

# Think TRUST

Korea Hydro & Nuclear Power Co., LTD  
Sustainability Report 2014



## About This Report

Through this sustainability report, green energy company Korea Hydro & Nuclear Power (KHNP) wishes to maintain transparency by disclosing its overall economic, social and environmental performances to the public. This fifth report reflects as much as possible the perspectives of key stakeholders, with external expert interviews as well as professional opinions and advice amply included.

### Reporting and verification guidelines

This report was prepared in accordance with GRI (International Sustainability Reporting Guidelines) G3.1 and in the case of Disclosure on Management Approach (DMA), GRI G4 has been partially applied. In addition to this, the international standard for corporate social responsibility (ISO 26000), as set by GRI EUSS (Electric Utilities Sector Supplement) and ISO (International Standards Organization), has also been applied. To improve the reliability of the information reported and enhance its quality, we have consulted and attached a statement of assurance from a third party verification agency (refer to page 80).

### Reporting scope and period

The scope of this report covers corporate headquarters and domestic sites. Included are statistics on quantitative performance spanning three years (from January 2011 to December 2013) and partial reports on qualitative performance up to October 2014. It has been three years since our last report in 2011, and to ensure timely reporting, we are planning to make new reports every year starting from 2015.

### Report viewing and further question

This report is available in printable form at the KHNP website ([www.khnp.co.kr](http://www.khnp.co.kr)) and is also downloadable as an interactive PDF file. For further inquiries in relation to the sustainable management of KHNP, please contact the team in charge.

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## Think TRUST

**T**echnology  
**R**espect  
**U**ltimate Safety  
**S**ocial Responsibility  
**T**imeless Integrity



# Think TRUST

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A man with short dark hair and glasses, wearing a white long-sleeved shirt and a blue tie, stands in an office. He has his hands clasped in front of him and is looking towards the camera with a slight smile. The background shows a modern office environment with a desk, a laptop, a monitor, and some potted plants.

KHNP is up and at it again,  
ready to take on the future.



**As the country's largest power generation company, supplying about 30% of the nation's power through nuclear, water and pumped-storage hydroelectric sources, KHNP (Korea Hydro & Nuclear Power Co., Ltd.) is working relentlessly to create sustainable growth with a corporate vision of living up to its name as 'KHNP, a trusted global energy leader'.**

We went through a very difficult couple of years. The management has been working alongside employees to correct the mistakes that were made and change the outlook of the company. By promoting 'three major innovations' in personnel, organization and company culture, we set out to enhance nuclear power plant safety.

As a result of these efforts, the first half of 2014 has been filled with rays of hope. The reliable operation of nuclear power plants stimulated growth in power generation, while a tightening of management across the entire enterprise improved financial outcomes. Increased nuclear power plant utilization and a reduction in the number of power plant failures are indicative of improved levels of operating performance. Further reflective of our efforts, we also achieved second place with 87.9 points in the WANO (World Association of Nuclear Operators) comprehensive safety performance index, a global index measuring nuclear power plant safety and performance.

We will operate nuclear power plants with safety in mind, recover trust through communication and a win-win spirit, and will continue to create new growth. We strive ceaselessly to better ourselves, in order to become a world-class nuclear power company appreciated by the people and respected by the international community.

First, we will achieve the highest standards of nuclear safety, which is our top priority.

We are increasing investments in technology development for the purpose of improving nuclear safety, and continue to promote enhanced safety measures. By strengthening our own quality assurance and safety management with a fundamental reform of nuclear safety and quality controls, as well as by actively engaging in the safety audits of regulatory agencies, safety inspections of the government and special inspections of international agencies, we are striving to ensure safety from multiple angles. We will continue to maintain the highest levels of safety by making it a priority of the utmost value at our company.

Second, we will regain the trust of our stakeholders through communication and a win-win spirit.

The sustainable growth of our company calls for the support and commitment of stakeholders, including national and local communities. First, we are trying to achieve an open organizational culture by promoting internal communication based on respect and trust among the staff. By providing external communication channels, such as through a nuclear power plant operation council, integrity ombudsman, and conferences concerning mutual growth, we are hoping to increase the confidence of stakeholders. Also, to improve the overall competitiveness of the nuclear industry ecosystem, we are striving to accompany growth with more partnerships. We want to connect with actively employed, outstanding individuals in the nuclear power plant industry, who have made a number of social contributions and are committed to the community.

Third, we will create new growth to secure the future of nuclear technology.

Nuclear power is a realistic alternative in response to high oil prices and climate change. Many countries are realizing the advantages of using nuclear power, and in light of this trend, we are looking for ways to make the world our stage, with regards to both our company, as well as our country. Since 2009, we have been constructing nuclear power plants in the United Arab Emirates (UAE) with our technology, and we hope to contribute in upgrading the nation's image through continued involvement in the nuclear operational support business and international export trade.

Turning crisis into opportunity, and further, into sustainable management goals, we are committed to improving company constitution through bold innovation and by practicing social responsibility. With determined resolution, and an expectation to restore the confidence of the people, we issue this sustainability report. We hope this report will be a valuable handbook that facilitates communication with the public and with stakeholders, informing them of company efforts toward sustainable management. We look forward to the continued interest and respect in our company as we seek a new beginning and pursue innovative change.

Thank you.

**Cho Seok**  
President & CEO, Korea Hydro & Nuclear Power Co., Ltd.



# 2012-2014 Highlights

## Recognized as the world's top tier nuclear power plant with regards to safe operation capability

In November 2013, members of WANO (World Association of Nuclear Operators) conducted a thorough inspection of four nuclear power sites and the headquarters of five areas (leadership and management, superintendence and observation, HQ support, human resource management and communication) and recognized that we are maintaining the world's top level of stability and operational capability.



## Achieved nuclear power plant standard design approval for 1.5 million kW APR+

We received nuclear power plant standard design approval from the Nuclear Safety and Security Commission for APR+ (a 1.5 million kW high-capacity nuclear power plant), which has been developed with genuine, native technology. It is the first 100% native technology has been applied to design. The export of two of these nuclear power plants is expected to achieve a profit of USD 10 billion.



## Yecheon pumped-storage power plant completed construction of Korea's first solar power plant utilizing the incline of a dam

KHNP completed construction of Korea's first 2MW solar power plant utilizing a dam incline. It is equivalent in effect to a greenhouse gas reduction of 1,800 tons per year and was registered at the UN's CDM (Clean Development Mechanism) to additionally obtain greenhouse gas emission rights.



## Localization of nuclear power plant core technology, safety analysis code

Following the nuclear power companies in the advanced countries of US and France, KHNP was the third in the world to localize the source technology, 'nuclear safety analysis code (SPACE)'. The safety analysis code, a computer program that verifies nuclear power plant safety, is an essential core technology when it comes to designing nuclear power plants. By localizing the code along with the nuclear reactor cooling pump and nuclear power measurement control system, we have secured the perfection of core nuclear technologies.

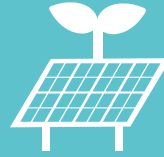


### Wolsong #3 achieved five consecutive cycles of safe operation without failure

Wolsong #3 (pressurized heavy water reactor, 700,000 kW) operated safely with no failures from May 24, 2007 to June 15, 2015 a span of 2,107 days. It is the first among pressurized heavy water reactor nuclear power plants to have achieved safe operation without a single failure for five consecutive cycles, demonstrating the overall safety and operational ability of our nuclear power plants.

### Full-scale operation of BPM (Business Process Management) system

We completed construction of the BPM in April 2013 and began its full-scale operation. BPM analyzes and eliminates problems from each job process, standardizing work processes so that they can be done through a computer system, allowing for real-time monitoring on the whole system and making it possible to enhance management effectiveness and transparency.



### Received grand prize in renewable energy

In October 2012, we received the grand prize from the Ministry of Knowledge Economy in recognition of our efforts for a mandatory renewable energy supply system. The system calls for power producers to supply a fixed rate of renewable energy in accordance with the government's policy of green growth and expansion of renewable energy supply, and the results reflect our leading role in the policy.



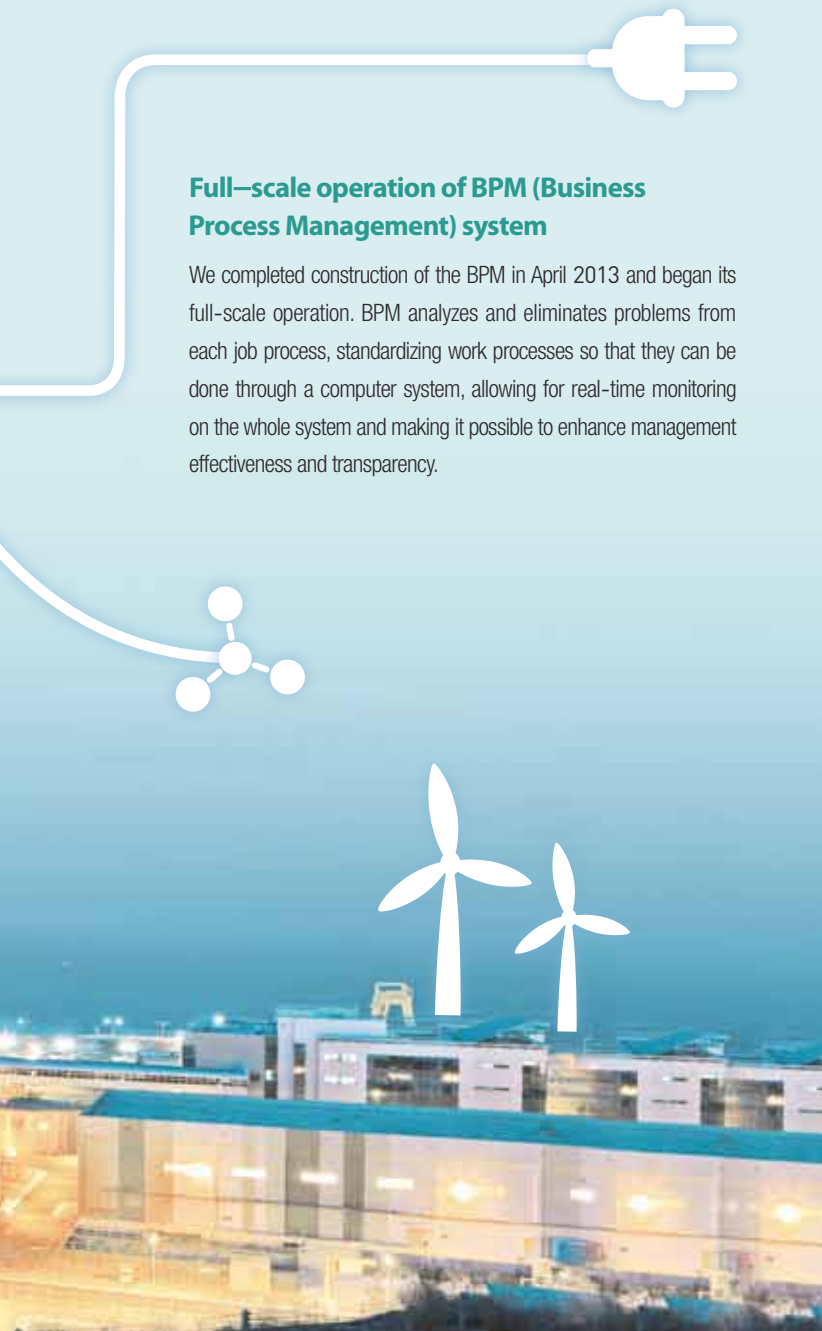
### Certification for safety & health management system integration

In September 2014, KHNP acquired certification for the renewal of an integrated safety & health management system based on the domestic standards of KOSHA 18001 (Korea Occupational Safety & Health Agency) and international standards of OHSAS 18001 (Korea Knowledge Standard Registrars), to become an undisputed global safety & health management system certified workplace.



### Hanbit Nuclear Power Site received the Minister of Security and Public Administration's Award at the 2013 Korean Volunteer Awards

As a result of their continuous volunteer activity and donations suited to various regional characteristics, Hanbit Nuclear Power Site received the Minister of Security and Public Administration's Award at the 2013 Korean Volunteer Awards in the area of corporate social contribution.





# Company Profile

## Company overview

KHNP is a public energy corporation that was established in April 2001 in compliance with the 'Electricity Industry Restructuring Program' of the government. Divided from the power sector of the Korea Electric Power Corporation, KHNP supplies reliable and affordable electric power through green energy (nuclear, hydro and renewable energy).

(As of June 30, 2014)

<b>Company name</b>	Korea Hydro & Nuclear Power Co., Ltd.
<b>Location of headquarters</b>	125 Hwarang-ro, Gyeonju-si, Gyeongsangbuk-do, Korea
<b>Main function</b>	Development of electric power resources / power generation and related businesses / R&D and affiliated businesses / overseas businesses
<b>Established</b>	April 2, 2001
<b>Capital</b>	KRW 1.2122 trillion (January 3, 2011)
<b>No. of employees</b>	9,563
<b>Organization</b>	7 divisions, 25 departments and offices / HQ, 4 nuclear power site (Kori, Yeonggwang, Wolsong, Uljin), 1 hydro power site, 7 pumped-storage power plants and 7 other offices

## Vision and Core values

**Vision** | To produce the most affordable and reliable electricity in order to improve the quality of life and become a strong pillar in the economic development of the state, KHNP established a vision of becoming "KHNP, a trusted global energy leader" and constantly strives toward realizing this.

**Core Values** | KHNP pursues five core values that are highly differentiated to carry out the original purpose of its establishment as a public company and at the same time to fulfill its responsibility as a member of society.

### KHNP Way

<b>T</b>	<b>Technology</b> With a foundation in the personal development of expertise and ongoing identification of opportunities for company improvement, KHNP aims to reach a world-class level.
<b>R</b>	<b>Respect</b> We acknowledge individual diversity and foster an organizational culture seeking synergy through cooperation based on open communication.
<b>U</b>	<b>Ultimate Safety</b> Safety is highly valued, such that we seek safety as a way of life through preventative measures in daily work activities, rapid response and the internalization of recurrence prevention.
<b>S</b>	<b>Social Responsibility</b> As a major producer of power in the national industrial basis, we will achieve social responsibility through public-oriented, environment-friendly management and stakeholder satisfaction.
<b>T</b>	<b>Timeless Integrity</b> As a public company serving the nation and the state, we foster a spirit of world-class anti-corruption and stand squarely against corruption of all forms.

### 2030 mid to long-term strategy overview

Mission	Enrich Life through Environment Friendly Energy			
Core values	Technology / Respect / Ultimate safety / Social responsibility / Timeless integrity			
Vision	KHNP, a trusted global energy leader			
Business goal	2030 revenue of KRW 25 trillion	37 domestic nuclear power plant sites in operation 11 overseas nuclear power plant contracts	achieve 16% in overseas sales	secure 'the world's best nuclear power plant technology'
Strategy direction	First priority given to the safe operation of nuclear power plants	Step-by-step promotion of overseas business	Expansion of technology-based business	
Business strategy	Domestic nuclear power plants sustainable and safe operation <ul style="list-style-type: none"> <li>process systematization <ul style="list-style-type: none"> <li>» establish KHNP's own integrated management model</li> </ul> </li> <li>technological leadership <ul style="list-style-type: none"> <li>» obtain leading global nuclear power plant technology</li> </ul> </li> <li>specialization of manpower <ul style="list-style-type: none"> <li>» diversification of recruitment pool</li> </ul> </li> <li>redefining the organization <ul style="list-style-type: none"> <li>» redesigning 2030 mid to long-term business organization</li> </ul> </li> </ul>	Overseas nuclear power plants step-by-step expansion of business model <ul style="list-style-type: none"> <li>short to mid-term pursuit of EPC business model</li> <li>expand to BOO business model in the long-term</li> <li>successful execution and development of joint project with KEPCO for overseas nuclear power plant and look into phased expansion of own business</li> </ul>	Hydraulics regional expansion in stages <ul style="list-style-type: none"> <li>secure reference in Southeast Asia and South Asia</li> <li>in the long-term, secure market share of 3~5% in three major countries including Indonesia</li> </ul>	New business selection and concentration <ul style="list-style-type: none"> <li>focus on nuclear power plant dismantling business <ul style="list-style-type: none"> <li>» secure core dismantling technology</li> </ul> </li> <li>after securing reference, enter overseas market</li> <li>optimization of economically feasible renewable energy portfolio</li> </ul>

## Main business

KHNP is predominantly engaged in the business of nuclear power generation, hydroelectric power generation and renewable energy, promoting R&D and international business as well as nuclear power plant construction projects. We are currently operating 23 nuclear power plants and in the process of constructing 9 more, in addition to operating 21 ordinary hydro, 16 pumped-storage, 5 solar, 1 wind and 14 small hydro power plants.

### Power generation facility

(As of June 30, 2014)

	Nuclear power				Hydro ncluding pumped storage)	Renewable	Total
	Kori	Hanbit	Hanul	Wolsong			
No. of operating plants	6	6	6	5	37	20	80
Facility capacity (MW)	5,137	5,900	5,900	3,779	5,295	28	26,039
Total (MW)	20,716						
Market share (%)	23.50				6.01	0.03	29.54

\* Based on standard total domestic power generation capacity of facility as 88,184 MW (excluding self-generating facilities)

### Power generation

(unit: GWh, %)

	2010	2011	2012	2013	June 2014
Nuclear power (domestic share)	148,596 (31.3)	154,723 (31.1)	150,327 (29.5)	138,784 (27.0)	77,908 (30.2)
Hydro, renewable (domestic share)	1,502 (0.3)	4,714 (1.0)	5,034 (1.0)	5,590 (1.1)	2,699 (1.0)
Total (domestic share)	150,098 (31.6)	159,437 (32.1)	155,362 (30.5)	144,374 (28.1)	80,607 (31.2)

\* KEPCO electricity statistics news (June 2014)

## Milestones

KHNP has been pioneering Korea's nuclear power industry and leading development of energy industry. Now we strive to leap as a global energy leader.

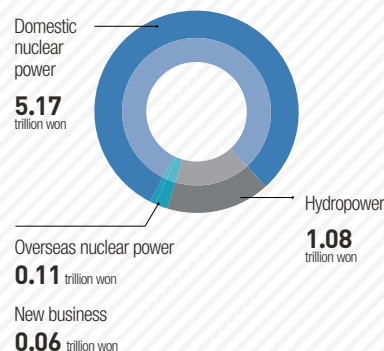
Beginning Stage (1978~1998)	Growth and Development Stage (1999~2007)	Takeoff Stage (2008~)
<p><b>1978</b> Completed construction of Kori #1</p> <p><b>1983</b> Completed construction of Wolsong #1, Kori #2</p> <p><b>1985</b> Completed construction of Kori #3</p> <p><b>1986</b> Completed construction of Kori #4, Yeonggwang #1</p> <p><b>1987</b> Exceeded 100 billion KWh of nuclear power generation</p> <p><b>1988</b> Completed construction of Ulin #1</p> <p><b>1998</b> Completed construction of Korea Standard NPP, Ulin #3 Won the first overseas NPP contract (Guangdong NPP technical advisory)</p>	<p><b>2001</b> Launched Korea Hydro &amp; Nuclear Power Co., Ltd. (spun off from KEPCO)</p> <p><b>2002</b> Completed construction of Yeonggwang #5,6 to reach world's 6th in facility capacity</p> <p><b>2003</b> Ulin #2 reached total power generation of 100 billion KWh</p> <p><b>2004</b> Completed ERP system Founded KHNP local community volunteer team</p> <p><b>2005</b> Renewable energy (Kori wind power and Yeonggwang solar park) Completed construction of Ulin #5 and #6</p> <p><b>2006</b> Total power generation of Ulin NPP exceeded 400 billion KWh</p> <p><b>2007</b> Groundbreaking of Shin-Wolsong #1,2 Completed construction of Wolsong Tritium Removal Facility Breaking ground of Wolsong nuclear power environment management center</p>	<p><b>2008</b> Domestic nuclear power generation reached 2 trillion KWh.</p> <p><b>2009</b> Won the UAE NPP project (USD 40 billion)</p> <p><b>2010</b> Installed Shin-Kori #3 reactor (first APR1400)</p> <p><b>2011</b> Acquired pumped storage power generation from thermo-power generation company (4,700MW) Commercial operation of Shin-Kori #1 (first OPR 1000) Declared vision 2025 and mid to long-term strategy for 2025 Selected as an excellent family friendly organization Selected as top Korean company in quality competitiveness</p> <p><b>2013</b> Signed contract with ACRC for integrity success project Heavy water reactor nuclear power plant made with domestic technology acquired safety analysis approval for the first time</p> <p><b>2014</b> Groundbreaking ceremony of new headquarter building (Gyeongju) Launched 'Future Development Committee' that internal and external experts participate in</p>

1978

2014

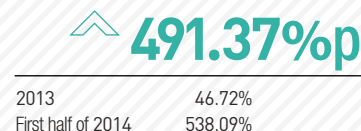
Global Energy Leader

### 2013 Business portfolio (revenue)

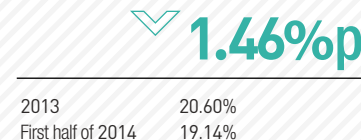


### Financial Stability Evaluation

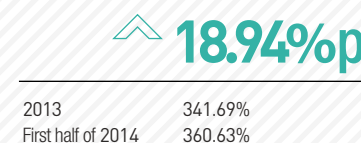
#### Interest coverage rate



#### Dependence on debt



#### Cashflow coverage rate



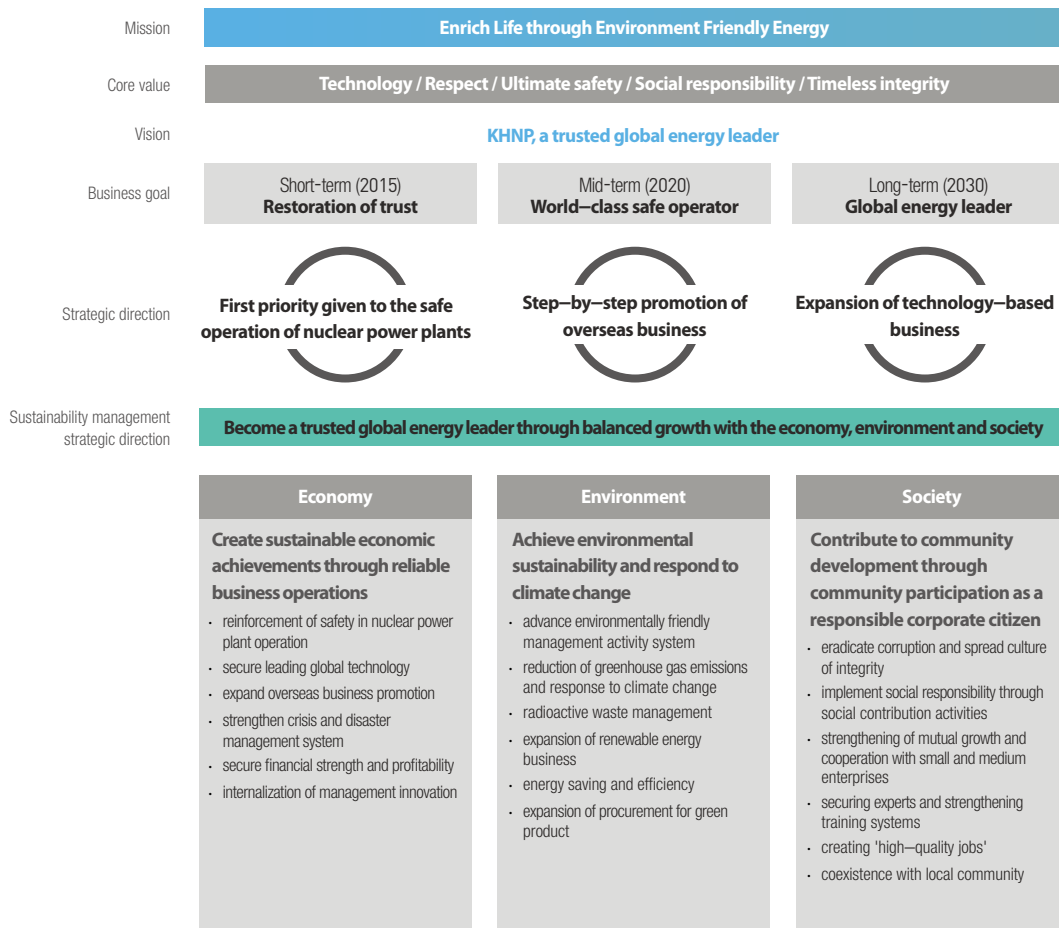
#### Credit ratings



# Sustainable Business Strategy

## Sustainable business strategy

As a trusted global energy company, KHNP has established a long-term strategy to comply with and has built a sustainability strategy framework. Also, detailed execution tasks are derived in accordance with strategic direction. This is aimed at enhancing the execution capability of sustainable management activities and carrying them out systematically while strengthening monitoring.



## Sustainability management implementation system

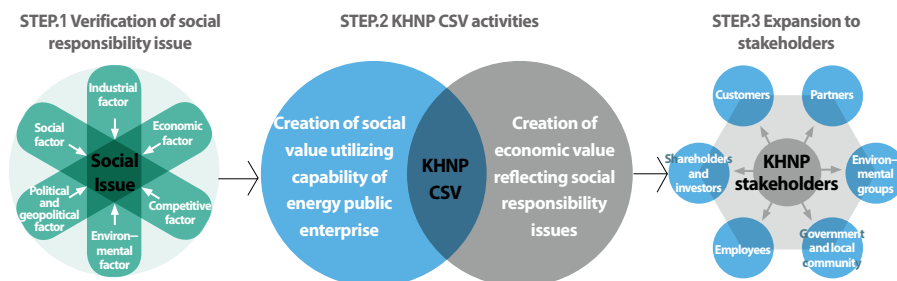
KHNP reflects sustainability of the overall management process through an effective organizational structure. We practice enterprise-wide sustainable management through the systematic cooperation of economy · society · environment-related departments, in particular. By emphasizing the supervision of responsibility of organizations on a sector-by-sector basis, and clearly identifying and defining the tasks to be performed by each sector, we promote individual sector activity.





## CSV framework

KHNP does not regard social responsibility and corporate management as separate, and will respond to the social responsibility issues in all processes that occur throughout the business by constructing a CSV (Creating Shared Value) framework for practicing sustainable management.



## Sustainability management system promotes corporate performance management

Target indicators	2013 target	2013 result	Result evaluation	2014 target
<b>Safety first management</b>				
Unplanned shutdown rate (%)	0.35	0.26	●	0.4
Unplanned shutdown by human error (case)	less than 2	0	●	less than 2
Improvements and replacement of major facilities (case)	13	13	●	2
Fukushima accident follow-up action rate (%)	65.2	65.2	●	82.6
NPP safety accident rate (%)	0	0	●	0
Radioactive integral dose (man-Sv/unit)	0.65	0.53	●	0.60
<b>Internalization of management innovation</b>				
Personnel system innovation result	completed	completed	●	—
Job specialist retention rate (%)	59.9	60.2	●	64.1
BPM promotion result	planning	planning	●	proliferation
Organizational culture reform	planning	planning	●	building trust
Debt ratio (%)	135	132.1	●	154
Interest coverage rate (times)	9.62	0.552	●	6.82
<b>Restoration of trust of stakeholders</b>				
Support for nuclear power (%)	69.2	52.0	●	72.6
Local residents' receptivity (point)	49	46.1	●	56
Integrity indicator (grade)	good	very poor	○	excellent
International trade integrity (point)	8.43	n/a	○	8.63
Employment rate of unemployed youth (%)	4	5.6	●	4.1
Purchase rate of technologically developed products (%)	17.1	11.2	●	17.1
Public service activity index (time)	18	16.2	●	20
<b>Reinforcement of business potential</b>				
Construction progress rate (%)	80.82	81.07	●	84.98
Overseas business sales (USD million)	92.78	105.21	●	121.53
RPS achievement rate (MW)	778	893	●	878
Power generation capacity indicator (%)	86.3	89.62	●	90.8
Pumped-storage power generation under full level maintenance (%)	96	99.9	●	96.5



**0.26%**

Unplanned shutdown rate



**60.2%**

Job specialist retention rate



**65.2%**

Fukushima accident follow-up action rate



**89.62%**

Power generation capacity indicator



**0.53** man-Sv/unit

Radioactive integral dose



**105.21** USD million

Overseas business sales

# Corporate Governance Structure

## Composition and operation of the board of directors

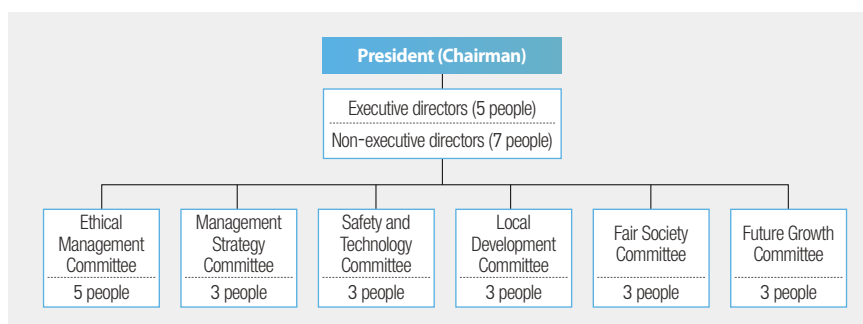
The KHNP Board of Directors (BOD) consists of six executive directors including the CEO, as well as seven non-executive directors. The BOD is a final decision-making body that makes major business, sustainability and corporate social responsibility (CSR)-related decisions. It is required that BOD be composed of less than 15 directors, with non-executive directors in the majority.

(As of Oct. 2014)

	Name	Position	Term at office
<b>Executive directors</b>	Cho Seok	President & CEO	2013. 9 ~ 2016. 9
	Wie Jae Min	Auditor General	2014. 10 ~ 2016. 10
	Kim Bum Nyun	Head of Power Generation Division	2014. 8 ~ 2016. 8
	Cho Byung Ok	Head of Quality & Safety Division	2012. 10 ~ 2014. 10
	Jung Ha Hwang	Head of Planning Division	2014. 1 ~ 2016. 1
	Lee Young Il	Head of Construction Division	2014.10~2016.10
<b>Non-executive directors</b>	Lee Tae Hyeong	Chairman, Soobong Educational Foundation Senior non-executive director (chairman of the board)	2014. 2 ~ 2016. 2
	Kwon Gi Heon	Professor, Sungkyunkwan University	2010. 6 ~ 2014. 12
	Jeon Seong Hwan	Chairman, Bohae Scholarship Foundation	2014. 2 ~ 2016. 2
	Ryu Sung Kyu	Former president of Korea Coal Corporation	2014. 2 ~ 2016. 2
	Cho Jeong Je	Chairman, Daehannews Media Group	2014. 2 ~ 2016. 2
	Park Kyu Ho	Executive vice president of Domestic Operations, KEPCO	2014. 2 ~ 2016. 2
	Cho Seong Hee	Director, Research Council of Energy & Resources Industrial Development	2014. 10 ~ 2016. 10

We installed six specialized committees in 2013 to expand the activity and enhance the expertise of the Board of Directors.

Specialized committee	Role	2013 core contents
Ethical Management	Ethics, Integrity	Strongly requested to limit reemployment of executives to partner companies * Reflected to the code of conducts : 1(b) → 2 grade
Management Strategy	Vision, strategy	Requested to operate special T / F to raise revenue in the aftermath of NPP suspension caused by quality forgery and debt reduction
Safety and Technology	Nuclear safety	Instructed to report at any time on 'comprehensive measures to improve NPP operations,' anti-corruption and promoting the innovational process
Local Development	Local cooperation	Review the adequacy of the plan and scale for regional businesses supporting nuclear power plant projects
Fair Society	Management innovation	Requested continuing promotion of open employment system to recruit external experts
Future Growth	R&D, NPP export	2013 R&D plan review, Finnish NPP bid proposal review



## Board of Directors operation performance

The fruitful operation and stability of the BOD is achieved as we actively identify business issues and make submissions to the board. In the year 2013, 11 board meetings were held and the attendance rate was 92.8%. In particular, we instituted preliminary agenda reporting to help non-executive directors understand the matters then at hand, and the proportion of non-executive directors actively speaking out at meetings increased from 76% in 2012 to 85% in 2013.

	2011 result	2012 result	2013 result
Number of BOD meetings (event)	12	14	11
Resolved agenda (item)	41	43	34
Preliminary review rate (%)	100	100	100
Amended and resolved agenda (items / %)	8 / 20	4 / 10	2 / 6
Reported agenda (item)	9	13	23
Attendance rate (%)	96.1	90.3	92.8
Non-executive directors' attendance rate (%)	100	90	95
Non-executive directors' rate of speaking (%)	70	76	85
Non-executive directors' management suggestions (item)	40	42	48

## Composition and operation of audit committee

To secure the independence and expertise of the audit and to activate internal audit function, we operate an audit committee. The audit committee is composed of one executive director (executive auditor) and two non-executive directors, and members are appointed by resolution of the Board of Directors. The audit committee, in principle, is held quarterly and when necessary, but has been held every month since its installation in June 2012. The meeting is held with more than half of the members present and decisions are made by majority vote.

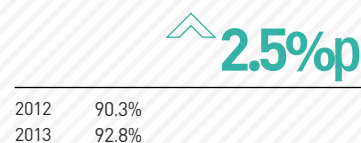
## Recommendation and appointment of directors

Appointment of the CEO, Auditor General and non-executive directors are proceeded by an 'executive recommendation committee,' which gathers candidates by recommendation or public invitation, selecting usually multiple candidates to be recommended by the 'public agency steering committee.' The CEO is appointed by the President following a resolution of a general meeting of shareholders and by recommendation from the Minister of Trade, Industry and Energy. The Auditor General is likewise appointed by the President after resolution of a general meeting of shareholders and by recommendation from the Minister of Strategy and Finance. While non-executive directors are appointed by the Minister of Strategy and Finance, executive directors, on the other hand, are appointed by the CEO at the general shareholders' meeting without any recommendation process.

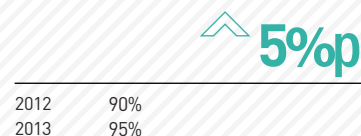
## Evaluation of and remuneration of directors

The CEO enters into the management contract with the Minister of Trade, Industry and Energy, who acts as a supervising department. The CEO's performance in the three categories of leadership & responsible management, management effectiveness and major business are subject to government management evaluation. Executive directors enter into the management contract with the CEO on major issues to be resolved in that year and their performance is evaluated through an internal management performance evaluation. To invigorate the system of management checks and supervisory functions, KHNP operates an individual evaluation system for non-executive directors. The remuneration limit of executives is determined by resolution of the shareholders' meeting as well as by the standards and payment methods of executive remuneration as determined by the Board of Directors. The remuneration for the CEO and executive directors is determined by the Board of Directors in accordance with remuneration instructions prescribed by the Minister of Strategy and Finance as per the review and decision process of the steering committee.

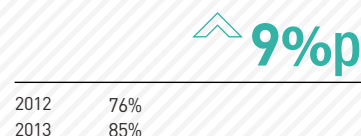
### Attendance of board of directors



### Non-executive directors' attendance rate



### Non-executive directors' rate of speaking





# Stakeholder Engagement

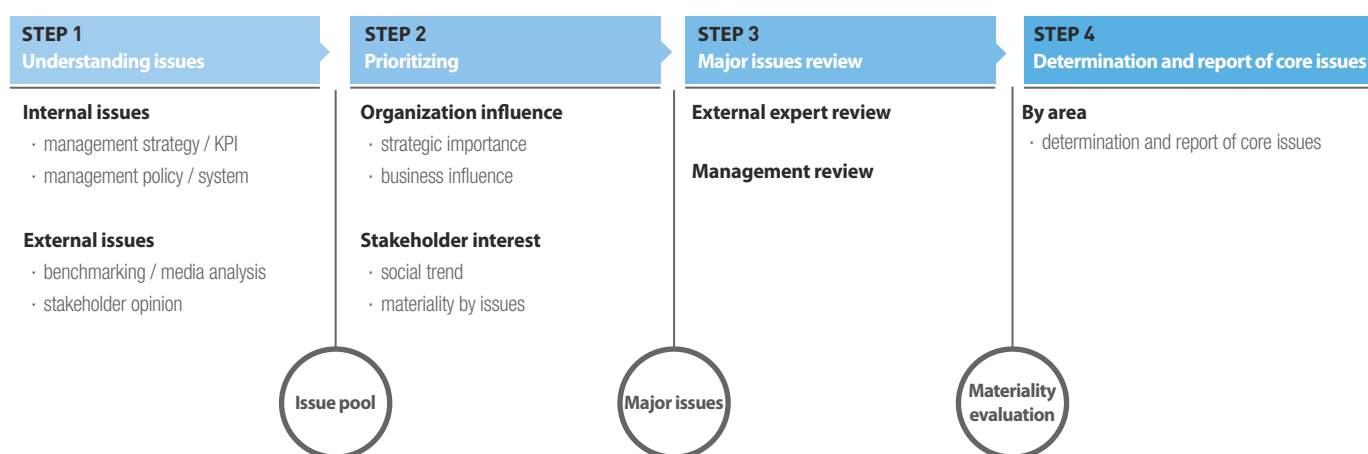


KHNP is the first Korean company, in October 2014, to have received 'SR10 SRMS (Certification of Social Responsibility Management System)', an international certification of sustainable management that defines and manages major stakeholders of seven types in accordance with the SR10 standard.

		Communication channel	Opinion	Reflected to management	Report
Shareholders and investors	1	Non-executive director management advice	promote a comprehensive reformation plan to regain national trust	· establish a management innovation plan	37
			establishment and execution of a plan to improve organizational culture	· establish roadmap for comprehensive improvement of safe culture	37
			establishment of a plan to manage partners to prevent recurrence of accidents	· establishment and execution of comprehensive improvement plan	44
			report to board of directors on audit results to enhance integrity and ethical management	· report quarterly audit result	45
			necessary to reinforce audit personnel that is required to perform audit so that it suits organization size	· reinforce personnel to Audit department	46
			necessary to arrange response system in relation to 'Sewol' accident	· redefine response system for disaster or major accident	23
Customers	2	Ombudsman system	necessary continuous effort to reinforce transparency on fuel purchase and investment projects	· establish external expert advice process, periodic review and revision on standard purchase process	45
			the local requests in relation to the construction of Shin-Kori #5 and #6 should not be treated with temporary support but with CSV strategic support business so that KHNP and locals can coexist	· setup CSV strategy and reflect to local community support project	62-63
Partners	3	Accompanied growth meetings	resolve 'thorns under the nail' red tapes for partners	· discover 50 tasks to improve and take corrective measures on 43 others	70
		Partner companies council	support strengthening competency of second and third partners	· execution of KHNP industry innovation movement 3.0 (fostering of second and third partner companies) · extend contract between first and second partners of accompanied growth and fair trade	71
Government	4	National audit	expand audit personnel such as personnel management / audit task force	· continuous reinforcement on headquarters audit infra · strengthen function of audit team and secure personnel for business unit	46
		Management assessment	break nuclear pure blood principle and activate internal communication	· expand recruitment of managers from outside · establish job capability oriented cross placement among job groups	37
		NPP purchase system improvement committee	prepare mid to long-term plan to promote competition	· supply-chain management and establishment of team responsible for production cost investigation to maintain wholesome checks and exterminate corruption · standardization of NPP parts, establish localization road map to setup NPP market supply chain · eliminate responsibility blind spots by redefining quality control area of NPP organizations	36, 69
Employees	5	Labor-management council	improve irrational labor-management customs	· improve excessive holiday clauses by deleting time-off 17,500H agreement and retirement preparation leave (30 days) · strengthening rationality for performance appraisal	77
		Employee opinion survey	gather opinions for elimination of unnecessary tasks	· selected ten vows for happy workplace	37
Local community	6	Citizen reporters	improve purchase quality system that directly connects to NPP safety, such as forgery of test reports	· adopt forgery prevention system · adopt NPP component-related integrated information system	25
		Anti-corruption citizen watch group	worries about radioactivity around NPP on the environment	· analyze and publicize influence of radioactivity around NPP on humans	57
Environment groups	7	ISO140001 environment management system review	recommend to develop and apply waste water amount and chemical inputting condition table so that to identify appropriate neutralization chemical input amount to treat waste water of power plants	· create and manage waste water and inputting chemical condition list	55
			recommend to materialize and quantify the target and promotion plan for environment improvement	· develop and apply international standard for environment performance index	54
			recommend to perform change of waste oil and waste lubricants at designated area in accordance with environmental impact assessment report	· designate and install place for change of waste lubricant and waste oil reuse	55

# Materiality Evaluation

When preparing this sustainability report, the KHNP focus was on figuring out and reflecting the interests of stakeholders as well as internal opinions on related issues. To do this, we analyzed the internal and external environment according to our own materiality decision process, selecting the most important issues to stakeholders and reflecting them in both our report and sustainable management strategy.



## STEP 1 Understanding issues



To better grasp sustainable management issues at KHNP, we performed various internal and external analyses. A media analysis review included a total of 643 articles and through report materials, related company analysis, trend & impact analysis, government task analysis and management issue analysis, we derived 166 issues important to KHNP.

## STEP 2 Prioritizing



On the basis of these 166 issues, we conducted a survey of 10,960 major KHNP stakeholder groups and 2,698 (24.6%) participated in the prioritizing process. We reviewed the materiality of stakeholders' points of view against that of the KHNP business point of view and then prioritized issues. From this, 8 economic issues, 10 social issues, 4 environmental issues and 4 general sustainable management issues, or a total of 26 issues, were selected.

## STEP 3 Major issues review



We underwent external expert and management reviews to decide on the final core issues that would be reported in our sustainable management report. Also, we checked separately whether opinions of external stakeholders, and moreover opinions of external stakeholders who are on the value chain, were faithfully reflected in the chosen pool of issues and within the prioritizing process.

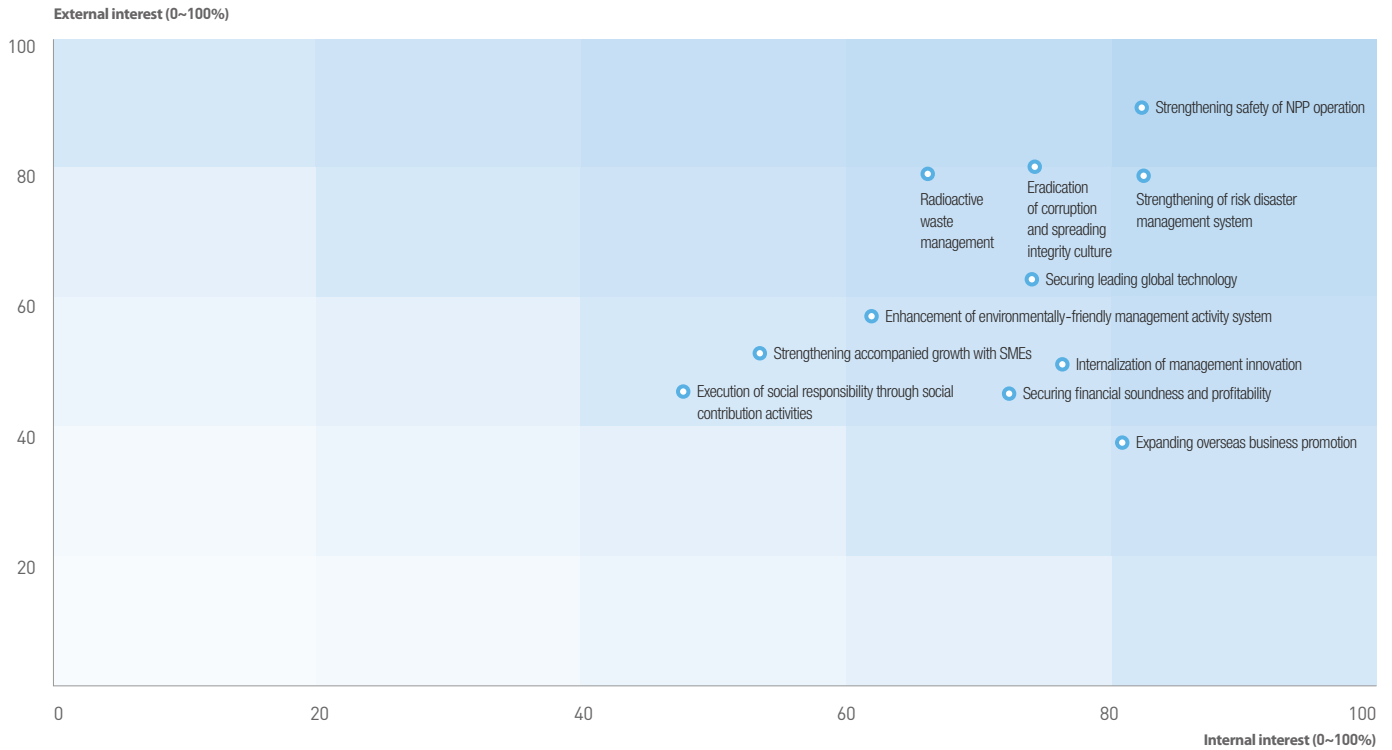
## STEP 4 Determination and report of core issues



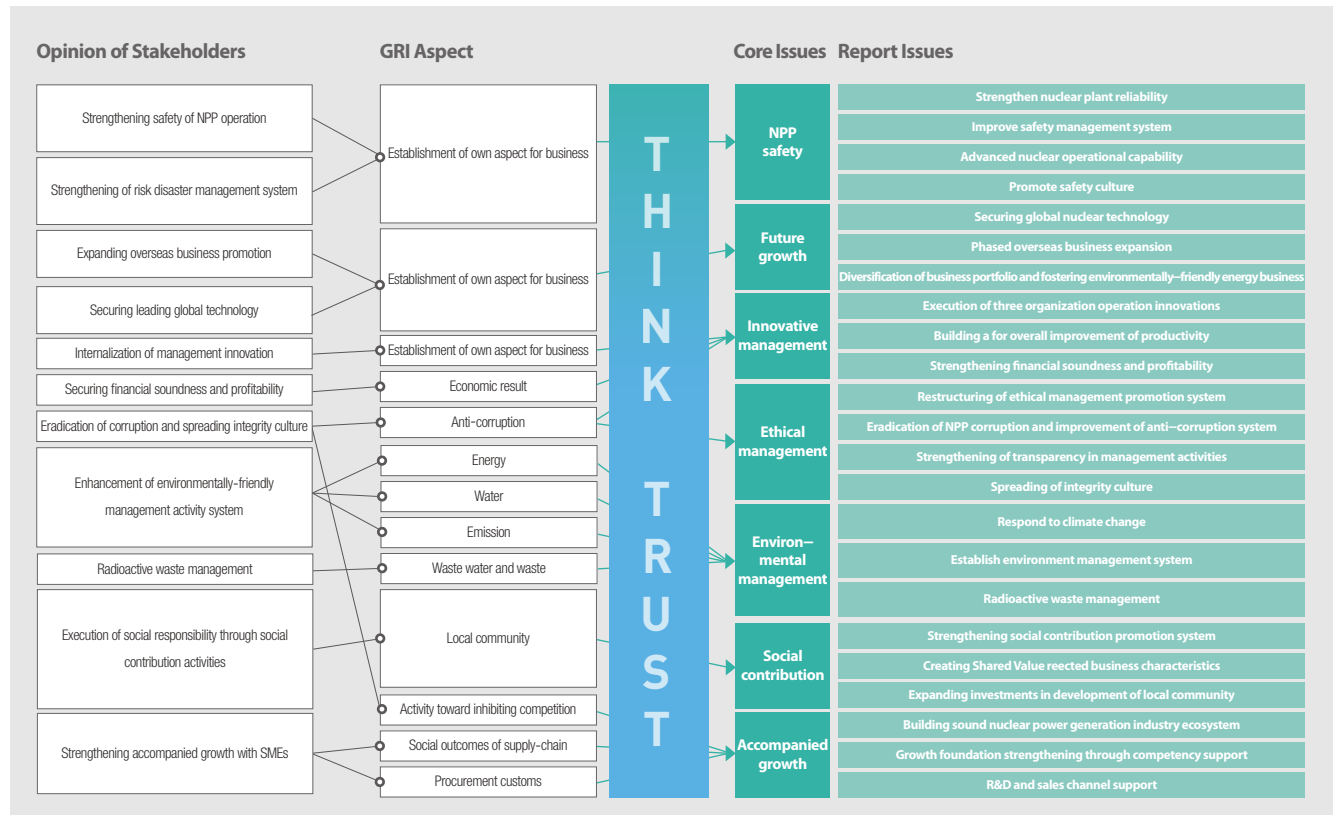
We selected 7 items on the basis of the 11 core issues that were selected through the major issues review. 'NPP safety', 'Future growth', and 'Innovative management' which considered KHNP's characteristics, in addition to 'Anti-corruption', 'Environment', 'Local community', and 'Procurement custom,' which were suggested by GRI, were selected and passed deliberation of a management advisory committee. They have subsequently been reflected in this report of major activities and results.



## Materiality evaluation result



## Core issues and GRI G4 Aspects





Think TRUST 01.  
NPP Safety

Korean NPPs  
should be safely  
constructed and  
operated.

#### 2013 unplanned shutdowns

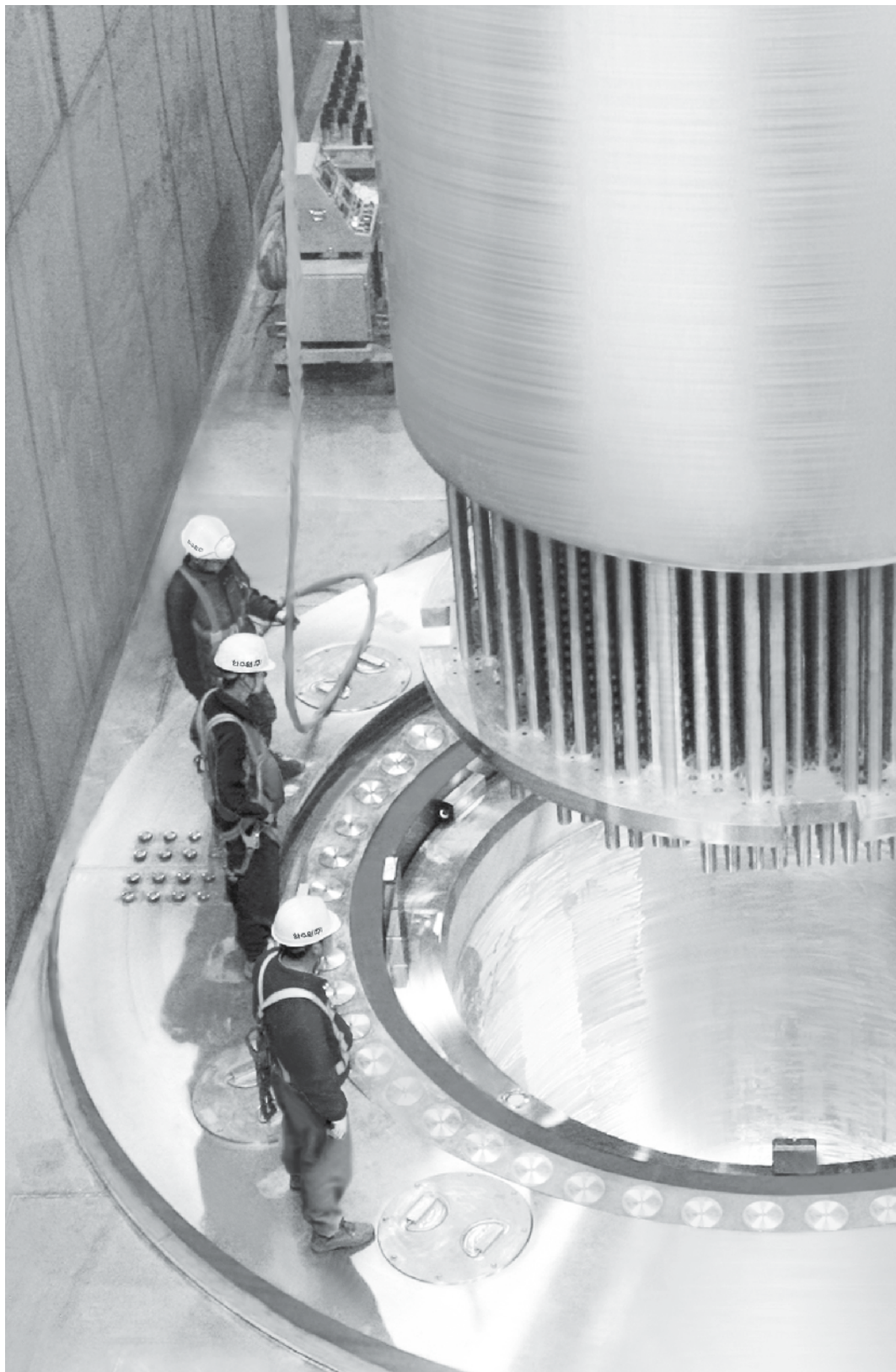
**33% down**

The total number of hours (days) of unplanned shutdown in 2013 was 40.21 days, more than a 45% decrease compared to that of 2012. There were 6 (0.26 cases per power plant) unplanned shutdowns in 2013, which is 33% less than the 9 cases in 2012. We are truly giving it our all when it comes making safe NPPs.

#### 2013 NPP safety accidents

**Zero**

In 2013, there were no nuclear power plant accidents, marking 3 consecutive accident-free years since 2011.





## Where we stand

### Environmental changes surrounding KHNP and the present

Until recently, the nuclear power policy in Korea was to keep electricity rates cheap in support of export competitiveness, promoting economic efficiency. This was not only true for nuclear power but was one of the major growth-centric policies the whole economy was based upon. However, the 2011 Fukushima Nuclear Power Plant accident left us with the hard-learned lesson that efficiency-oriented policies can be rather disastrous. In particular, concealment of reports on outages that occurred at the time at Kori nuclear power plant #1 stirred up anxiety among the local population. According to a survey conducted by the Korea Nuclear Energy Foundation in May 2014, 69.4% of the nation responded that 'A nuclear accident in Korea is likely' and another 64.2% responded that 'Nuclear power is not safe.' These results came out after Korea had achieved the highest levels of performance in the area of nuclear safety operations, placing second in the world in 2013 on the WANO PI Index, a clear indication that public perception of nuclear power safety had not improved. As such, now more than ever, we need to put enhanced effort into regaining the trust of the people, especially in a situation where a big difference lies between public opinion and actual internal and external measurements. In particular, since KHNP needs to expand nuclear power rates to 29% by 2035 according to the government's 2<sup>nd</sup> National Energy Plan, the confidence of the people is tied directly to the survival and sustainability of KHNP. Thus, KHNP is further driven to raise the standards of safety for the company, to prove safety objectively, and at the same time to restore confidence among the people by constantly informing them of our commitment to safety as a top management challenge.

## What we listen

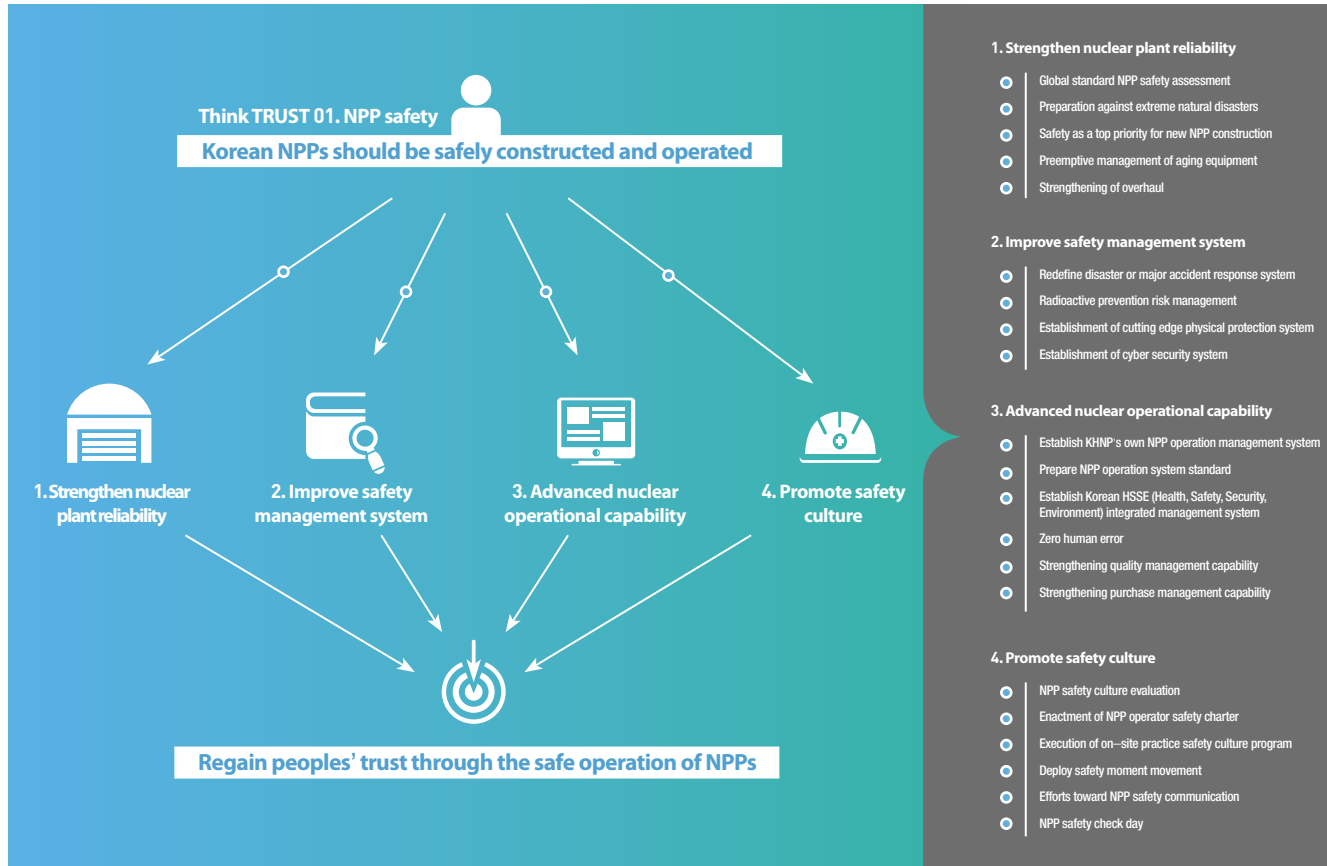
### Opinions of stakeholders

Out of the various issues surrounding the KHNP, 'Strengthening the safety of nuclear power plant operation' and 'Strengthening of risk disaster management system' have been drawn to the forefront of the core issues from the 'nuclear safety' section. Stakeholders used a 7-point scale to assess the materiality of these two core issues. An average score of 6.6 points was obtained and selection was prioritized by also considering business impact. We report the derived key issues in detail in this report and will continue to manage the comments made to and reflective of our business.





## How we do what we do How to promote nuclear safety at KHNP



**Since the Fukushima NPP accident, the paradigm of nuclear policy across the world is shifting its focus to safety.**

**Moon Shin Hak**  
Manager, Ministry of Trade, Industry and Energy

In the past, when establishing nuclear policy, safety and economy were almost equally considered, but after the Fukushima accident, safety is now believed to be the most important factor. Therefore, the government is putting emphasis on safety, even if economic efficiency is somewhat lowered. Since KHNP was the last bastion for stable power supply, in the past the majority of people and the government considered the most important role of KHNP to be supplying stable power, but at present we consider restoring the confidence of citizens in terms of nuclear safety to be our top priority. In line with these changes, we aim to enhance the site management of four nuclear headquarters with safety in mind, and at the same time, we will once again enhance the ethics and transparency of workers, which has a significant impact on levels of safety.

We recently were condemned by the public due to various issues. However, thanks to the efforts of more than 10,000 KHNP workers, we have almost overcome that obstacle. Indeed, we have a long way to go and there are many things left to do. To those in the government and to all those who worked silently beside us, I would like to extend my deepest gratitude. Please do not feel at a loss regarding all our efforts or lose hope due to these issues.



## Strengthen nuclear power plant reliability

### Global standard NPP safety assessment

Despite domestic concerns about nuclear safety, we maintain a safety level that places us second in the world according to the WANO PI (World Association of Nuclear Operators Performance Index), and we also achieved first place among 7 advanced nuclear countries (G-7) for Unplanned Capability Loss Factor, an indication of readiness for unplanned power generation loss. In particular, in 2013, a WANO inspection team consisting of 16 world nuclear experts reviewed the five areas of leadership, oversight, HQ support, human resource management and communication for two weeks, concluding that there was an 'organizational environment in which members can participate and collaborate,' 5 areas that improved, four exemplary areas and finally, a designation as 'the world's top' with regards to the whole spectrum of WANO performance indicators. In addition, German professional organizations TUV SUD and Rheinland TUV independently reviewed Wolsong #1 and Kori #1 and confirmed the operational safety of these nuclear power plants.

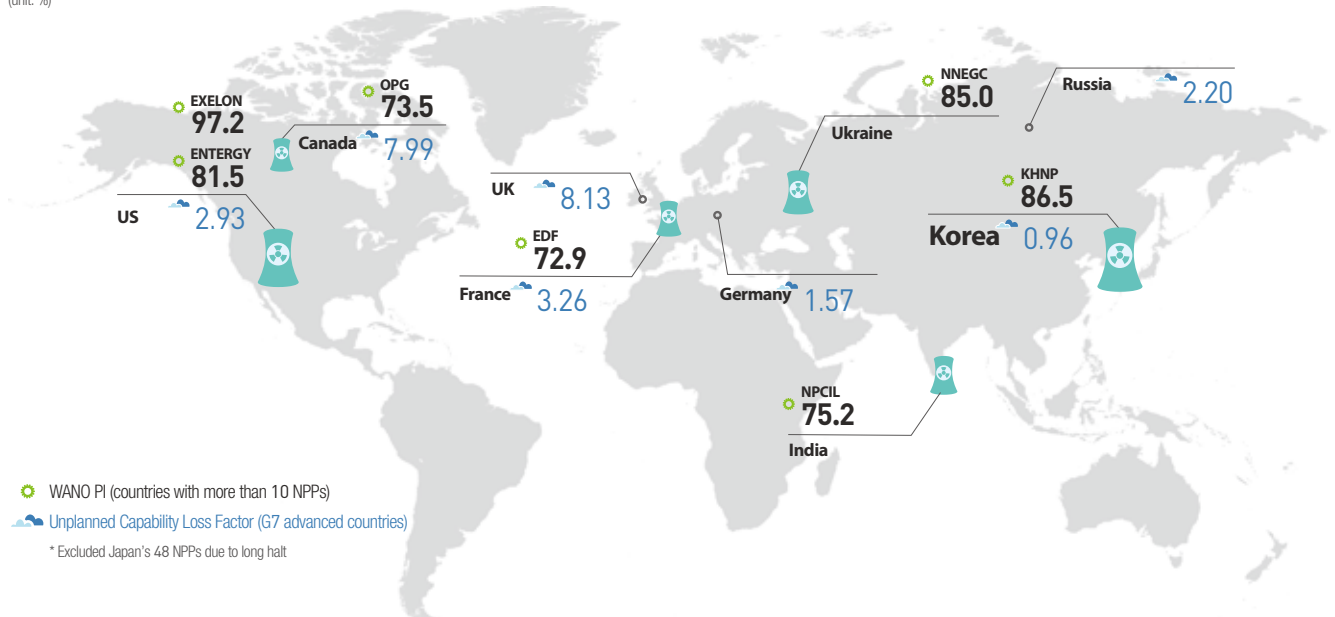
WANO PI (countries with more than 10 NPPs)		Unplanned Capability Loss Factor (G7 advanced countries)	
	Dec. 2013		Dec. 2013
EXELON (US)	97.2	<b>Korea</b>	<b>0.96</b>
<b>KHNP (Korea)</b>	<b>86.5</b>	Germany	1.57
NNEGC (Ukraine)	85.0	Russia	2.20
ENTERGY (US)	81.5	US	2.93
NPCIL (India)	75.2	France	3.26
OPG (Canada)	73.5	Canada	7.99
EDF (France)	72.9	UK	8.13

\* As of June 2014, 87.9 (2nd place)

\* Excluded Japan's 48 NPPs due to long halt

### Global comparison of NPP safety operation performance for the year 2013

(unit: %)



### Overseas professional agencies' independent review assessment results



#### WANO

KHNP has demonstrated years of high performance. However, it requires continuous efforts to improve internal awareness in order to make the next leap.



#### TUV Rheinland

We were able to add value to the efforts taken toward actively resolving the safety issues from the inspection and evaluation of Wolsong #1.



#### TUV SUD

We could find a high level of safety culture with transparent and accurate disclosure, as gathered from Kori #1 assessment results.

## Preparation against extreme natural disasters

Immediately after the Fukushima nuclear crisis broke out, KHNP initiated an NPP inspection group of 73 people, gravitating toward private academic-industrial experts to check safety issues, and unearthing 56 tasks in six areas for the improvement of nuclear facilities. Accordingly, if earthquakes above a certain scale (0.18g) were detected, we programmed the reactor to automatically stop and installed emergency power systems, waterproof gate including flood gates for major facilities and waterproof drain pumps. We also conducted stress tests for Wolsong #1 and Kori #1 as the Fukushima nuclear accident increased popular concern over long-running nuclear power plants. Stress tests assess the response capacity of nuclear power plants for large natural disasters that exceed the limits of their design. The five inspection areas are ①earthquakes, ②tsunamis and other natural disasters, ③loss of safety function of power system, ④severe accident management, and ⑤emergency response. Stress tests in 2013 were diagnosed as sufficient in terms of extreme natural disaster response capacity, and improvements were also made.

### Major items improved after Fukushima crisis (6 major areas 56 improvement tasks)



#### Earthquake

Ensuring safety in case of earthquake

▶ 6 improvements including automatic stopping function during earthquake



#### Tsunami

Ensuring safety in case of tsunami

▶ 4 improvements including coastal barrier at Kori NPP



#### Flood

Electricity cooler upon flooding

▶ improved including secured mobile generator vehicle



#### Severe accident

Response to severe accident

▶ 10 improvements including Passive Autocatalytic Recombiner



#### Emergency response

Emergency response and emergency medical system

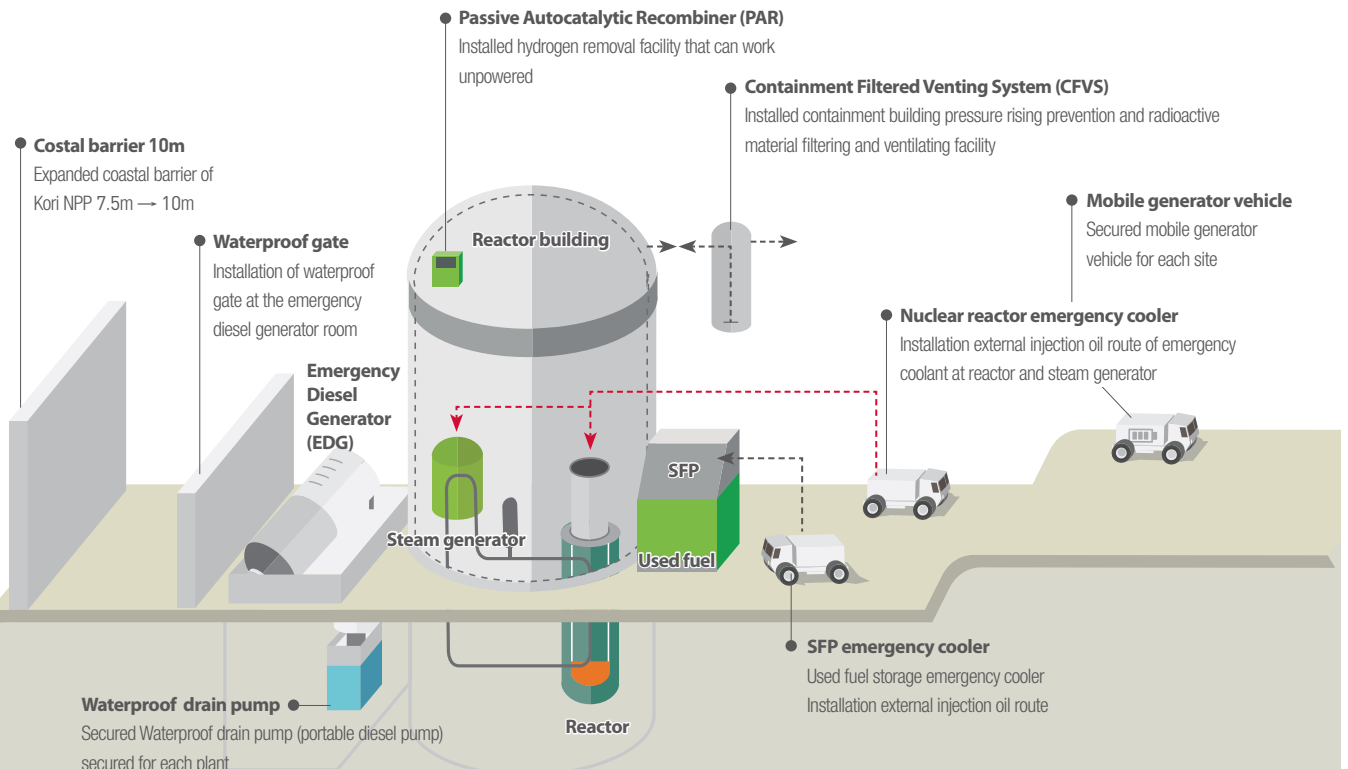
▶ 11 improvements including securement of radioactive protection medicine and masks



#### Long running NPP

Kori #1 and long running NPPs

▶ 10 improvements including strengthening of regular inspection, safety inspection



## Expansion of safety sector R&D Best Practice



### Improved cooling water intake pipe installation method

The existing “concrete box” cooling water intake pipe installation method is complex and takes a long time, so we developed an installation method utilizing a GRP (Glass-fiber Reinforced Plastic) pipe, instead. We proceeded with a mock-up test that maintained the same burial depth and existing conditions as with current sites. Through consultation with Bechtel Corporation and Hongik University research center, we gathered opinions on reinforcing the quality standards of the GRP and received verification regarding its structural safety. As a result, the required installation time was significantly shortened, from 12 to 7.5 months, while corrosion resistance and improved workability minimized factors that interrupted construction.



### Developed seismic isolation (absorption of earthquake energy) equipment and related technology in case of an earthquake

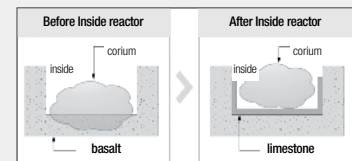
KHNP developed a Korean seismic isolation device (equipment that reduces the seismic forces passing between the ground and the foundation of buildings) in compliance with international nuclear standards. By benchmarking nations with thriving NPP industries, like Japan and France, we set up a performance standard based on an earthquake acceleration of 0.5g and finished our design. And with the advice of various domestic and foreign experts, we developed a high-performance material for the seismic isolation equipment and conducted 10 verification tests before announcing its final completion. With the development of this seismic isolation equipment, we have secured export competitiveness for overseas areas that experience strong earthquakes. Also, we developed excellent seismic-safety and high performance watertight flood control gates and will install them at all operating nuclear power plants by August 2015. These flood control gates were developed to prepare for tsunamis similar in magnitude to that of the Fukushima NPP and they weigh less than half (157kg) of the current ones (350kg), making emergency operation much easier. Thanks to structural design optimization, the production costs have been reduced by KRW 4.2 billion.



### Developed Korean concrete with excellent erosion resistance

In preparation for severe NPP accidents, KHNP began development of Korean limestone concrete that has excellent erosion resistant in July 2013, finished the design and in September acquired a grade of ‘good’ from a MCCI\* verification test and pressure strength test by KICT (Korea Institute of Civil Engineering and Building Technology). With this technology, we improved concrete erosion problems caused by reactor core melting during severe accidents. We also enhanced the protective barrier function of reactor buildings and are able to prevent damage that would be dealt by high-temperature melting of the reactor core. While corrosion resistance and improved workability minimized factors that interrupted construction.

- MCCI (Molten Core Concrete Interactions): After a reactor vessel is damaged, a phenomenon in which high-temperature melting erodes the concrete at the bottom of a reactor, threatening the soundness of the containment building.



### Developed application technique for high performance structural material (HPC / rebar)

In addition to the necessity to secure high durability concrete, especially when considering the NPP export environment, other concerns include excessive rebar, the uneconomical nature of rebar overcrowding, and a decline in constructability. To solve these problems, we first tackled concrete application technology. In June 2013, we proceeded with a performance evaluation of concrete derived from a nominal mix of extreme environment HPC\* and also built a global database about concrete material, standards and the user environment. Our second task was developing a high-strength rebar application technology and in June 2013 we presented the test results of a high-strength rebar performance evaluation at ACI\* and KEPIC\*.

\*HPC: High Performance Concrete (high strength / high durability / high construct ability)

\*ACI: American Concrete Institute

\*KEPIC: Korea Electric Power Industry Code

## Safety as a top priority for new NPP construction

Shin-Kori #1 began commercial operation in February 2011, as did Shin-Kori #2 and Shin-Wolsong #2 in July 2012. Shin-Wolsong #2, Shin-Kori #3 and #4, as well as Shin-Hanul #1 and #2 are currently under construction. KHNP reestablished a business plan that puts safety first when constructing NPPs, and from the very start of the construction of a new NPP, we work to ensure maximum safety and strengthen severe accident response. In particular, in preparation for a sudden loss of power, we extended battery capacity from 8 hours to 24 hours. Through a new preventative design for excess drainage of the reactor cooling system, we are able to maintain the necessary flow of cooling water and have strengthened the overall safety of reactor core design for new NPPs. At present, Shin-Kori #3 and #4 are preparing to acquire permission for operation in accordance with a replacement of components that addresses previously forged quality test reports.



## Preemptive management of aging equipment

Through economic analysis utilizing a long-term investment plan in conjunction with an investment feasibility evaluation system unique to KHNP (Nuclear Asset Investment Project Evaluator NAIPE), KHNP has improved the major facilities its operating nuclear power plants in a timely manner and in accordance with set priorities. In 2013, we enhanced safety by changing out the main nuclear control panel and thermal output control reactor head in the control room of Kori #1, in addition to replacing several large plants. We are replacing four steam generators of Hanul nuclear power plant #3 and #4 in 2013 and 2014. In October 2014 and July 2015, each reactor vessel head of Hanbit NPP #3 and #4 are going to be replaced.



Hanul #3 steam generator replacement



Hanbit #3 reactor vessel head water pressure test

## Strengthening of overhaul

Nuclear power plants undergo fuel replacement during regular overhaul (OH) maintenance after operating for 15-18 months. In 2012, KHNP has switched this maintenance paradigm to strengthen safety even more. To this end, KHNP has been reviewing the overall management of OH by focusing on its safety aspects, such as the adequacy of the maintenance period and process and task management techniques. We therefore derived safety processes related to power loss and safety injection instigation to perform management at the primary process level, adjusting the process by considering risks, by creating a buffer process for safety during operation, and by extending construction maintenance periods. In 2014, to further improve service quality and safety, if at least 3 of 4 maintenance team shifts were not in operation, we stopped the service at night time and other vulnerable hours. In addition, by closely inspecting facilities that fail often, and performing maintenance regularly throughout expected ranges of durability, we are laying the foundation for enhanced maintenance quality and a reduction of sudden stops.

### Strengthened design for reactor core safety for new NPPs

Secured additional time for operator to respond and take appropriate measures toward accident

16h

extended the battery capacity from 8 hours to 24 hours

Achieved world's lowest level of core damage frequency

47%

in comparison with APWR\*

\*APWR : Advanced Pressurized Water Reactor

## Improve safety management system

### Redefined disaster or major accident response system

KHNP improved its crisis response system in preparation for various disasters and accidents. In September 2013, we improved disaster emergency bylaws and operation guidelines for the disaster safety response division. By establishing an emergency duty system we are able to operate flexibly and in accordance with the specific emergency situation. This differs fundamentally from our past system, where uniform rules were applied regardless of the type of disaster, its scope or the damages incurred. There has also been a change in the emergency grade ruling system. Whereas in the past the whole company followed the same system, now each business unit can decide on their own emergency ranking scale.

Also, in November, risk evaluation that had previously only been performed by certain departments was extended to all business units, with 4,911 items evaluated in total. We also installed a partner safety management cooperation program to four nuclear power sites in order to reinforce the industry safety health management system and improve the accident prevention system. In December, we developed a 'disaster management mobile application' to enable real-time disaster information sharing and integrated management. KHNP also established an emergency response system to protect people who are most likely to be harmed first in an emergency situation. During vulnerable hours, we are operating a regular emergency response system based around key executives. We have executed emergency alarm network drills that engage both local governments and residents, utilizing emergency response guidelines in preparation for major accidents.



Disaster management mobile application

### Radioactivity prevention risk management

In accordance with the 'nuclear facilities' protection and radioactive disaster prevention measures law,' KHNP established and operates a radioactive emergency plan and execution procedure at each NPP site. The plan contains details about emergency response groups and their tasks, emergency classification and emergency issue standards, measures that address the initial stage of an emergency, and actions to be taken to protect residents. KHNP is also operating a radioactive disaster response facility and dedicated organization to smoothly restore control of the situation following an emergency. In 2013, thyroid protection medicine and respiratory protective equipment were

distributed to local governments within a 16 Km radius from NPPs so that a residential population of about 400,000 people was provided for. From now on, we will shorten the cycle for how often radioactive disaster response drills are performed. The former 5 year cycle will be reduced to 1 year and site-specific joint drills will likewise be reduced from 4 years to 2 years, strengthening the radioactive emergency management system.

### Establishment of cutting edge physical protection system

Ever since North Korea opened fire on Yeonpyeongdo Island in 2010, NPP defense and protective readiness has been strengthened. In particular, Korea successfully received inspection from IAEA's IPPAS (International Physical Protection Advisory Service), as promised in the 2012 Nuclear Security Summit. Accordingly, we have setup a high-tech entrance management system and strictly control unauthorized entrance. We are protecting NPP blueprints and design data by strengthening the technology security responsibility of service companies and tightening checks and inspections on the NPP material being shipped in and out. Also, after the KHNP-government joint protection diagnosis, we installed high-rise watch towers for field command, added CCTVs and increased security personnel to further strengthen the state of security and protection.

### Establishment of cyber security system

To prepare for an attack like Stuxnet, as experienced by an Iranian NPP, or intelligent hacking threats such as APT (Advanced Persistent Threat), we are strengthening cyber security status. In April 2013, KHNP physically divided intranet and extranet to protect important internal data. Infrastructural equipment such as the NPP control system is safely managed by setting up separate closed networks. In November 2013, we were the first among power-generating companies to establish a separate cyber security control center, to link up with both the national cyber security center and cyber security center of the Ministry of Trade, Industry and Energy, a triple interconnected system. Besides this, we formed an emergency response team in preparation for a cyber crisis. The team would analyze system disabilities, ensure timely restoration and be important in the maintenance of a full-time emergency response system.



Implementation training for radioactive emergency preparedness



## Advanced nuclear operational capability

### Establish KHNP's own NPP operation management system

Since the Fukushima disaster, when safety became a top priority, K-PO&C (KHNP-Performance Objectives & Criteria) was enacted to systematically manage safety-oriented NPP operational ability. For the smooth execution of K-PO&C, we optimized seven KHNP Operation Management Processes including self-diagnosis, root cause analysis, operation experience, and an operation improvement program. Also, to comprehensively manage NPP safety and performance, we developed 30 KHNP Performance Indicators over 4 major areas. After performing a trend analysis and performance evaluation of each site and looking for areas of insufficiency, through self-diagnosis and benchmarking, we relentlessly improved the safety and performance of power generators.

### Prepare NPP operation system standard

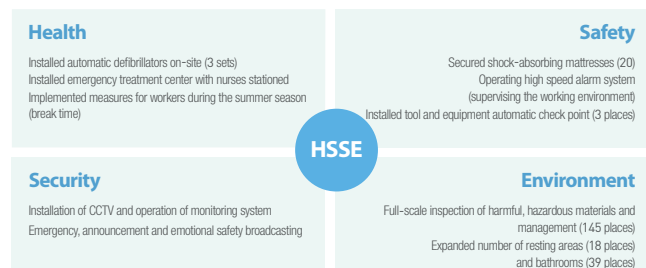
To standardize the operation process of all NPPs, we developed a detailed manual. First, we enacted a 'process manual creation and usage procedure,' and standardized NPP operation manuals' numbers, composition and compilation methods. This eased the ability to make comparisons between power plants, allowing for immediate reflection of process manual improvements with regards to operating experience, design alteration, and classification of the process manual using grade, all in accordance with an eye to prevent human error. Also, to operate 23 NPPs in sync, as if it were only one, every year we develop NPP operation guides such as the 'comprehensive guide to prevent human error',

'standard operation guideline for power plant manager' and 'basic rules for operator.'

### Establish Korean HSSE (Health, Safety, Security, Environment) integrated management system

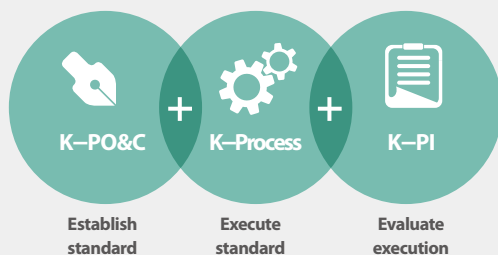
The NPP industry has been focusing on administrative management to prevent safety accidents, but lacks the field awareness and integration of the HSSE (Health, Safety, Security, Environment) management system. With a goal to prepare an international response system for overseas business, KHNP set up a business strategy after benchmarking construction sites in UAE and Hyundai Green Power. Accordingly, in April 2013, we launched for the first time in the NPP construction industry a dedicated team for HSSE integrated management and adopted the HSSE integrated management system at both the Shin-Hanul #1 and #2 construction sites.

#### Expansion of HSSE facilities and equipment



#### KHNP's original NPP operation management system

##### NPP operation innovation (K-3P)



**K-PO&C** Suggest optimal operation goals and expectations for Korean NPPs  
**K-Process** Improvement of work process to execute K-PO&C  
**K-PI** Quantitative evaluation of power plant performance according to execution of K-PO&C



Trend analysis of each power plant and execution of performance evaluation to search for weak areas and implement self-diagnosis and benchmarking

#### Achieve enhancement in NPP performance



Continuous improvement of NPP safety and performance

## Zero human error

We are implementing systematic prevention measures to make sure that no unintended stops are caused by human error. Due to the full-scale promotion of the UAE NPP project and growing number of operating NPPs, the proportion of new recruits is increasing rapidly. This makes even more salient the requirement for a comprehensive and systematic measure to prevent unintended stops of power generation due to human error. As major instances of human error are mistakes made by the staff or by not following the procedure manual, we established a 'power plant manager position' to oversee the usual '2 people, 1 team' operation of equipment, and established an 'operator basic manual.' Also, we made it compulsory to take 32 hours of human error prevention education to become an NPP operator, running 2 courses dividing the main control room personnel class from the field operator class. Also, to strengthen NPP operator capabilities, we developed a JQC (job qualification certificate). By developing 167



Human error class example



Self-assessment / Draw improvement

kinds of JQC for 12 NPPs, through an evaluation of an NPP operator's position-specific education and job capability, we will be able to determine their expertise in a short period of time. Besides this, we developed a core job knowledge management system and adopted an NPP manager qualification program for those without SRO (Senior Reactor Operator) licenses to further strengthen the capability of NPP workers.

## Strengthening quality management capability

To prevent a reoccurrence of quality test report forgery and to strengthen equipment quality safety, we have set up specific measures. In October 2013, we nominated Lloyd's Register, an NPP inspection specialist, to act as a third party in re-verifying quality test reports and in December, we established an on-offline forgery prevention system. To solve quality problems with equipment suppliers, we provide quality competence reinforcement education to partner companies. The content of this education program includes nuclear power quality systems, nuclear power quality assurance and inspection practices, and 813 people from 464 companies completed it in 2013. Also, we improved the supplier registration system by extending the restriction period of registration

### Major improvements for on-offline forgery prevention system

Past	Improved
<ul style="list-style-type: none"> <li>Database management for quality test reports not in place</li> <li>Original copy of the quality test report was not registered at KHNP, making it impossible to make checks on production inspection</li> <li>Possibility of reusing the quality test report</li> <li>Impossible to check the original copy upon receipt / shipment</li> </ul>	<ul style="list-style-type: none"> <li>Systematic management of test report database with QR code</li> <li>Registered original copy of quality test report at KHNP and enabled real-time check within the office</li> <li>Prevented double registration</li> <li>Real-time check of original document upon receipt / shipment</li> </ul>

from companies in violation of having forged quality documents from 1 year to 10 years, tightening the company management standard.



### Strengthened quality management competence

Completion of quality competence reinforcement education for partner companies in 2013

813 people

competence reinforcement education including nuclear quality system

Restriction of registration for companies in violation of having forged documents

10 years

extended from the previous 1 year period

## Strengthening purchase management capability

As we have learned from the spare parts test report forgery incident that stopped NPP operation, procurement of material for KHNP is important since it is directly connected to safety. To create a sound NPP business ecosystem, KHNP is promoting advancement in the contract system by building an NPP industry SCM system and preparing reasonable prices based on cost. By loosening the requirements to participate in bidding, more companies were able to take part. In addition, cost-based purchase price calculations helped to advance the contract system. In June 2014, we built an NPP parts-related comprehensive management system covering information about construction, operation, purchase, inventory and quality. Also, to improve the purchase quality system, we completed a government NPP corruption reoccurrence prevention comprehensive measure and promoted a phased, mid to long-term structural improvement measure for the NPP purchase system improvement committee.

### NPP corruption reoccurrence prevention comprehensive measure

Major results	
Purchase improvement	advance disclosure of purchase plan, introduction of equipment purchasing eligibility evaluation system, minimization of private contracts
Strengthening of quality	re-verification by third party of quality documents, direct payment of testing cost from KHNP

### What is the purchase system improvement committee?

A part of the corruption-related NPP-government joint measure (June 2013, National policy coordination meeting), they are a private expert committee implementing a 'systematic improvement measure' for NPP purchase quality. With Kang Ho-in, ex-director of Public Procurement Service as the chairman, the committee is composed of 14 members who are experts from international organizations, private companies, and from the fields of academia and research. The committee diagnosed structural problems of the NPP industry for 3 months and prepared mid to long-term improvement measures related to the supply chain, purchase system, purchase management and quality management aspects, and since October 2013, KHNP has been executing these measures in phases.

Problem	Improvement measure	Expected effect
inadequate supplier participation environment	promote NPP equipment and parts market competition	securing stable parts supply chain
following irrational purchase procedure	advance purchase procedure, such as through a multiple contractor system	strengthening transparency of purchase system
lacks systematic purchase management system	establish purchase management integrated system	comprehensive purchase management capability enhancement
quality management blind spot	strengthen quality management by establishing NPP quality verification center	prevent forgery and eliminate blind spots

## Promote safety culture

### NPP safety culture evaluation

In 2011, using our experience in the operation of NPPs and by referring to international standard safety culture evaluation guidelines such as IAEA, WANO, and INPO, KHNP has set Korea's own safety culture evaluation standards for surveying, interviewing, document review and field observation. From 2012, we utilized these evaluation standards every year to execute safety culture evaluation on all our power plants with the help of academic and research groups as well as senior experts.

### 2013 results of NPP safety culture evaluation

Performance index	2013 target	2013 performance	Performance analysis
Safety culture enhancement effort	improve workers' safety consciousness	continuous enhancement of safety consciousness	creation of safety considering work environment foundation
Safety check of long-running NPPs	evaluate Wolsong #1, Kori #1	completed contractor evaluation	prepared foundation for continuing operation of long-running NPPs
NPP safety communication effort	operate citizen evaluation group, private participation	issued operation report and verification	expanded scope of participation to ordinary citizens for NPP safety operation
Extension of used fuel saturation year	extend saturation year for Hanul #5 and #6	extended saturation year (2015 to 2021)	contributed to safe operation by securing storage capability before arrival of saturation year
Development of flood control gates to prepare for major disasters	waterproof gate performance improvement	development completed	design, production and test completed
Reinforce major accident response capability	develop response guide by area	guide development completed	enhancement of response capability upon major accident and otherwise large-scale damaging accident
Advancing disaster management system	develop mobile app. for disaster	mobile app. development completed	real-time disaster information sharing and secured integrated management network
Set up roadmap for NPP dismantling technology development	set up roadmap execution plan and secure business foundation	completed execution plan, executed workshop, received advice	information exchange among industry, academia, research groups, and government and reinforcing communication with active disclosure of public information
Reasonable post-treatment cost management	provision spending management and setup settlement guide	setup completed	prepare transparent dismantling provision spending standard

## Enactment of NPP operator safety charter

For the 'safe and transparent operation of NPPs and to provide stable electricity,' KHNP prepared clear operation principles that all NPP public organizations should uphold, and to declare its firm will, the 'NPP operator safety charter' was enacted and announced. The NPP operator safety charter is composed of 6 clauses for securing the utmost safety level, transparent NPP operation, development of a nuclear safety culture, transparent information disclosure, enhancement of

communication with citizens, and the pursuit of easing national fears regarding nuclear power.

### Execution of on-site practice safety culture program

For continuous enhancement of safety culture, KHNP is implementing a practical field-type safety culture promotion program that involves supervisor observation, a worker safety suggestion system, and an objection system. The safety culture promotion program is targeted at revamping safety culture and encouraging it to take root in the daily duties of all NPP workers, including among partner companies.



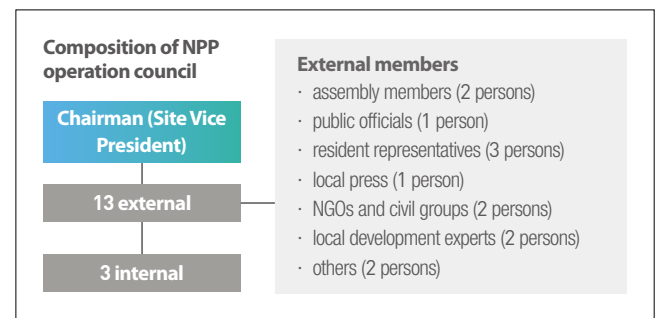
### Deploy safety moment movement

Safety Moment is a safety culture practice movement that KHNP started enterprise-wide beginning in December 2013. By allotting 2 to 3 minutes of every meeting or event for the delivery of a 'safety message' to all attendants to emphasize safety as our first priority, we are creating safety while emphasizing the working environment. Such safety messages greatly contribute to the enhancement of overall worker and staff safety culture consciousness. Through the power plant heads' safety meetings and postings on the intranet homepage, the staff as well as partner companies are educated regarding safety.

### Efforts for NPP safety communication

To relieve the anxieties people have about NPPs, KHNP is strengthening communications. First, by operating an NPP operation council for each of the 4 nuclear power sites, we are gathering opinions and requests and discussing with the local community about the operation of power plants and safety enhancement. The NPP operation council is headed by the Site Vice President,

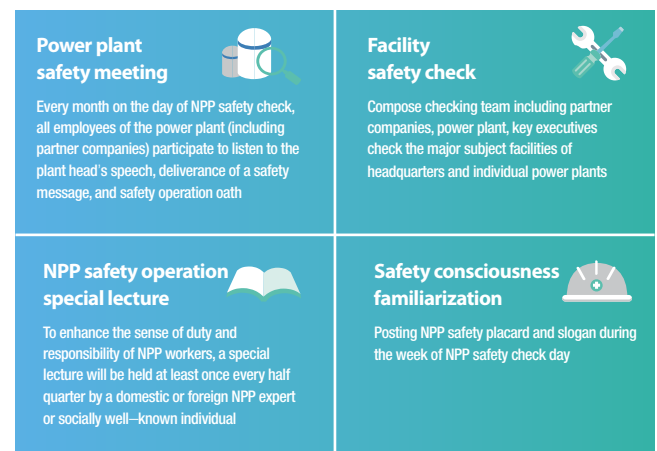
and is composed of 13 external members including assembly members, officials, resident representatives, local press, NGOs, local development experts, and 3 internal members. In 2013, council meetings were held twice each in Kori, Hanbit, Wolsong and 3 times in Hanul. Also, in August 2013, we tried to secure transparency and objectivity when a private verification group (appointed by the NPP safety counsel) of 19 people including local recommended experts and environmental groups executed a joint checkup on the self-evaluated stress test of Wolsong #1.



### NPP Safety Check Day

The government enacted a Nuclear Power Safety Check Day in March 2003 to enhance workers' safety consciousness, prevent NPP accidents or failures, execute safety checks of major facilities, and gather safety meetings, all with the purpose of delivering safety messages and safety culture education. Accordingly, KHNP has set every first Tuesday of the month as Nuclear Power Safety Check Day and this has been implemented at all power plants. Also, to reinforce facility safety inspections, failing or otherwise malfunctioning facilities are checked on a regular basis by headquarters and at each power plant.

#### Major events on NPP safety check day







## Think TRUST 02. Future Growth

We need to develop  
leading global  
technology and  
expand overseas  
business.

### 2013 Research and Development (R&D) investment

KRW

**353.9** billion

Despite a difficult economic situation, we expanded R&D investment from KRW 346.7 billion in 2012 to KRW 353.9 billion in 2013 to concentrate on our competence in the development of leading technology.

### 2013 revenue from overseas business

USD

**105** million

Revenue from overseas business increased from USD 100 million in 2012 to USD 105 million in 2013. We are aiming for USD 123.77 million in 2014.







## Where we stand

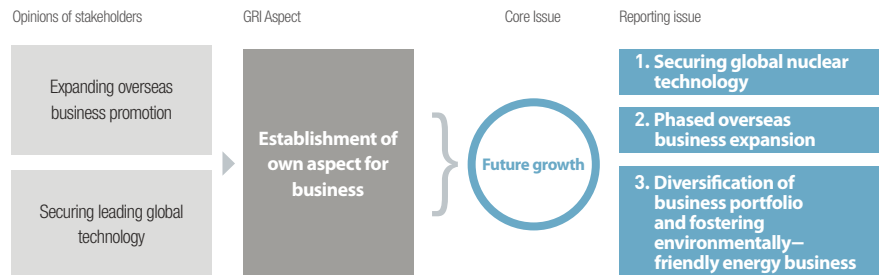
### Environmental changes surrounding KHNP and present

We are facing important an opportunity and challenge for sustainable growth in the future. The opportunity is that despite the negative public sentiment after the Fukushima crisis, there is an expectation that the global NPP construction market will grow until 2030, in accordance with the number of units operating and those under construction. Rapid growth is especially anticipated in Asia, Western Europe and the Middle East, and KHNP has prepared a stepping stone to promote itself in the global market by exporting Korean NPPs to UAE. On the other hand, the important challenge that KHNP is facing is securing nuclear technology with global competitiveness. Securing global NPP technology in KHNP's main business, nuclear power, such as with the recent success in technology development of a new next generation NPP (APR+), NPP safety technology and dismantling technology, is a very important factor in enhancing export competitiveness and discovering new areas for business venture. Accordingly, KHNP should focus more on investing in NPP technology R&D and executing systematic technology developments as per mid to long-term development strategy and road mapping.

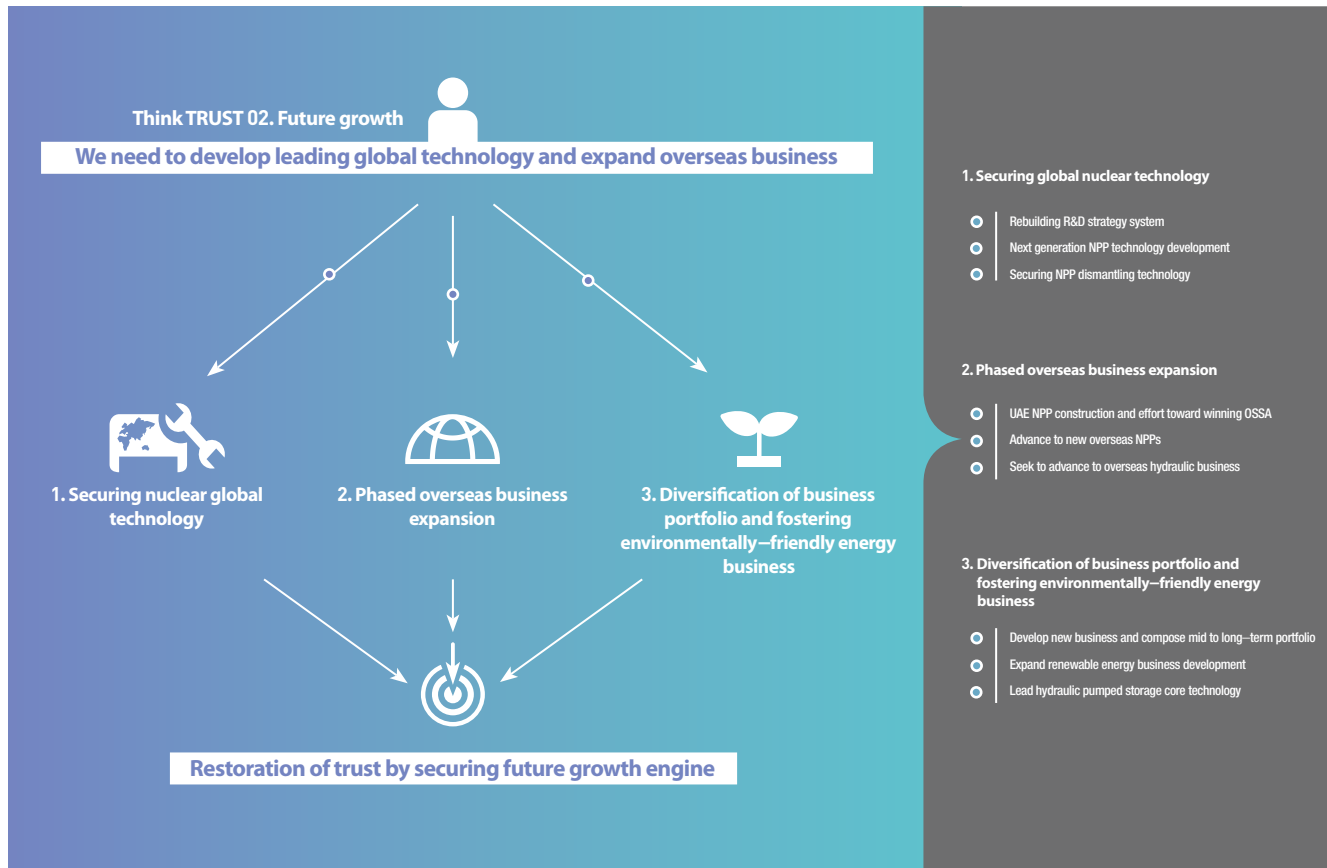
## What we listen

### Opinions of stakeholders

Out of the various issues of relevance to KHNP, 'Expanding overseas business promotion' and 'Securing leading global technology' were derived as core issues in terms of future growth aspect. The result of the stakeholders' 7 point evaluation on the materiality of these two core issues showed an average of 5.8 points, with prioritization based on the effect on business. We are reporting in detail about the core issues that were derived among stakeholders and will reflect suggested opinions and advice back to the management.



## How we do KHNP's future growth promotion direction



**To enhance sustainability, it is necessary to operate future growth engines effectively.**

**Kim Hoe Cheon**  
Head of planning, KEPCO

For KHNP to enhance its sustainability, it is necessary to effectively operate future growth engines such as overseas business, R&D projects and the renewable energy business. To enhance brand recognition of KHNP in the overseas market, I think collaboration with KEPCO is necessary. If the NPP operation capability of KHNP is combined with KEPCO's brand power, the result will be not only a positive power, but also a strengthening of KHNP's brand power as time goes. The most important thing for KHNP R&D is to keep an honest and open stance, disclosing the entire process of technological developments and if any misdeed is found, acknowledging it and improving it; or, if there are any areas that call for persuasion, a confident attitude becomes the key. These efforts will contribute greatly in resolving the anxiety of

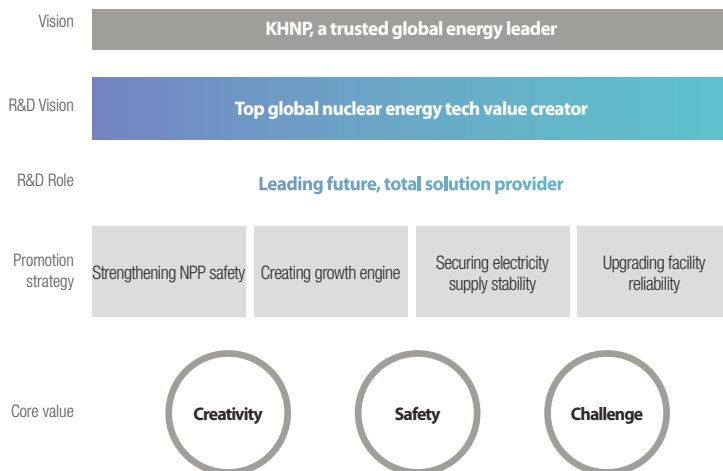
the people when it comes to operation and closure of NPPs. Renewable energy would be the most important theme for KHNP. Together with nuclear power, renewable energy is also included in clean energy and if KHNP can continue to develop that business niche, it can build its own image as an environmentally-friendly company.

## Securing global nuclear technology

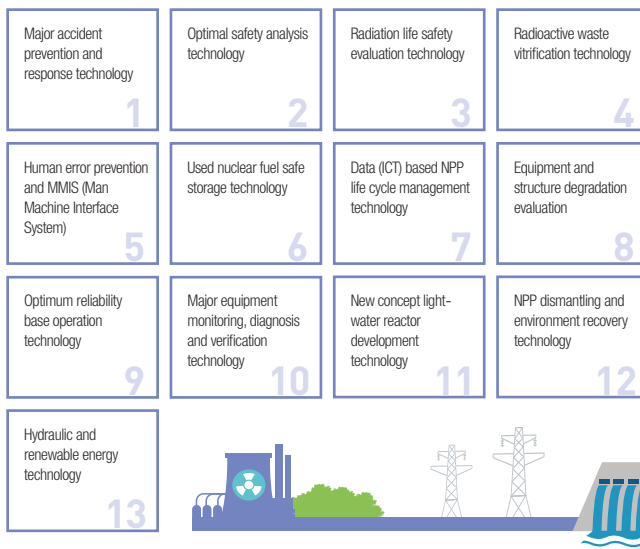
### Rebuilding R&D strategy system

With a change in the environment of this industry, as can be seen with the demand for safety-strengthening following the Fukushima disaster and with the deepening global competition to win new NPP contracts, KHNP has rebuilt its business strategy and connected R&D strategy. We selected 13 nuclear representative technologies in the 4 areas of strengthening NPP safety, securing stability in electricity supply, securing facility reliability and creating a growth engine, establishing a technology development goal to be reached by 2025.

#### R&D Strategy system



#### 13 major technology developments



### Next generation NPP technology development

In 2014, KHNP acquired standard design approval for a new 1.5 million kW reactor (APR+: Advanced Power Reactor Plus), developed with Korea's own technology. Standard design approval is a system of getting approval for a standardized design after a comprehensive review by an approving organization (Nuclear Safety Committee), which means the technology is well-developed so long as construction proceeds with site-specific considerations and a detailed design. APR+ has made reactor, auxiliary, and related buildings much stronger. The characteristics of APR+ are based on the Korean standard OPR1000 and next generation UAE export type reactor, APR1400, which has reinforced safety. Compared to APR1400, APR+ has a 10% increased electricity production capability. With the technological development of APR+, we achieved a new type of reactor worth 1.5 million kW; it is expected to have a tremendous effect on the diversification of the overseas export market.

### Securing NPP dismantling technology

As the number of long running NPPs continues to grow, securing safe NPP dismantling technology early on becomes important for the future. Accordingly, KHNP has set and is currently following a road map to secure NPP dismantling technology. The road map is composed of three steps: development of a standard dismantling technology model, business application technology development and an upgrading of dismantling technology. A total of KRW 302.1 billion is planned to be invested, an amount that includes government support. To execute the roadmap, 2 teams from the NPP follow-up management department, a dismantling technology team at headquarters and a dismantling technology team at a central research center were formed, and since 2014, domestic and foreign education training in the NPP dismantling field has been carried out.

#### Roadmap for securing NPP dismantling technology

##### STEP. 1

2013~2017  
Development of standard dismantling technology model

##### STEP. 2

2018~2022  
Business application technology development

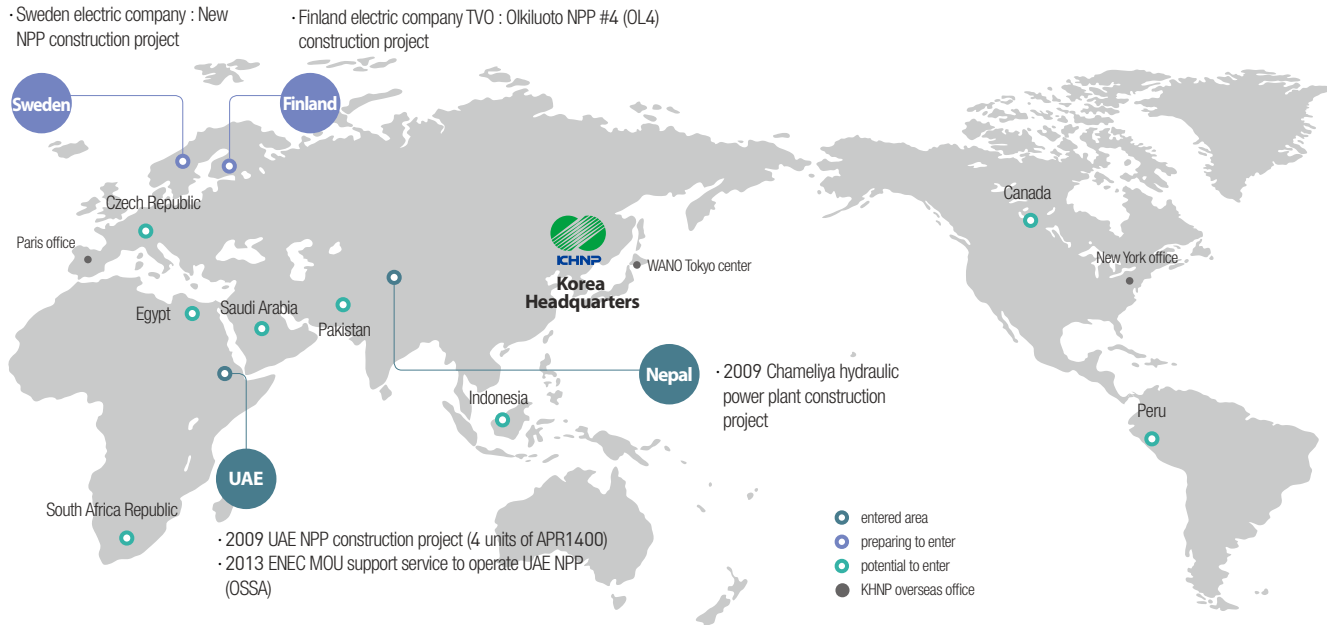
##### STEP. 3

2023~  
Upgrade of dismantling technology

#### Government research subsidy record

(unit: KRW 100 million)





## Phased overseas business expansion

### UAE NPP construction and effort toward winning OSSA (Operating Support Services Agreement)

The US 20 billion dollar UAE NPP construction project that we won in 2009 by forming a consortium with KEPCO is proceeding as scheduled and generating stable revenue every year. KHNP dispatched 176 NPP technicians to the construction site to fully execute NPP construction, while on-the-job training and operation education for personnel at home and abroad was successfully completed by NPP ordering organization ENEC (UAE nuclear power company). After the completion of the UAE NPP, to discover additional areas of business and to generate job opportunities, we signed an MOU with ENEC in October 2013 on 'UAE NPP operation personnel supply,' working toward winning the 'OSSA for NPP operation'. If we win, we would need a large scale number of Korean NPP technicians to send to UAE, and through this, we expect to alleviate youth unemployment by creating quality job opportunities. In 2019, a total of 929 people are expected to be deployed and we are planning to secure these recruits two to four years earlier to educate them, so that they acquire NPP operation experience and meet the necessary qualifications for work. In 2014, we selected and have proceeded with the education and training of 605 individuals, working to build an educational infrastructure for the incoming labor force that includes such things as education program development.

### Advance to new overseas NPP

The overseas NPP business is proceeding with government support and around

KEPCO's strong nuclear industry supply chain foundation that stretches to Vietnam, Saudi Arabia, Egypt and the Czech Republic, with customized activities developed to match individual countries. With phased overseas expansion acting as an axis, we established a mid to long-term business strategy up until 2030. In general, we will proceed forward with the EPC (Engineering Procurement Construction) turnkey business, operation and maintenance-oriented EPC-O&M as a key business, and in the mid to long-term, we will expand to BOO (Build-Own-Operate), as well. We plan to obtain 11 overseas NPPs by 2030, generating a revenue of KRW 3.2 trillion (13% of total revenue). Also, we have taken on the OL NPP #4 construction project for TVO of Finland, as well as a new NPP project of Sweden.

### Seek to advance to overseas hydraulic business

As the hydraulic market expands overseas, we are striving to develop a prospective hydraulic business. The Chameliya hydro power plant construction project of Nepal began in April 2009, but due to financial difficulties and a delay in civil engineering, the construction period has been extended twice so far. Even with these difficulties, however, we completed 86.6% of the work schedule by 2013, achieving the target construction period goal. Through networking and strategy negotiations, we also came to an agreement for paying the cost of the unexpected extension. In addition, by utilizing key countries such as Nepal, Tajikistan, Canada, and Indonesia, we are striving to develop new prospective hydraulic projects. Among these, we supported feasibility investigations in Nepal and passed down our advanced hydraulic power generation technology in Tajikistan, building up friendly relationships while increasing possibilities for future business.

Through the cooperation of domestic and foreign companies and with self-determined effort in pursuing hydraulic power generation technology, we are overcoming the difficulties of our technological disadvantage to other advanced countries and price competitiveness with China.

## Diversification of business portfolio and fostering environmentally-friendly energy business

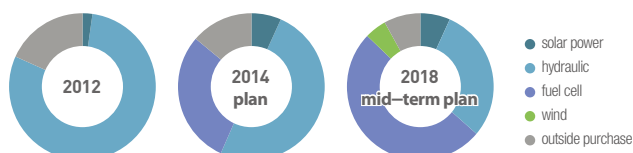
### Develop new business and compose mid to long-term portfolio

KHNP is striving to develop new business to preoccupy limited domestic renewable resources. To achieve this, we composed a mid to long-term portfolio for renewable energy with a consideration for supply and demand by energy type as well as the prevailing business environment, while promoting partnership and business connected with government policy to enhance effectiveness. In 2013, we participated in several public business-oriented organizations, such as Noeul fuel cell joint development (Seoul), Busan fuel cell joint development (Busan), industrial solar power businesses, and private-public accompanied growth projects, such as the Gyeonggi fuel cell joint development project, Yeongwol solar power joint development project, and Miryang solar power joint development

#### Renewable energy mid to long-term portfolio re-formation (unit: MWh)

	2012	2014 plan	2018 mid-term plan
Obligated amount	2,010,256	2,523,871	4,573,645
Solar power	38,679 (2.4%)	182,257 (6.8%)	323,779 (7%)
Hydraulic	1,289,124 (79.3%)	1,337,743 (50%)	1,340,681 (29.3%)
Fuel cell	—	790,731 (29.6%)	2,312,890 (50.5%)
Wind	—	—	240,113 (5.2%)
Outside purchase	296,813 (18.3%)	364,872 (13.6%)	364,872 (8%)
Total	1,624,616	2,675,603	4,582,335
Execution rate	80.81%	76.3%	98.6%

※ As of July 2014 REC execution result reflected up to June application



project. Also, as a non-solar power business, we jointly participated in a South west sea wind power development project to diversify our renewable energy business.

### Expand renewable energy business development

To achieve a mandatory supply of renewable energy, we are actively promoting external joint development projects and constructing our own facilities, and through contract selection, our own contracts and the spot market, we are securing REC (Renewable Energy Certificate). In connection with an expansion of the renewable energy business, we are promoting a CDM (Clean Development Mechanism) business, and in preparation for a second designation as an obligatory greenhouse gas reduction country, we are laying the groundwork to obtain CER (Certified Emission Reduction).

#### RPS execution result

	2012	2013	2014 plan	remark
Obligated supply amount(GWh)	2,010	2,463	2,524	2012~2013 no penalty
Executed amount(GWh)	1,625	1,770	1,926	
Execution rate(%)	80.82	71.87	76.3	

※ obligated supply amount (GWh) = base generation x adjust obligation rate

#### RPS execution strategy

<p>In the short-term, selected investment in solar power and actively promote own fuel cell / wind business to set up plan targeting more than 80% of RPS</p>	<p>Mid to long-term non-solar power to execute fuel cell business set up of wind power site development system, develop various power generation sources like bio / marine wind</p>	<p>To combat limited resources in Korea, concentrate on research and development</p>
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### Lead hydraulic-pumped storage core technology

KHNP is trying to lead core hydraulic and pump storage power generation technology and to prepare for a future overseas hydraulic business foundation through localization development of core technology and modernization of old power plants. To accomplish this, we invested KRW 26.5 billion over a 4 year span starting in 2012, trying to localize 15 MW water-turbine-generator. In 2013, we replaced the old water-turbine-generation facilities of Uiam hydraulic #2 and Chungpyeong hydraulic #3 with new ones and subsequently increased power generation. In April 2014, we signed an operation and technology exchange MOU with Tokyo Electric Power and Harbin Electric Company, acquiring source technology in hydraulic power generation.





## Think TRUST 03. Innovative Management

We need to raise  
profitability  
and enhance  
management  
effectiveness  
through strong  
innovation.

Per capita welfare expense

**34%** decreased

Decrease in per capita welfare expense from KRW 5.17 million in 2013 to KRW 3.41 million in 2014, approximately 34%.



## Where we stand

### Environment changes surrounding KHNP and the present

The deteriorated business environment of 2013 was especially harsh to KHNP. Not only was there long-term suspension of some power plants, but because of the downward regulation of electricity trading coordination factors, revenue from electricity sales rapidly decreased, creating a deficit. In addition, there was an increase in construction investments and appropriated liabilities. Liability increased 71% from KRW 15.6 trillion in 2010 to KRW 26.7 trillion in 2013, while the debt ratio increased from 81.8% to 132% within the same period. As a result, we received the lowest level of "E" in a business evaluation by the Ministry of Strategy and Finance, and were requested to prepare a plan to reduce liabilities and rectify reckless management. Despite the efforts to reduce debt and increase profit, the circumstances were far from favorable. According to the second national basic energy plan, for the coming 5 years an investment of KRW 30.5 trillion is expected, however because KRW 15.2 trillion is an insufficient amount of funds, an increase in borrowing was inevitable. In addition, the NPP post-treatment restoration provision liability, which takes up the majority of our non-financial debt, is supposed to increase in unit cost every 2 years according to law, so there is a limit to what we can accomplish with our own efforts. Also, other public organizations are reducing debt by selling assets,

whereas KHNP has been concentrating on investing in our main business, NPPs, meaning that only a small portion of assets can be sold to reduce debt. However, we are not making excuses for the cards that have been dealt to us. Rather, we will work with the existing circumstances to turn impossible into possible, trying to find new opportunities and change the organization and business through intense innovation.

## What we listen

### Opinions of stakeholders

Among the various issues surrounding KHNP, from the innovative management aspect, 'Internalization of management innovation', 'Eradication of corruption and expansion of integrity culture', and 'Strengthening financial soundness and profitability' were determined to be core issues. The result of the stakeholders' 7 point evaluation on the materiality of these particular issues showed an average of 5.9 points, with priority given after taking into account the effect on business. We are offering a detailed report of core issues derived from stakeholders and will reflect suggested opinions and advice toward to the effective management of our business.

# 1<sup>st</sup>

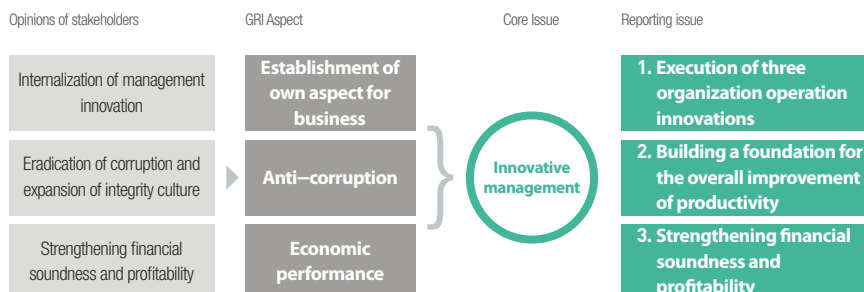
Utilization of project financing (PF) investment technique to relieve the burden of the procurement of capital, and for the first time, domestic electric generation PF introduced a tender system.

# Aa3

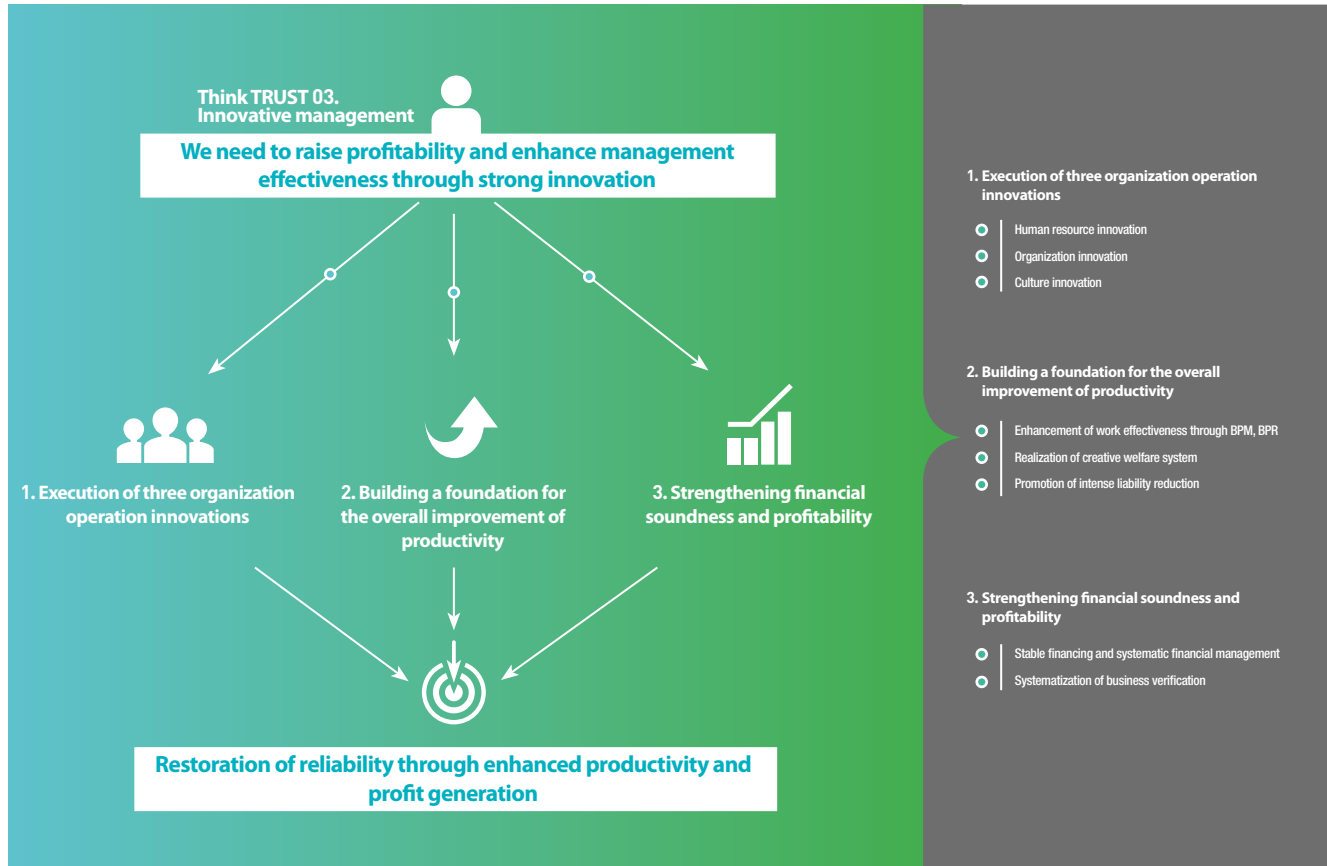
MOODY'S

Successful issue of long-term bond with 20 year maturity, and through active investor relations, our 2014 Fitch rating was upgraded from A+ to AA-.

A<sup>+</sup> AA<sup>-</sup> A<sup>+</sup>  
STANDARD & POOR'S FitchRatings R&I



## How we do KHNP's innovation management promotion direction



**To achieve high-intensity innovation and performance evaluation, both the discovery of an accurate performance measurement index and effective communication are necessary.**

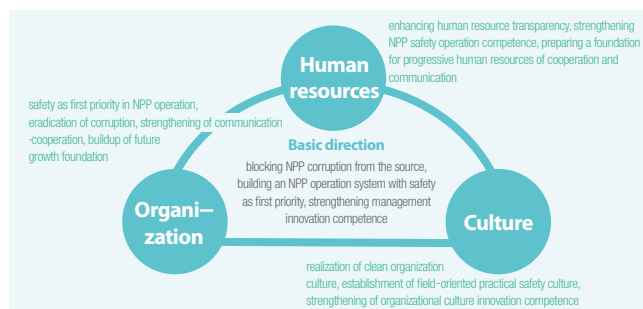
**Jung Do Jin**  
Professor, Chung-Ang University

KHNP's achievement through management innovation is relatively undervalued in comparison to the efforts that have been taken. The reason for this undervaluation is believed to be due to the nonexistence of standards to properly measure results and a lack of communication. For instance, if the financial report of KHNP is evaluated only by its debt ratio, it is easy to assume that the company is in trouble. However, debt is not always bad. If we look at the latest index for evaluating the stability of a company, which considers interest coverage ratio, total borrowings to total assets, and cash coverage ratio, the company's outlook can actually be evaluated as very stable. Likewise, it is important to grasp and utilize the measurement index that is best able to accurately portray company performance, and further, to effectively deliver these

results to internal and external stakeholders, actively notifying them of the genuinely changing face of the company.

## Execution of three organization operation innovations

KHNP is trying to change from the bottom-up in terms of organization operation and work methodology, wishing to restart as a corruption-free, transparent company. Three major innovations illuminate the basic direction that the company is taking, joining together the concepts of blocking corruption from its source, prioritizing safety in the establishment of NPP operation systems, and finally, reinforcing management innovation competence. Through an opinion gathering process comprising of attention to both organization and hierarchy, we are analyzing problems and arranging for various improvements, all the while developing an innovative culture where anyone can freely speak out regarding potentially faulty company practices.



## Human resource innovation

We introduced an open promotion review system that external personnel and outside participants could take part in, and to prevent local alliances and combat corruption, we implemented a rotation system for long-term employees and customer service staff. At the end of 2013, we implemented a large scale replacement of personnel to bring in a new organizational atmosphere, and adopted an open personnel system to continue expanding the excellence present in our professional workforce. In 2013, we recruited a total of 5 executives, including 2 females, through internal and external open recruitment, and also employed 33 outside experts from NPP dismantling and other professional fields. Also, the CDP (Career Development Program) was adopted to induce voluntary development of competence and to diversify the recruitment channel for experienced personnel, ultimately reinforcing the safe operation of NPPs. Breaking away from the management of working personnel based on occupational groups, we introduced an intersecting system for the assignment of individuals to positions, and oriented it instead toward job capability. This helped to eliminate selfishness between departments and reinvigorated communication between groups.

### Present state of external personnel recruitment



## Organization innovation

KHNP went through a massive reorganization of its goals with 'safety as first priority in NPP operation,' 'eradication of corruption,' 'strengthening of communication-cooperation,' and 'buildup of a future growth foundation'. Firstly, for 'safety as first priority in NPP operation', we merged the quality assurance office with the safety technology division to form a quality safety division, expanded and reformed the facility division to the engineering division and also newly established an engineering support center. To target 'eradication of corruption,' we established SCM (Supply Chain Management) and a department dedicated to the investigation of production costs, and reinforced purchase-related engineering personnel. Also, we reinforced audit personnel to strengthen preliminary prevention of NPP corruption. We changed the closed nature of our organizational culture, and to establish a communication base with the areas neighboring power plants and encourage a 'strengthening of communication-cooperation', we expanded management organization innovation and established an external cooperation team at nuclear power sites. We set up a human resource development team and a management research team to foster strategic human resources and to reinforce CEO Think Tank functions. For the timely promotion of UAE NPP and stabilization of domestic NPP construction and trial operations, and through a reinforcement of organization and workforce personnel, we are preparing to 'buildup a future growth foundation.'

## Culture innovation

Cultural innovation includes the 'realization of clean organization culture', 'establishment of field-oriented practical safety culture', and the 'strengthening of organizational culture innovation competence,' goals that are being promoted through the willpower of the and entire staff. For the 'realization of clean organization culture,' we implemented a real-time public opinion poll (Live Poll) of all staff and on the basis of their opinions we selected '10 vows for a happy workplace.' For 'establishment of field-oriented practical safety culture,' we benchmarked domestic and foreign companies with exemplary safety measures, set up a comprehensive improvement roadmap for safety culture, and built a safety culture cooperation system with partner companies. For the 'strengthening of organizational culture innovation competence,' we carried out intensive consciousness reform education through a communication & sympathy innovation debate for 800 executives, letting them lead the changes in company organizational culture. Also, for animated and healthy communication within the organization, we keep on developing various communication activities, such as an 'idea cafe,' 'happy workplace bulletin,' 'compliment relay movement,' and more.

### 10 unsound practices to fix (10 vows for happy workplace)

- Job order** make clear the background, direction, deadline
- Meeting culture** only have the necessary number of people with an appropriate time limit
- Communication / conversation** do not be disrespectful of others
- Event / protocol** minimize events and simplify protocols
- Clock out culture** minimize overtime and use it effectively when necessary
- Vacation culture** make team plan every month, with superiors going first
- Post-work get-together culture** finish after the first round and do not force alcohol upon others
- Coexistence culture** treat people of partner companies as true 'partners'
- Company housing culture** respect the private life of others within company housing
- Daily life** concentrate during work hours and minimize personal affairs

### Safety culture comprehensive improvement roadmap

	2014	2015 ~ 2018	2019 ~ 2024
<b>Management system</b>	· introduction of international standard safety culture system	· upgrade nuclear power safety culture evaluation methodology	· lead global nuclear safety culture
<b>Human competence</b>	· safety culture education customized for each worker	· building worker safety culture competence / leadership improvement system	· fostering global safety culture core experts
<b>Policy / System</b>	· execution of field-type practice for safety culture program	· establish Korea's own safety culture operation model and strengthen cooperation	· establish global safety culture cooperation system

## Building a foundation for the improvement of overall productivity

### Enhancement of work effectiveness through BPM, BPR

To stop corruption at its source and for increased transparency and NPP safety, we have established and are currently operating a BPM system. BPM analyzes each job process, eliminates problems and standardizes the work process so that it can be done through a computer system, enabling real-time progress monitoring and enhancing management transparency. This automatization has sped up the work process and greatly reduced work errors, enhancing work effectiveness. First applied to the areas that influence NPP safety and management transparency the most (the purchase, material, and quality divisions), the system will eventually be expanded to include all other areas of business.

#### BPM proceeding stages

	1 <sup>st</sup> stage (2012.12~2013.6)	2 <sup>nd</sup> stage (2013.6~)
<b>BPR promotion</b>	<ul style="list-style-type: none"> <li>Subject: selection of 4 core process areas with consideration for management environment (purchase&amp;material, power generation maintenance, quality, construction business management)</li> <li>Work process mapping: 119 processes</li> </ul>	<ul style="list-style-type: none"> <li>Subject: power generation operation and 16 related areas (managerial accounting, financial accounting, human resources, power generation operation, data management)</li> <li>Work process mapping : 522 processes</li> </ul>
<b>BPM establishment and operation</b>	<ul style="list-style-type: none"> <li>Purchase&amp;material, quality management (1 Apr 2013~)</li> <li>Power generation maintenance, construction business management (6 May 2013 ~)</li> </ul>	<ul style="list-style-type: none"> <li>Planning to establish streamlined processes among related departments and improve work effectiveness</li> </ul>

### Realization of creative welfare system

We switched from a welfare system based on monetary support to a creative welfare system that provides practical benefits to employees. In 2014, we formed a labor management task force and through active labor management negotiations, such as with a labor management council and collective negotiations, the welfare system was improved. We abolished educational support for employee children, and rather than freely supporting college student-

level children, we now offer scholarships. By drastically reducing gift money and adjusting the vacation system, we reduced employee welfare costs by 34% and tried to meet the government's request to resolve reckless management and enhance management effectiveness through a promotion of innovation in our welfare system.

#### Reduction in welfare cost

	Old	New
<b>Education</b>	actual amount for middle and high school tuition	limited tuition support for children of government officials (KRW 1.83 million)
	support tuition for college student (limited to 2 children)	introduction of scholarship system – support provided according to achievement
<b>Nursing</b>	support for education of children (0 to 4 years old, KRW 700 thousand per year; 5 year olds KRW 1 million per year)	abolish
<b>Gift money</b>	parents' 60 <sup>th</sup> birthday, 70 <sup>th</sup> birthday, paid gift money	reduce to 50%
<b>Vacation</b>	sick leave set to 90 days per year	adjust to less than 60 days for sick leave
	parents 60th birthday (1 day), 70th birthday (2 days)	abolish
<b>Per capita welfare cost</b>	2013: KRW 5.17 million	2014: KRW 3.41 million (reduced KRW 1.76 million, 34%)

### Promotion of intense liability reduction

KHNP's debt is expected to be KRW 40.1 trillion in 2017, with a debt ratio of 181.1%. We are trying to reduce debts without affecting NPP safety. Our target is to reduce the debt to KRW 34.5 trillion by 2017, with a debt ratio of 151.9%. To achieve this target, we are rationally reducing investments without compromising safety and are reforming the way we do business. We are restricting new business ventures by strengthening investment deliberations, and from the level of management effectiveness, we are reducing purchase costs through SCM and by performing cost investigations. We remain vigilant of any chances to further reduce our budget.

Besides this, we exported radioactive waste process vitrification technology to Japan, Finland and UAE and are selling tritium that is created during the operation of heavy water reactors.

In 2013, sales of electricity reduced greatly due to lowered NPP availability, and we reduced debt by KRW 597.4 billion by executing an extremely tight budget operation according to a contingency plan. As a result of these efforts, we achieved a grade of 'good' from an interim evaluation by a public organization.

#### Strengthening debt reduction budget operation

##### Debt ratio by 2017

181% (expectation) →  
**152** % (target)  
make it less

##### Debt reduction in 2013

KRW  
**597.4** billion  
debt reduction until October 2014 :  
KRW 1.1433 trillion



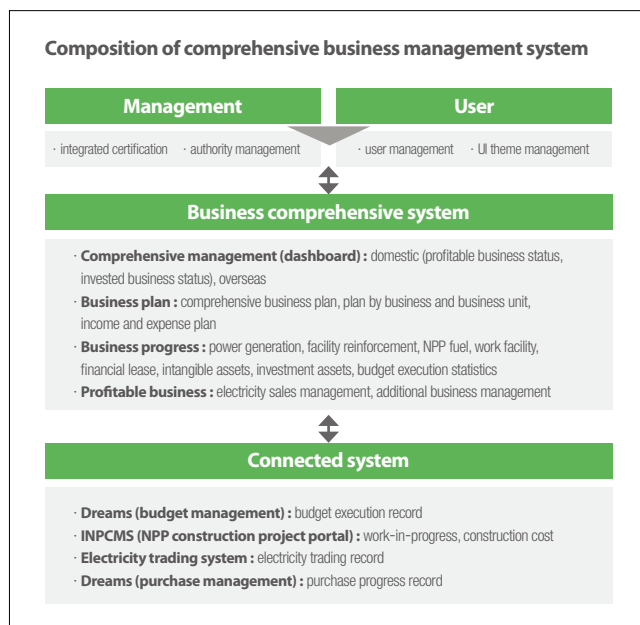
## Strengthening financial soundness and profitability

### Stable financing and systematic financial management

With regards to management strategy, we set up a rolling 5 year mid to long-term financial plan, and through a contingency plan based on circumstance-specific scenarios and crisis situations, we have carried out systematic financial management. In addition, we are not only executing close analysis of assets, liabilities, profits and losses, and cash flow trends according to changes in exchange and interest rates, but also established a financial risk management system to monitor every type of risk and perform quantitative financial risk management. Upon diagnosing financial risk management levels, for objective verification purposes, we operate an external expert advising committee. In 2013, on the foundation of systematic financial management, we alone were able to successfully issue a 20 year maturity long-term bond, in contrast to other power companies, and through active investor relations, our Fitch credit rating increased from A+ to AA—.

### Systematization of business verification

To prevent deterioration of the financial structure, we strengthened our deliberation system and set up a rational budgeting system. In the past, we deliberated amongst ourselves within the business unit and decided upon investments in that manner, which resulted in a lack of objective feasibility verification.



To improve this, in the latter half of 2013, we introduced a CEO chairing investment feasibility verification process known as the 'enterprise investment business deliberation committee.' On the other hand, in executing the budget, to make checks on the effectiveness of the investment management system, we set up a comprehensive business management system. At every step along the way, through a real-time 'watch and warning' system, we gain immediate insight into the present state of business promotions, and through this are able to effectively manage the budget. Also, for the budget allocated toward poor business transactions, business that was cancelled or that resulted in a difference in bidding amount, we recollect the whole amount so that the budget is not recklessly executed.

### Best Practice



#### Enterprise investment business deliberation committee

The enterprise investment business deliberation committee verifies the necessity of business proceedings through debate among related departments before establishing basic plans for construction that cost more than KRW 5 billion (any business costing more than KRW 1 billion is verified instead at the 'enterprise investment business deliberation practical committee' chaired by the head of the planning division). The CEO, management and groups from various fields of finance / strategy / technology deliberate about objective economy and comprehensive business risks when making decisions regarding business investments. The first enterprise investment business deliberation committee was held in November 2013 and deliberated over the feasibility of 4 businesses, reducing total business costs by KRW 82.4 billion. In the first half of 2014, the enterprise investment business deliberation committee was held 6 times, while the enterprise investment business deliberation practical committee was held 3 times. A total of 33 businesses were deliberated about, which reduced business costs by KRW 124 billion. To reflect on potential areas of improvement derived from the operation of the committees, and to proceed with a more systematic implementation of the 'enterprise investment business deliberation practical committee' in the future, an investment business deliberation guide was created. In 2015, every subject business is required to complete the guide before a budget allocation, an active attempt toward a more accurate, investment plan-based budget operation.

#### Result of 2013 investment business deliberation

Name of business	Total cost (KRW 100 million)	Result
Noeul fuel cell power generation business	1,114	conditional approval
Wolsong #1 machinery facility reinforcement	384	postponed emergency diesel generator replacement
Hanbit #3, #4 reactor head upper structure replacement	70	business postponed
Kori #2 reactor head and affiliated facility replacement	495	received approval



## Think TRUST 04. Ethical Management

We should improve the system to prevent corruption and stay armed with strict ethical standards.

The number of information items disclosed in advance increased two fold compared to the previous year

**150** items

Increased two fold compared to the previous year, with advance information disclosure items posted on our homepage





## Where we stand

### Environment changes surrounding KHNP and the present

Following the Fukushima NPP disaster, various issues continued to arise among KHNP employees, with corruption, test verification document falsification and NPP malfunctioning all greatly damaging KHNP's reliability and overall image. The amount of loss compensation for KEPCO and loss in sales was enormous. To our shame, our ex-CEO was arrested for bribery and 20 employees were put on trial due to procurement corruption, accepting bribes, unfair purchase contracts, unfair profits, and a number of related corruption cases like these were discovered. Due to these circumstances, the public regarded KHNP as a corrupt group and in 2013 KHNP indeed received the lowest grade in an integrity evaluation. However, these events came as an opportunity for all the people in the country to recognize that 'the corruption of KHNP, who maintains NPPs, is not relevant only to this single company, but is an important problem that can threaten the safety of the whole nation.' Thus, from now on, KHNP approaches ethics not only from a company perspective, but from a wider perspective for the country's reliability and safety. It will take a long time and concentrated effort to regain the trust that has been broken once already, and the process will not be easy. However, for the safety of this country, all the employees at KHNP will try endlessly to reform the organization and meet the expectations of the public.

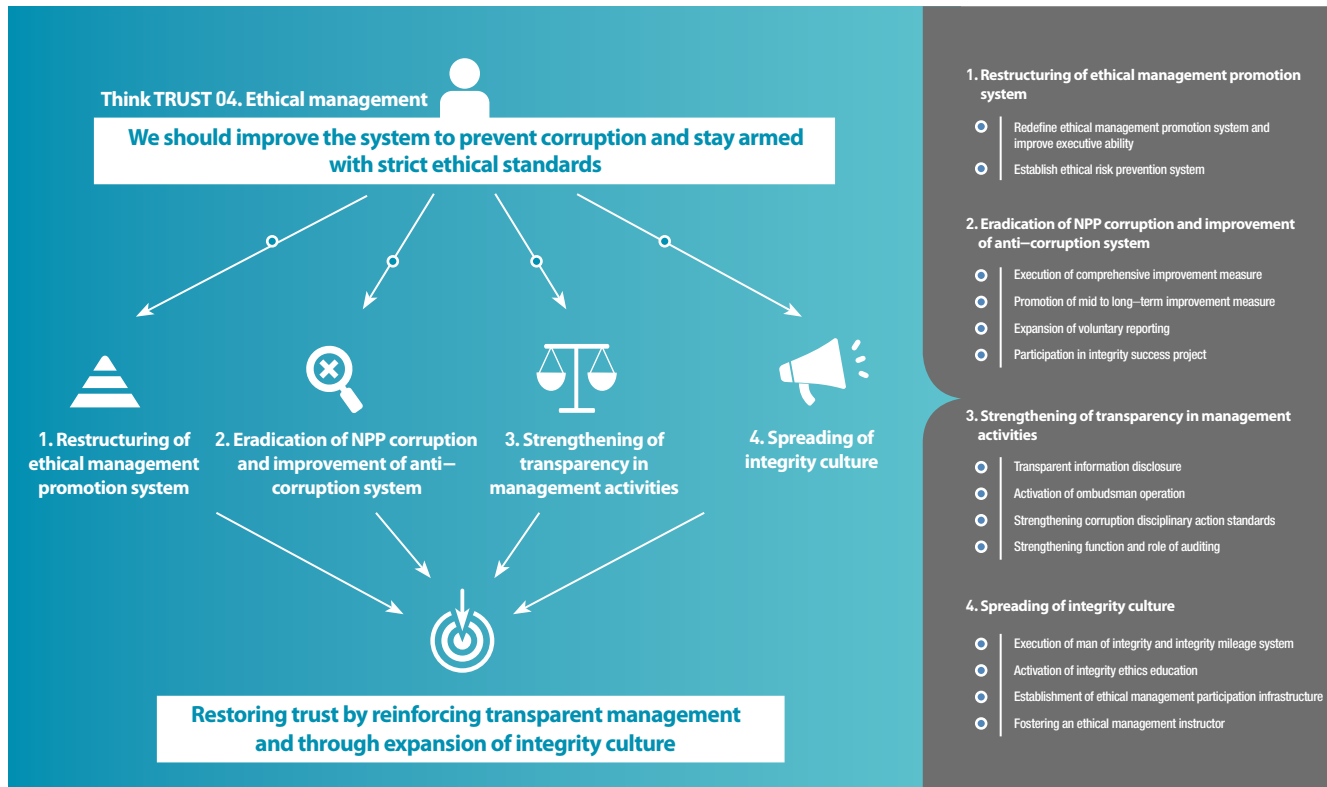
## What we listen

### Opinions of stakeholders

Among the various issues of concern to KHNP, from the ethical management aspect, 'Eradication of corruption and spreading integrity culture' was determined to be a core issue. The result of stakeholders' 7 point evaluation on the materiality of this issue was a 6.6 point average, and selection was prioritized by also considering business impact. We are reporting the derived key issue in detail and will continue to manage the comments made to our business and reflect deeply upon them.



## How we do KHNP's ethical management promotion direction



**To restore the people's trust, we will consider integrity and safety as our first priority.**

**Hong Byung Gi**  
Assistant Manager, Planning Team, KHNP

Ethical management became a very important factor not only for strengthening company competitiveness but also for survival. For the last 3 years following the incidents of corruption, all employees at KHNP have recognized the importance of ethical management and have set out to adopt a code of ethics and make

institutional improvements, but still the public is unforgiving. To clear our name as a corrupt company, and to restore people's trust, we need to establish an ethical management environment that comes from within employee consciousness and that is attainable only through direct action. On top of this, and with the stable operation of NPPs, we can meet people's expectations.



**Transparent disclosure of information that caters to the public eye is necessary.**

**Moon Byung Gi**  
Reporter, Dong-A Ilbo

Compared to the high level of alarm regarding the safety of NPPs, there is simply not enough appropriate information made publically available to the people. In this regard, NPP operation failure due to corruption even more severely amplifies anxiety among the people. Accordingly, to restore people's trust, the disclosure of information about NPP operation and construction processes, as well as transparency, are most important above all else. Though KHNP informs the public of its NPP operation and failures via its homepage, the truth of the matter is that this information is still largely inaccessible to the general public because it is difficult for a non-expert to understand. From now on, KHNP should disclose information while keeping in mind their audience-the people-and through this transparency will be strengthened.

## Restructuring of ethical management promotion system

KHNP has thoroughly reflected upon the corruption cases and various problems that occurred in 2012 and subsequently has been trying to eradicate the potential for future instances of this. Especially after the concealment of a NPP failure report in 2012 along with the forgery of quality warrant and test reports, the ethical management system has been drastically improved. We formed a management innovation task force team to set innovation measures and for the first time for a public company, we enacted a partner company code of conduct, reinforcing education by fostering an in-house ethical management instructor. To prevent quality warrant and test report forgery, we reformed the purchase process, and to break down the closed organizational culture of the company, we adopted an external recruitment system for key positions.

Key issues	Emergency arises	Effort to overcome
<ul style="list-style-type: none"> <li>Concealment of NPP stop report (2012.2)</li> <li>Corruption investigation announced (2012.7)</li> <li>Finding quality / testing verification certificate forgery (2012.11)</li> <li>Find cable certificate forged (2013. 5)</li> </ul>	<ul style="list-style-type: none"> <li>Kori #1 stopped</li> <li>22 employees arrested and accused</li> <li>Hanbit #5, #6 stopped</li> <li>Shin-Kori #1, #2, Shin-Wolsong #1 stopped</li> </ul>	<p><b>1<sup>st</sup> stage</b></p> <ul style="list-style-type: none"> <li>Management consciousness reform debate</li> <li>Management innovation TFT operation</li> </ul> <p><b>2<sup>nd</sup> stage</b></p> <ul style="list-style-type: none"> <li>Code of Conduct revision</li> <li>Strengthened ethical management system</li> </ul> <p><b>3<sup>rd</sup> stage</b></p> <ul style="list-style-type: none"> <li>External open recruitment for key positions</li> <li>Improvement of entire purchase process</li> </ul> <p><b>4<sup>th</sup> stage</b></p> <ul style="list-style-type: none"> <li>Promote comprehensive measure for eradication of corruption</li> <li>NPP industry resolution for self-purification</li> </ul>

## Redefine ethical management promotion system and improve executive ability

Following the CEO's unwavering volition for a 'New start, realization of a trusted KHNP,' the company has redefined its ethical management promotion system. With a goal of 'enhancing the integrity of KHNP's image through participating in ethical management activity,' we emphasize creating a culture of integrity that members can voluntarily participate in. In this vein, we derived 4 plans of action that include building an participatory ethical management environment, a rearming of ethical consciousness, promotion of external recognition improvement, and strengthening feedback. Also, we established an annual plan in the areas of ethics and integrity in accordance with the ethical management

promotion process, strengthening promotion infrastructure. After the execution of the plan, we subject both KHNP headquarters and domestic business sites to integrity measurements and a self-ethics diagnosis investigation (KHNP-BEX), and implemented feedback monitoring. Based on the results, we decided to establish an integrity ombudsman activation plan and by redefining integrity and safety as core values, we have propelled improvements.

### New ethical management promotion system

2030 vision

**KHNP, a trusted global energy leader**

Core value

**Technology / Respect / Ultimate safety / Social responsibility / Timeless integrity**

CEO management direction

Safe NPPs   Clean company   Creative innovation   Coexistence and communication   Establish future foundation

2014 ethical goal

### Realization of integrity of KHNP's image through participation in ethical management activity

Action tasks



### Ethical management promotion process

Establish plan	Execution	Monitoring	Evaluation / education
Set up of annual plan for the areas of ethics and integrity	Strengthen promotion infrastructure integrity success project	Integrity evaluation KHNP – BEX	Benchmarking education organization activity

## Establish ethical risk prevention system

To ensure that occurrences of corruption are kept at zero, KHNP established a prevention-discovery-response management system. For the preemptive prevention of ethical risks, the employee code of conduct was revised, while full-time online monitoring, public interest whistleblowing, and in-depth audits of vulnerable areas were promoted. Integrity evaluations of senior positions, in particular, have been weighted more heavily, and a systematic risk prevention management system is being operated.

### Ethical risk prevention management system

#### Ethical risk prevention   Ethical risk discovery   Strengthen post response

<ul style="list-style-type: none"> <li>revision of employee code of conduct (5 times)</li> <li>activation of integrity ethics education</li> <li>1 ethical task for 1 team and anti-corruption idea contest</li> </ul>	<ul style="list-style-type: none"> <li>full time online monitoring</li> <li>activation of whistle-blower</li> <li>in-depth audits for vulnerable areas and strengthening of mobile inspection activity</li> </ul>	<ul style="list-style-type: none"> <li>evaluating integrity of senior positions</li> <li>increase weighted value</li> <li>strengthening disciplinary action against corruption</li> </ul>
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## Eradication of NPP corruption and improvement of anti-corruption system



### Eradication of NPP corruption and improvement of anti-corruption system execution

Establishment of comprehensive improvement measure	Establishment of mid to long-term improvement measure	Expansion of voluntary reporting	Participation in integrity success project
Eradicate connection, Improve purchase, Strengthen quality	Standardize NPP parts, Localized roadmap, Integrated system management, Redefine quality control domain by NPP organization	Red whistle, Executive auditor communication hotline, Expand reporter compensation	Promotion and execution of 37 tasks in 9 areas

### Execution of comprehensive improvement measure

To eradicate structural irregularities, we set up and executed an 'NPP irregularity eradication comprehensive improvement measure,' with a goal to strengthen quality management, improve the purchase system, and eradicate corrupt NPP industry connections. We selected and intensely promoted key core tasks

Comprehensive improvement measure for NPP corruption eradication		
Area	Core task	Major promotion achievements
<b>Connection eradication</b>	<ul style="list-style-type: none"> <li>above second level retiree reemployment restriction</li> <li>restricting retiree hired company from tender</li> </ul>	<b>Enhancing internal competitiveness</b> <ul style="list-style-type: none"> <li>set up of personnel operation improvement plan</li> <li>strengthening tender system transparency</li> <li>operation of purchase system improvement committee</li> </ul> <b>Strengthening industry co-work</b> <ul style="list-style-type: none"> <li>NPP industry and related organization</li> <li>compose and operate council</li> </ul>
<b>Purchase improvement</b>	<ul style="list-style-type: none"> <li>enhancement of purchase group expertise and strengthening independence</li> <li>minimize private contract, advance disclosure of purchase plan</li> </ul>	
<b>Quality strengthening</b>	<ul style="list-style-type: none"> <li>re-verification of quality documents by 3rd party</li> <li>KHNP direct payment for cost of testing and verification</li> </ul>	

such as expanding the ban on retiree reemployment to include those above a second-level rank, strengthening the expertise and independence of purchasing groups, and ensuring re-verification of quality documents through third party organizations. Also for executives, we introduced a voluntary asset registration system and encourage reporting partner company stock holding status. In addition, with a vision to secure transparency in bidding, we adopted a tender appropriateness deliberation system and pre-reporting of purchase plans, further improving the system to eradicate structural back-scratching relationships in the overall NPP industry.

### Promotion of mid to long-term improvement measure

To prepare a mid to long-term improvement measure to eradicate NPP irregularity, from June to September 2013 we operated a purchase system improvement committee composed of 15 private experts. By setting up a roadmap for the standardization and localization of NPP parts, we are promoting 8 phased mid to long-term tasks, which include promoting sound competition, operation of an equipment and parts integrated information system, and eliminating blind spots in quality management through a redefinition of quality management areas specific to individual NPP organizations.

### Expansion of voluntary reporting

To expand anti-corruption reporting, we put into operation 'red whistle,' a reporting system where tracking the identity of the informer is impossible. This anonymity feature contributed to an increase in the number of reports made, which rose from 18 in 2012 to 42 in 2013. We also opened a hotline to an executive auditor and expanded the rewards for informants, further inducing voluntary reports from employees.

### Participation in an integrity success project

To strengthen anti-corruption competitiveness, KHNP participated in an integrity success project that ACRC(Anti-Corruption and Civil Rights Commission) hosted. Through the policy debate that ensued, we found items for improvement that would enhance integrity and defined 37 execution tasks in 9 areas with the help of ACRC policy suggestions and department action plans. We formed a nuclear power site operation council and carried out a 'thorn under the nail' movement to reduce red tape, executing and completing all integrity success project promotion tasks, except for a single mid to long-term task.

## Strengthening of transparency in management activities



### Execution of management activity transparency strengthening

Transparent information disclosure	Strengthening audit function and role	Expansion of ombudsman system utilization	Transparent management
Advanced disclosure of information, Disclosure of original information, Opening public data	Expansion of audit organization, 3 strategies for strengthening audit (both sides strategy, Field-oriented, in-depth) Strengthening disciplinary standard	Expand and revise integrity ombudsman system  Strengthening business unit field instruction activity	Activation of management checking function  Expand participation of non-executive directors
Self-effort	Internal monitoring		External monitoring

## Transparent information disclosure

To systematically carry out the government policy 'Government 3.0,' which relates to public information opening, cooperation and facilitation of communication, we set up a goal based on the foundation of the CEO's active interest and support, which was 'proceeding full-scale with Government 3.0 to realize a safe and transparent KHNP.' We derived 3 major strategies and key tasks for the application of Government 3.0 and spread of its core values to the entire workplace. These included removing internal and external partitions, activation of private and public cooperation, and preemptive provisions for user-customized service. We formed the KHNP 3.0 proceeding task force and working task force to put these item into practice, checking quarterly how performance was proceeding, and sharing the results in a management strategy meeting. In 2013, the number of information items disclosed in advance increased two fold to 150, and these items were also posted on our homepage. In addition, to analyze data on original document disclosure, we prepared an information disclosure record with a 3 year standard, and disclosed data most frequently requested from the people first.

## 2013 information disclosure record

	2011	2012	2013
Information disclosure request (case)	52	60	108
Information disclosure decision (case)	48	51	96
Information disclosure rate (%)	92.3	85	88.9
Information disclosure decision days took (average/day)	4.4	4.1	4.2

※ major cases for not disclosing: evaluation report for new NPP site selection and other proceedings at that moment or trade-secret related.

## Activation of ombudsman operation

KHNP introduced an ombudsman system in October 2010 and appointed to it 5 experts from various fields. By May 2014, the first term ombudsman members had conducted a total of 12 meetings, 4 of which ran parallel to field instruction activities. Ombudsman members had an in-depth deliberation about the Doam dam civil complaint, the 9.15 blackout incident, employee corruption incidents, quality document forgery incidents, the Uljin Shinhwa-ri collective migration, and the Shin-Kori #5 and #6 construction civil complaints. In order to enhance expertise, starting from June, second term ombudsman members began to be referred to as 'integrity ombudsman,' and with execution of division allocations by member, the operation of the ombudsman advising group and field instruction activity were strengthened.

## Best Practice



### Introduction of 'fair trade SINMOONGO' following ombudsman suggestion

#### 1. Diagnosis of problem

- the importance of 2nd partner companies is growing, however there is no direct communication channel
- necessity to spread fair trade consciousness for 2nd partner companies

#### 2. Present advice item

- arrange for transparent communication channel with 2nd partner companies
- enhance accessibility and simplify reporting process for unfair trading

#### 3. Direction of improvements and proceedings

- introduced 'fair trade SINMOONGO' for 2nd partner companies
- created 'fair trade SINMOONGO' menu at SME support center homepage
- real name and anonymous postings for 'fair trade SINMOONGO' bulletin

#### 4. Expected effects

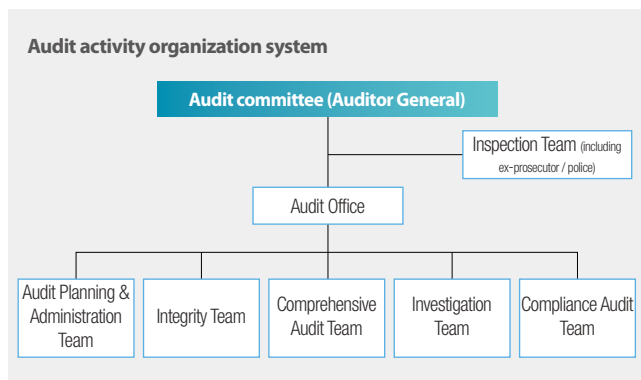
- expansion of fair trading consciousness and culture of 1st partner company concerning 2nd partner company
- enhancement of transparency and fairness of relationship with 2nd partner company

## Strengthening corruption disciplinary action standards

In July 2013, there was a complete revision to the guidelines relating to the disciplinary practice and criminal prosecution. A dismissal of gratuities of under KRW 100 thousand are stipulated, and accusations against a subject can be extended to the company and external members. Also, if corruption occurs, the accused subject's name will be openly disclosed to all employees through the intranet portal.

## Strengthening function and role of auditing

To strengthen audit activity, the number of headquarter audit departments was greatly increased, from 33 to 54. Organization was expanded from 3 teams to 6 teams, with a newly formed inspection team and an investigation team divided into a comprehensive audit team and investigation team to strengthen expertise in core areas. For 6 business divisions, the audit team was divided as separate planning and administration teams to strengthen independency, with audit personnel increasing from 59 in 2011 to 108 in February 2014.



### Pursuing transparent management

KHNP integrity ombudsman meeting

12 times

composed of experts from various fields and discussed in-depth various issues

Strengthened discipline standards against corruption

less than KRW

100,000

receiving money or valuables is also dismissible

### 3 strategies for strengthening audit



**Doubled-sided strategy**

KHNP selected vulnerable areas and blind spots derived from internal and external audit results as priority subjects for auditing. In connection to this, we set 'irregularity eradication audit development' and 'establishment of irregularity controlling environment' as a double-sided strategy and proceeded with 8 strategic tasks.



**In-depth strategy**

KHNP quickly patched up the NPP cable quality document forgery incident and arranged the appropriate measures. Among them include severe punishment, NPP safety-related full investigation, preventive measures for recurrence and development of self-audit activities. For quality area equipment certificate forgery, the audit department generalized the investigation and requested a police investigation of all involved companies.



**Field-oriented strategy**

KHNP is proceeding with a full-time secretion inspection that has aroused alertness among workers. In December 2013, we participated in a 'joint inspection on electric groups and generation companies' hosted by the Ministry of Trade, Industry and Energy. As a result of these regular inspections, we discovered the unfair receipt of lecture tuition and education costs, employees who were not on duty, and mild disciplinary actions were taken.

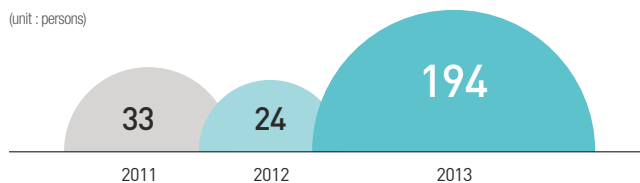
## Spreading of integrity culture

### Execution of man of integrity and integrity mileage systems

We are executing a 'KHNP man of integrity certificate system' to employees with over 70 points of annual integrity mileage. In 2013, 194 or 2% of all employees received the certificate. The system, introduced in August 2010, intended to give monetary compensation to those with a certain amount of mileage, but it lacked practical effects on the improvement and promotion of integrity consciousness. It was also difficult to take part in due to its criteria for participation. In 2013, we expanded the criteria to make more individuals eligible for mileage, sent official letters, and awarded certificate logos within the groupware to enhance participation.

#### Man of integrity yearly change

(unit : persons)



### Activation of integrity ethics education

To enhance the integrity level of employees, we stipulated to pass a proposal for integrity education. In 2013, 3 courses of collective ethics education were held 18 times, with a total of 378 people completing the education. 8,363 others completed it through 3 cyber education courses.

#### KHNP integrity education completion standard



### Establishment of ethical management participation infrastructure

We established a participatory ethical management environment to get sympathy from every employee. From the enterprise ethical management slogan contest, we selected 'think in terms of integrity, act fairly' as the best one, to be posted across the whole company and utilized in electronic approval. At the team level, we operated an autonomous ethics task to all teams in the company, and awarded 26 excellent teams. For individuals, through an anti-corruption idea contest, a total of 415 items (197 related to system improvement, 218 to consciousness innovation) were accepted, and 9 excellent ideas including 'improvement in product purchase price investigation method,' have been reflected in our company policy.

### Fostering an ethical management instructor

KHNP has been fostering an ethical management instructor since 2012. An ethical management instructor is an expert who possesses professional knowledge in ethical management and takes charge of related jobs or provides ethical management consulting, such as through education, counseling, or coaching services. Each business unit selected a qualified person to be such an instructor and proceeded with education at outside professional educational institutions. Those who completed the course became certified as ethical management instructors. As a result, 21 ethical management instructors in 2012, and 16 in 2013 were fostered. These ethical management instructors perform their duties at business units all over the country, spreading ethics culture through ethical education and by providing contents to partner companies.

#### Integral pride healing tour

To recover the integral pride of employees, integrity-related activities and education were executed for four months (May to August 2013), targeting all business units. Through a pride recovery program and mutual debate, the efforts of employees were encouraged and the entirety of the workforce had a strong will to reform KHNP into a more transparent, ethical company.



Discovering integrity education



Integral pride healing tour





## Think TRUST 05. Environmental Management

We should respond to  
climate change and manage  
environmental risk.

National greenhouse gas emissions  
from nuclear power generation in 2013  
reduced by

**16.3** %

If bituminous power plants replace NPPs for power generation,  
114.22 million tons more carbon dioxide will be emitted by 2013  
standards. It follows that NPPs have reduced national greenhouse  
gas emissions by about 16.3% every year.

Compared to 2012, energy  
consumption in 2013 reduced by

**28** %

In 2013, the whole company used 262TJ of first energy and  
839TJ of second energy, which is 424TJ less than the total  
1,525TJ of energy used in 2012.

Compared to world average, the worker  
radioactive cumulative dose for 2013 was

**0.2**  **man—Sv/unit**

The 2013 cumulative worker radioactive dose increased only a  
little compared to the 2012 dose of 0.46, but a level much lower  
than the the world average of 0.73 has been maintained.





## Where we stand

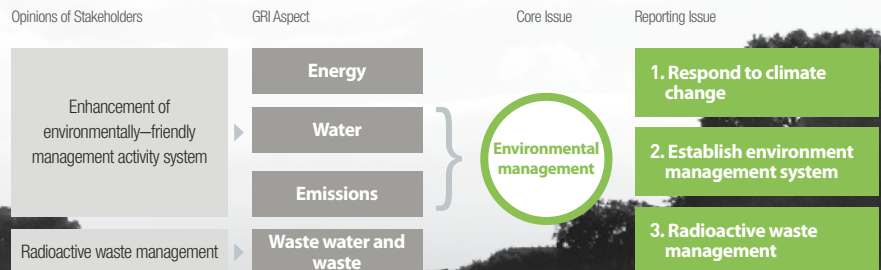
### Environment changes surrounding KHNP and the present

As global warming becomes increasingly more serious, the UN IPCC(Intergovernmental Panel on Climate Change) expects that, 'if the average temperature of the earth rises by 2.5°C, worldwide GDP will decrease by about 2%,' and that the cost to respond to climate change will reach USD 100 billion every year. Power generation is blamed as a major contributor and it has been suggested by the IPCC that expenses for fossil fuel power plants should be lowered to USD 30 billion by 2030. As an alternative to this, a plan was announced to increase investment in renewable energy and nuclear power generation through low carbon energy development and carbon trapping facilities. This is an example of how nuclear power generation is recognized as a realistic alternative to solving the problem of global warming and shows how what KHNP is pursuing as a business will gradually be magnified in importance. Thus, KHNP, as Korea's representative energy cooperation, recognizes global warming as a national energy management issue and acknowledges the necessity to strengthen external influence by participating in international agenda setting.

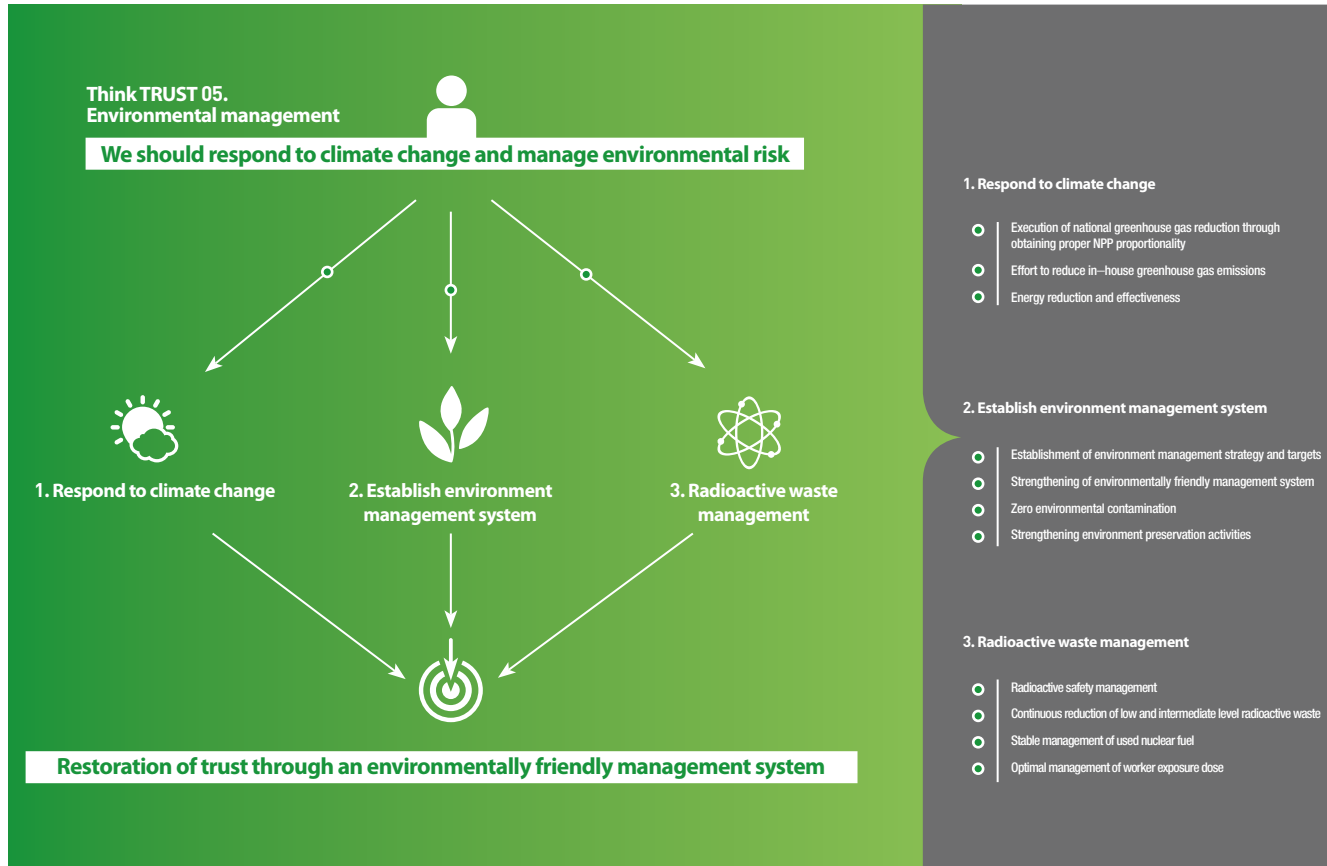
## What we listen

### Opinions of stakeholders

Among the various environmental management issues surrounding KHNP, 'Radioactive waste management' and 'Enhancement of environmentally-friendly management activity system' were derived as core issues. These two core issues received an average of 6.2 points on a 7-point evaluation of issue materiality completed by stakeholders and were selected as priorities after considering their effects on business. We are reporting in detail the core issues that were derived and will reflect suggested opinions and advice back to management.



## How we do KHNP's environmental management promotion direction

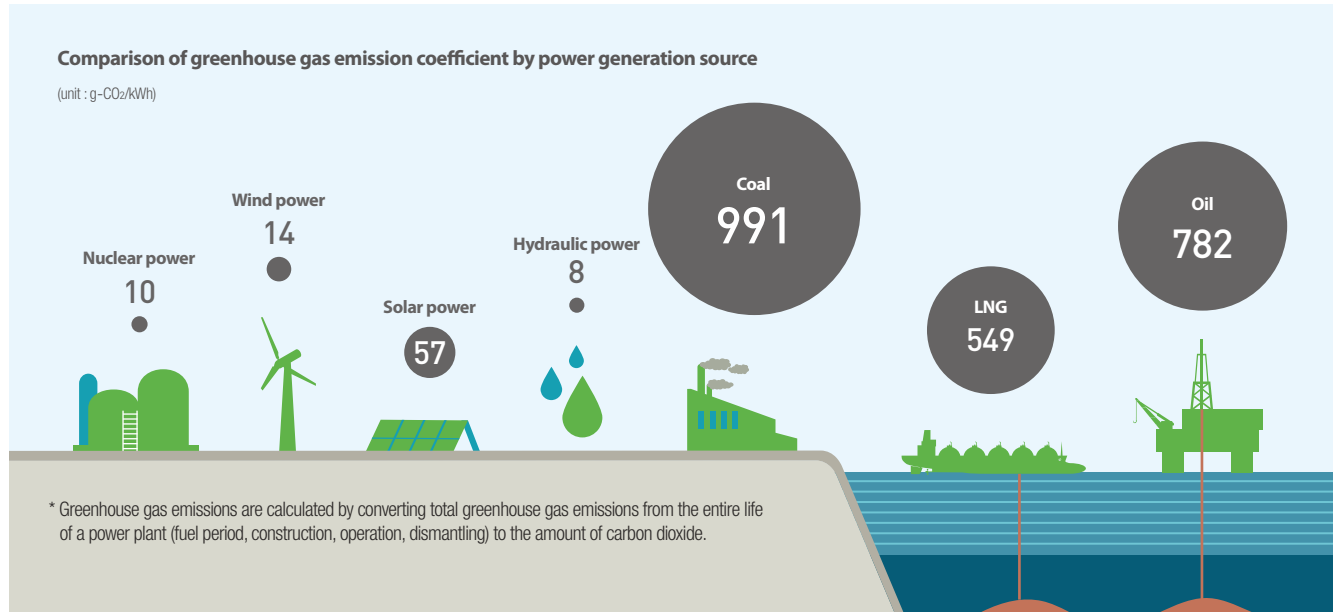


**The only answer to greenhouse gas reduction is nuclear power generation.**

**Noh Dong Suk**  
Head of Nuclear Policy, Korea Energy Economics Institute

As nuclear power generation does not emit greenhouse gases, it is in fact the only alternative to greenhouse gas reduction. Thermal power generation and renewable energy could be considered alternative power. Renewable energy, however, has limits because of its restricted potential, and thermal power is in a weak position in terms of greenhouse gas emissions. After the Fukushima NPP disaster, countries such as Germany and Switzerland decided to abolish NPPs. Most countries, though, have maintained their existing NPP policies. These countries judged that nuclear power generation is an important alternative when considering energy supply and demand, the demand for electricity, and the environmental and economic situations in their own countries. Our country also needs to gradually expand the capacity

of nuclear power generation facilities to respond to the trend of increasing electricity demand and to reduce greenhouse gases. If construction of NPPs stops, we need to give up on greenhouse gas restriction policies. The issue of greenhouse gas reduction is more important than any other in order for KHNP to obtain the people's trust and approval.



## Respond to climate change

The greenhouse gases responsible for climate change are carbon dioxide, methane and nitrous oxide and are usually expressed as CO<sub>2</sub>-eq or CO<sub>2</sub> (carbon dioxide equivalent or carbon dioxide). A thermal power plant that uses fossil fuels such as coal, oil or LNG (Liquefied Natural Gas) emits great amounts of greenhouse gases during the power generation process. Nuclear power, however, does not emit carbon dioxide during the power generation process and emits only small amounts during uranium mining, enrichment, and the operation or dismantling of a power plant. Even considering this, the amount of greenhouse gases emitted is 1~2% compared to other fossil fuels and the same or less when compared to renewable energy.

Comparing 1 unit for the standard type of NPP (1,000MW) to fossil fuels, bituminous power plants emit 6.49 million tons, oil 5.53 million tons, and LNG 2.86 million tons. If nuclear power generation is replaced by bituminous power plants, 114.22 million additional tons of carbon dioxide would be emitted by 2013 standards. It could be said that NPPs reduced 16.3% of national greenhouse gas emissions. As such, since nuclear power generation does not emit any carbon dioxide during the power generation process, it is an essential form of power generation necessary to achieve national greenhouse gas reduction targets.

### Greenhouse gas emission coefficient during power generation

(unit : ton-CO<sub>2</sub>/MWh)

	Bituminous coal	Oil	Gas composite	Hydraulic	Renewable	Nuclear
Emission coefficient	0.8230	0.7018	0.3625	0	0	0

\* 2012 power exchange issued entire cycle carbon dioxide equivalent emissions by generation source, nuclear power is the same as renewable energy '0'

### Greenhouse gas emission coefficient by generation source

(unit : g-CO<sub>2</sub>/kWh)

Issuing organization	Year of issuance	Coal	Oil	LNG	Solar	Hydraulic	Wind	Nuclear
IAEA	2006	991	782	549	57	8	14	10
IPCC	2011	1001	—	469	22	4	12	16

\* Greenhouse gas emissions are calculated by converting total greenhouse gas emissions for entire life of power plant (fuel period, construction, operation, dismantling) to carbon dioxide amount

\* IAEA : International Atomic Energy Agency

\* IPCC : Intergovernmental Panel on Climate Change

### Greenhouse gas emissions if nuclear power generation is replaced by other generation sources

	CO <sub>2</sub> emission coefficient (tCO <sub>2</sub> e/MWh)	CO <sub>2</sub> emission (tCO <sub>2</sub> e)	**gain from reducing greenhouse gas (KRW)
Bituminous coal	0.8230	114.22 million	962.7 billion
Oil	0.7018	97.40 million	820.9 billion
LNG	0.3625	50.31 million	424.0 billion

\* 2013 nuclear power generation : 138,784 GWh (KEPCO electricity statistics news, Dec. 2013)

\*\* Carbon trading price= KRW 8,429/tCO<sub>2</sub>, [5.82 €/tCO<sub>2</sub> X 1,448.20 won/€, 2012 European average]

## Execution of national greenhouse gas reduction through obtaining proper NPP proportionality

Despite the controversy over the safety of NPPs since the Fukushima disaster, the government apportioned a 29% share to NPP facilities in the second energy basic plan announced earlier this year. This is because, among other things, nuclear power positively contributes to the nation by reducing greenhouse gases. In addition, for the effective furtherance of greenhouse gas reduction policy, the government set up a comprehensive plan in response to the UNFCCC (2005~2017) and proceeding third stage (2013~2017) program. In accordance with the plan, KHNP selected 16 items in 4 areas: greenhouse gas reduction, adaption to climate change, establishment of infrastructure and new growth engines and R&D cooperation. We will continue to proceed with response activities. From now on, we will reestablish climate change response programs and continue to execute government policy based on the government's second green growth 5 year plan and basic plan for climate change response.

## Effort to reduce in-house greenhouse gas emissions

As KHNP is using clean nuclear power and hydraulic energy as its sources of power generation, it does not emit any greenhouse gases during the fuel burning process. Only small amounts of greenhouse gases are emitted during the

process of power plant operation, and a greenhouse gas inventory system is run to manage emissions amounts by inputting energy usage of emitting sources.

### Greenhouse gas emission status

(unit:1,000 tCO<sub>2</sub>e)

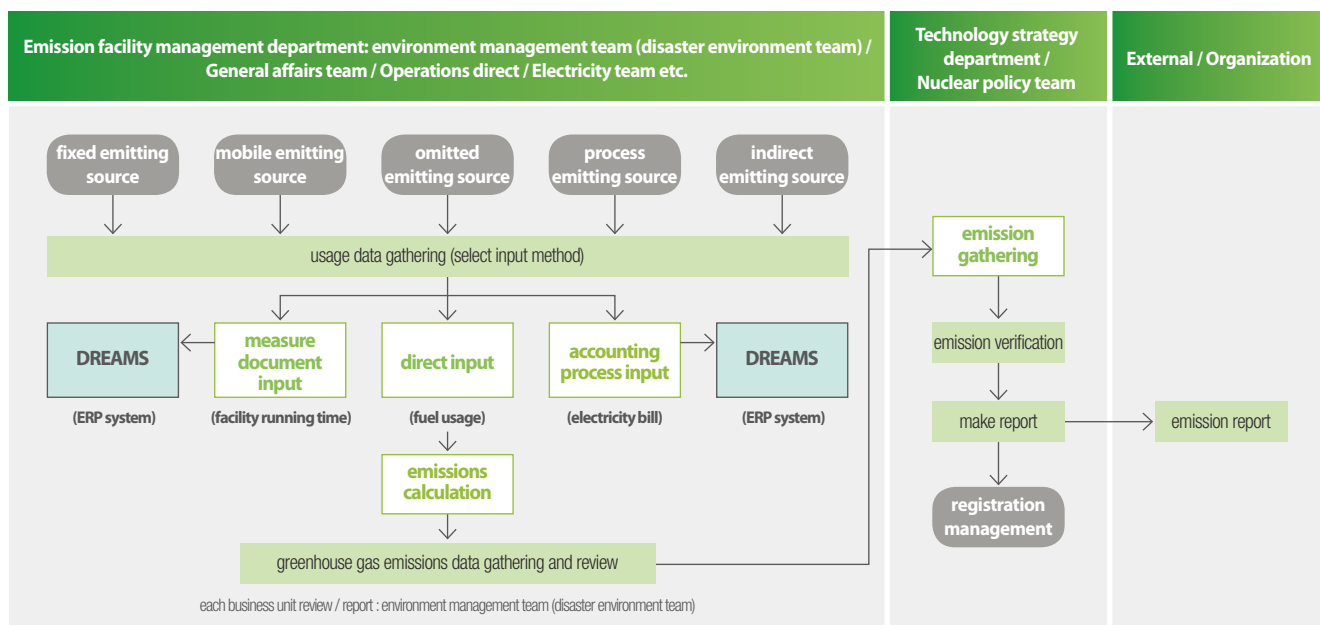
	2011	2012	2013
Direct emissions	102	105	64
Indirect emissions	2,717	2,959	3,232
Total	2,819	3,064	3,296

\* Indirect emissions : pumped-storage and NPP safety operation accompanying necessary external electricity

## Energy reduction and effectiveness

KHNP is developing various energy saving efforts. The expansion of installation renewable facilities for new buildings and mandatory high efficiency energy equipment usage, rational use of electrical equipment and air-conditioning facilities, operation of a self-car free system, and lightweight car only parking lots reduced energy usage by 28% compared to 2012. In addition, we are proceeding with an enterprise energy saving movement through an energy saving idea and catchphrase contest. Periodic energy saving education and presentations of excellent enterprise energy saving every October upgrade employees' recognition of energy saving.

### Greenhouse gas inventory system work process





## Energy usage record by business unit

(unit : TJ)

	2011	2012	2013
Kori Nuclear Power Site	79	291	251
Wolsong Nuclear Power Site	189	394	162
Yeonggwang Nuclear Power Site	128	183	129
Uljin Nuclear Power Site	152	381	289
Hydro and pumped-storage	153	131	132
Special business unit	123	145	138
Total	824	1,525	1,101

\* For energy usage, only energy saving subject is calculated (excluding starting current)

## Enterprise usage record by energy source

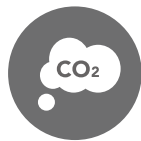
(unit : TJ)

	2011	2012	2013
Primary energy usage (oil, coal, natural gas etc.)	358	669	262
Secondary energy usage (electricity, renewable)	467	856	839

\* For energy usage, only energy saving subject is calculated (excluding starting current)

\* In 2012, due to stops of Hanul #3 and #4 and test running of Shin-Wolsong #2, sub boiler operation hour increased, resulting much in primary energy usage. Uljin #4 long-term stop (steam generator replacement) and Yecheon #1 and #2 completion of construction (later half of 2011) increased secondary energy usage.

## 2014 KHNP climate change response comprehensive plan (16 items in 4 area)



### Greenhouse gas reduction areas

- securing appropriate NPP proportionality
- establishment of RPS mandatory implementation promotion foundation
- respond to greenhouse gas, energy target management system
- enhance power plant waste recycling rate



### Climate change adaptation area

- establish and execute energy saving promotion plan
- expand climate change related expert fostering education and internalization
- establishment of preemptive response base for emission right trading system execution
- setup of climate change responding company mid to long-term roadmap



### Infrastructure and new growth engine establishment

- expand environment friendly, high efficiency building introduction
- greenhouse gas, energy comprehensive management system operation and improvement
- proceed renewable facility CDM business



### Research and development and cooperation area

- strengthen promotion for clean image enhancement
- expand green product purchase
- strengthen technology competitiveness
- climate change industry, academic, research cooperation

## Establish environment management system

### Establishment of environment management strategy and targets

KHNP set an environmental vision as 'Environment friendly company trusted by people' and for 'Internalization of safety-oriented, environmental-friendly management' by practicing three environment management strategies. These strategies included strengthening an environmentally friendly management system, producing zero environmental pollution and strengthening environment saving activities. Also, for voluntary and active environment management practice, we set and executed an entire employee code of conduct with 'environment guidelines'.

### Environment management strategy structure

Vision	Environment friendly company trusted by people
Goal	Internalization of safety-oriented, environmental-friendly management

Strategy and key promotion task

Strengthening environment friendly management system	Zero environment pollution	Strengthening environment saving activity
<ul style="list-style-type: none"> <li>• maintain enterprise ISO14001 (environment management international certificate) and green company designation</li> <li>• continuing enhancement of environment performance</li> <li>• expand green product purchase</li> </ul>	<ul style="list-style-type: none"> <li>• strengthening chemical substance management system</li> <li>• reducing hazardous substance usage</li> <li>• reducing water pollutant emission</li> <li>• expand waste recycling</li> <li>• establish marine environment management infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• ecosystem preserving activity</li> <li>• fish resources creating activities</li> <li>• marine environmental cleanup operation</li> </ul>

### Strengthening of environmentally friendly management system

**Continuous environment investment** KHNP is continuously investing in environment facility maintenance, application of cutting edge technology and new facility installation. The cost of environment investment is divided into installation, operation and technology development costs and invests more than KRW 10 billion every year.

### Domestic and foreign environment certificate acquisition and maintenance

In 2006 we set up an ISO standard environment management system(ISO 14001) for systematic environment management and have operated it every year since. Through internal evaluation and post-evaluation by a professional organization, we search for and act on environment improvement items. Also, following designation as green companies in 2010 according to 'low carbon green growth act', 9 business units are designated as green companies as of 2014.





#### Environment improvement items search and treatments

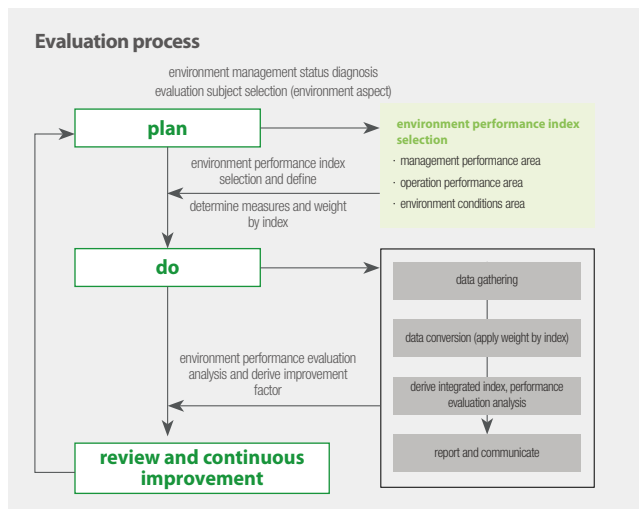
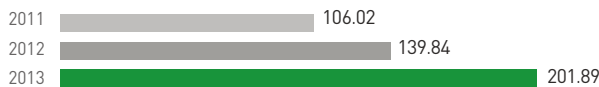
(unit : case)

	2011	2012	2013
Internal review	29	36	42
External review	30	8	17
Total	59	44	59

**Development and application of global standard environment performance index** To actively respond to ever strengthening levels of environmental demand and regulation standards, we are measuring environmental performance by nuclear power site and comparing and evaluating the results. By developing and applying an environment performance index containing a 17 detail index chosen from 6 areas which are the same as those used in the environment value evaluation model EcoValue21™, a Davos 100 company evaluating tool and ISO environment performance evaluation(ISO 14031), we are enhancing enterprise environment management competence.

#### Environment performance index by year

(unit : point)



#### Continuous environment investment

##### 2013 general environment investment amount

KRW  
**11.6** billion

investing more than KRW 10 billion every year for environment investment expense



**Strengthening green product purchase activity** To save resources and to protect the environment, KHNP is actively participating in a green product purchasing system. Since the signing of a 'green product purchasing voluntary contract' in 2005 with the Ministry of Environment, we revised purchase guidelines and contract rules and set up a green product purchase results monitoring system. Periodic education to enhance the rate of green product purchases is also being executed.

#### Green product purchase amount and purchase rate

	2011	2012	2013
Total purchase amount (KRW, thousand)	15,826,891	12,665,521	16,971,170
Green product purchase amount (KRW, thousand)	14,713,268	12,436,445	16,332,413
Green product purchase rate (%)	93.0	98.2	96.2

#### Green items KHNP mainly purchases

Electronics	Furniture	Office supplies	Others
laptop, computer, television, copier, laser printer, fax machine, cooling and heating unit	panel system partition, working chair, desk chair, folding chair, desk	paper for printer and copier, toner, file folder	LED indoor lighting, LED lamp, fluorescent lamp, down-light facility, street light facility

#### Zero environmental contamination

##### Strengthening harmful chemical substance management system

Harmful chemical substances within the NPPs are sulfuric acid, hydrochloric acid, sodium hydroxide and hydrazine and are used for corrosion prevention and water treatment. Humans can be exposed to these chemical substances during the entire process of manufacturing from use to disposal via various routes. If a large scale chemical accident happens, it can produce a critical disaster, so thorough management and prevention is essential. In order to prevent chemical accidents and strengthen response competence, KHNP developed the 'NPP customized standard chemical accident emergency response guide', applied it in the field, and then expanded and designated a toxic substance manager from 1 to 6~7 for each nuclear power site. Also, since 2013, we have been looking for and treating insufficient matters through safety checks on chemical substance storage facilities of NPPs by working with toxic chemical substance experts. In addition, to reduce the usage of the harmful chemicals from the source through

efforts to improve the pure production process, chemical substance usage was reduced in 2013 to 6,673 tons, which was 153 tons less than in 2012.

#### Chemical substance usage within NPP

Substance name	usage
Sulfuric acid	· the water treatment chamber: ion exchange resin regeneration
Hydrochloric acid	· multiple desalination plants: ion exchange resin regeneration
Sodium hydroxide	· waste water treatment plants: pH adjustment
Hydrazine	· secondary system: removal of dissolved oxygen
Ammonia	· secondary system: pH adjustment
Sodium nitrite	· auxiliary systems: anti-corrosion
Hydrogen peroxide	· electrolysis plants: removal of residual chlorine

**Reducing water pollutants** Water waste from NPPs is treated by plant sewage water treatment facilities and waste water treatment facilities and discharged after it has been legally treated. We are setting a standard 35% higher than the standard established by law.

#### Water pollutant discharge standard

(unit : mg/L)

	COD	SS	total nitrogen	total phosphorus
Legal discharge standard	70 or less	60 or less	60 or less	8 or less
Own discharge standard	20 or less	20 or less	20 or less	2 or less

#### Major water pollutant annual average discharge concentration

(unit : mg/L)

	2011	2012	2013
COD	5.3	5.2	5.2
SS	1.8	1.3	1.3
T-N	8.0	8.6	8.9

**Expansion of business unit waste recycling rate** The wastes from NPPs that are released from outside radioactive control areas are general waste, specified waste, construction waste, waste synthetic resin, waste oil, and about 15 kinds of waste wood, and are tightly controlled for throughout the entire process, from the beginning to the final treatment. To minimize air pollutants such as greenhouse gases that are generated by waste incineration, KHNP expanded and built new waste storage facilities for each NPP headquarter. Also, waste was subdivided by kind, state and treatment method, recycling about 90% of combustible waste (domestic waste, waste plastic and waste wood).

**Water use and waste water management** At power plants, great amounts of water are used from power generation water to cooling water of various machinery and drinkable water. Kori uses water from Ulsan and fresh water from Busan, Yeonggwang uses the Gochang Ungog dam, and Wolsong uses the Daesuhu dam as their water intake source. In order to effectively use water, each headquarter uses a portion of water discharged after having been treated by the waste water treatment facilities for filter washing and chemical washing. Furthermore, newly built power plants adopted grey water facilities to expand reusing.



#### Expand waste and waste water recycling

##### Recycling combustible waste

2,851 ton

about 90% of combustible waste

##### Waste water recycling rate

13.7%

adopted grey water facility for newly constructing power plants

## Strengthening environment preservation activities

### Marine environmental research and marine ecosystem conservation

During both the construction and operation of NPPs, KHNP is conducting on land and marine environment research around the power plants in accordance with environment effect evaluation laws. After the expiration of the legally mandated execution period for environmental research, we are doing continuous monitoring of environmental change according to our own 'guide for environmental research around NPPs.' To observe long-term changes in marine environments of the seas surrounding Kori, Wolsong, and Hanul, surface centered marine research was changed to depth research and since 2011 ecosystem changes have been monitored not only from the surface but also to the bottom. Comprehensive research results from over the past 28 years show that the surrounding environment has a similar community structure to that of a natural ecosystem and that no unique influence has been found from the operation of NPPs.

#### Yearly changes of community of algae around NPP

(unit of population : population /m<sup>2</sup>)

		2011	2012	2013
Number of species appeared	Kori	54	46	48
	Wolsong	77	49	49
	Hanbit	27	28	23
	Hanul	136	199	77
Average presence	Kori	137	305	199
	Wolsong	190	208	189
	Hanbit	7	7	4
	Hanul	737	111	86

#### Status of marine zoobenthos (soft bottom) around NPP

(unit of population : population /m<sup>2</sup>)

		2011	2012	2013
Number of species appeared	Kori	79	126	134
	Wolsong	73	128	142
	Hanbit	34	58	83
	Hanul	351	343	286
Average presence	Kori	860	668	687
	Wolsong	914	689	683
	Hanbit	744	106	159
	Hanul	1,555	2,481	1,952

### Building fish stocks and improving ocean environment

In order to build fish stocks in the ocean area near NPP, KHNP release fish and shellfish fostered by utilizing warm drain water on every May 31 as 'Oceans day'. Since 1997, we have released fishes, 22 million of abalone, and 377 tons of shellfish cultivated by warm drain water, in which contributed to increase of fishing village's income and improvement of ocean environment. Furthermore, we continuously strive to improve the environment by environment preservation activities such as cleanup beach near NPP and removing starfishes and fishery environmental improvement.

## Radioactive waste management

### Radioactive safety management

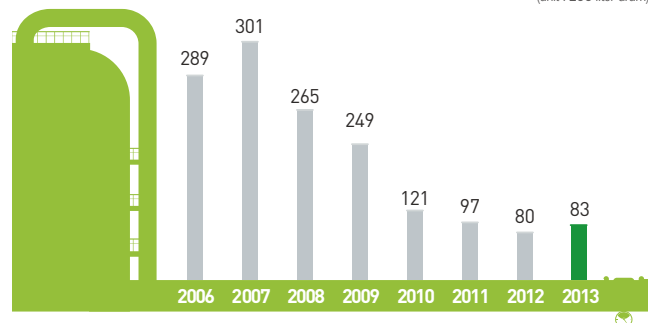
Radioactive waste is divided into used nuclear fuel, which is high level radioactive waste, and low and intermediate level radioactive waste. Radioactive waste management requires policy establishment and for the completion of storage facilities, stable management is very important for minimizing environmental influence and the stable operation of NPPs. The ultimate goal of radioactive waste management is to reduce the amount of radioactive waste that comes from NPP operation and to keep worker exposure doses as low as possible. Through continuous management improvement activities, KHNP is reducing the amount of radioactive waste and safely storing used fuel within the power plant until management policy is established. We continue trying to prevent accidental radioactive exposure to local residents and workers and thoroughly managing radioactive substance emissions by setting limits for each power plant.

### Continuous reduction of low and intermediate level radioactive waste

Low and intermediate level radioactive wastes are arising from the process of using nuclear power of coveralls, booties, waste filters and waste papers, with weak radioactive wastes. We treat them safely or pack them in waste drums that are temporarily stored within the NPP. However, as the number of operating units grows and improvements and increases in old large machinery and facilities develop, continuous increases of low and intermediate level radioactive wastes are expected. Accordingly, KHNP composed and held a 'radioactive waste management committee and work committee' and is making continuous effort through the improvement of supply materials and the waste treatment process to reduce radioactive waste. A 'waste storage management guide' was also developed to divide radioactive waste and general waste for treatment and

#### 2006 – 2013 low and intermediate level radioactive waste generation trends

(unit : 200 liter drum)



introduced waste contamination inspection equipment for the self-disposal of non-contaminated or less contaminated waste, continuously reducing the amount of radioactive waste. Most notably, a 'vitrification facility' installed at the Hanul 3 power plant reduces radioactive waste to 1/30, so the waste of the Hanul 3 power plant is very small. The facility also acquired approval from the Nuclear Safety Commission to treat radioactive waste at Hanul #1 and #2.

## Stable management of used nuclear fuel

Used nuclear fuel includes fission product, generated radiation and even heat from the reactor. Thus, it should be temporarily kept in storage at certain facilities for some amount of time and disposed of according to final management measures. The final management measures include reprocessing, permanent disposal and intermediate storage. Most countries choose intermediate storage on designated land nearby the power plant. Korea decided through the 253rd Nuclear Safety and Security Commission in 2004 to store and manage used

Used nuclear fuel storage status (As of end of December 2013)

(unit : bunch)

		*Storage capacity	Present storage	Saturation year	
				Before expansion	**After expansion
Kori		6,494	5,154	2016	2028
Hanbit		7,912	5,141	2019	2024
Hanul		7,066	4,385	2021	2026
Wolsong	Light-water	523	64	2022	2038
	Heavy-water	499,632	378,040	2018	2026
Total		521,627	392,784		

\* Excluding emergency core amount

\*\* Expected saturation year after expansion, considered below

— Kori : Shin-Kori #3, #4 construction completed

— Hanul : Shin-Hanul #1, #2 construction completed

— Hanbit : Hanbit #2 compact storage replacement install

— Wolsong : Heavy-water reactor compact dry storage facility additionally install

nuclear fuel within power plant sites until 2016, and through the Atomic Energy Commission in 2012 decided to 'publicize and establish management measures for used nuclear fuel.' For stable management of used nuclear fuel before the decisions regarding used nuclear fuel and construction of intermediate storage, a method of compact storage of wet storage using a material superior in neutron absorption performance to maximize storage capacity was adopted for light water reactors. For heavy-water reactors, we installed more Silo and MACSTOR to expand temporary storage facilities. In 2013, compact storage for Hanul #5 and #6 was installed, and we are planning to change compact storage of Hanbit

#2 and Shin-Kori #1 and #2 by 2015. For standard type NPPs (Hanbit and Hanul) to prepare for transportation of used nuclear fuel, proceeding to secure carrier (KN-18).

## Optimal management of worker exposure dose

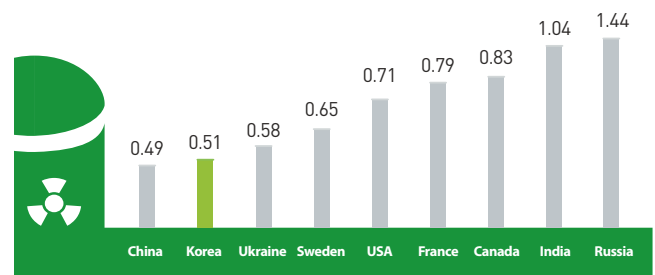
The exposure dose of workers in Korean and global NPPs has maintained a continuous downward trend due to the development of exposure lessening technology, strengthened standards for new NPP shielding designs and the improvement and changing of facilities. In Korean NPPs, worker's exposure dose keeps decreasing. In 2013, the exposure dose increased a little due to increases in NPP operation years and massive NPP facility safety enhancement improvements. When measuring the radiation exposure dose of workers in countries operating more than 10 NPP units, we are second in the world, maintaining low levels compared to the world average. For systematic process

Worker exposure dose

(unit : man-Sv/unit)

	2008	2009	2010	2011	2012	2013
Average domestic NPP	0.51	0.82	0.79	0.53	0.46	0.53
Average international NPP	1.03	1.12	0.89	0.85	0.76	0.73

Worker radiation exposure dose rank by nation



improvement to lessen exposure doses, KHNP developed a web-based cyber radiation exposure minimization management system (ALARA). For effective operation of annual exposure management and overhaul radiation safety management utilizing the developed system, we are planning ALARA work process standardization. In addition, to reduce worker radiation exposure, we are operating real-time radiation monitoring system that can remotely monitor in real time and communicate with video and audio. Respiratory protective equipment to prevent internal exposure due to inhalation of radioactive substances has also been improved.





## Think TRUST 06. Social Contribution

We try to contribute to the development of local society through the creating shared values.

MINDULE HOLSEE (Dandelion spores) fund

KRW

**4.37** billion

social contribution fund raised by KHNP until 2013.

2013 per capita volunteer hours

**16.3** hours

per capita volunteer hours increased from 15 hours in 2012 to 16.3 hours in 2013.







## Where we stand

### Environment changes surrounding KHNP and the present

According to the 'power station surrounding area supporting act' and 'electric utility act' KHNP developed various social contribution activities around areas where NPPs are being constructed or operated. The social contributions KHNP has been promoting were regarded as satisfying the needs of the local society and were considered long-term and sincere projects from the point of view of the beneficiaries. Similarly, the social contributions of KHNP are meaningful from a 'corporate social responsibility' point of view, but moreover, they also hold importance on a business level. Due to the characteristics of the nuclear power industry, the relationship with local society is very important. All of our business, ranging from site selection to construction, operation, and continued operation, is based on the understanding and cooperation of local residents. That is why, from the start, KHNP has not only approached local society contribution activities with the view that they are only government solutions to the welfare gap or support projects for those with low income, but also from the perspective of local society development. This contributed to KHNP's social contribution growth as a CSV(Creating Shared Value) aspect, which is where company growth integrates into society. As a company leading social contribution to public organizations through various efforts for the development of local society, we will lead in the establishment of a new social contribution model so that the company grows together with society.

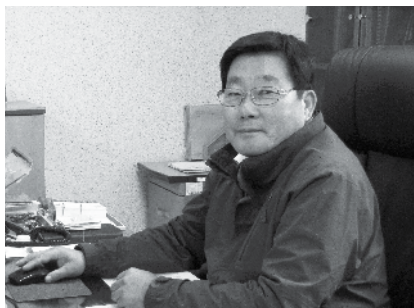
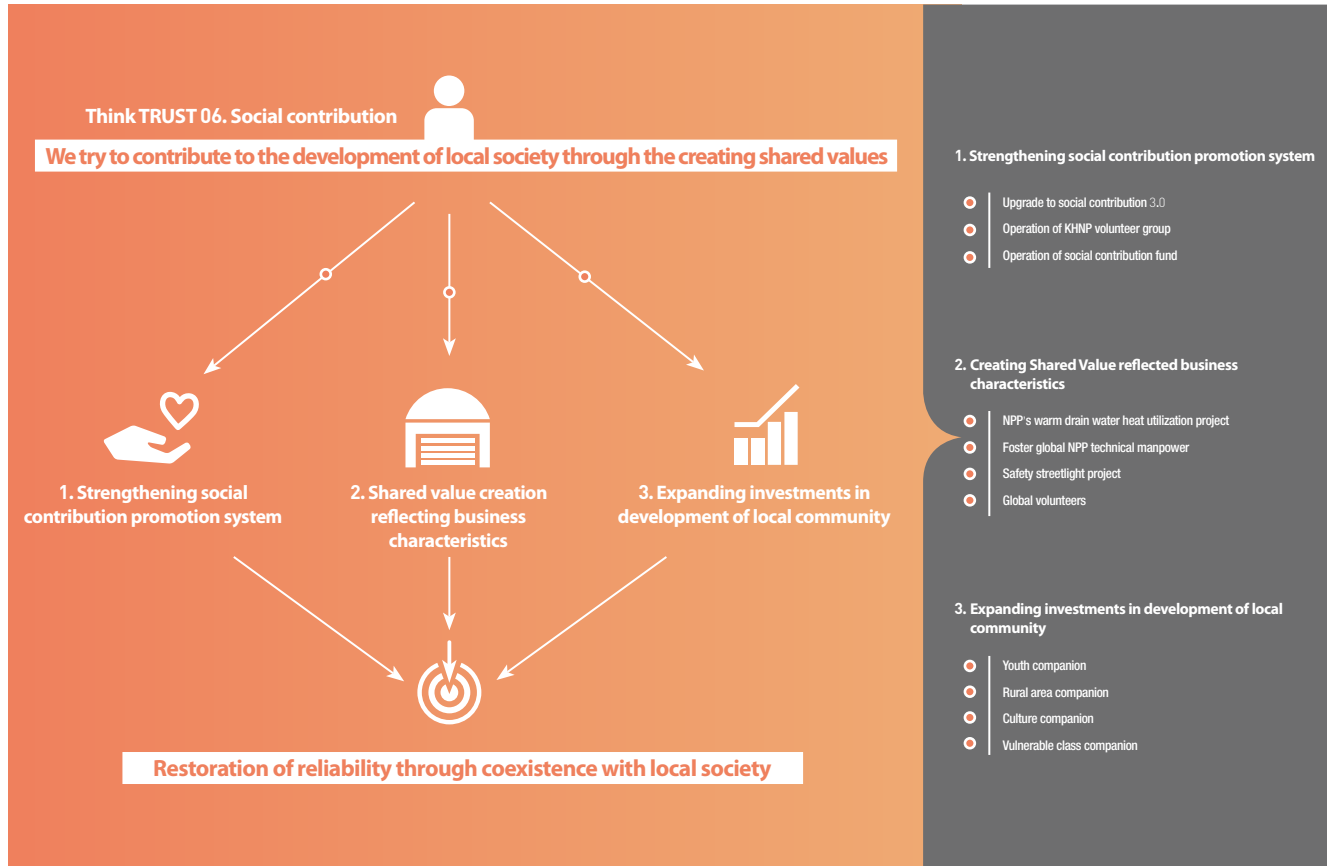
## What we listen

### Opinions of stakeholders

Among the various social contribution issues surrounding KHNP, 'Execution of social responsibility through social contribution activities' was derived as a core issue. This core issue received an average of 5.9 points on a 7-point evaluation of issue materiality completed by stakeholders and was selected as a priority after considering its effects on business. We are reporting in detail the core issue that was derived and will reflect suggested opinions back to management as well as continually manage the issue.



## How we do KHNP's social contribution promotion direction



**A measure that allows NPPs  
and neighboring areas to grow  
together is necessary.**

**Kim Young Man**  
Neighborhood Supervisor  
Wolnae-ri, Jangan-eup, Kijang-gun  
(Kori NPP surrounding area)

KHNP has been hiring local people and benefitting local service companies in order to aid in the development of local society. However, there are cases in which people from other areas have moved in under false claims only to receive benefits, thereby harming the original local people. We hope that KHNP can work with us to help solve this kind of problem. Also, to improve the negative image of the village due to the NPP, we hope KHNP can actively promote the positive aspects of the NPP such as clean village and environment facilities and free electricity for local residents. Therefore, I wish more people would visit the NPP and our village.

## Strengthening social contribution promotion system

### Upgrade to social contribution 3.0

KHNP reflected the changing social contribution trends by moving forward from simple welfare, strategic social contribution to establishing a 'social contribution 3.0 strategy' that reflects the characteristics of the NPP business and demands of stakeholders. 2013 was declared as the first year of leading social responsibility management. The vision of the 'social contribution 3.0 strategy' is that 'everyone in the world should be safe and happy'. People, Public Responsibility, and Public Interest are the core values. We are promoting a practical social contribution program with the strategic goals of 'enhancing the brand value of social contribution', 'establishing a global social contribution system', 'establishing a stakeholder communication system', and 'strengthening employee expertise, such as competence'

Vision

Everyone in the world should be safe and happy

Core value

People

Public Responsibility

Public Interest

Strategic goal



### Operation of KHNP volunteer group

KHNP officially launched an organization dedicated to social contribution and a 'KHNP volunteer group' in June 2004 and proceeded with various volunteering activities. 9,000 employees participate as volunteers for this volunteer group and work in 4 areas connected to the social contribution vision: 'safety and happiness', 'local love', created for support and communication within areas surrounding NPPs, 'human resource fostering', which gives wings to growing children, and 'global' that contributes to solving the social problems of developing countries and contributes to education and culture. In 2013, global volunteer and local offices were established by business units and the operation guide was revised.

### Operation of social contribution fund

The KHNP volunteer group is operating on voluntary donations, the love fund and a matching grant supported by the company, the 'MINDULE HOLSEE (Dandelion spores)' fund. As of the end of 2013, 93% (9,024 people) of employees were participating in the love fund. The 'MINDULE HOLSEE' fund raised KRW 4.37 billion and in 2014 we are targeting a 7% expansion from the previous year.

#### Best Practice



#### What is the happiness plus hope wing project?

KHNP is developing a happiness plus hope wing project that improves the studying environment of child welfare facilities where social care needed. In 2013, KRW 1 billion from the 'MINDULE HOLSEE(Dandelion spores)' fund was invested to support 25 commuting buses and 16 hope libraries for 41 local child centers. In 2014, we are going to support 40 hope libraries and deliver them to 60 local child welfare facilities by investing KRW 3 billion.

#### 2013 support status

##### Hope library support

16 locations



##### Commuting bus

25 vehicles



##### Support money

KRW 1 billion



## Creating Shared Value reflected business characteristics



Virtuous circle of welfare and growth through a corporation

## NPP's warm drain water heat utilization project

KHNP is implementing a warm drain water support project that supplies waste heat from warm drain water that is generated by power plants at a rate of about 23 billion tons per year. Waste heat is supplied to farm and fishing village facilities after appropriate discussions with relevant local government officials and local residents. The Hanbit and Wolsong Nuclear Power Site utilize warm drain water discharged from power plants to develop cutting edge glass greenhouse and fish farm businesses to grow fish and shellfish that contribute to increases in local income through energy savings and job creation and resolve anxiety concerning warm drain water. The Hanbit Nuclear Power Site notably installed an aquarium to provide a place for educational experiences for local residents.



Hanbit Nuclear Power Site aquarium



Fish and shellfish releasing event

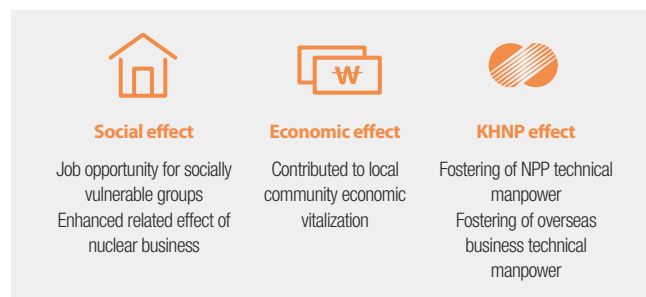
## Foster global NPP technical manpower

KHNP offers job opportunities to socially vulnerable groups around NPPs and established the 'Global Nuclear Training Center (GNTC)' in August 2011 with the purpose of fostering NPP skilled manpower. It proceeded to be certified as KHNP's first social enterprise when in August 2014, it was designated as a preliminary social enterprise, the stage prior to social enterprise designation, by Gyeongsangbuk-do. At present, 4 courses for special welding, pipe welding, electrical process, and non-destruction have been opened as nuclear skilled manpower fostering courses and educate 120 people annually. In 2013, 109 people completed the courses and 99 were employed (an employment rate of 90%). Local communities around NPPs expect that the establishment of the GNTC will enhance industry related effects of nuclear industry and employment inducement and greatly contribute to the creation of job opportunities and activation of the local economy. KHNP will secure government expenditures up to KRW 4 billion and with the goal of opening an international nuclear technical manpower education center in 2016, will strive to foster overseas business technical manpower.

### 2013 GNTC operation result

(unit : persons)

	Completed	Acquired certificate	Employed	Employed at NPP related company
Number of people	109	88	99	47



## Safety streetlight project

Despite the fact that a lot of violent crime occurs in dark alleys, installation of streetlights in crime-prone areas is only 6% for Seoul, so public anxiety is growing. The government takes measures such as strengthening security to reduce

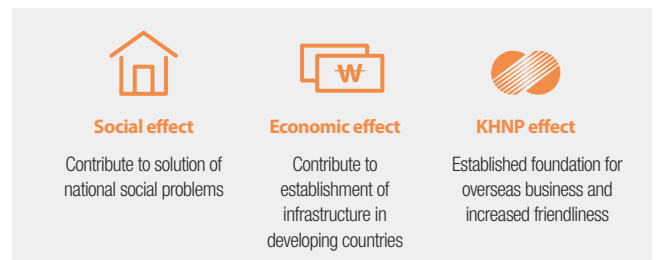
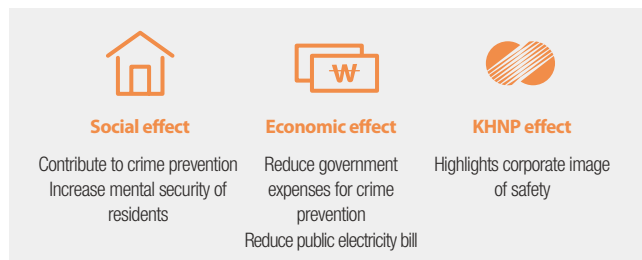




crimes, mostly focusing on highly populated areas or school zone, leaving quiet places vulnerable to safety issues. Low-income areas especially are treated as blind spots, receiving little support while asking for help. Thus, KHNP started the 'safety streetlight project' in 2013 to install solar powered LED streetlights and CCTVs on roads in dangerous areas that are vulnerable to safety issues at night. Jointly with the Safe Living Citizens' Coalition, the project focuses on low-income areas and narrow alleys that are ways to and from school and will continue to become KHNP's representative focus project.

## Global volunteers

KHNP deployed social contribution activities to potential NPP export countries to establish a foundation for entering the overseas market. Out of simple financial support for developing countries through the improvement of residential environments and educational and cultural supporting activities, contributions to resolve the social problems of the country were made. In 2013, an industry-academic cooperation volunteer group was formed with the Seoul National University volunteer group and went twice, once in February and once in June, to Vietnam in order to provide labor services for the construction of cultural and sports convenience facilities supported by the Korea-Vietnam disabled rehabilitation center. A talent donation service for children and medical support for disabled people were also implemented.



## Photo Story



1. Einstein class
2. Happy+ Heemang Narae (wing of hope) car delivery ceremony
3. 2013 winter SNU-KHNP volunteer group
4. Free medical checkup and treatment at Onyang-eup



## Expansion of investment for local community development



### Youth companion

For youth in poor family or educational environments, we are proceeding with study guides and career counseling activities.



### Rural area companion

For the health of residents around NPPs, we are providing visiting medical services.



### Culture companion

For those who are not able to participate in cultural activities due to geographic location, we are holding various cultural activities.



### Vulnerable class companion

For the welfare of socially neglected neighborhoods, we are proceeding with various service activities.

## Expanding investments in development of local community

### Youth companion

**Einstein class** 'Einstein class' is the educational support mentor program for rural area youth. It was started in January 2010 for rural areas with poor educational environments and introduced to resolve the educational gap between city and rural areas. The Einstein class, composed of 40 college students from top 10 Korean universities, provides study guides and career counseling to primary, middle and high school students every year. The program is KHNP's representative activity for talent donation and receives good response from mentees and their parents.



### Human resource fostering activity results

2013 participants for Einstein class

239 people

2013 KkumNaMu scholarship amount

KRW  
2.94 billion

### Junior engineering technology class / KkumNaMu scholarship

Together with The National Academy of Engineering of Korea, KHNP is operating a junior engineering technology class in which 100 company volunteer teachers participate as mentors twice a year, once in the first half of the year and again in the second half. In 2013, the class helped 1,700 rural primary school students become interested in engineering technology, enlightening the principles through various processes such as 'electricity runs through painting', 'temperature differences make the merry-go-round move', and 'engineering technology in a propeller.' Also, the 'KkumNaMu scholarship' supported middle and high school students as well as college students who have difficult family situations with KRW 2.94 billion in 2013.

### Rural area companion

**Rural citizen health protection** The KHNP rural health protection medical volunteer group provides general hospital level medical service to rural areas around power plants through 'rural citizen health protection' activities. They visit villages and provide medical checkups and essential medicines, from blood to liver function tests, thyroid to bone density tests, and care and prescriptions for internal medicine and surgery in addition to treating rheumatoid and arthritis and diagnosing various types of cancers to facilitate early treatment. The 'rural citizen health protection' activities enhance medical welfare a great deal and reach up to three thousand beneficiaries every year.

### Rural citizen health protection activity performance

(unit : persons, KRW million)

	2009	2010	2011	2012	2013	Total
Number of beneficiary	2,390	3,060	3,253	2,707	3,297	14,707
Expense	493	441	493	470	450	2,347

## Culture companion

**Local community mecenat activity** For rural people who are not active in sports and cultural activities due to their geographic location, KHNP satisfies local residents' cultural needs by hosting 'little love sharing concerts' for neglected groups, as well as sports events and concert tours for rural areas. Especially, the 'Uljin music farm festival' that has been hosted every year since 2007 near the Hanul NPP, has especially drawn lots of tourist families and is becoming the area's representative festival. We are also supporting a beach song contest that local residents and tourists can enjoy together, 'Hanlim concert' that is held in human resource development center, 'Jangansansa temple concert'. In addition, in order to contribute to local cultural development, we are supporting the 'Kim Yu Jeong literary award' and 'Dong-ni, Mok-wol literary award', each awarded in Chooncheon and Gyeongju every year.

## Vulnerable class companion

**Various welfare activities for vulnerable classes** To assist marriage immigrants, disadvantaged children, senior citizens living alone, and the disabled, KHNP develops various welfare activities. Since 2005, we have provided mobile homes to vulnerable groups including senior citizens living alone by investing KRW 500 million from the MINDULE HOLSEE(Dandelion spores) fund every year. Also, as a regional special activity, we are proceeding with various volunteer services through the 'HYO love practice program'. The program includes love meal box delivery, inquiring after senior citizens' welfare, hand acupuncture, domestic help, a mobile bathing service, and the taking portrait photographs. These activities by KHNP show its special love for the senior citizens. Additionally, through activities such as open air picnics with disabled children, delivery of side dishes to families headed by children, visiting bath services for the disabled, volunteer services at welfare organizations and operational cost support, KHNP is making a better world.

**Job opportunities through social contribution** KHNP has been making a great deal of effort to set up social enterprises to create more quality jobs in areas surrounding NPPs. At present the social enterprises that have been set up at the Hanbit location are 'Chungram', which supports businesses supporting rural living, 'sanmeoru maeul', which processes and sells the leaves of ramie, and Songpyun, which provides English classes for migrant women. Also at the Hanul location 'dream happy work' provides residential environment improvement projects, at the Wolsong location 'Gongyeong ABS' breeds and processes Woori wheat, and at the Kori location, 'Heemang Choongjeon' operates an insect ecology experience hall and local food business. These have all been established to contribute to local economy activation and job opportunities for vulnerable groups. KHNP contributed KRW 2.21 billion to social enterprises for NPP communities and plans to invest KRW 580 million in 2014.

### Best Practice



#### Midsummer festival 'Uljin music farm festival'

Utilizing the top level culture show and tour resources in the Uljin area with an aim of not only local promotion but also the activation of the local economy, the 'Uljin music farm festival' has been hosted every year since 2007. This festival is composed of sports activities such as wind surfing, MTB, and marathon in the daytime, as well as musical performances at night representing various musical genres. Vacationers and tourists flock en masse during the festival period to see the abundant supply of eye catching events at the local festival that has come to represent Uljin.



#### Eupcheon port wall painting village fostering project

The Wolsong Nuclear Power Site started to foster a wall painting village in 2010 to contribute to the development and enhancement of local economic and culture welfare around the power plant area. At the Eupcheon port wall painting village, one can see about 200 wall paintings along the 1.7Km of seaside from contests over the past 4 years. It has become famous for being the biggest wall painting village in Korea.







## Think TRUST 07. Accompanied Growth

We try to establish  
partnership  
relationship for  
coexistence.

2013 human resource support for small  
and medium partner companies

**1,325** people

Through accompanied growth programs, KHNP is continuing a project to support and foster human resources which has seen increasing participation every year from 849 people in 2011 to 997 people in 2012 and 1,325 people in 2013.





## Where we stand

### Environment changes surrounding KHNP and the present

Towards the continuous growth of our economy, it is important to establish a fair and transparent market system. To do this, we need to enter an era in which the coexistence of big and small to medium-sized companies is highly valued. Over the last 10 years, only 696 companies out of 4 million grew from small and medium sized companies into medium-sized enterprises, meaning that company size and status are usually fixed. To address this structural limitation, the economic system required change. KHNP, as a large and influential public company, has played a major role in conducting accompanied growth projects. However, as a result of recent problems with NPP deliveries, such efforts have faded. From these incidents, we have realized that 'for true coexistence, the creation of a fair business environment is more important than any financial support'. Through the creation of this environment, trust will be built, leading to a natural increase

in productivity and the creation of a competitive, win-win industrial ecosystem. To build a nuclear industrial ecosystem in which big and small to medium-sized companies can grow together, there must be a change from abnormal to normal, distrust to trust, support to win-win, and concern to effort.

## What we listen

### Opinions of stakeholders

Among the various accompanied growth issues surrounding KHNP, 'Strengthening accompanied growth with SMEs' and 'Eradication of corruption and spreading integrity culture' were derived as core issues. These core issues received an average of 5.8 points on a 7-point evaluation of issue materiality completed by stakeholders and were selected as priorities after considering their effects on business. We are reporting in detail the core issues that were derived and will reflect suggested opinions back to management as well as continually manage the issues.

### 2013 SMEs product purchase rate

**50.2 %**

SMEs product purchase rate was 51.2% in 2011, 54.3% in 2012 and has been exceeding the legal mandatory purchase rate (50%) and the 2014 target of 51.6%.

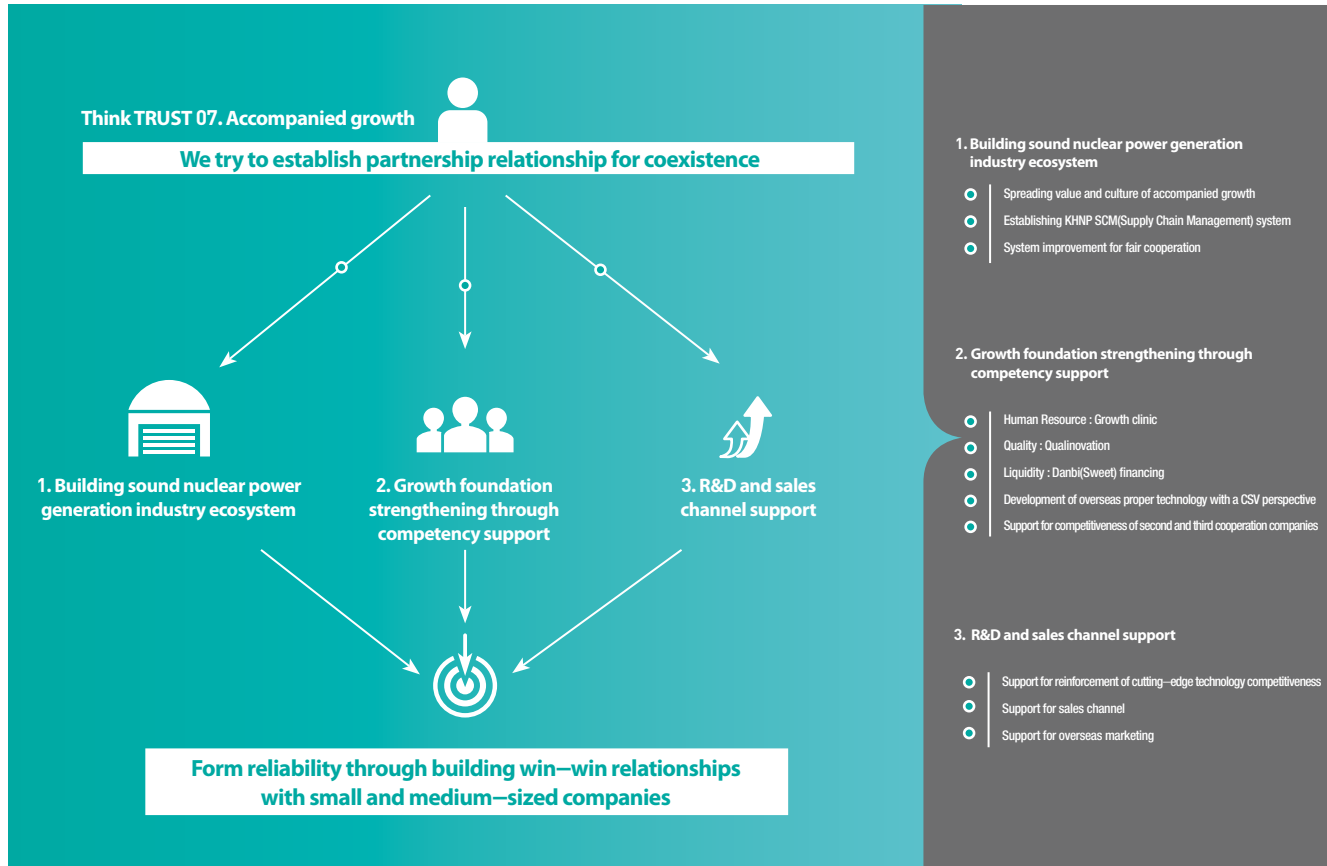
### 2013 removed obstacles

**43 cases**

To solve difficulties arising from relationships with partner companies, KHNP discovered 50 'thorn under the fingernail' tasks and removed 43 obstacles.



## How we do KHNP's accompanied growth promotion direction



**Rather than stopping at cooperative research and development, with a foundation and backing of continuous support, true accompanied growth can be realized.**

**Kim Min Ho**  
CEO, NADA S&V

My company developed a 'turbine monitoring system' with some developmental cost and technology and information on power generation facilities support through KHNP's cooperation research and development project and delivered and installed it at the Kori NPP #3 and #4 in 2011. Thanks to that, my company possessed an important reference in the power generation field. We delivered the same system to the Dangjin thermal power #3 and #4 in 2013, and created various other results. One unfortunate thing is that despite the fact that local products are developed with quality equivalent to that of imported products, we are having difficulty finding a sales channel due to the lack of promotion, I am certain the cooperation research and development project will shine more through not just supporting

development, but also through the continued promotion of products and feedback to partner companies.

## Building sound nuclear power generation industry ecosystem

### Spreading value and culture of accompanied growth

KHNP established 'leading sound nuclear power generation industry ecosystem Global Top KHNP' as its vision for accompanied growth. Having selected 'WITH KHNP' as its core value for accompanied growth, it has proceeded with 6 items in 4 areas. To expand the accompanied growth culture domestically and abroad, accompanied growth week is held and meetings, seminars, purchase meetings and exhibitions are hosted. In particular, by establishing accompanied growth cooperative systems with related organizations such as KITECH (Korea Institute of Industrial Technology), Busan TechnoPark, Gyeongbuk TechnoPark, Ulsan TechnoPark, Dongnam Institute for Regional Program Evaluation, and Korea Nuclear Equipment Advancement Association, small and medium-sized companies are encouraged to enter into the nuclear market and enjoy a positive response of understanding and sympathy for nuclear industry. We deployed volunteer services with partner companies under the heading of 'KHNP-partner company together warm companion'.

#### Accompanied growth strategy system



'Big dream of small and medium-sized companies, KHNP will be together.'

- W World-class (Leading global level accompanied growth)
- I Innovation (Creation of differentiated value with continuous innovation and challenge)
- T Transparency (Execution of transparent accompanied growth on the base of firm ethical consciousness)
- H Harmony (Creation of growing together through sustainable development)

Core value

KHNP WITH

Vision

Leading sound nuclear power generation industry ecosystem Global Top KHNP

Promotion  
strategy and  
items

Technology  
support

Management  
support

Sale channel  
support

2nd partner  
company  
support

Strengthen  
small and  
medium-sized  
company  
growth  
foundation

Technology  
development  
open platform

Expansion  
of public  
purchase

Fostering  
global hidden  
champion

Performance  
sharing  
spreading  
creating shared  
value

Accompanied  
growth  
1-2-3  
companion

## Establishing KHNP SCM(Supply Chain Management) system

KHNP is preparing the 'KHNP style SCM(Supply Chain Management) system to drastically improve the equipment supply system to suit NPP industry characteristics so that the competitiveness of the entire NPP industry ecosystem is strengthened. To do this, we will establish the 'SCM integrated information system', which will act as the control tower of equipment delivery management, so that all information related to the supply chain can be checked in real time. Once the SCM integrated information system is completed, life cycle monitoring from equipment delivery to discarding will be possible, preventing partner company insolvency through early response to problem occurrence and maintaining and strengthening the soundness of the whole NPP industry. Also, through VOP(Value Offering Point), a fair value system has been introduced that guarantees appropriate prices to suppliers to prevent distortion and enhance the drive for technological development in order to strengthen the competitiveness of the whole NPP industry ecosystem.

#### What is KHNP style SCM?

To secure NPP's safety and reliability and receive delivery at right time, at appropriate price, with the best quality product, the system entirely manages the whole supply chain of partner company, contract, inventory statistics, material management, quality assurance.

#### SCM control tower

Quality  
assurance

Value  
creation

Procurement  
at right time

Establishment of integrated SCM IT system

#### 5 short-term tasks

Private contract item regular disclose / Next term material billing /  
Big Data System / Open Platform / Create Special case

## System improvement for fair cooperation

KHNP is proceeding with various system improvements to establish a fair business infrastructure with partner companies. In 2013, in order to remove obstacles to partner companies, 50 'thorn under the fingernail' tasks were found, and after review of the working department, 43 obstacle factors were removed. Also, to continuously gather the opinions of partner companies, we invite outstanding small and medium-sized partner companies to regularly hosted accompanied growth meetings, as well as open various communication channels such as an electronic trading system customer service center.

### 2014 'thorn under the fingernail' discovery and removal



#### Contract

- Contract condition, payment of advance etc. 13 items of obstacles discovered
- The most suggestions



#### Technology, Quality

- Support and expand promotion on technology, quality excellent equipment design preferred reflection etc. 8 items obstacles discovered



#### Cooperation research development

- Cooperation research localization expansion etc. 12 items and most of them immediately completed measurement



#### Development selection

- Development selection was the most controversial area. 9 items including headquarter package contract task discovered, completed measurement

	Completed	Under action
Contract	11	2
Technology, quality	6	2
Cooperation research development	11	1
Development selection	9	—
Others	6	2
Total	43	7

## Growth foundation strengthening through competency support

### Human Resource : Growth clinic

To address shortages in technical manpower for small and medium-sized companies, KHNP is operating veteran employee exchange, sending technical manpower to KHNP to stay and work for six months. The 'techno doctor project' dispatches retired experts to small and medium-sized partner companies and transfers knowhow. The 'atom mentor alliance' sends nationally certified technology masters, including professional technical manpower, to partner companies at anytime. Also, to expand educational training support and participation opportunities of small and medium-sized partner companies, employees of small and medium-sized partner companies were invited in 2013 to KHNP field for OJT(on-the-job training), marking the first time this was done for a public company.

### Quality : Qualinnovation

The 'Qualinnovation' of KHNP stands for Quality and Innovation, which is a program supporting the 'strengthening of quality competitiveness' among partner companies. As part of this initiative, we are operating a 'KHNP small and medium-sized companies Q-Doctor' organization that generalizes accompanied growth related to the quality support of small and medium-sized companies. Composed of a division head(head of quality assurance office), center head(headquarter / business unit team manager), and quality expert(senior inspector / advanced inspector), KHNP small and medium-sized companies Q-Doctor will enhance the quality level of small and medium-sized companies. We also expect to enhance the safety and reliability of their facilities. Also, we are executing quality and safety education and quality consulting on quality practice to partner company employees. In 2013, quality activity improvement direction was given to 464 companies a total of 14 times in Seoul and at each nuclear power site, and a total of 813 people completed the NPP maintenance education.

### Liquidity : Danbi(Sweet) financing

To help small and medium-sized partner companies suffering financial difficulties, an 'accompanied growth cooperation loan' contract with IBK(Industrial Bank of Korea) was signed in June 2013 which secured support of KRW 40 billion at a lower interest than at other commercial banks. Also, a 'power energy loan' and 'grow together loan' are operated for companies having signed contracts with KHNP, and through a cooperative contract with Korea EXIM bank, an export support coexistence program is in operation for small and medium-sized partner companies using expert fund loans.

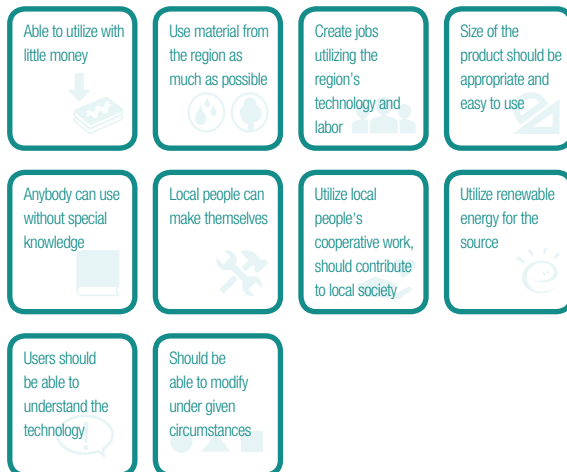


## Development of overseas proper technology with a CSV perspective

KHNP is preparing a new concept project that transfers the amount of appropriate technology developed by outstanding small and medium-sized partner companies to export prospective areas. The project is a business that links overseas sales channel exploration with social contribution activities, thus raising friendliness among Korean companies and acting as a catalyst for new project orders.

### What is appropriate technology?

Considering the political, cultural, environmental condition of the social community in which the technology is used, the technology is made so that continuous production and consumption is possible. For example, lifesaving products such as Life Straw and agriculture related technology such as manual water supplying pumps(Super Money Maker Pump).



## Support for competitiveness of second and third cooperation companies

Considering that in the NPP construction field there are about 400 2nd partner companies doing production activities and using equipment manufacturing characteristics, second and third partner company support projects have contributed greater strength than other public organizations. To address the biggest problem of financial difficulty, an 'accompanied growth cooperation loan' was executed for the first time to a public corporation, and a 'subcontractor payment monitoring system' was established. As a result, on-time time payment of subcontractor payments and wages was made possible as well as payment made within 5 working days of request. Also, to support 2nd partner companies, we are operating a technology advising group and educate 2nd and 3rd partner companies on excellent 1st partner company benchmarking in order to strengthen networks and support successful case presentation.

### Best Practice



#### KHNP industry innovation movement 3.0

To support industry competitiveness of 2nd and 3rd partner companies, the 'KHNP industry innovation movement 3.0' was deployed to promote voluntary innovation through technological innovation and improvements in work environments and production processes. The KHNP industry innovation movement 3.0 will invest a total of KRW 3 billion in 150 2nd and 3rd partner companies for the 5 years, until 2017. This will help develop self-sustaining power, referred to in the nuclear industry as the new Saemaul movement. To proceed with business in 2014, Korea Productivity Center was selected as a cooperative organization after through contest and review, and support was granted to 31 partner companies and companies wishing to enter the NPP industry, including Kowel Special Steel Wire, with a total of KRW 630 million (average of KRW 20 million per company) invested in 4 areas: 'enhancing productivity', 'technological innovation', 'factory innovation', and 'informatization promotion'.



### Partner company support record

Number of companies subject to partner company quality consulting

**464** companies

execute education of NPP maintenance case, quality activity improvement plan etc.

KHNP industry innovation movement 3.0 support amount

KRW  
**630** million

partner companies and companies wishing to enter the NPP industry

## R&D and sales channel support

### Support for reinforcement of cutting-edge technology competitiveness

With the aims of NPP safety enhancement and the strengthening of technological competitiveness among small and medium-sized companies, we are actively supporting joint research and development among small and medium-sized companies by encouraging excellent equipment development and localization of imported equipment. To address obstacles related to the business of research and development, the joint research and development system and development selection designation system were fully revised in 2013. Task public offering procedures were changed to let more companies participate, and if development was successful, purchase amounts were fixed in advance and improved every year we contracted for the price. This prevented the loss of developmental costs due to poor sales after development and solved the problem of management instability. Also, selecting companies competent to execute research and development introduced open competition and let more companies participate in research and development. 'Task briefings' were held in advance and received good responses. In addition, to expand the base of technology development and NPP equipment companies, we hosted 'the 2nd exhibition and briefing session for NPP equipment private contract reduction and research and development promotion' at Busan BEXCO in April 2014. This event was an inverse concept exhibition to provide business opportunities to development companies by exhibiting equipment imported and stored in storage facilities. 1,500 people from 500 companies visited and we provided information to companies wishing to enter the NPP industry.

### Support for sales channel

In order to open a new market for small and medium-sized companies, we are promoting business unit tours of excellent small and medium-sized companies for purchase meetings every year. About 100 companies participate every year and display a variety of excellent New Technology certified products. Furthermore, the 'buyer-supplier 1:1 meeting system' was highly evaluated from a practical result standpoint. In 2014, together with the Korea Venture Business Women's Association and Korea Venture Business Association, MOU for comprehensive cooperation was signed and exchanged to open doors to venture companies so that they may enter and diversify the supply chain foundation of the NPP industry. Also, as a part of the 'government 3.0' (public data disclosing movement), 'Big data' has been provided to small and medium-sized companies for the past 3 years and new business discovery has been supported.

## Support for overseas marketing

KHNP established a goal to advance to the world market together by fostering small and medium-sized companies that secure export competitiveness. Accordingly, promoting participation support for export related education and seminars, strengthening export support services, expanding cooperation with related organizations, and dispatching an overseas market pioneer group have all helped to support international exhibit participation. Also, in coordination with Busan TechnoPark, support for new acquisitions of standard certificates from overseas organizations such as the ASME(American Society of Mechanical Engineers) has been continued to encourage exports of small and medium-sized partner company products.

### Core performance index

	2011	2012	2013	2014 (target)	Remarks
Purchase amount of SME product (KRW, 100 million)	5,785	6,366	5,984	6,256	+5%
Purchase amount of technology development product (KRW, 100 million)	431	304	216	253	10% of purchase amount of SME product
Fund liquidity support amount (KRW, 100 million)	1,835	2,230	2,179	2,244	+3%
Human resource support and fostered people (people)	849	997	1,325	1,450	+9%



1. Technology transfer signing ceremony and discussion  
2. Signing ceremony and Atom Mentor alliance ceremony

# APPENDIX

**Other Sustainable Management Achievements**

**Third–Party Assurance Statements**

**SR10 Certificate**

**GRI Index**

**Membership and Participating Principles**

# Other Sustainable Management Achievements

## Creating Job opportunities

### Employee status and recruitment

As of the end of 2013, there are 9,553 employees working at KHNP. Recruiting takes into consideration both gender and social equality. Meanwhile, with an expectation that the domestic and overseas NPP industry will expand, 13,200 new recruits are going to be needed by 2021. To meet this demand, we are preemptively recruiting, keeping in mind that a characteristic of the NPP industry is its long-term employee workforce training period and education infrastructure.

#### Employee status by employment type and by region

		2011			2012			2013		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Employee grand total (person)		8,277	711	8,988	8,539	798	9,337	8,654	899	9,553
Rank	Executive	6		6	6		6	4		4
	Middle manager	2,567	31	2,598	3,036	54	3,090	3,133	60	3,193
	Staff	5,704	680	6,384	5,497	744	6,241	5,517	839	6,356
Region	Headquarters	907	125	1,032	1,159	167	1,326	1,027	167	1,194
	Nuclear power site	6,043	452	6,495	6,106	496	6,602	6,332	587	6,919
	Hydro & pumped-storage	780	59	839	751	59	810	709	62	771
	Other business units	547	75	622	523	76	599	586	83	669
Average year of service		16.3	9.7	15.8	15.9	9.3	15.3	15.9	9	15.2
Out of the total number of people	Number of females and proportion		711 / 7.9%			798 / 8.5%			899 / 9.4%	
	Females above the rank of team leader		3 / 0.42%			4 / 0.50%			7 / 0.78%	
	Proportion of disabled		2.9%			3.1%			3.1%	

#### Employment record

(unit : persons)

		2011	2012	2013
Permanent new recruit	Female	84	118	125
	Disabled	100	18	7
	Local talent	441	448	409
	High school graduate	6	132	189
	Science and engineering	602	585	561
	Total	680	697	627
Temporary employment size	Youth intern	660	606	613
	Fixed term worker	97	151	232
	Short term worker	3	5	0

### Operation of intern system linked to permanent positions

In 2013, in addition to the conversion of 585 nuclear professional interns (selected from 2011 ~ 2012) into permanent positions, we preemptively selected 314 more people to prepare for the timely construction, stable operation and maintenance of UAE NPPs, and to have a human resource base ready. In 2014, we selected about 1,050 people in the intern system linked to permanent positions and proceeded with the new NPP construction project without any problems.



## Recruiting for UAE dispatch

Global talent must be fostered for overseas NPP export and early securing of NPP core technology, but we are also open to the recruitment of core experts of specific areas. Especially for the operating personnel of UAE NPP (OSSA), considering the necessity for the completion of SAT (main control room operation training) education in order to meet the qualifications of ENEC (Emirates Nuclear Energy Corporation), we are planning for about 200 people to be separately recruited as the UAE NPP dispatch.

## Expansion of recruiting expert personnel

To break the elitism of the nuclear power industry and to overcome the limitations of internal manpower, and while considering that the fostering period required to educate a nuclear expert workforce is 5 years, in 2013 we recruited 42 outside executives and experts in specific areas (maintenance and safety). In 2014, we plan to recruit 250 more people with 3 to 5 years of experience, including personnel, lawyers, and certified public accountant license holders.

## Healthy human resource development

### Promotion of 3 human resource development strategies

To enjoy the value systems of KHNP and to secure the quality that our members should possess, we established a new talent aspect that reflects the environmental changes within management. With a vision for 'fostering convergence talents possessing core values and expertise', we proceeded with three human resource development strategies, including 'internalization of vision and core values', 'strengthening of leadership competence by class', 'strengthening of job and global competence.'

#### KHNP talent fostering system



### Integrating strategic human resource management (HRD)

To continuously enhance organic connectivity among in-house education and training organizations and quality standards of education and training programs, KHNP established a new talent fostering team that directs enterprise education

and training. Also, by introducing an education training mileage system and by reflecting upon personal education and training record in the promotion system, members are induced to voluntarily participate in education and training, which maximizes development of competence.

## Fostering global job expert

We executed customized education and training reflecting characteristics by job group and recruit level of newcomers. For the safe operation of NPPs, we extended the education period to a maximum of 2 years to ensure enough job experience was obtained, and to secure global competence, we are using English teaching materials that are for US NPP workers. Existing personnel are growing as experts in their fields by cultivating job competence in phases. To do this, we are operating an in-house certificate system together with various job education and training programs. Also, by fostering an in-house expert for 100 core jobs that are essential for the safe operation of NPPs, and through a knowledge management system, we are sharing and propagating core job knowledge.

#### Rate of securing job experts

(unit : %)

	2011	2012	2013
Target	48.9	54.4	58.9
Result	50.2	54.7	60.2

\* Job expert : RO / SRO (reactor operator / supervisor) license, JQC (Job Quality Certification) recipient

#### Per capita employee education and training hours

(unit : hr)

	2011	2012	2013
Education hours	122	122	127

#### 100 core jobs

	Core job
Power generation	11 incl. emergency, operation technology
Safety	7 incl. safety culture, safety evaluation
Machine	29 incl. emergency diesel generator
Electricity	20 incl. cooler pump, generator
Measurement	19 incl. power plant protecting facility
Eng.	12 incl. prevention / prediction maintenance
Quality	2 incl. quality assurance, quality inspection

#### Number of people, by rank, that participated in education (number of people per capacity)

(unit : persons)

		2011	2012	2013
By rank	First grade	190 (120.2%)	167 (97.6%)	267 (158.9%)
	Second grade	1,066 (170.8%)	930 (139.4%)	1,246 (178.5%)
	Third grade	3,300 (160.6%)	4,064 (180.4%)	4,185 (179.8%)
	Fourth grade	9,957 (197.7%)	10,407 (201.9%)	11,210 (207.7%)

## Employee welfare

### GWP program

To create a workplace where employees work merrily and happily like a family, KHNP is operating a family-friendly program that focuses on the life cycle of marriage - giving birth - fostering - support - retirement. To encourage giving birth, maternity leave has been extended from 1 year to 3 years and from the third child onward, the whole maternity period will be added to the total years of service. For fostering support, together with economic support, we expanded and are operating daycare centers by business unit, and have furnished feeding machines in the female lounge of every business unit. We also increased 'family love day,' a day where workers leave on time, from once to twice a week, supporting family harmony and encouraging workers to use up their leave before it expires. In 2013, we introduced a more flexible work system and employees are gradually utilizing this to set their own schedules.

		2011		2012		2013	
		Personnel (person)	Percentage (%)	Personnel (person)	Percentage (%)	Personnel (person)	Percentage (%)
Percentage that used maternity leave	Male	1	0.0	—	—	—	—
	Female	41	0.5	58	0.6	72	0.8
Percentage returning to work after vacation	Male	1	100	—	—	—	—
	Female	41	100	58	100	72	100
Percentage that work more than 12 months after return to work	Male	1	100	—	—	—	—
	Female	37	90.2	54	93.1	59	81.9

### Worker support program

For the stability of the body and mind of employees, KHNP is operating a worker support program. We provide outside expert counseling on issues that can arouse in personal life (family, emotional, mental, law, finance) or in relation to work, supporting problem solving techniques for stress and other encountered difficulties. All counseling costs are supported by KHNP, and the with regards to the content of the counseling, privacy is guaranteed. In 2013, 398 employees used this program. Also, we are taking care of not only physical health, but mental health. We formed a 'visiting medical healing expert team' with one specialist and 2 nurses, who move between business units to help prevent depression of employees. In addition, for employees above the rank of team leader, we executed mental health self-diagnoses, and aimed to prevent suicide well in advance by having all employees watch suicide prevention educational videos.

## Retired employee support program

In preparation for the aging of professional personnel, we improved term insurance including accident insurance, and strengthened the retirement pension system in preparation for a stable retired life. Also, to allow employees with retirement ahead of them to prepare for their uncertain futures with continuous self-improvement, we provided a 14 week out-placement education program that is composed of lessons on investment techniques, health management, entrepreneurship, and reemployment. In 2013, 64 applicants (47%) completed this program.

### Status of introduction of retirement pension system

- introduction : May 6, 2010
- introduction type : Defined Benefit (DB) type, Defined Contribution (DC) type
- operating institution : 8 financial institutions including Shinhan bank (3 banks, 3 securities companies, 3 insurance firms)
- number of people enrolled: 9,115 (DB : 4,821, DC : 4,294)
- external deposited amount : KRW 101.6 billion

### Social insurance support record

(As of December 31, 2013, unit : KRW 100 million)

	Beneficiary	Company	Total
Health insurance	235	232	467
National pension	186	185	371
Occupational hazard	—	49	49
Unemployment	44	109	153

※ Difference in financial period (Jan. 1, 2013 to Dec. 31, 2013) and salary period (Dec. 16, 2012 to Dec. 15, 2015) resulting in different beneficiary payment amount and company supporting amount

## Legal minimum wage compared to newcomer wage

KHNP pays the same wage as defined by the legal minimum wage regardless of employee sex. The wage is calculated fairly according to related regulations that take into account years of service, job description and job performance.

### Average wage of new recruit

	2011	2012	2013
Average wage of new recruit (thousand KRW)	28,015	32,942	33,885
Compared to legal minimum wage	259	287	278

※ Status of minimum wage: In year 2011, 4,320/H (KRW 902,880 / month), year 2012 4,580/H (KRW 957,220 / month), year 2013 4,860/H (KRW 1,015,740)

## Advancement of labor–management relationship

### Labor union status

The KHNP labor union was established on August 10, 2001 and is organized to operate as a central labor union with 7 headquarters and 40 branches. As of June 2014, 5,858 out of a total 9,563 joined the union, which is 61.3% of employees. KHNP signed a ‘Time-off’ with labor unions on August 2011 and recognized a total of 24,200 hours of paid exemption from working hours, equivalent to 12.1 peoples’ paid working hours, and additionally recognized 2 non-paid full-time union officials.

**Number of union members and proportion by business unit** (As of June 2014)

Business unit	Number of union member	Union member proportion
Main office	514	8.8
Nuclear power site	4,605	78.6
Hangang hydro power site	211	3.6
Pumped-storage	327	5.6
Research institute & education institute	201	3.4
Total	5,858	100

### Redefining new labor–management culture strategy

Through internal and external environment analysis and a detailed diagnosis of labor–management, we derived points of improvement for labor–management culture, and by running in parallel annual mid to long-term labor–management culture visions with strategy, we redefined a new labor–management culture strategy that reflects KHNP’s traditional labor–management culture. Especially at the 7th labor diagnosis executed in 2013, we were able to derive improvement by concentrating on what problems existed in the larger labor–management relationship. The result of our labor diagnosis was a decrease as compared to the previous year. It analyzed the accumulation of fatigue from long-lasting NPP corruption investigations and audits, and confirmed that joint activity and cooperation is required to overcome crises.

**Result of member consciousness survey through labor–management diagnosis**

(5-point scale per item)

	Organizational culture	Communication	Labor–management relationship
2012	4.03	3.43	3.17
2013	3.66	3.19	3.03

### Collective agreement to improve irrational practices

Since 2010, KHNP has continuously been trying for the advancement of a collective agreement to improve irrational labor–management practices. We established a paid union activity time limit (Timeoff) and prohibition of unfair

labor activity clause, and removed only the bargaining party clause to improve clauses that make undue claims toward personnel and management rights, thus finding ways for labor and management to coexist. In 2013, we signed 17,500 time-off agreements, removed retirement preparation leave (30 days), improved excessive holiday clauses, and also signed a collective agreement that strengthened predictability of the supplement of manpower and rationality of job evaluation, all in an attempt to enhance labor–management rationality.

### Established various communication channels

KHNP has been trying to establish various communication systems as a cooperative solution between labor and management. The CEO selected ‘coexistence’ and ‘communication’ as the direction of the management, and two-way communication is being attempted by opening a ‘plaza with the CEO’ that includes a KHNP Talk, CEO’s letter, and conversation with the CEO. To encourage the active participation of employees, we implemented a ‘happy work place bulletin board’ to gather opinions on various subjects such as human resource management, pending management issues, and social culture, reflecting upon an overall improvement in the management of KHNP. In the beginning of 2013, for the early stabilization of the newly started labor union, we hosted practical labor–management workshops and executive pending issue briefings to facilitate the exchange of different opinions on various areas including the relocation of Headquarters, and to enhance understanding. Also, if a major change in business occurs that influences union members’ status, prior notice must be given and processes must be mutually agreed upon.

### Labor–management joint social contribution activity

Through a strengthening of labor–management communication, KHNP adopted a rational labor–management culture, and to fulfill the social responsibility of being a public company, executed various joint labor–management programs. In 2013, we hosted a labor–management joint program contest to share and propagate business unit best practices. Meanwhile, through a revision of the joint labor–management collective agreement, the social responsibility clause was strengthened. We established a human rights clause, and reinforced a mutual effort clause to become a trusted company and to jointly create social contribution funds for socially disadvantaged classes, and to enhance power of execution ability.

## Human rights protection

### Percentage and number of major investment agreements that include human rights clauses or that have undergone human rights screening

When contracting for an investment, during various risk review processes, KHNP comprehensively examines possibilities of human rights breaching. When

contracting an investment with a constructor and partner company, we ask for agreement and cooperation with UN Global Compact's 10 principles and we continuously check that these items have been reflected. However, there are no investment contracts that specify a human rights protection clause. Also, despite that there is no explicit screening factor for it, we are evaluating partner companies through a comprehensive consideration of their financial soundness, company credibility, quality, sales records, and environment and safety management, as well as by executing an external integrity investigation regularly every year to check up on partner companies' corruption status.

## Education of security managers on job-related human rights policy

For all employees, such as security guards, police squad members, and other security-related employees who have a high possibility for breaching human rights during their job, we educate them about working procedures and acquisition of know-how, as well as on the constitution and the human rights protection clause specified in the criminal code, to prevent human rights violation.

## Total discrimination and related measures

KHNP clearly specified in its code of conduct that it provides equal opportunities in education and promotion according to personal capability and qualifications, fairly evaluating employees and providing compensation in accordance with performance and achievement, and further, that it does not discriminate based on sex, education, religion, region of origin nor disability. Also, KHNP abides by ILO (International Labor Organization) agreement NO.111 (agreement of discrimination in employment and job). KHNP has no record of legal measures or restrictions that have arisen due to discrimination since its foundation in 2001.

## Partner companies' health and safety

We are setting the enhancement of partner company safety competence as the basic policy of industry safety management, and to do this, we have implemented a partner company safety management symbiosis cooperation program in 4 nuclear power sites. Also, all partner companies working in NPP construction, as well as in NPP operation and maintenance, must legally comply to an 8-hour work day as outlined in the 'Labor Standard Act', while periodically receiving safety management and health safety education set by industry safety health rules.

## Business areas with a high danger of using forced children labor and measures for eradication

KHNP abides to ILO's 'Convention Concerning the Prohibition and Immediate Actions Toward the Elimination of the Worst Forms of Child Labour' and UN Global Compact labor standards and principles. Since the establishment of the company, there have been no cases of breaching either the forced labor policy or the child labor prohibition policy, with an aim to prevent child labor from its source.

## Migrant-related policy and management principles

For residents who are subject to migrate, we composed a 'compensation conference' that the local government, migrating residents, and local influential persons are participating in, supporting the creation of a migrating village and migrant measures according to 'the law on acquisition and compensation of land for public service Article 78.'

### Migrant status

	Project period	Migrating family	Migrating time
Shin-Kori #3, #4	2007.9~2014.9	20 household	2007.9~
Shin-Wolsong #1, #2	2005.9~2013.1	122 household	1995~2003

## KHNP's marketing and promotion-related activities

KHNP has been providing accurate information on nuclear power generation through the media and internet, newsletters, and various promotion publications, satisfying the people's right to know and enhancing social acceptance of nuclear power generation. Also, KHNP is abiding by the procedures stipulated in various regulations and in the prime minister's instruction on 'regulation of government advertisement execution,' with no instances of breaching either.

## Other

### Status of loss rates including injuries and occupational disease

	2011	2012	2013
Number of injured and diseased employees	1	0	1
Percentage of injured and diseased employees	0.01	0	0.01
Loss days related to injury and disease	57	0	19
Percentage of loss days related to injury and disease	0.002	0	0.001
Job related death	1	0	0
Absence rate	0.017	0.053	0.023
Number of employees with occupational disease	0	0	0
Percentage of employees with occupation disease	0	0	0

### Employee turnover rate

		2011		2012		2013	
		Persons	Rate	Persons	Rate	Persons	Rate
Voluntary resigners	Male	31	0.3	42	0.4	42	0.4
	Female	3	0.0	9	0.1	4	0.0
Non voluntary resigners	Male	155	1.7	259	2.8	272	2.8
	Female	1	0.0	3	0.0	6	0.1
Total resigners	Male	186	2.1	301	3.2	314	3.3
	Female	4	0.0	12	0.1	10	0.1
	Total	190	2.1	313	3.4	324	3.4

\*Non-voluntary resigners: everyone including retirement at retirement age, dismissal, dismissal upon death and contract termination, except voluntary resigners

\*Voluntary resigners: dismissal at request, voluntary resignation and early retirement plan (excluding transferees, affiliation change, dismissal upon death and promotion to directors)



## Percentage of retired employees

Percentage of retired employees	Next 5 years	Percentage	Next 10 years	Percentage	Next ten years (cumulative sum)	Percentage
Director-level	6	0.1		0.0	6	0.1
Executive-level	640	6.5	822	8.4	1,462	14.9
Regular employees (except directors and executives)	619	6.3	513	5.2	1,132	11.5

## Regional restrictions on bidding

To encourage economic activity in areas around NPPs, during the procurement of some construction, manufacturing, or service bids, KHNP applies regional restrictions. According to presumed purchase prices, bidding participation is restricted to a business residing and operating in metropolitan cities and other areas.

## Participation restriction standard

	Subject
Nationwide bidding	KRW over 230 million
Greater city	KRW less 230 million
Province	KRW less 100 million
Neighborhood	KRW less 50 million

## Direct indirect fuel usage

(unit: KgU)

		2011	2012	2013
NPP fuel	Light water (concentrated uranium)	501,443	411,216	380,222
	Heavy water (natural uranium)	427,761	381,934	291,143

## Terminology

Term	Explanation
WANO index	A global index published by the World Association of Nuclear Operators Index (WANO) that makes it possible to evaluate countries' cooperating nuclear power plants, and compare NPP operations and safety between different NPP operators. 10 items including the productivity of the power plant, shutdowns and the wholeness of fuel, are quantified to evaluate the safety performance.
seismic isolation equipment	Impact absorbing equipment to reduce seismic energy and reducing impact transmitted to the structure
Unplanned loss rate	Unplanned loss is the loss electricity, calculated by deducting possible power generation capacity and planned loss from facility capacity, meaning the electricity that was generated due to failure of the generator or accident during operation, and unplanned loss rate is unplanned loss compared to facility.
INPO (Institute of Nuclear Power Operations)	An institute that pursues the best safety and reliability in NPP operation, that all american NPPs in commercially operating and nuclear operating organizations of other countries are members.
KHNP-BEX (KHNP Business Ethics Index)	KHNP self-developed ethics level diagnosis model
REC	A certificate that the electricity has been produced using renewable energy facility that the certifying organization verifies the renewable energy facility and power generation of power generator and based on this distribute according to power generation
CDM project	In accordance to the Article 12 of Kyoto Protocol which was accepted at United Nations Framework Convention on Climate Change (UNFCCC), to loosen global warming, advanced countries and developing countries jointly promoting reduction of greenhouse gas emissions.
Vitrification technique	This technology chemically locks the radioactive waste from a nuclear power plant permanently in a glass structure in the melting furnace. It can perfectly prevent radioactive materials from being exposed, and drastically reduces the volume to less than 1/33 as compared to conventional technology.
ISO 14031	A standard of environment effect evaluation, that defines ways to measure, analyze and evaluate the achievements of an organization.
Correction factor	A system marginal price correction factor applicable to each power generation source to stabilize electricity price and to mitigate financial imbalance. The nuclear correction factor is a coefficient for allocating the share of KHNP in the added value (system marginal price – variable cost) generated from the sale of 1KWh of electricity.
Exposure dose of workers	Total exposure dose (dose equivalent) of a person exposed to radiation (excluding the exposure of the skin or limbs)
CSV (Creating Shared Value)	It is not that a corporate does social contribution activity after generating profit, but the corporate activity itself is generating social value and at the same time pursuing economic profit
Mecenat	A support on culture and art, sports and corporate support on public service in social and humanitarian point of view
SR10 SRMS	Composed of requirements that if a corporate recognizes the influence on stakeholders and society and checking if the management system to manage it is practically setup and operating. SR10 is developed by an international certificate network, IQNet and includes ISO26000 (social responsibility), ISO9001 (quality management), ISO14001 (environmental management), OHSAS18001 (industry safety and healthcare), Includes SA8000 and other management system standards.

# Third-party assurance statements

## Verification Statement of KOREA HYDRO & NUCLEAR POWER Co., LTD 2014 Sustainability Report

### Preface

KOREA HYDRO & NUCLEAR POWER Co., LTD (Hereinafter 'KHNP') is responsible for establishing compilation criteria including content of this Sustainability Report (Hereinafter 'the Report'). KFQ responsibility is to provide a verification conclusion of KHNP 2014 Sustainability Report based on our verification procedures in accordance with the selected standard and criteria.

GRI G3.1 Sustainability Reporting Guidelines and Electricity Utilities Sector Supplement G3.0 (Hereinafter 'EUSS G3.0') is finding globally acceptance and those are applied as a reporting criteria.

This Sustainability Report is intended for various stakeholders of KHNP.

### Independence

KFQ was not involved in the preparation of any part of the Report, other than providing a verification opinion, and there has been no conflict of interest between KHNP and KFQ. Further to this KFQ has no biased opinion on stakeholders of KHNP.

### Verification standards

Assurance/verification standards

- AA 1000 Assurance Standard 2008
- AA 1000 Accountability Principles Standard 2008
- GRI G3.1 Sustainability Reporting Guidelines
- GRI G3.0 Electricity Utilities Sector Supplement
- ISO 26000: Social Responsibility Standard

### Verification scope

The following are included in the scope of this verification.

- Report content in relation to the headquarter and entire local power plants of KHNP
- Application Level 'A+' to GRI G3.1 and GRI G3.0 EUSS
- GRI G3.1 to assess compliance with content of the Report and assurance principles of reporting quality
- Type 2- Moderate level of AA 1000 and AA1000 AS 2008 to assess compliance with inclusiveness, materiality and responsiveness principles and reliability of sustainability performance information
- Core subjects in ISO 26000

### Verification procedure

KFQ considered the procedures to achieve reasonable assurance of any apparent misstatements or material inconsistencies with the sustainability information, as well as internal process and system of data collection to have reliability of sustainability performance information provided in the Report.

#### • Desk review

KFQ have performed GAP analysis of the key issue and sustainability performance information provided in the Report against GRI guidelines and information acquired through media survey.

With regard to the financial data included in the Report, our procedures were limited to verifying that they were correctly derived from the KHNP's audited 2014 statement of accounts for the first half year.

• **Site visit**

Visited headquarter, two nuclear power plants in operation (Kori and Wolsong) and three hydroelectric power plants in operation (Chuncheon, Uiam, Cheongpyeong) to understand and assess the system and processes in place for managing and reporting the sustainability data.

Review of a sample of internal documents and interviews with the personnel responsible for internal reporting and data collection to discuss their approach to stakeholder inclusivity, materiality and responsiveness.

• **Resolution of findings**

Review the final report to check the error and issues identified during above process to provide correct and reliable sustainability performance information, and conducted in independent assessment of the Report in relation to GRI Guidelines Application Level.

**Consideration and limitation**

Completeness and responsiveness of sustainability performance information reported in the Report are subject to inherent limitation due to their nature and the methodology used determining, calculating and estimating such data.

**Verification opinion**

Based in the verification activity stated herein, KFQ confirmed that this Report meets the GRI G3.1 Guidelines at an Application Level of A+. According to the three principles of AA 1000 AS, namely, inclusiveness, materiality and responsiveness, sustainability performance information was assessed and KFQ could secured reasonable evidences to provide a moderate level assurance through followings.

1. KHNP implements the process of stakeholder engagement, accepts a variety of stakeholders' opinion, and works to reflect them in its sustainability policy.
2. KHNP Corporation has a process to define stakeholder group by materiality analysis and identify key issues through communication with each group to set priorities on stakeholder surveys and feedback.
3. KHNP connected key issues identified by stakeholders to long-term sustainability strategy and vision and its performance is clearly improved sustainably, and its activities and performance was appropriately reported.
4. KHNP has effective internal system and procedures of data creation, gathering and analysis for sustainability performance information. KFQ could confirm reliability of reported information through interview, comparison data of internal and external and not found any biased data and information.

**Recommendation for improvement**

We recommended that KHNP to develop performance index to comply GRI G3.1 and GRI G3.0 EUSS to review its performance sustainably. Also, we recommended that KHNP make a balance in the Report to include various activities and performance of positive and negative impact under consideration of materiality.

In addition, we commended that KHNP have variety communication channel to community with each stakeholder group to identify their needs and use it as essential information to develop company's long and short-term strategies.

October 2014  
Seoul, Korea



AA1000  
Licensed Assurance Provider  
000-80



A handwritten signature in black ink, reading 'Dae hyun Nam'.

CEO Dae hyun Nam  
Korean Foundation for Quality (KFQ)

## SR10 Certificate



THE INTERNATIONAL CERTIFICATION NETWORK

### CERTIFICATE

IQNet and  
KFQ  
hereby certify that the organization

**KOREA HYDRO & NUCLEAR POWER CO.,LTD.**

• HEAD OFFICE : #520 Yeong Dong Dae-Ro, Gangnam-Gu,  
Seoul, 135-881, Korea

for the following field of activities

**HYDRO & NUCLEAR ELECTRIC POWER GENERATION**

has implemented and maintain a

**Social Responsibility Management System**

which fulfills the requirements of the following standard

**IQNet SR 10 : 2011**

Issued on : 2014. 10. 08

Validity date : 2017. 10. 07

Registration Number : RC - 00001-SR



Michael Drechsel  
President of IQNet

Dae Hyeoun Nam  
President & CEO of KFQ



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# GRI Index

## GRI 3.1 / ISO 26000 Index

● Reported ○ Not reported N/A Not Applicable ◐ Partially reported

Description		ISO 26000	Reporting level	Reported	Additional information
Strategy and analysis					
1.1	Statement from the most senior decision-maker of the organization	6.2	●	2~3	
1.2	Description of key impacts, risks, and opportunities		●	2~3	
Organizational profile					
2.1	Name of the organization	6.2	●	6~7	
2.2	Primary brands, products, and/or services		●	6~7	
2.3	Operational structure of the organization, including main divisions, operating companies, subsidiaries, and joint ventures		●	6~7	
2.4	Location of organization's headquarters		●	6~7	
2.5	Number of countries where the organization operates, and names of countries with either major operations or that are specifically relevant to the sustainability issues covered in the report		●	6~7	
2.6	Nature of ownership and legal form		●	6~7	
2.7	Markets served (including geographic breakdown, sectors served, and types of customers/beneficiaries)		●	6~7	
2.8	Scale of the reporting organization (number of employees, net sales and net profits, capital adequacy ratio, quantity of products and services, etc.)		●	6~7	
2.9	Significant changes during the reporting period regarding size, structure, or ownership		●	—	There has been no major change during the reporting period.
2.10	Awards received in the reporting period		🕒	4~5	
Report Parameters					
3.1	Reporting period (e.g., fiscal/calendar year) for information provided		●	About This Report	
3.2	Date of most recent previous report (if any)		●	About This Report	
3.3	Reporting cycle (annual, biennial, etc)		●	About This Report	
3.4	Process for defining report content (determination of importance and priority, identifying stakeholders)		●	About This Report	
3.5	Process for defining report content (determination of importance and priority, identifying stakeholders)		●	12~15	
3.6	Boundary of the report (e.g., countries, divisions, subsidiaries, leased facilities, joint ventures, suppliers)		●	About This Report	
3.7	State any specific limitations on the scope or boundary of the report (see completeness principle for explanation of scope)		●	About This Report	
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		●	About This Report	
3.9	Data measurement techniques and the bases of calculations, including assumptions and techniques underlying estimations applied to the compilation of the indicators and other information in the report. Explain any decisions not to apply, or to substantially diverge from, the GRI Indicator Protocols		●	About This Report	
3.10	Explanation of the effect of any re-statements of information provided in earlier reports, and the reasons for such re-statement (e.g. mergers/acquisitions, change of base years/periods, nature of business, measurement methods)		●	—	There has been no reason for re-statement
3.11	Significant changes from previous reporting periods in the scope, boundary, or measurement methods applied in the report		●	—	There has been no major change during the reporting period.
3.12	GRI Content Index		●	83~87	
3.13	Policy and current practice with regard to seeking external assurance for the report	7.5.3	●	80~81	
Governance, Commitments, and Engagement					
4.1	Governance structure of the organization, including committees under the highest governance body responsible for specific tasks, such as setting strategy or organizational oversight	6.2	●	10	
4.2	Indicate whether the Chair of the highest governance body is also an executive officer		●	10	
4.3	For organizations that have a unitary board structure, state the number of members of the highest governance body that are independent and/or non-executive members		●	10	
4.4	Mechanisms for shareholders and employees to provide recommendations or direction to the highest governance body		●	10	
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)		●	11	
4.6	Processes in place for the highest governance body to ensure conflicts of interest are avoided		●	11	
4.7	Process for determining the qualifications and expertise of the members of the highest governance body for guiding the organization's strategy on economic, environmental, and social topics		●	10~11	
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		●	8	
4.9	Procedures of the highest governance body for overseeing the organization's identification and management of economic, environmental, and social performance, including relevant risks and opportunities, and adherence or compliance with internationally agreed standards, codes of conduct, and principles		🕒	10	

● Reported ○ Not reported N/A Not Applicable ◐ Partially reported

Description	ISO 26000	Reporting level	Reported	Additional information
4.10	6.2	<div><div></div></div>	11	
4.11		<div><div></div></div>	10~11	
4.12		<div><div></div></div>	88	
4.13		<div><div></div></div>	88	
4.14		<div><div></div></div>	12~13	
4.15		<div><div></div></div>	12~13	
4.16		<div><div></div></div>	12~13	
4.17		<div><div></div></div>	14~15	
Economy Disclosure on Management Approach				
Economic performance				
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	6.8/6.8.3/ 6.8.7/6.8.9	<div><div></div></div>	— <a href="http://cms.khnp.co.kr/management2/">http://cms.khnp.co.kr/management2/</a>
EC2	Financial implications and other risks and opportunities for the organization's activities due to climate change	6.5.5	<div><div></div></div>	48~53
EC3	Coverage of the organization's defined benefit plan obligations	6.4.4/6.8	<div><div></div></div>	76
EC4	Significant financial assistance received from government		<div><div></div></div>	31
Market presence				
EC5	Range of ratios of standard entry level wage compared to local minimum wage at significant locations of operation	6.4.4/6.8	<div><div></div></div>	76
EC6	Policy, practices, and proportion of spending on locallybased suppliers at significant locations of operation	6.6.6/6.8/6.8.5/6.8.7	<div><div></div></div>	79
EC7	Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation	6.8/6.8.5/6.8.7	<div><div></div></div>	74
Indirect economic impacts				
EC8	Understanding and describing significant indirect economic impacts, including the extent of impacts (including types of support)	6.3.9/6.8/6.8.3/ 6.8.4/6.8.5/ 6.8.6/6.8.7/6.8.9	<div><div></div></div>	19~22
EC9	Understanding and describing significant indirect economic impacts, including the extent of impacts (including scope of impacts)	6.3.9/6.6.6/6.6.7/ 6.7.8/6.8/6.8.5/ 6.8.6/6.8.7/6.8.9	<div><div></div></div>	32
Environment Disclosure on Management Approach				
Materials				
EN1	Materials used by weight or volume		<div><div></div></div>	79 No fuel consumption containing PCBs (Poly Chlorinated Biphenyls)
EN2	Percentage of materials used that are recycled input materials		<div><div></div></div>	— The US-South Korea nuclear agreement and Korean government policy prohibit nuclear fuel reprocessing
Energy				
EN3	Direct energy consumption by primary energy source		<div><div></div></div>	52~53
EN4	Indirect energy consumption by primary source		<div><div></div></div>	52~53
EN5	Energy saved due to conservation and efficiency improvements		<div><div></div></div>	52~53
EN6	Initiatives to provide energyefficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives	6.5/6.5.4	<div><div></div></div>	52~53
EN7	Initiatives to reduce indirect energy consumption and reductions achieved		<div><div></div></div>	52~53
Water				
EN8	Total water withdrawal by source		<div><div></div></div>	55
EN9	Water sources significantly affected by withdrawal of water		<div><div></div></div>	55
EN10	Percentage and total volume of water recycled and reused		<div><div></div></div>	55
Biodiversity				
EN11	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas		<div><div></div></div>	56
EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas		<div><div></div></div>	56
EN13	Habitats protected or restored	6.5/6.5.6	<div><div></div></div>	56
EN14	Strategies, current actions, and future plans for managing impacts on biodiversity		<div><div></div></div>	56, 62
EN15	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk		<div><div></div></div>	—
Emissions, effluents, and waste				
EN16	Total direct and indirect greenhouse gas emissions by weight		<div><div></div></div>	52

● Reported ○ Not reported N/A Not Applicable ◐ Partially reported

Description	ISO 26000	Reporting level	Reported	Additional information
EN17 Other relevant indirect greenhouse gas emissions by weight	6.5/6.5.5	●	52	
EN18 Initiatives to reduce greenhouse gas emissions and reductions achieved		●	52	
EN19 Emissions of ozone-depleting substances by weight		N/A	—	Due to the nature of nuclear power generation, there are no emissions of ozone-layer depleting substances.
EN20 NOx, SOx, and other significant air emissions by type and weight		N/A	—	
EN21 Total water discharge by quality and destination		●	55	
EN22 Total weight of waste by type and disposal method	6.5/6.5.3	●	54–57	
EN23 Total number and volume of significant spills		●	54–57	
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		●	—	No waste is taken out of the country.
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	6.5/6.5.4/6.5.6	●	56	
<b>Products and services</b>				
EN26 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	6.5/6.5.4/6.6.6/6.7.5	●	56–57	
EN27 Percentage of products sold and their packaging materials that are reclaimed by category	6.5/6.5.4/6.7.5	N/A	—	Not applicable in consideration of the characteristics of the industry
<b>Compliance</b>				
EN28 Monetary value of significant fines and total number of nonmonetary sanctions for noncompliance with environmental laws and regulations	6.5	●	—	There has been no violations of environment laws during reporting period.
<b>Transport</b>				
EN29 Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce	6.5/6.5.4/6.6.6	○	—	
<b>Overall</b>				
EN30 Total environmental protection expenditures and investments by type	6.5	●	53	
<b>Labor Disclosure on Management Approach</b>				
<b>Labor practices and decent work</b>				
<b>Employment</b>				
LA1 Total workforce by employment type, employment contract, and region	6.4/6.4.3	●	74	
LA2 Total number and rate of employee turnover by age group, gender, and region	6.4/6.4.3	●	78	Number of turnover and rate
LA3 Benefits provided to full-time employees that are not provided to temporary or part-time employees, by major operations	6.4/6.4.3/6.4.4	○	—	
LA15 Percentage of employees returning to work after parental leave and retention rate		●	76	GWP program
<b>Labor/management relations</b>				
LA4 Percentage of employees covered by collective bargaining agreements	6.4/6.4.3/6.4.4/ 6.4.5/6.3.10	●	77	
LA5 Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements	6.4/6.4.3/6.4.4/ 6.4.5	●	77	
<b>Occupational health and safety</b>				
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	6.4/6.4.6	●	—	Joint management-worker health and safety committee is composed within 10 representative.
LA7 Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region		●	78	
LA8 Education, training, counseling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases	6.4/6.4.6/6.8/ 6.8.3/6.8.4/6.8.8	●	23,64,76	
LA9 Health and safety topics covered in formal agreements with trade unions	6.4/6.4.6	●	77	
<b>Training and education</b>				
LA10 Average hours of training per year per employee by employee category	6.4/6.4.7	◐	75	
LA11 Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings	6.4/6.4.7/6.8.5	●	76	
LA12 Percentage of employees receiving regular performance and career development reviews	6.4/6.4.7	○	—	
<b>Diversity and equal opportunity</b>				
LA13 Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity	6.3.7/6.3.10/ 6.4/6.4.3	●	10,74	
LA14 Ratio of basic salary of men to women by employee category	6.3.7/6.3.10/ 6.4/6.4.3/6.4.4	●	76	

Description		ISO 26000	Reporting level	Reported	Additional information
<b>Human rights Disclosure on Management Approach</b>					
Investment and procurement practices					
HR1	Percentage and total number of significant investment agreements that include human rights clauses or that have undergone human rights screening	6.3/6.3.3/6.3.5/6.6.6	●	77~78	
HR2	Percentage of significant suppliers and contractors that have undergone screening on human rights and actions taken	6.3/6.3.3/6.3.5/ 6.4.3/6.6.6	●	77~78	
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 part-time employees, by major operations	6.3/6.3.5	①	78	
Non-discrimination					
HR4	Total number of incidents of discrimination and actions taken	6.3/6.3.6/6.3.7/ 6.3.10/6.4.3	●	78	
Freedom of association and collective bargaining					
HR5	Operations identified in which the right to exercise freedom of association and collective bargaining may be at significant risk, and actions taken to support these rights	6.3/6.3.3/6.3.4/ 6.3.5/6.3.8/6.3.10/ 6.4.3/6.4.5	●	77	
Child labor / prevention of forced and compulsory labor					
HR6	Operations identified as having significant risk for incidents of child labor, and measures taken to contribute to the elimination of child labor	6.3/6.3.3/6.3.4/ 6.3.5/6.3.7/6.3.10	●	78	
HR7	Operations identified as having significant risk for incidents of forced or compulsory labor, and measures to contribute to the elimination of forced or compulsory labor reviews		●	78	
Security practices					
HR8	Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations	6.3/6.3.5/6.4.3/ 6.6.6	●	78	
Indigenous rights					
HR9	Total number of incidents of violations involving rights of indigenous people and actions taken	6.3/6.3.6/6.3.7/ 6.3.8/6.6.7	●	78	
Assessment					
HR10	Percentage and number of operations supervising human rights and conducting impact assessment		①	77~78	
Remediation					
HR11	Number of human rights-related complaints raised through an official mechanism of complaint delivery	6.2	●	76	There has been no complaints regarding human rights
<b>Society Disclosure on Management Approach</b>					
Local communities					
S01	Nature, scope, and effectiveness of any programs and practices that assess and manage the impacts of operations on communities, including entering, operating, and exiting	6.3.9/6.8/6.8.5/ 6.8.7/6.6.7	●	58~59	
S09	Existence of operations having potential or real negative impacts on the local community		●	16~27	
S10	Mechanisms to relieve the negative impacts of operations on the local community or protect the local community from them		●	16~27	
Corruption					
S02	Percentage and total number of business units analyzed for risks related to corruption		●	40~47	
S03	Percentage of employees trained in organization's anti-corruption policies and procedures	6.6/6.6.3	●	47	
S04	Actions taken in response to incidents of corruption		●	40~47	
Public policy					
S05	Public policy positions and participation in public policy development and lobbying (prohibition of donation of political funds)	6.6/6.6.4/6.8.3	●	17	
S06	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country		●		We abide by political fundraising laws which prohibited any kinds of provision of political fund.
Anti-competitive behavior					
S07	Total number of legal actions for anti-competitive behavior, anti-trust, and monopoly practices and their outcomes	6.6/6.6.5/6.6.7	●		There has been no violation of laws.
Compliance					
S08	Monetary value of significant fines and total number of non-monetary sanctions for noncompliance with laws and regulations	6.6/6.6.7/6.8.7	●		There has been no fines or sanctions
<b>Social Product Responsibility Disclosure on Management Approach</b>					
Customer health and safety					
PR1	Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures	6.3.9/6.6.6/6.7/ 6.7.4/6.7.5	●	19	
PR2	Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes	6.3.9/6.6.6/6.7/ 6.7.4/6.7.5	●		There has been no violation of laws.
Product and service labelling					
PR3	Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements	6.7/6.7.3/6.7.4/ 6.7.5/6.7.6/6.7.9	●	78	



● Reported ○ Not reported N/A Not Applicable ◐ Partially reported

Description	ISO 26000	Reporting level	Reported	Additional information
PR4 Total number of incidents of non-compliance with regulations and voluntary codes concerning product and service information and labeling, by type of outcomes	6.7/6.7.3/6.7.4/ 6.7.5/6.7.6/6.7.9	●	—	There has been no violation of laws.
PR5 Practices related to customer satisfaction, including results of surveys measuring customer satisfaction	6.7/6.7.4/6.7.5/ 6.7.6/6.7.8/6.7.9	●	17	
Marketing communications				
PR6 Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship	6.7/6.7.3/6.7.6/6.7.9	●	78	
PR7 Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes	6.7/6.7.3/6.7.6/ 6.7.9	●	78	There has been no violation of laws.
Customer privacy				
PR8 Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data	6.7/6.7.7	●	—	KHNP's customer is Kepco and there has been no leaks of customer information.
Compliance				
PR9 Monetary value of significant fines for non-compliance with laws and regulations concerning the provision and use of products and services	6.7/6.7.6	●	—	There has been no violations of laws.
Additional GRI Indexes for the Electric Utilities Industry				
EU1 Equipment capacity by power source		●	7	
EU2 Power generation by source		●	7	
EU3 Classification and number of general households, industrial, commercial and institutional customers		N/A	—	We do not have a role in electricity sales to general customers
EU4 Length of transmission and distribution line		N/A	—	We have neither holding facilities for transmission and distribution nor any role in managing them
EU5 Emission credit quota under the emission trade system		●	—	we have neither emissions trading performance nor results.
EU6 Disclosure of short-term and mid-term management policy for stable supply of electric power		●	28~29	
EU7 Whether electric power demand management program is in place and current status		N/A	—	We do not have a role in managing electricity demand.
EU8 R&D expenditure and activities for stable supply of electric power and sustainable growth		●	31	
EU9 Laws and guidelines for decommissioning nuclear power plants		●	31	
EU10 Plan to expand facilities by source according to long-term estimated demands for electric power		●	22	
EU11 Efficiency of thermal power generation by source		N/A	—	There are no thermal power generation facilities.
EU12 Ratio of transmission and distribution loss to total energy		N/A	—	We have neither holding facilities for transmission and distribution nor any role in managing them
EU13 Ecological status in biodiversity protection activity areas		◐	56	
EU14 HR management process and programs for reinforcing professional manpower		●	75	
EU15 Percentage of employees scheduled to retire within 5~10 years by job category and by region		●	79	
EU16 Policy and guideline concerning the health and safety of KHNP's employees and suppliers' employees		●	78	
EU17 Working hours of subcontract workers engaged in power plant construction, maintenance and operations		●	78	
EU18 Percentage of suppliers' employees who received training on health and safety		●	78	
EU19 Stakeholders' participation in the decision-making process concerning energy supply and demand planning and construction of power generation infrastructure		●	26,52	
EU20 Resident relocation policy and management policy		●	78	
EU21 Measures to prevent accidents and disasters and education programs		●	23	
EU22 Number of relocating residents by projects			78	
EU23 Programs for improvement of diffusion of electric power		N/A	—	We do not have a role in electricity sales to general customers
EU24 Programs for supporting supply of electric power to the disadvantages in terms of electric power consumption		N/A	—	We do not have a role in electricity sales to general customers
EU25 Number of general deaths or disasters for which legal sanctions were given or with regard to which a legal action is in progress(harms done to the general public, not employees)		●	16	There have been no general death or disaster accidents among court lawsuits.
EU26 Number of people living in areas without any transmission and distribution network		N/A	—	There are no power transmission and distribution facilities.
EU27 Number of households for which electric power supply was cutoff due to unpaid electric rates (reported as segmented by length of supply suspension)		N/A	—	We do not have a role in electricity sales to general customers
EU28 Frequency of shutdowns		●	16	
EU29 Average length of shutdowns		●	16	
EU30 Average NPP capacity factor		●	—	75.5% in 2013

## Membership and participating principles

## Joining and support UN Global Compact

KHNP joined an international convention on corporate social responsibilities, the UN Global Compact in March 2007 act up to its 10 principles in the 4 sectors of human rights, labor, environment and anti-corruption.



**Principle 1**  
Business should support and respect the protection of internationally proclaimed human rights.

**Principle 2**  
Business should ensure that they are not complicit in human rights abuses.



**Principle 3**  
Business should uphold the freedom of association and the effective recognition of the right to collective bargaining.

**Principle 4**  
Business should support the elimination of all forms of forced and compulsory labour.

**Principle 5**  
Business should support the effective abolition of child labour.

**Principle 6**  
Business should support the elimination of discrimination in respect of employment and occupation.



**Principle 7**  
Business should support a precautionary approach to environmental challenges

**Principle 8**  
Business should undertake initiatives to promote greater environmental responsibility.

**Principle 9**  
Business should encourage the development and diffusion of environmentally friendly technologies.



**Principle 10**  
Businesses should work against corruption in all its forms, including extortion and bribery.

## Membership

Domestic	
Korea Atomic Industrial Forum	Korea Fusion Industry and Technology Association
Korean Association for Radiation Protection	Korean Committee of Northeast Asia Economic Forum
Korean Nuclear Society	Korean Radioactive Waste Society
Korea Radioisotope Association	Korean Society of Pressure Vessel and Piping
Korea Industrial Safety Association	Korea Nuclear Equipment Qualification Association
Korea Project Management Association (KPMA)	Korean Society of Energy & Climate Change
Korea Environmental Preservation Association	Korean Society for New and Renewable Energy
Earthquake Engineering Society of Korea	Korea Forum for Progress
Korean Standards Association	Korea Energy Foundation
Korean Institute of Internal Auditors	Korea Institute of Plant Engineering and Construction
Korea Association of Standards and Testing Organizations	Korea Society of Innovation
Korean Society for Quality Management	Korea Chamber of Commerce & Industry
Korean Institute of Electric Engineers	Korean Society of Radiation Bioscience
Korea Electric Association	Korea Employers Federation
Korea National Committee on Large Dams	Korean Society of Public Enterprise
Korean Society for Nondestructive Testing	Energy & Mineral Resources Development Association of Korea
Korea Academy of Nuclear Safety	Korean Society of Suggestion Activities
Korea Management Association	Korea Smart Grid Association
Corrosion Science Society of Korea	The Korean Society of Mechanical Engineers
Korean Federation of Women's Science & Technology Associations	Forum on Climate Change and Energy Policy
Korean Resource Economics Association	Korea Productivity Association
Korea Plant Industries Association	

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