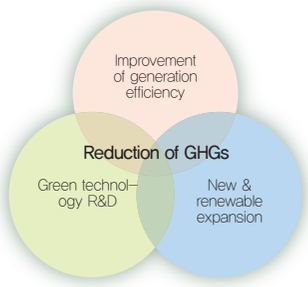
No. 1 in Climate Change Competitiveness Index in the Power Generation Sector by the Ministry of Knowledge Economy for 3 consecutive years

In the Industry Survey for Competitiveness Index in Climate Change conducted in 2012 by Business Institute for Sustainable Development (BISD) and the Ministry of Knowledge Economy, EWP ranked first for 3 years in a row. This survey looked into climate risk, climate performance, market opportunity and policy cooperation sectors with 333 companies in the generation industry (including 32 power generation enterprises). EWP acquired higher marks in climate performance, market opportunity and policy cooperation sectors.

GHG mentoring project provided by the Ministry of Knowledge Economy

In 2012, EWP, as the only public enterprise, participated in the large, small and medium enterprise energy partnership project held by the Ministry of Knowledge Economy. This cooperation project is planned to share and distribute energy management know-hows of large enterprises to SMEs. Thus, EWP implemented energy management diagnosis on its five SME partners and supported their energy saving activities.

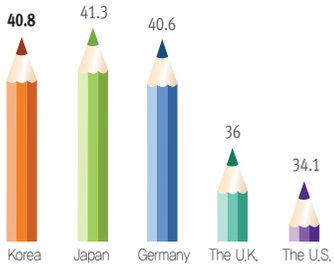
Coping with Climatic Change



Goals of GHG emissions reduction

Due to the characteristics of the power generation sector, its GHG emission depends on the nation's electricity demand and power mix and there can be no inventory. So it is more reasonable to set a goal for reduction with GHG emissions intensity. The company's goal is to reduce its intensity up to 10% from the base period value(average of 2007~2009) by 2020. To achieve this, all the capabilities for the reduction of GHG are collected by improving the efficiency of power generation facilities, expanding new & renewable energy, expanding investment in R&D of green technologies such as collection and storage of CO2, and expanding programs for the practice of green life.

❖ Plant Efficiency of Coal-fired Power Plant (%)



World-class Plant Efficiency

EWP's power plants are mainly composed of new facilities with world-class operation abilities. As a result, they maintain the highest plant efficiency, which results in the less emissions. Especially, Dangjin Power Plant Units #1~#8, which take 63% of all the power generation capacity of EWP with 4,000MW in total, were completed between 1999 and 2007 and have the world's highest efficiency among coal plants. In addition, the New-Ulsan Combined Heat and Power Plant (948MW) will be completed in 2014 with 55% of plant efficiency. The Dangjin Power Plant Units #9 and #10 will be completed in 2015 and 2016, which will upgrade the overall plant efficiency of EWP with a super large new concept power generation facility similar to a nuclear power plant.

Current Status of GHG Emissions

In 2012, EWP's GHG emissions were 44,174,000 ton-CO2, with direct emissions of 44,107,000 ton-CO2 (99.8%) and indirect emissions of 67,000 ton-CO2 (0.2%). The GHG emission unit of 2012 was 0.804 ton/MWh, and EWP is trying to reduce the emission unit through continuous introduction of new & renewable energy sources.

❖ Company-wide GHG Emissions

Classification	Type	2010	2011	2012
Emissions (ton)	Scope 1	41,452,688	41,377,486	44,107,078
	Scope 2	63,293	57,678	67,144
	Total Emissions (includ-ing head office)	41,515,981	41,435,164	44,174,222
GHG emission unit (ton/MWh)		0.803	0.81	0.804

Transparent GHG emission information disclosure through carbon reports and carbon information disclosure projects

Ever since the first issue of the carbon management report in 2010, EWP has published the report for 3 years in a row for the first time to disclose EWP's green house gas emission information and to inform EWP's effort to deal with climate changes to its stakeholders. In addition, EWP joined spontaneously in an international climate change response project, the Carbon Disclosure Project, for the first time as a public enterprise and as an information-unrequested company. The Carbon Disclosure Project is being implemented in 60 countries and supported by international financial agencies, such as Goldman Sachs. In Korea, 250 listed companies are required the information disclosure. EWP, as an unlisted enterprise, is not requested the information disclosure.

Reduction of Greenhouse Gas

Obtaining GHG Credits

EWP is pursuing a CDM project and a national GHG reduction registration project as a part of GHG reduction activities. The Photovoltaic Project of Donghae Power Plant was registered in the UN CDM for the first time in the world as a photovoltaic sector, and a small hydro-power generation project in Dangjin was also registered in the UN CDM in August 2009 for 5MW which used to be the largest as one unit of facility. As for the national GHG reduction registration project, a high-voltage inverter was installed in Honam Power Plant in May, 2007, which was followed by registration of new technology development by Dangjin Coal-Fired Plant in September, 2008. HRSG Waste Heat Recovery of Ilsan CHP Plant and GT Waste Heat Recovery of Ulsan Power Plant were registered in November 2009. In 2010, Fuel Cell of Ilsan CHP was registered. The Hybrid SCR of Ulsan Power Plant was registered in December.

■ Status of Carbon Credits Projects

Title of Project	Registration Date	Certified Reduction (ton/year)
Donghae Photovoltaic (1MW)	Aug. 2006	690
Dangjin small hydro-power (5MW)	Aug. 2009	15,000
Honam high-voltage inverter	May. 2007	16,419
Dangjin new technology generation	Sep. 2008	91,789
Ilsan HRSG Heat Recovery	Nov. 2009	52,653
Ulsan GT Heat Recovery	Nov. 2009	5,547
Ilsan fuel cell 1st stage	Apr. 2010	6,476
Ilsan fuel cell 2nd stage	Nov. 2011	7,216
Ulsan Hybrid SCR	Dec. 2011	4,749

Continuing Green Projects to Reduce GHG emissions

Under the Negotiated Agreement for GHG emissions that came into effect in 2011, it is impossible for a company which was assigned a goal of reduction to register a new KCER project. Also, the uncertainties in the global carbon market is increasing including the decreases in the prices of carbon credits, and the merits of CDM project have virtually disappeared as the registration of new CDMs in the EU emission trading scheme from 2013 is only applied to the poorest nations. However, apart from such uncertainties, EWP continues to find out the projects to reduce GHG and making efforts to fulfill its green goal successfully. Especially, the old Ulsan Heavy Oil Thermal Power Plant is being replaced with a new Combined Heat and Power Plant to reduce about 600,000 ton of GHG emissions.

Expanding the co-firing of Biomass

As a major short-term measure to achieve the nation's goal in reduction of GHG, EWP is actively implementing co-firing of biomass. A test in Donghae Thermal Power Plant for burning in mixture with wood chip, wood pallet and RDF (Refuse Derived Fuel) successfully completed and the amount of such fuels will be expanded. For Dangjin Thermal Power Plant, the organic solid fuel, which is treated at the sewage treatment facility of the local government, and bituminous coal are used in co-firing.

❖ Characteristics of Diverse Biomass Fuels

Item	Wood			Organic Solid Fuel	SRF
	Wood Chip	Pellet	PKS		
Shape					
Characteristics	Forest by-products, waste wood	Dry and shape wood	Cocoa husk, seed, etc.	Dry and carbonize sewage sludge	Litter dry carbonized
LHV (kcal/kg)	2,500~3,500	3,500~4,500	4,000	3,000~3,500	3,500~4,500
Power Plant	Donghae Thermal	Donghae Thermal	Under consideration	Dangjin Thermal	Under consideration

R&Ds regarding Climate change

In preparation for the increasing pressure of the international society to reduce GHG according to IPCC, EWP will invest regularly on the R&D related to cope with climate change. Through such investment, EWP will continue to secure the high technology for the reduction of GHG. Especially, in cooperation with other power generation companies, EWP will concentrate its capabilities in carbon capture and storage (CCS) and integrated coal gasification combined cycle (IGCC) that can be applied immediately to power companies. For this, EWP secured available lands in Dangjin Thermal Power Plant for CCS site and in Ulsan Thermal Power Plant for IGCC site.

Implementing Step-by-Step Simulated Emissions Trading Scheme

EWP joined with other power generation companies and the Korea Power Exchange on business cooperation for simulated emissions trading scheme to actively and jointly respond to the IPCC. Also, according to the EWP action plan, EWP, for the first time as a generating company, performed a simulated emissions trading scheme with SK Group in October, 2010. In 2012, EWP participated in the test trading supervised by the Ministry of Knowledge Economy in preparation for the compulsory emissions trading system which will begin in 2015.

❖ Performance in Emissions Trading

Stage 1 2006~2009	• Simulated Emissions Trading Supervised by KEMCO	Power generation companies, LG Chemical, SK Energy, etc.
Stage 2 2010	• Simulated Emissions Trading between EWP* and SK Group * Suggest the trading and design its own scheme.	5 workplaces of EWP, 6 affiliates in SK group
Stage 3 2011	• Test Emissions trading supervised by Ministry of Knowledge Economy (July, 2011) • Education of international experts in emission trading (Oct. 2011)	Companies that will be applied by Negotiated Agreement (69 companies)
Stage 4 2012	• Emission trading simulation project in the industrial/generation sector (May, 2012) • raining for the certificate of carbon emission broker (Oct. 2012)	Companies that will be applied by Negotiated Agreement (138 companies)

2012 Goal Achievement of Negotiated Agreement

EWP is an enterprise (GHG heavy emission and heavy energy consumption company) that receives goals under the scheme of Negotiated Agreement. In the Negotiated Agreement (NA), the government assigns each company the goal for GHG emission and energy consumption and examines the performance. It is a preparatory stage for the initiation of the emissions trading. EWP has prepared itself to minimize risks caused by the execution of the system by participating in the test project of NA and establishing a countermeasure prior to the system. The specifications for GHG emissions and energy consumption between 2007 and 2012 were prepared, and they were submitted to the Greenhouse Gas Inventory & Research Center of Korea in the Ministry of Environment after obtaining the verification of a certified verification agency. In 2012, EWP emitted GHG of 0.804 ton/MWh, which was lower than the goal from the government, 0.834 ton/MWh, achieving the goal.

Efforts to Minimize Environmental Pollutant Emission

Power plants are producing electricity using coal, heavy oil and LNG. It is inevitable that various environmental pollutants are emitted according to the consumption of the fuel for power generation. However, EWP is minimizing pollutants by operating state-of-the-art facilities that can reduce environmental pollutants and by recycling wastes, and therefore, to contribute to sustainable development of our society.

❖ Fuel for power generation

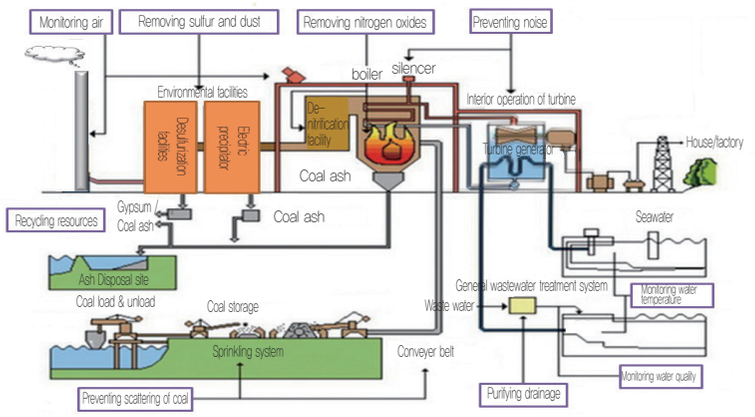
Bituminous coal	15,886,000 tons
Anthracite coal	521,000 tons
Heavy oil	1,504,000kℓ
Diesel oil	12,000kℓ
LNG	1,682,000 tons

Power generation water
14,044,000 tons

Limestone
376,000 tons

Magnesium hydroxide
54,000 tons

Chemicals
15,000 tons



Classification	Coal Ash	Desulfurization Gypsum	Waste Water
Q'ty	2,112,000 tons	520,000 tons	3,087,000 tons
Recycled Q'ty	1,696,000 tons	504,000 tons	1,222,000 tons
Recycling Rate	80%	97%	40%

❖ Air emissions

SOx	16,813 tons
NOx	32,040 tons
Dust	687 tons
CO_2	44,174,000 tons

❖ Water emissions

COD	30.2 tons
SS	7.2 tons
Total nitrogen	45.4 tons
Total phosphorus	0.6 tons

❖ Output

Power generation Q'ty	57,653GWh
Power transmission Q'ty	54,891GWh

Management of Air and Water Pollutants

The pollutants produced in power plants can be largely divided into air pollutants, water pollutants and wastes. Air pollutants that are produced in the process of boiler combustion are sulfur oxides, nitrogen oxides and dust, and the water pollutants include COD and suspended solids. EWP is doing its best to reduce the amount of the emission of pollutants by setting stricter criteria than the legal restriction. EWP is operating high-tech air pollution prevention facilities such as desulfurization, de-nitrification and dust-collecting facilities as well as the general wastewater treatment system.

❖ Facilities treating air pollutants

Power Plant	Desulfurization facilities (to remove sulfur oxides)		Denitrification Facilities (to remove nitrogen oxides)		Dust Collector (to remove dust)	
	Units installed	Type	Units installed	Type	Units installed	Type
Dangjin Thermal	8	Wet limestone-gypsum method	8	SCR	8	Electric Precipitator
Dangjin Thermal	3	Wet limestone-gypsum method	3	SCR	6	Electric Precipitator
			3	SNCR		
Honam Thermal	2	Magnesium hydroxide method	2	SCR	2	Electric Precipitator
			2	SNCR		
Donghae Thermal	2	Desulfurization in a dry furnace	–	–	2	Electric Precipitator

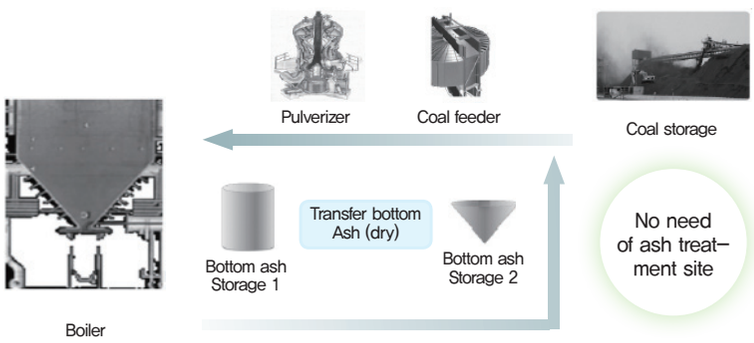
※ SCR: Selective catalytic reduction, SNCR: Selective non-catalytic reduction

Raw material recycling

EWP recycles such wastes as coal ash, gypsum or waste oil that are produced in the process of power generation as a way for profit creation.
In addition, the company is making efforts to increase recycling continuously and curtail the treatment costs by diversifying the usage of recycling, continuing R&D, searching for new usage, etc.

석탄회 재활용 확대

EWP is making an effort to make a virtuous circle, recycling fly ash, which is produced in coal-fired power plants, as cement material, and EWP is also considering a reduction and recycle plan of bottom ash. For instance, the technology for its complete combustion by putting it back into the boiler will be applied to the design of Dangjin units #9 and #10 to reduce the quantity of bottom ash. As a result, the lifespan of the ash pond will be extended and the consumption of coal for fuel will be reduced. Meanwhile, research and development for the recycling of coal ash is also expanding.



❖ Recycling coal ash and desulfurized Gypsum

Classification	Unit	2010	2011	2012
Recycled plaster	1,000 ton	414	405	504
Ratio of recycled plaster	%	98	96	97
Recycled coal ash	1,000 ton	1,157	1,368	1,696
Ratio of recycled coal ash	%	58	65	80
Profits created by recycling	100 million won	77.9	77.5	64.7

❖ Usage of service water and recycling waste water

The service water used at a power plant is supplied from the river and dam near the workplace. It is used for the water supply for boilers, cooling water for machines, desulfurization of facilities and other potable water. A general wastewater treatment system, which treats the wastewater in physical and chemical ways, is installed at every power plant. The wastewater is reused for process water or discharged into the sea, at a level of the standard water quality for discharged water. EWP is making efforts to solve the problem of water shortage by reducing the amount of wastewater or raise the percentage of reuse through the application of new technologies to the process of wastewater treatment. In 2012, we recycled 1.22 million tons of wastewater, which was 40% of the total waste water produced by EWP.

❖ Quantity of water intake and usage of service water at power plants

Power Plant	Raw Water (1,000 ton)	Source of water
Dangjin Thermal	6,252	Boryeong Dam, Sambong Lake
Ulsan Thermal	2,654	Nakdong River
Honam Thermal	1,370	Juam Dam
Donghae Thermal	256	Dalbang Dam
Ilsan Combined	3,512	Han River
Total	14,044	

❖ Quantity of usage of raw water and quantity of recycled wastewater

Year	Output (GWh)	Raw Water		Wastewater		
		Usage (1,000 ton)	Intensity (ton/GWh)	Q'ty (1,000 ton)	Recycled Q'ty (1,000 ton)	Recycled Percentage (%)
2012	57,653	14,044	0.244	3,087	1,222	40

Use of chemicals

More than 30 kinds of chemicals are used at a power plant for the prevention of corrosion of power generation facilities, pure production and treatment of waste water. To reduce the quantity of chemicals used, EWP has adopted hydrazine-free system, oxygen treatment method, etc.

Classification	Unit	2010	2011	2012
Power generation	GWh	54,135	53,637	57,653
Amount of chemicals used	Ton	12,625	17,130	15,405
Intensity	Ton/GWh	0.233	0.319	0.267

Coping with Environmental Risks

Coping with leakage of chemicals and oil

To prevent environmental accidents, EWP has established the procedures of coping with each kind of environmental accident, and is holding exercise for leakage of toxins and oil every year to take prompt measures upon accident. Also, EWP is preparing itself for emergencies by placing a water surface cleaner consigned to Korea Marine Environment Management Corporation. There have been no accidents of the leakage of oil, wastes or harmful materials.

Drill for cleaning ocean pollution

Anhydrous ammonia leak response training

Real–time Monitoring of Docks and Coal Yards

While unloading docks and coal yards monitoring occurs in real–time. Unloading is observed and monitored through CCTV, and the information is reported to the management to check for the environmental impact and to prevent environmental accidents. Real–time information through coal yard CCTVs facilitates the management of coal storage, coal quality and reduces spontaneous ignition. Through the system EWP is endeavoring to minimize the environmental impact on nearby areas.

Protection of Biodiversity

EWP is making efforts to analyze the effects in the vicinity of the power plants to minimize environmental impact.

Environmental Impact Assessment and Post Assessment

Through the environmental impact assessment, EWP analyzes the environmental impact of power plant construction in advance, and seeks for solution to minimize the impact when constructing its plants, as well as sincerely complying with the contents of agreement. In addition, EWP monitors the nearby areas of its power plants not only during the construction, but also after the completion of plant construction with the post impact assessment to protect the environment and ecological system.

❖ Environmental Impact Assessments

Classification	Assessment period	Examined items
Dangjin #9~10 Environmental Impact Assessment on construction	Aug. 2006 ~ Aug. 2009	Spread of hot cooling water, air quality, noise, soil, marine water and sediment quality, marine ecosystem, agricultural products, land plant, eco-friendly circulation of resources
Donghae Bio Mass Plant Environmental Impact Assessment on construction	Apr. 2010 ~ Sep. 2011	
Ulsan #4 Combined Thermal Environmental Impact Assessment on construction	Aug. 2008 ~ Jun. 2012	

❖ Post Environmental Impact Assessments

Classification	Assessment period	Examined items
Dangjin #1~8	Jul. 1994 ~ Dec. 2017	Spread of hot cooling water, air quality, noise, soil, marine water and sediment quality, marine ecosystem, agricultural products, land plant, eco-friendly circulation of resources
Dangjin #9~10	Oct. 2009 ~ Jun. 2021	
Donghae Bio Mass Plant	Dec. 2011 ~ Jul. 2018	
Ulsan #4 Combined Thermal	Jun. 2012 ~ Jul. 2019	

Protection of Biodiversity

EWP is making efforts to minimize changes in the ecosystem and to conserve the environment. To practice EWP's love of nature, EWP is carrying out diverse environmental conservation programs including nature purification activities, '1-company 1-shore' cultivation and feeding wild animals.

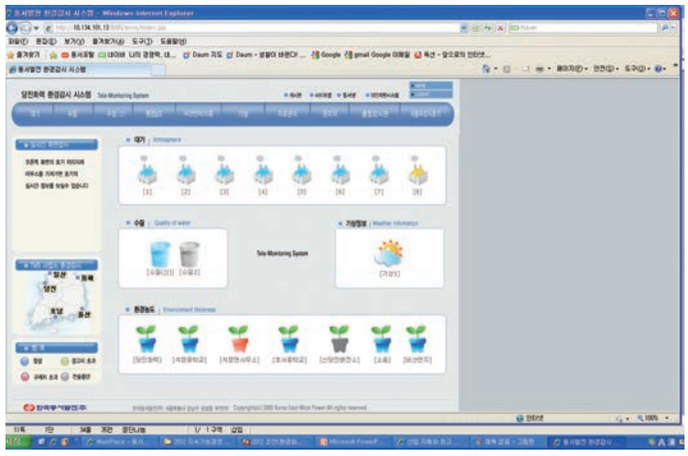
Clean up campaign (Dangjin Thermal Power Plant)

Feeding wildlife (Ilsan Combined Heat & Power Plant)

Transparent Environmental Information Disclosure

Environment monitoring system

All the power plants of EWP are subject to the installation of CleanSYS (Smokestack Tele-Monitoring System). EWP is operating a CleanSYS to monitor pollution emissions in real-time. Information on pollution emissions is transferred on-line to the control center of the Environmental Management Corporation in real time. The system is linked with an environmental monitoring system within the plants to check information on emissions through smokestacks, and the surroundings, including water quality, around-the-clock.

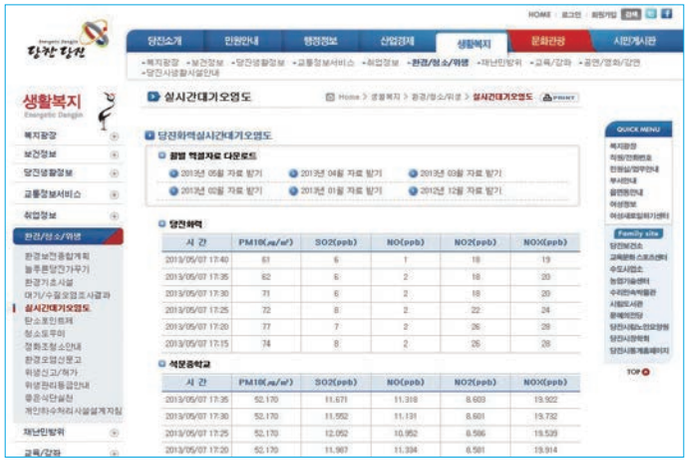


Cleansys

Measuring Air pollution of Surrounding Environment

Dangjin and Ilsan plants regularly measure and provide real-time air pollution level of the vicinity on the display board for local residents. The air pollution level near Dangjin plant is updated on the Dangjin City Hall website.

Air pollution board at Dangjin Terminal



Real-time air pollution concentration in the Dangjin City Hall website

Transparent Environmental Information Disclosure

In accordance with the environmental information disclosure system, which is implemented for public enterprises and green companies since 2012, EWP discloses its environmental information clearly – 13 compulsory items, including environmental pollutants, GHG emissions and compliance details about environmental regulations, and other 8 optional items.

We will take one step in advance for a future filled with hope.

EWP enriches our life realizing our dreams with electricity.
Through value-creating management based on differentiated technologies and reinforced competitiveness, EWP is energetically growing into a global energy company.

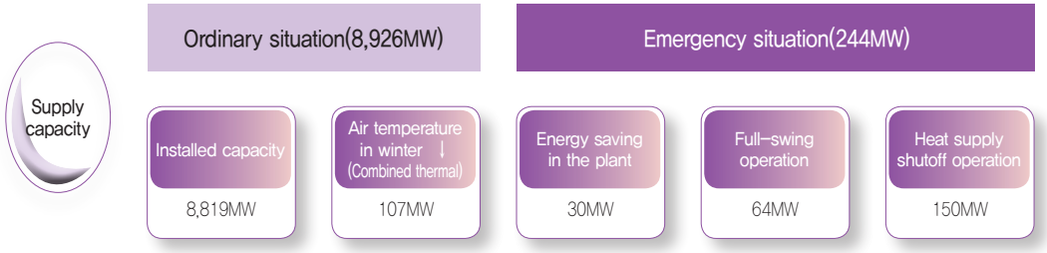
Economic Value Creator

Stable Electricity Supply
Future Growth Business
Overseas Business
Continuous R&D
Financial Performance

Stable Electricity Supply

Stable electricity supply during the peak season

Ever since the rolling blackout at the 15th of September, 2011, EWP has made an utmost effort for stable electricity supply, operating the emergency response plan for power supply and maximizing power supply capability. To revise the crisis response manual and to shorten crisis response time, EWP has carried out a lot of drills on its own or with related organizations and reinforced the emergency response plan. Also, the availability of Ulsan and Honam plants has improved by 20%, compared to the previous year, with active maintenance and improvement of old equipments in those plants. Moreover, another 244MW capacity is achieved via emergency output increase, which is equivalent to operating one extra Honam plant.

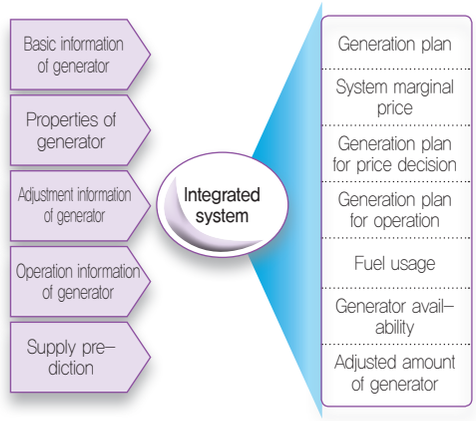


Integrated system for supply prediction

On the other hand, EWP has established 「the Integrated system for supply prediction」 to actively manage the inventory of fuel. EWP also adopted the dualized operation, in which the calorific value is increased for stable boiler operation when output increase is needed by power load, and is decreased for the efficiency in weekends, when power demand is relatively low.

In order to fulfill its social responsibility, EWP has largely contributed to stable power supply during peak seasons, improving the availability and power capacity of old facilities. Moreover, EWP set a good example to cope with nation-wide electricity crisis by establishing an emergency response system and strong cooperation.

❖ Diagram of the Integrated system for supply prediction



Timely construction of new power plants

Dangjin Units #9 and #10 (2,000MW) are now under construction to be completed in 2016 by the national demand for expansion of facilities according to the rapid rise in electricity demand. In addition, the superannuated and high-cost Ulsan Heavy Oil Thermal Power Plant (Units #1~3) will be replaced by lowcarbon, high efficiency Ulsan #4 Combined Heat and Power Plant (950MW) planned for completion in 2014.

Safety first operation of the power plants

After Fukushima nuclear accident in the 11th of March, 2011, EWP built mid- & long-term IT-based enforcement system for disaster safety management, and benchmarked advanced international companies, such as MHI and Weir International. As a result, EWP has achieved 5-year-long no injury record. In addition, EWP is now operating various safety management systems, such as 2 Strike Out, Work Stop and Safety Alarm systems, to prevent negligent accidents similar to recent scaffold collapse accident, electrical fire or toxic material (e.g. hydrofluoric acid) leakage accident in Korea.

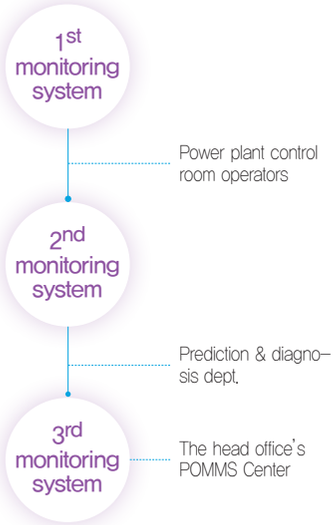
❖ Safety management structure

❖ Safety management systems for preventing similar accidents and following safety rules

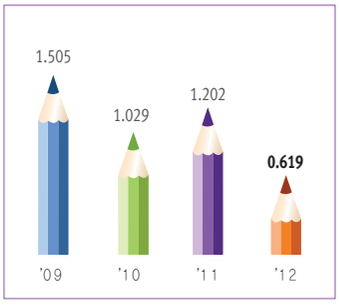
Work Stop	In case of accident, stop relevant working until measures are made.
Safety Alarm	In case of serious accident in other plants, issue an alarm and conduct safety check on relevant working
2 Strike Out	Pick out danger-causing workers with strict personnel transferring

Prevention of failure by strengthening real-time prediction & diagnosis

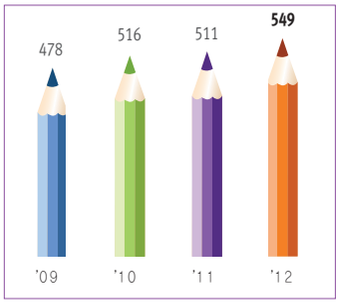
EWP is utilizing a future facility monitoring system and has actively introduced scientific analysis techniques and the latest maintenance technologies on the basis of sufficient professional technological manpower to perform optimum operation and maintenance appropriate for the condition of the facilities. In addition to the 1st monitoring conducted on the basis of the experience and technological power of the operators of the power plants, EWP is doing the 2nd monitoring to prevent fatal accidents in power plant facilities by sensing the problem of the facilities in advance with the application of intelligent algorithm to the system monitoring the operation of the power plant facilities; and the 3rd monitoring system designed to prevent emergent breakdown through the monitoring at the head office's POMMS Center. Through such triple monitoring system, EWP has minimized blind spots in facility monitoring and enabled stable operation of facilities. Moreover, EWP has developed a smart solution by itself to prevent facility breakdown and performance degradation.



❖ Forced outage rate (unit : %)



❖ Sales (Unit: 100,000,000 kWh)



Future Growth Business

Development of New & Renewable Energy

Major Sources of New & Renewable Energy

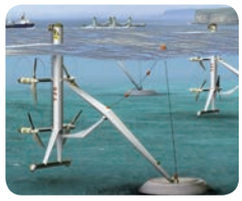
Photovoltaic Power

Solar cells convert sunlight directly into electrical energy

Wind Power

The turning force of windmill is changed into electricity

Tidal Power



The flow of high tide and low tide is used

Small Hydro Power

Small dams are used for waterpower generation

Fuel Cells

Chemical reaction of oxygen and hydrogen is used

Biomass

Woody biomass fuel is used

Bio Gas Turbine

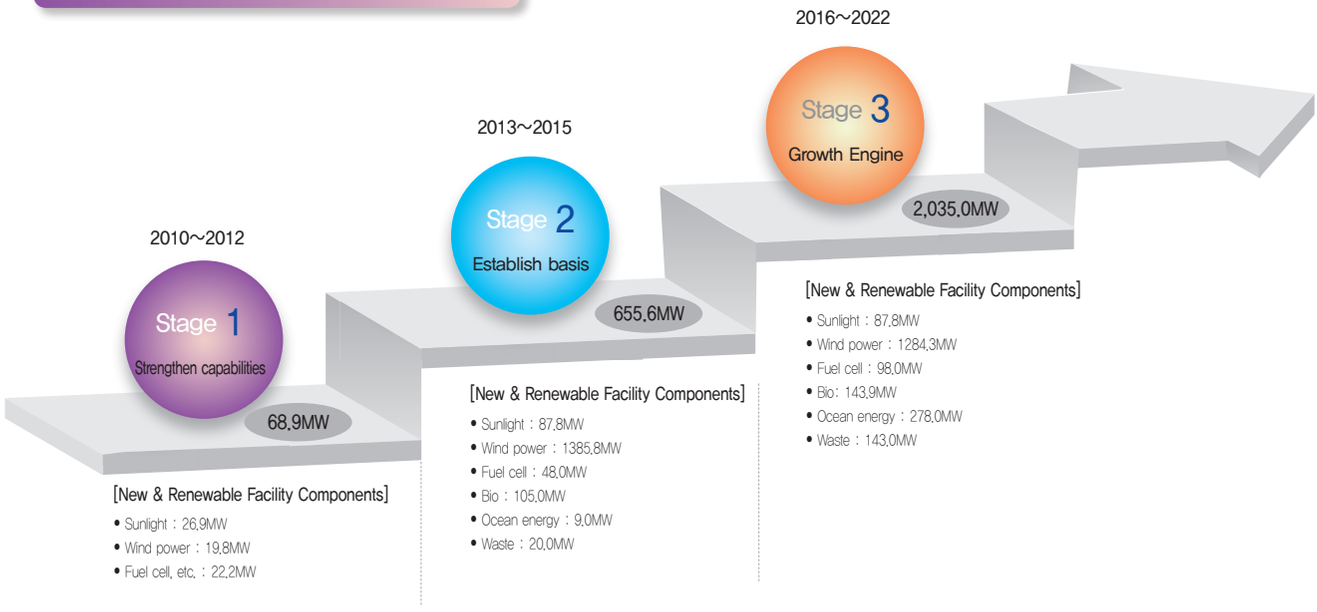
Combustible gas in food garbage waste water is used

Wastes (SRF)

Combustible wastes are used as resources

Step-by-step Plans for New & Renewable Energy

Development Road Map for New & Renewable Businesses



Major Projects

Fuel Cell

The unused space in the precinct of Ilsan Combined Heat & Power Plant was used to construct eco-friendly high-efficiency fuel cell facility units #1~#3 step by step for an operation of 8MW facilities in total. The heat generated during the operation of the equipment is retrieved to be offered to the nearby consumers at cheap prices contributing to the efficient usage of energy. In addition, EWP is now constructing 2.8MW fuel cell facility in Ulsan plant site, which is planned to complete in September, 2013, and with this facility, EWP will secure an independent technology in fuel cell sector by transferring O&M technology, for the first time among power generation companies. Through this, the company is focusing in securing new growth engines with the development of fuel cell business both home and abroad and advancement into O&M business.

Photovoltaic Power

EWP has constructed and is operating high value added rooftop-style photovoltaic power generation facilities without environmental damage by using the existing buildings including the parking lot and roof of warehouse in Donghae Thermal Power Plant (1MW), the roof of Dangjin Thermal Power Plant's turbine building (1.7MW), the roof of Dangjin City Waste Landfill Building (1.3MW), and the roof of the warehouse in the container berth in Gwangyang Harbor. As a result, EWP is contributing to the effective fulfillment of the compulsory amount of Renewable Portfolio Standard (RPS). Especially, in the RPS business, EWP has successfully implemented 20MW photovoltaic power generation business at Renault Samsung Motors (i.e. 11MW at the vehicle waiting area, 7.4MW at the plant roof and 1.6MW at the customer parking lot), which is the largest capacity of its kind in Korea. In fact, the roof-type photovoltaic power facility at the vehicle waiting area is regarded as one of successful win-win models of new renewable energy business, preventing newly produced vehicles from discoloration by direct rays.

Busan Shinho Solar Power(20MW)

Construction of Wind Power Plants

EWP is focusing on the development of on-shore wind power plants close to the grid parity. The construction of the 1st stage Gyeongju Wind Power Plant (16.8MW) and Jisan Wind Power Plant at Yeonggwang have completed in October, 2012 to construct eco-friendly power plants, and the construction of the 2nd stage Gyeongju Wind Power Plant (20MW), Gangneung Daegiri Wind Power Plant (24MW) and Yeonggwang Honam Wind Power Plant (20MW) are being considered.

In addition, EWP is participating in the large scale wind power project, the construction of 2.5GW off-shore wind power plant complex supervised by the Ministry of Knowledge Economy, to contribute to the technological development for land and ocean wind power industry in Korea. EWP is also fostering professional manpower for the development of wind power business to focus on technological independence and commercialization. And as a result, 3 new renewable energy managers in EWP have achieved WAsP certificates.

Grid Parity

A point where the price of the electricity produced by new & renewable energy source becomes the same as the price of the electricity produced by fossil energy.

WAsP(Wind Atlas Analysis and Application Program)

WAsP is an internationally well-known program that is used in designing wind power plants with the prediction of wind speed and direction. As a wind power plant designing license, the certificate of WAsP started in 2001, and today there are only 197 certificate holders in 30 countries.

Gyeongju wind power (1st stage)(16.8MW)

Bio Energy

Donghae 30MW Woody Biomass Power Plant, the largest capacity of its kind in Korea, using waste woods which are simply buried and the residual materials in forest that are left in the mountains due to the high cost of disposal, is leading the commercialization of green energy. Also, EWP is considering constructions of the world first and largest 5MW bio gas turbine power generation facility that uses food waste effluent in a filled-in ground on the metropolitan area, 38.9 MW Biomass Plant in Seokmun Industrial Complex, Dangjin sewage co-firing facility and Donghae Thermal Biomass co-firing facility to maximize recycling of wasted resources and to comply with the government's Renewable Portfolio Standards (RPS).

Ocean Energy such as Small Hydro and Tidal Power

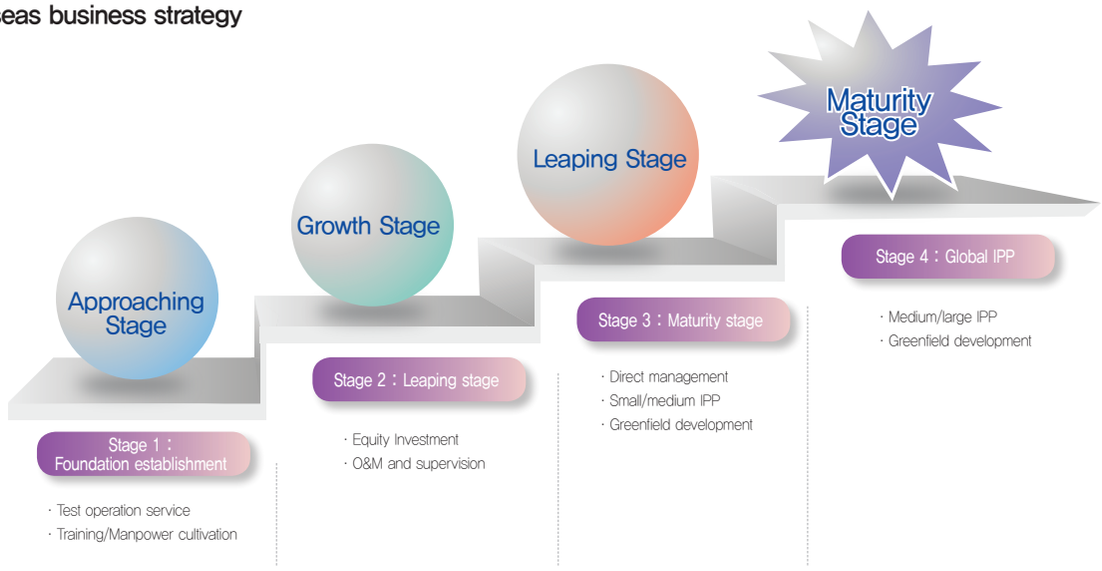
EWP has actively promoted the R&D projects with domestic research institutes to improve the technological power of Korea in tidal power generation. A 1MW pilot tidal power plant has been constructed in Uldolmok Waters for the first time in Asia, and a large capacity tidal power plant (14.5MW) is being promoted on its basis. In addition, a 5MW small hydro power generation facility has been completed by using the outlet which leads to the sea through a cooling system. A 3MW small hydro power generation facility is under construction for the 2nd stage, and the development of a 254MW tidal power plant is being propelled for the usage of ocean energy.

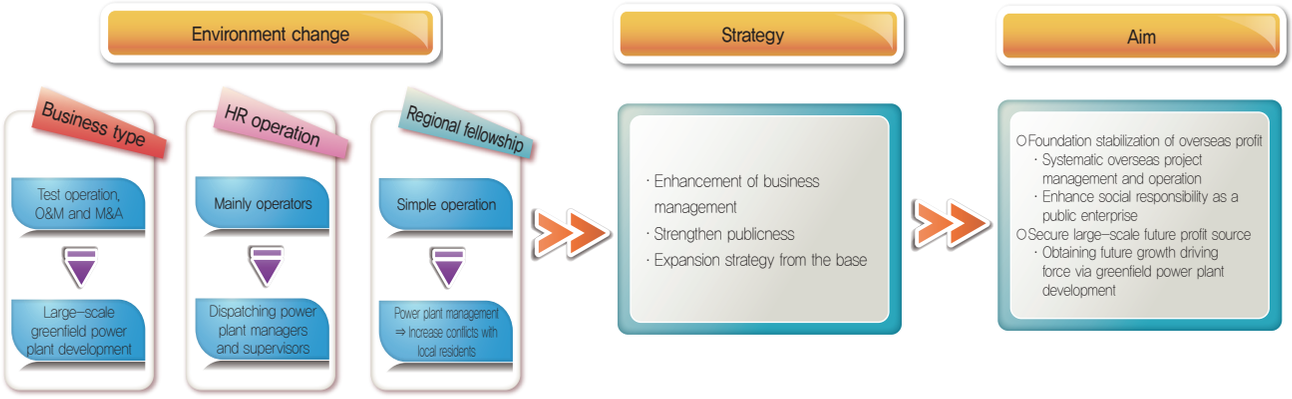
Waste Energy

EWP is carrying forward 100㎿ Samcheok SRF Power Plant, the largest of its kind in Korea, which uses the solid recovery fuel (SRF) produced by recycling of buried and burned waste resources among the combustible wastes occurring in living and workplaces, a 22㎿ SRF power plant in a filled-in ground in the metropolitan area a 20㎿ SRF Combined Heat and Power Plant in Wonju. As a result, EWP creates a composite synergy effect and environmental convenience at the same time.

Overseas Business

Overseas business strategy





Enhancement of overseas business

EWP successfully completed the test operation of Nueva Ventanas coal-fired thermal power plant in Chile in 2008, and then it has been expanding its overseas service projects, such as O&M of a fluidized-bed plant in Cebu, the Philippines in 2009, US EWP RC Biomass and natural gas plant in 2010, and Jamaica JPS and Haiti E-power investment in 2011. From service businesses with dispatching operators at the beginning to the management of overseas power plants, EWP diversifies its business fields. This is because of EWP's world-class plant constructing and managing experience acquired from domestic power generating business, specialized fluidized-bed coal power plant and wind power plant experience, systematic and specialized manpower for overseas development and broad network for overseas projects. Also, along with such growth, EWP introduced the self-supporting system which can analyze individual profitability with overall benefits and costs of each overseas project to systematically manage and analyze overseas business.

On top of the previous business analysis system, which simply adds up the benefits and costs of overseas projects, this new system allows EWP to calculate overseas subsidiary profits, the overall profit of overseas business, including direct/indirect costs, as well as the overall expenses, and thus, to accurately analyze the profitability based on each business's real financial statement.

❖ Overseas Power Generation Business in Operation

No	Project Name	Capacity (MW)	Type	Related organization
1	Jamaica Public Service (JPS)	636	Equity Investment (–40%)	Marubeni, OUR
2	US EWP RC Biomass & natural gas plant facility in the U.S.	152	Equity Investment (–100%)	–
3	US EWP RC Biomass & natural gas plant facility in the U.S.	30	Equity Investment (–30%)	EDH
4	O&M of CFBC in Cebu, Philippines	200	O&M	KSPC
5	Guam Cabras #3,4 diesel power plant PMC business	80	O&M	GPA
6	Operation service for Ambatovy CFBC power plant in Madagascar	135	Test Operation	KEPCO KPS
7	Test operation service for Campiche Coal Thermal Power Plant in Chile	240	Test Operation	POSCO E&C

Global partnership that results in win–win growth with domestic partners

In order to obtain publicness of overseas business, EWP, as a public enterprise, is actively supporting exports of relevant domestic partners. At first, the win–win growth performance was merely 0.8 billion won from 1 overseas project in Guam in 2010 due to the simple purchase of domestic consumable products. However, with an effort to increase diversity, such as purchasing equipments, the export amount reached to 10.3 billion won, which was 13 times bigger than the one at the beginning. In addition, when EWP participates in overseas green field business, we go with domestic construction companies together, making the construction industry vibrant. Moreover, to become a global IPP and to fulfill its corporate social responsibility (CSR), EWP also supports the infrastructure of the vicinity of overseas business areas.

Base–centered greenfield business development

Since 2012, EWP has been focusing on overseas greenfield business development, for example 1,200MW coal–fired thermal power plant in Namdinh, Vietnam, with human resources for overseas business that are secured for stable and continuous overseas business and joint investment with verified partners. In addition, EWP also improves economic feasibility of planned projects via strategic negotiation. In case of the 360MW combined thermal power plant project in Jamaica, EWP reduced the construction cost via the optimalization of technical specification, and in case of the Kalsel–1 fluidized–bed development project in Indonesia, EWP improved the PF conditions with long–term low interest.

Continuous R&D

EWP strengthens the competitiveness of its technologies in the world and fosters core competence of the future through continuous R&D. By converting its paradigm of R&D into the type of active discovery of missions, EWP is leading technological management and promoting value-creating 4th generation R&D to create future growth engines and secure the technological capabilities for global green growth. Moreover, EWP was certified by the government in 2008 as an 'organization exclusive for R&D' for its leadership in R&D in the power generation industry.

R&D Status

Along with the demand survey of technical development for the whole EWP employees, EWP established EWP industry-academic R&D Cluster for maximizing profit via the improvement of critical technology and preventing internal and external business environment changes. Also, in order to strengthen future technology competitiveness, core technologies to be secured in a long term are selected and their mid- and long-term R&D plans have been devised. On such basis, EWP developed Plant Operations and Maintenance Management system (POMMS), the world's first comprehensive power plant operation and maintenance working system, and is actively coping with RPS and environmental regulations by preoccupying the technologies for the usage of low-quality fuels, such as upgrade technology for low grade coal, and making R&D activities in the area of new & renewable energy for low-carbon green growth, such as biomass plant for food waste, through the performance of an 'R&D with Vision'.

❖ R&D Investment Status

Classification	2010	2011	2012	2013
Classification	23.9 billion won	25.2 billion won	28.0 billion won	31.0 billion won(estimated)

R&D Achievements

EWP has actively invested in the R&D for not only commercialization but also securing original technology. A total of 430 research projects have been conducted to save maintenance and purchasing costs, and the amount of profit is expected to increase in the future.
Such expansion in the systematic and continuous investment in R&D was recognize by the awarding of the 'Korea Technological Innovation Management Grand Prize' and the award from the Korean government for the company's contribution to the development of power generation industry through the successful 'Hybrid de-nitrification system' for the first time in Korea. Besides, EWP has secured a total of 160 industrial property rights including the 'method to provide trouble diagnosis and preventive maintenance for generator controlling system', and 58 cases among them have been transferred to the companies which need them to contribute to the creation of added value in addition to achieving co-prosperity with SMEs.

❖ Status of Industrial Property Rights of EWP

Classification	Patent	Utility Model	International Patent	Trademark	Service Mark	Total
건수	119	19	1	12	9	160

Financial Performance

EWP will secure competitive edge through innovation of business structure, create new growth engines through business diversification, and support the execution of strategies with an advanced management system.

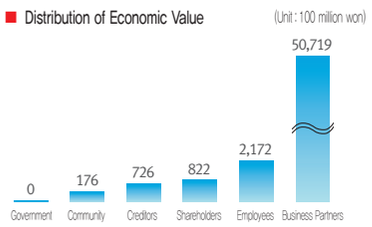
Management Index

EWP's sales volume of electricity in 2012 was 54.9 billion kWh, which was 13.3% increase from the volume of the previous year, 51.1 billion kWh. The total sales recorded 995.8 billion won which was an increase by 23.5% compared to the previous year due to the rise in unit price of electricity. To cope with unfavorable external management environments, such as the increase of oil prices and exchange rates, EWP made efforts for innovative improvement in management, such as the reduction of maintenance periods and the curtailment in fuel purchasing costs, the profit recorded 231.1 billion won, which was an increase by 39.2 billion won from a year earlier.

Classification	2010	2011	2012
Sales (100 million won)	44,513	48,550	59,958
Operating Profit (100 million won)	2,002	1,919	2,311
Net Profit (100 million won)	1,416	929	1,675
Assets (100 million won)	57,000	58,675	61,203
Debts (100 million won)	20,520	24,665	26,511
Capital (100 million won)	36,480	34,010	34,692
Debt Ratio (%)	56.3	72.5	76.4
Dividends (100 million won)	725	694	822
Dividends per Share (won)	1,281	1,226	1,453

Distribution of Economic Value

The profits created by continuous and stable supply of high-quality electricity are distributed in various types to the stakeholders including employees, business partners, creditors, shareholder, local community and the government.



Investment in Facilities

The total amount paid to business partners in 2012 was 5,071.9 billion won which was spent for purchase of fuel, maintenance, etc. The materials necessary for the improvement in the maintenance of power generation facilities as well as fuels of coal, heavy oil, LNG, etc. were purchased.

Unit : 100 million won

Classification	2010	2011	2012
Investment in Facilities	34,955	40,450	50,719

Salary & Benefits

In 2012, the personnel expenses for employees including salary, retiring allowance reserve and fringe benefits were 217.2 billion won in total. Among them, the salary was 176.9 billion won, which was 25.5 billion won increase from the previous year, and the retiring allowance reserve decreased by 1.3 billion won year on year. Meanwhile, 23.0 billion won was spent for fringe benefits, which was a decrease by 1.9 billion won from the previous year.

Unit : 100 million won

Classification	2010	2011	2012
Salary	1,404	1,514	1,769
Retiring allowance reserve	184	186	173
Fringe benefits	223	249	230
Total	1,811	1,949	2,172

Compensation for Shareholders

For the economic performance made in fiscal year 2012, a resolution was made in the annual meeting of shareholders in March, 2013 to pay 82.2 billion won in dividends.

Unit : 100 million won

Classification	2010	2011	2012
Cash Dividend	725	694	822

Tax

The amount of tax assessment from the net profit before–tax in 2012, 215.4 billion won, was 52.1 billion won. However, the actual corporate tax paid was 23.2 billion won, due to the 2011 deficit deduction carried forward and relevant investment tax deduction. And the local tax of 3.1 billion won from local income tax on the corporate tax was paid.

Unit : 100 million won

Classification	2010	2011	2012
Corporate Tax	528	0	232
Local Tax	55	29	31
Total	583	29	263

Social Contribution Expenditure

A total of 17.6 billion won was used for social contribution in 2012. Among this expenditure, approximately 17.2 billion won was used by the controlling local governments and each power plant for the activation of the local economy according to the Law on the Support for the Areas near Power Plants. The 0.5 billion won created by the collection of money by employees for social contribution fund and a matching grant by the company was used for the expenses for social contribution activities.

Unit : million won

Classification	2010	2011	2012
Projects for income increase	4,027	2,786	4,320
Projects for public facilities	1,415	1,518	2,350
Social welfare projects	1,161	961	650
Educational projects	2,950	2,241	2,971
Others	533	515	7,283
Total	10,086	8,021	17,574

Appendix

Performance of 10 Principles of UN Global Compact

WE SUPPORT

EWP became a signatory to the UN Global Compact in August 2006 as part of its mission to ensure transparent management and to fulfill its social responsibilities. The company discloses its compliance with the Global Compact through the following ten principles in four major areas..

Classification	Principles	Reference
Human Rights	Businesses should support and respect the protection of internationally proclaimed human rights; and	Collective Agreement Charter of Ethics Code of ethics, Articles 19 & 21 Code of Conduct, Article 27
	Make sure that they are not complicit in human rights abuses	Corporate Philosophy Collective Agreement Code of Conduct, Article 27
Labor	Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;	Collective Agreement
	Businesses should eliminate all forms of forced and compulsory labor;	Collective Agreement Code of ethics, Article 22
	Businesses should eliminate child labor; and	Collective Agreement
	Businesses should eliminate discrimination in respect to employment and occupation.	Collective Agreement Charter of Ethics Code of ethics, Articles 10 and 20 Code of Conduct, Article 7
Environment	Businesses should support a precautionary approach to environmental challenges	Environmental Vision Environmental Policies ISO 14000 Certification Charter of Ethics Code of ethics, Article 26
	Businesses should support a precautionary approach to environmental challenges	Environmental Policies Charter of Ethics
	Businesses should encourage the development and diffusion of envi-ronmentally friendly technology.	Environmental Vision Environmental Policies Charter of Ethics
Anti-Corruption	Businesses should work against corruption in all its forms, including extortion and bribery.	Code of ethics, Articles 6 and 8 Code of Conduct, Chapter 3

Awards in 2012 and Association Membership

Major Awards in 2012

Awards	Awarder	Month	Remarks
Prime Minister citation (Childbirth Encouragement Policy)	Prime Minister	7	
Award for Global field–training of specialized high school	Ministry of Education, Science and Technology	2	
2012 EUCG Best Performer	The Electric Utility Cost Group (EUCG)	4	
Accreditation of excellent climate change competitiveness (1st in the generation industry)	Ministry of Knowledge Economy	6	
Grand Prize of labor–management cooperation	Korea Employers Federation	2	
Presidential citation (win–win growth)	President of Korea	9	

Association Membership

Membership Organization	Purpose
The Institute of Internal Auditors	To learn the latest auditing techniques and exchange information.
The Business Ethics for Top performance	To establish ethical culture in the company and root down transparent management system.
Korea Suggestion System Association	To acquire information for the promotion of suggestions and small group activities in the company.
The Edison Electric Institute (EEI)	To acquire the information on the electricity industry of the U.S. and establish cooperative relationship.
UN Global Compact	To enhance the status as a global company.
Korea Plant Industries Association	To acquire information on business development and seek the opportunity for participation.
Korea International Cooperation Agency	To seek the opportunity for participation in business development.
The Korea Employers Federation	To know the trend of the latest labor affairs in the congress and the administration
Korea International Trade Association	To cooperate on the data and information related to international trade.
Korea Power Exchange	To consult on the affairs related to electricity transaction.
The Korean Society of Mechanical Engineers	To grasp the domestic and overseas trend of machinery industry by participating in academic meetings and lectures.
The Korean Institute of Electrical Engineers	To exchange the latest academic and technological information in related industries.
The Korea Energy Foundation	To fulfill corporate social responsibility and implement energy welfare programs effectively.
Korean Standards Association	To introduce advanced quality control techniques and spread quality management mind throughout the company.
The Korea Electric Association	To stipulate technological and systematic matters to secure credibility of power generation facilities.
Korea New & Renewable Energy Association	To exchange information in the area of new & renewable energy.
Korea Wind Power Generation Industry Association	To exchange information among companies and jointly promote PR and cooperative projects.
The Electric Utility Cost Group (EUCG)	To acquire overseas information on electricity.
Korea Project Management Association	To enhance the capabilities for project execution.
The Business Institute for Sustainable Development	To promote sustainable development of the company.
The Korea Carbon Capture and Storage Association	To improve the technology for collection and storage of carbon dioxide.

GRI Index

GRI Index		Description	Page	Note
Strategy and Analysis	1.1	Statement from the most senior decision-maker of the organization (e.g., CEO, chair, or equivalent senior position) about the relevance of sustainability to the organization and its strategy.	3	
	1.2	Description of key areas of impact, risks, and opportunities	12	
Organizational Profile	2.1	Name of the organization	4	
	2.2	Primary brands, products, and/or services	4	
	2.3	Operational structure of the organization, including main divisions, operating companies, subsidiaries, and joint ventures	4	
	2.4	Location of the organization' s headquarters	4	
	2.5	Number of countries where the organization operates, and the names of countries with either major operations or that are specifically relevant to the sustainability issues covered in the report	5	
	2.6	Nature of ownership and legal forms	7	
	2.7	Markets served (including geographic breakdown, sectors served, and types of customers/beneficiaries).	4	
	2.8	Scale of the reporting organization	5	
	2.9	Significant changes during the reporting period regarding size, structure	4, 8	
	2.10	Awards received in the reporting period	72	
Report Parameter	3.1	Reporting period (e.g., fiscal/calendar year) for information provided	1	
	3.2	Date of most recent previous report (if any)	1	
	3.3	Reporting cycle (annual, biennial, etc.)	1	
	3.4	Contact point for questions regarding the report or its contents.	1	
	3.5	Process for defining report content	1	
	3.6	Boundary of the report (e.g., countries, divisions, subsidiaries, leased facilities, joint ventures, suppliers)	1	
	3.7	State any specific limitations on the scope or boundary of the report	1	
	3.8	Basis for reporting on joint ventures, subsidiaries, leased facilities, outsourced operations, and other entities that can significantly affect comparability from period to period and/or between organizations.	N/A	
	3.9	Data measurement techniques and the basis of calculations	1	
	3.10	Explanation of the effect of any re-statements of information provided in earlier reports, and the reasons for such re-statement	N/A	
	3.11	Significant changes from previous reporting periods in the scope, boundary, or measurement methods applied in the report	1	
	3.12	GRI Content Index	73	
	3.13	Policy and current practice with regard to seeking external assurance for the report	70	
Governance, Commitments, and Engagement	4.1	Governance structure of the organization	7	
	4.2	Indicate whether the Chair of the highest governance body is also an executive officer	7	
	4.3	For organizations that have a unitary board structure, state the number and gender of members of the highest governance body that are independent and/or non-executive members	7	
	4.4	Mechanisms for shareholders and employees to provide recommendations or direction to the highest governance body	12	
	4.5	Linkage between compensation for members of the highest governance body, senior managers, and executives (including departure arrangements), and the organization's performance (including social and environmental performance).	7, 8	
	4.6	Processes in place for the highest governance body to ensure conflicts of interest are avoided	8	
	4.7	Process for determining the composition, qualifications, and expertise of the members of the highest governance body and its committees	7	
	4.8	Internally developed statements of mission or values, codes of conduct, and principles relevant to economic, environmental, and social performance and the status of their implementation.	10	
	4.9	Procedures of the highest governance body for overseeing the organization's identification and management of economic, environmental, and social performance	7	
	4.10	Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance	13	
	4.11	Explanation of whether and how the precautionary approach or principle is addressed by the organization.	12	
	4.12	Externally developed economic, environmental, and social charters, principles, or other initiatives to which the organization subscribes or endorses	72	

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Governance, Commitments, and Engagement	4.13	Memberships in associations (such as industry associations) and/or national/international advocacy organizations	72	
	4.14	List of stakeholder groups engaged by the organization	12	
	4.15	Basis for identification and selection of stakeholders with whom to engage	12	
	4.16	Approaches to stakeholder engagement, including frequency of engagement by type and by stakeholder group	12	
	4.17	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	12	
Economic Performance Indicators	EC1	Direct economic value generated and distributed, including revenues, operating costs, employee compensation, donations and other community investments, retained earnings, and payments to capital providers and governments	67, 68	
	EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change	46	
	EC3	Coverage of the organization's defined benefit plan obligations	N/A	
	EC4	Significant financial assistance received from government	N/A	
	EC5	Range of ratios of standard entry level wages by gender compared to local minimum wages at significant locations of operation	–	
	EC6	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation	39	
	EC7	Procedures for local hiring and proportion of senior management hired from the local community at locations of significant operation	20	
	EC8	Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement	38, 39	
	EC9	Understanding and describing significant indirect economic impact, including the extent of the impact	–	
Environmental Performance Indicators	EN1	Materials used by weight or volume	49	
	EN2	Percentage of materials used that are recycled materials	49	
	EN3	Direct energy consumption by primary energy source	49	
	EN4	Indirect energy consumption by primary source	49	
	EN5	Energy saved due to conservation and efficiency improvements	47	
	EN6	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives	47	
	EN7	Initiatives to reduce indirect energy consumption and completed reductions	50	
	EN8	Total water withdrawal by source	51	
	EN9	Water sources significantly affected by withdrawal of water	51	
	EN10	Percentage and total volume of water recycled and reused	51	
	EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	53	
	EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas	53	
	EN13	Habitats protected or restored	53	
	EN14	Strategies, current actions, and future plans for managing the impact on biodiversity	53	
	EN15	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	
	EN16	Total direct and indirect greenhouse gas emissions by weight	46	
	EN17	Other relevant indirect greenhouse gas emissions by weight	46	
	EN18	Initiatives to reduce greenhouse gas emissions and completed reductions	47	
	EN19	Emissions of ozone-depleting substances by weight	N/A	
	EN20	NO, SO, and other significant air emissions by type and weight	49	
	EN21	Total water discharge by quality and destination	49	
	EN22	Total weight of waste by type and disposal method	49	
	EN23	Total number and volume of significant spills	52	

지표		지표내용	페이지	비고
Environmental Performance Indicators	EN24	Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally	N/A	
	EN25	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization' s discharges of water and runoff	51	
	EN26	Initiatives to mitigate the environmental impact of products and services, and the extent of impact mitigation	53	
	EN27	Percentage of products sold and their packaging materials that are reclaimed by category	N/A	
	EN28	Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with environmental laws and regulations	55	
	EN29	The significant environmental impact of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce	–	
	EN30	Total environmental protection expenditures and investments by type	–	
Labor Practices and Decent Work Performance Indicators	LA1	Total workforce by employment type, employment contract, and region, broken down by gender	19	
	LA2	Total number and rate of new employee hires and employee turnover by age group, gender, and region	19	
	LA3	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by significant locations of operation	20	
	LA4	Percentage of employees covered by collective bargaining agreements	–	
	LA5	Minimum notice period(s) regarding operational changes, including whether it is specified in collective agreements	7	
	LA6	Percentage of total workforce represented in formal joint management? worker health and safety committees that help monitor and advise on occupational health and safety programs	28	
	LA7	Rates of injury, occupational diseases, lost days, absenteeism, and total number of work-related fatalities, by region and by gender	29	
	LA8	Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases	29	
	LA9	Health and safety topics covered in formal agreements with trade unions	28	
	LA10	Average hours of training per year per employee by gender, and by employee category	23	
	LA11	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing the conclusion of their careers	23	
	LA12	Percentage of employees receiving regular performance and career development reviews, by gender	19, 21	
	LA13	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity	7, 19	
	LA14	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation	20	
Human Rights Performance Indicators	HR1	Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening	–	
	HR2	Percentage of significant suppliers, contractors, and other business partners that have undergone human rights screening, and the subsequent actions taken	–	
	HR3	Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained	21	
	HR4	Total number of incidents of discrimination and corrective actions taken	N/A	
	HR5	Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights	N/A	
	HR6	Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor	N/A	
	HR7	Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of all forms of forced or compulsory labor	N/A	
	HR8	Percentage of security personnel trained in the organization' s policies or procedures concerning aspects of human rights that are relevant to operations	–	
	HR9	Total number of incidents of violations involving rights of indigenous people and actions taken	N/A	
Society Performance Indicators	SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs	36	
	SO2	Percentage and total number of business units analyzed for risks related to corruption	16	
	SO3	Percentage of employees trained in organization' s anti-corruption policies and procedures	17	
	SO4	Actions taken in response to incidents of corruption	17	
	SO5	Public policy positions and participation in public policy development and lobbying	32	
	SO6	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country	–	
	SO7	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	N/A	
	SO8	Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with laws and regulations	N/A	

지표		지표내용	페이지	비고
Product Responsibility Performance Indicators	PR1	Life cycle stages in which the health and safety impact of products and services are assessed for improvement, and the percentage of significant products and services categories subject to such procedures	49	
	PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning the health and safety impact of products and services during their life cycle, by type of outcome	N/A	
	PR3	Type of product and service information required by procedure, and percentage of significant products and services subject to such information requirements	N/A	
	PR4	Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcome	N/A	
	PR5	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	36	
	PR6	Programs for adherence to laws, standards, and voluntary codes related to marketing communication, including advertising, promotion, and sponsorship	22	
	PR7	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communication, including advertising, promotion, and sponsorship by type of outcome	N/A	
	PR8	Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	N/A	
	PR9	Monetary value of significant fines for noncompliance with laws and regulations concerning the provision and use of products and services	N/A	
(EUSS) Electric Utilities Sector	EU1	Installed capacity, broken down by primary energy source and by regulatory regime	5, 6	
	EU2	Net energy output broken down by primary energy source and by regulatory regime	6	
	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.	N/A	
	EU6	Management approach to ensure short and long-term electricity availability and reliability	58, 59	
	EU7	Demand-side management programs including residential, commercial, institutional and industrial programs	58	
	EU8	Research and development activity and expenditures aimed at providing reliable electricity and promoting sustainable development	66	
	EU9	Provisions for decommissioning of nuclear power sites	N/A	
	EU10	Planned capacity versus projected electricity demand over the long term, broken down by energy source and regulatory regime	63	
	EU11	Average generation efficiency of thermal plants by energy source and regulatory regime	46	
	EU12	Transmission and distribution losses as a percentage of total energy	N/A	
	EU13	Biodiversity of offset habitats compared to the biodiversity of the affected areas	53	
	EU14	Processes to ensure the availability of a skilled workforce	21	
	EU15	Percentage of employees eligible to retire in the next five and ten years broken down by job category and by region	–	
	EU16	Policies and requirements regarding health and safety of employees, contractors' employees and subcontractors	28	
	EU17	Days worked by contractor and subcontractor employees involved in construction, operation and maintenance activities	29	
	EU18	Percentage of contractor and subcontractor employees that have undergone relevant health and safety training	–	
	EU19	Stakeholder participation in the decision making process related to energy planning and infrastructure development	12	
	EU20	Approach to managing the impacts of displacement	37	
	EU21	Contingency planning measures, disaster/emergency management plans, disaster/emergency training programs, and recovery/restoration plans	11, 52	
	EU22	Number of people physically or economically displaced and compensation, broken down by type of project	N/A	
	EU23	Programs, including those in partnership with government, to improve or maintain access to electricity and customer support services	37	
	EU24	Practices to address language, cultural, literacy and disability related barriers to accessing and safely using electricity and customer support services	37	
	EU25	Number of injuries and fatalities to the public involving company assets, including legal judgments, settlements and pending legal cases of diseases	N/A	
	EU26	Percentage of population un-served in licensed distribution or service areas	N/A	
	EU27	Number of residential disconnections for non-payment, broken down by duration of disconnection and by regulatory regime	N/A	
	EU28	Power outage frequency	61	
	EU29	Average power outage duration	61	
	EU30	Average plant availability factor by energy source and by regulatory regime	6	

Reader Opinion Survey

In this report, EWP has tried to disclose its sustainability management activities as openly as possible. To improve its contents and level of completeness, we would like to hear from you. Your opinions will be reflected in future reports.

1. What is your position?

① Investor/shareholder ② Employee of Business Partner ③ Local Resident ④ NGO
⑤ Employee of a Power Generating Company ⑥ Member of the Academic Community
⑦ Civil Servant ⑧ Employee of EWP ⑨ Other ( )

2. What is your overall evaluation of this report?

☐ Good ☐ Moderate ☐ Bad

3. How understandable is this report?

☐ Easy ☐ Moderate ☐ Difficult

4. What is your evaluation of the amount of information in this report?

☐ Too much ☐ Moderate ☐ Too little

5. Which section of this report did you find the most interesting?

☐ Sustainability of EWP ☐ Economy ☐ Environment ☐ Society

6. Which section of this report do you think needs improvement?

☐ Sustainability of EWP ☐ Economy ☐ Environment ☐ Society

7. Please feel free to make any comments on this report.

Thank you for your cooperation.

Please forward this form to 82-2-3456-8519 (Fax) or sustainability@ewp.co.kr (E-mail).