

RELIABLE GLOBAL
ENERGY LEADER,
KHNP

KHNP Sustainability Report 2017

About This Report



Introduction

Korea Hydro & Nuclear Power Co., Ltd. (KHNP) has been publishing its sustainability report every year with the aim of releasing its sustainability management goals and performance to share its commitment to creating future value with the public. This is KHNP's eighth sustainability report, which focuses on introducing changes and directions in its management activities since 2016.

Reporting scope and period

This report includes major financial and non-financial performances from January 1 through December 31, 2016. Quantitative data of the three most recent fiscal years from 2014 through 2016 were utilized to provide time-series trends, while some qualitative data included performances in 2017. The scope of this report covers the head office and all domestic and overseas offices. Time and region-based boundaries were also complied with.



Reporting and verification guidelines

This report was compiled in accordance with the Global Reporting Initiative (GRI) Standards Core option. Major issues in the power plant facility category recommended in the GRI Sustainability Topics for Sector were adopted with the purpose of selecting key issues suitable for our business. Some unchanged performances and information since the previous report have been restated to assist readers' understanding, and revised data were reported with separate notification. The reliability of the content was verified by a third-party assurance institute, and the detailed results can be found in the independent assurance statement (pages 83 to 84).

Additional information of the report



Korean and English versions of this report are available on the KHNP website (www.khnp.co.kr) and can be downloaded in PDF format. For further inquiries related to this sustainability report, please reach us by referring to the contact information provided on page 86.



Cover Story

KHNP, Korea Hydro & Nuclear Power Co., Ltd.'s acronym designed a straight line against a white background represents KHNP as a dependable global energy corporation. Our five core values—abbreviated as “T.R.U.S.T”—demonstrate KHNP's strong commitment to sustainability management by realizing those values.

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KHNP
Sustainability Report 2017

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CEO Message



“ KHNP will
stand by your side
as we embark
on a new journey
”

Dear valued stakeholders,

Korea Hydro & Nuclear Power (KHNP) is Korea's largest electric power company, generating approximately 30% of domestic electricity through nuclear power, hydro power and pumped-storage plants. In 2016, we achieved remarkable business performance, demonstrated by increasing both sales and net income over three consecutive years through safe and efficient operation of our nuclear power plants. We also successfully launched commercial operation of a third-generation nuclear reactor, Shin-Kori #3, for the first time in the world, significantly contributing to the stable supply of electricity. KHNP's efforts to create a corporate culture of integrity and transparency was recognized by the Korean government, reflected by obtaining the highest grade in the Integrity Assessment and the Anti-corruption Initiative Assessment by the Anti-corruption and Civil Rights Commission (ACRC). Notwithstanding such recognition, we will continue to make relentless efforts to secure competitiveness which will enable us to effectively respond to the rapidly-changing business environment.

Most notably, we established the 2031 Mid- to Long-term Management Strategy to actively take part in government efforts and to prepare for our future growth by expanding investment in renewable energy based on domestic nuclear energy businesses. Our new management strategy reflects KHNP's firm commitment to both establishing and undertaking measures to achieve sustainable growth by safely operating our nuclear power plants, diversifying our business structure and creating social values as a public enterprise in an ever-changing business environment. To this end, we will strive to become a "trusted global energy leader" by faithfully carrying out the following three commitments :

First, we will earn public trust by safely operating our nuclear power plants.

All employees at KHNP place the highest priority on safe operation of nuclear power plants and endeavor to become the most trusted enterprise through the stable supply of electric power. In particular, we expect to dramatically increase nuclear safety by applying the latest Fourth Industrial Revolution technologies to the construction and operation of nuclear power plants, which include establishing the NPP control room (E-Tower) and big data-based preventive maintenance system. Furthermore, we will strengthen our nuclear safety management efforts by investing more heavily in safety to make our nuclear power plants resistant to even the most extreme natural disasters.

Second, we will secure future growth engines to become a global energy leader.

KHNP has secured world-class nuclear technologies through 40 years of experience in constructing and operating nuclear power plants, based on which we achieved the feat of signing a \$600 million Operating Support Services Agreement (OSSA) with the United Arab Emirates (UAE) in July 2016. Meanwhile, we will turn the decommissioning of Kori #1 into new business opportunities, focusing on securing decommissioning technologies. Furthermore, we will build a solid foundation for our future growth by continuously expanding our investment in renewable energy such as photovoltaic power plants with participation of farms.

Third, we will strive to become a respected public enterprise by fulfilling our social responsibilities.

Earning the trust of local residents near nuclear power plants as well as the general public is an essential factor in the smooth operation of the nuclear power plant business. To this end, we actively invest in generating social values and high-quality jobs to grow hand-in-hand with the local communities and contribute to regional development. In particular, we take various CSR initiatives to create jobs by promoting social enterprises and support local children by building libraries and donating vans through projects such as "Happiness Plus, Hopeful Wings."

Esteemed stakeholders,

In the face of the fast-changing energy business environment and the Fourth Industrial Revolution, KHNP will make the utmost efforts to become a socially responsible enterprise while achieving sustainable growth. I ask for your continued support and encouragement as we grow into a future global energy leader.

Thank you.

President & CEO Korea Hydro & Nuclear Power Co., Ltd.
Lee Kwan-Sup

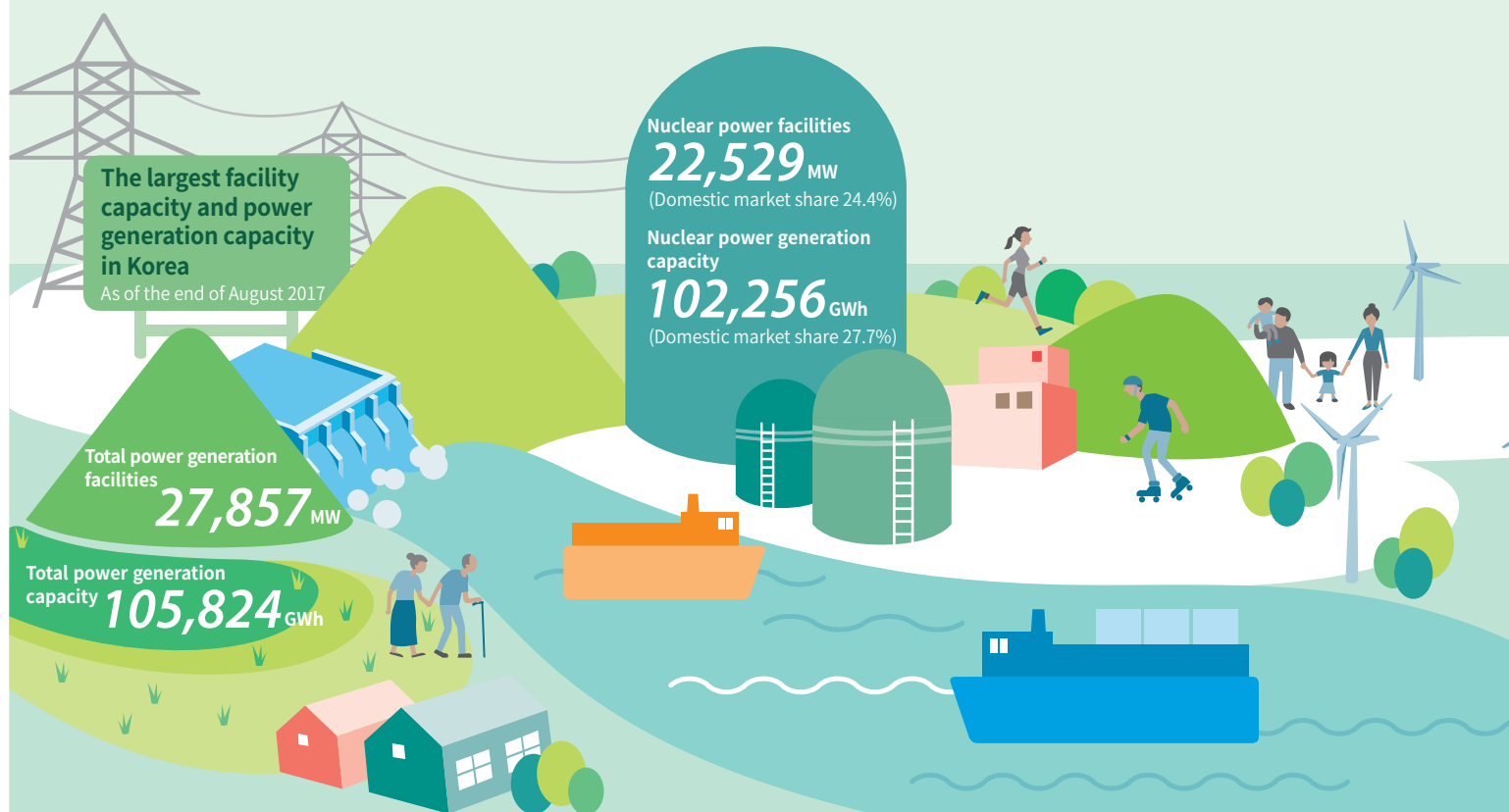
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KHNP, Korea's Top Energy Corporation

About Our Sustainable Growth and Development

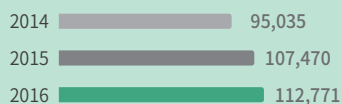
KHNP—an energy leader making life prosperous with eco-friendly energy |

For 38 years since April 1978 when the Kori #1 reactor first went into commercial operation, KHNP has been in charge of generating nuclear energy in Korea. KHNP currently generates approximately 28.7% of domestic electric power with renewable energy sources such as hydropower and pumped-storage power, contributing to a stable power supply for the nation. KHNP continues its relentless efforts to support Korea's economic growth and supply power to enrich the lives of people everywhere.



Revenue

Unit : billion KRW



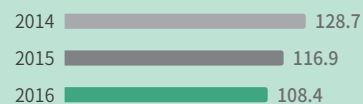
Operating income

Unit : billion KRW



Liability ratio

Unit : %



2016
Sales

11.3 trillion

2016

Operating income **3.8** trillion

2016

Liability ratio

108.4 %

Main Businesses

Our business domain covers power generation (nuclear power, hydro power, and new and renewable energy), construction, and overseas business. As of August 2017, KHNP operates 24 NPPs, 21 hydro power plants, 14 small hydro power plants, 16 pumped-storage plants, six photovoltaic plants, and one wind power plant.

	Units in operation	Capacity (MW)
Nuclear power	24	22,529
Hydro & small hydro power	35	606
Pumped-storage power	16	4,700
Photovoltaic power	6	21
Wind power	1	1

(As of August 2017)

Hydro power, pumped-storage, renewable generation capacity **3,568 GWh**

Hydro power, pumped-storage, new & renewable facility capacity **5,328 MW**



Corporate Profile



Company name
Korea Hydro & Nuclear Power Co., Ltd



Governing organization
Ministry of Trade, Industry, and Energy



CEO
Lee Kwan Sup



Institution type
Public enterprise



Organization
8 HQs, 28 departments and offices (Head office), 5 nuclear power sites, 1 hydro power site, 7 pumped-storage power plants, and 8 other offices



Head office
1655 Bulguk-ro
Yangbuk-myeon
Gyeongju-si
Gyeongsangbuk-do, Korea



Employees
11,507 people
(As of Dec. 31, 2016)



Major function
Development of electric power resources / power generation and related businesses / R&D and affiliated businesses / overseas businesses



Date of establishment
April 2, 2001



Paid-in capital
KRW 1,212.2 billion
(As of Dec. 31, 2016)

KHNP's Main Businesses

Creating Sustainable Values

KHNP is Korea's largest electric power company, generating approximately 30% of the nation's power through nuclear, hydro, and pumped-storage power generation. Due to its low cost, nuclear power can be generated 24 hours a day, providing the base load of Korea's domestic electric power. KHNP also enacts various efforts to develop renewable energy as well as stabilize hydro and efficient pumped-storage power systems that only require a short time from halt to power generation.

Nuclear Power Nuclear Power Business

Nuclear power uses heat released from the nuclear fission of uranium in reactors in steam turbines to produce electricity in an NPP. The nuclear power generated by 1kg of uranium in nuclear fission is equivalent to 9,000 drums of petroleum and 3,000 tons of coal. It is a particularly important source of energy in Korea, which is highly dependent on imported energy.

Power plant operation business



In 2016, NPPs generated 161,995,428MWh, accounting for over 31% of the total electric power generated in Korea. As of August 2017, 24 nuclear power plants are in commercial operation with a total facility capacity of 22,529MW since the permanent shutdown of Kori #1.

Power plant construction business



By constructing the Korean standard NPPs, KHNP has secured the technology to construct 1,400MW NPPs. In December 2016, KHNP successfully completed the construction and commenced operation of Shin-Kori #3, a third-generation power plant with a much lower frequency of core damage and stronger seismic design standards. By applying the domestically-built pressurized water reactor APR1400—a first in the world—KHNP was recognized for its technological excellence in NPP construction.

Overseas power plant business



Based on its technological expertise and experience in the domestic NPP business, KHNP is actively taking the initiative to expand the company's businesses overseas. Since the export of the UAE reactor #4, KHNP is seeking to expand its businesses to countries in need of NPPs and related technology, including Great Britain and the Czech Republic.

Nuclear Power Plant Status (As of the end of August 2017)

Classification	Number of units	Facility capacity (MW)	Domestic market share
Kori	5	4,550	19.73
Hanbit	6	5,900	
Wolsong	6	4,779	
Hanul	6	5,900	
Saeul	1	1,400	
Total	24	22,529	

Electricity Generation through Nuclear Power (Unit : MWh)



161,995,428 MWh



Hydro Power Hydro Power Business

Hydro power is generated by converting the potential energy of falling water to mechanical energy, which is then converted again to electric energy. It is a pollution-free and clean energy source and an alternative to imported fuel, as well as an important part of the nation's supply of high-quality electric power. KHNP currently operates 21 hydro power plants and 14 small hydro power plants, with a total facility capacity of 606.5MW. In 2016, KHNP won a \$525 million hydro power project in Athmuqam, Pakistan, securing construction rights for two 175 MW hydro power plants. With over 70 years of experience in operating hydro power plants, KHNP will continue its efforts to expand its businesses overseas.

Electricity Generation through Hydro Power (Unit : MWh)

2014 788,924

2015 644,831

2016
868,263 MWh



Pumped Storage Pumped-Storage Business

Pumped-storage plants pump water from a lower elevation reservoir to a higher elevation reservoir using inexpensive power during nighttime or low-demand hours. They then drop water from the higher elevation reservoir downstream to generate electricity. As of September 2017, KHNP operates 16 pumped-storage power plants in Cheongpyeong, Samnangjin, Muju, Sancheong, Yangyang, Cheongsong, and Yecheon with a total facility capacity of 4,700 MW. Through its pumped-storage business, KHNP plays an important role in supplying electricity in a stable manner during high-demand seasons, enhancing the reliability and long-term continued operation of power generation facilities.

Electricity Generation through Pumped-Storage (Unit : MWh)

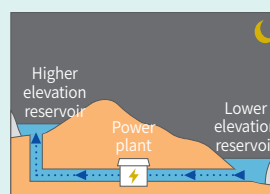
2014 5,054,547

2015 3,650,910

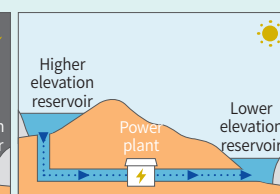
2016
3,625,562 MWh



Pumped-storage



Power generation



Renewable Renewable Energy Business

As required by the Renewable Portfolio Standard (RPS) and in compliance with the government's policy of "20% of electricity generation through renewable energy by 2030," KHNP is actively taking the initiative in the company's renewable energy business. KHNP currently operates the Hanbit Solar Park and Yecheon/Kori photovoltaic power plants as part of its photovoltaic power business, and plans are underway to construct a power plant in Miryang. KHNP also operates a 750kW wind power generator in the Kori site as part of its wind power business. It is also closely cooperating with local governments to initiate wind power businesses in Cheongsong and Goheung.

Electricity Generation through Renewable Energy (Unit : MWh)

2014 21,168

2015 21,156

2016
18,749 MWh



KHNP at a Glance

KHNP takes yet another step toward future growth.



World's first commercial operation of APR1400

In December 2016, KHNP began the commercial operation of Shin-Kori #3, a third-generation NPP to which the domestically-built new light water reactor APR1400 was applied. Compared to existing nuclear reactors, the APR1400 has superior safety features. As the first in the world to succeed in the commercial operation of APR1400, KHNP is recognized for its technological excellence.

KHNP earns greater public trust through the safe operation of nuclear power plants.



Awarded the Safety Management Grand Prize for two consecutive years

KHNP was awarded the Safety Management Grand Prize at the 2017 Global Standard Management Awards organized by the Korea Management Registrations (KMR). Winning the award for two consecutive years, KHNP has been at the forefront of safety management by upholding its three principles of "System," "Infrastructure," and "Employee awareness" to prevent accidents. KHNP employees' level of understanding of safety management policies, their safety awareness, and KHNP's technical assistance to suppliers contributed to winning the award.

KHNP shows true commitment to fulfilling its corporate social responsibility.



Awarded the Social Contribution Grand Prize for five consecutive years

KHNP won the Grand Prize in the regional social contribution sector for five consecutive years at the 2017 KCCI-Forbes CSR Award. KHNP's "Photovoltaic Power Safety Streetlights" project for street safety, "Happiness Plus, Hopeful Wings" project to improve learning environments for children, and "Health Keeper in Rural Areas" activities were all highly evaluated because they enhanced regional welfare and set the foundation for win-win growth.



KHNP signs OSSA for UAE nuclear power plant



In July 2016, KHNP signed an Operating Support Services Agreement (OSSA) with the Emirates Nuclear Energy Corporation (ENEC) to support the operation of the Barakah Nuclear Power Plant (BNPP). The \$600 million agreement is expected to create over 3,000 high-quality jobs.



KHNP hosts WANO General Meeting

In October 2017, KHNP hosted the General Meeting of the World Association of Nuclear Operators (WANO) in Gyeongju under the theme of "Leading Nuclear Safety in a Changing World." Lee Kwan-sup, CEO of KHNP and chairman of WANO, emphasized the need to reinforce safety standards at a global level through cooperation and to promote a positive perception of nuclear power.

KHNP establishes seismic safety action plans



Unaffected by the earthquake that struck Gyeongju in September 2016, KHNP's NPPs continued to operate safely. Nevertheless, KHNP has established a comprehensive seismic safety action plan comprising 21 tasks in four areas in an effort to build and operate safer NPPs.



KHNP achieves world's top performance in nuclear power plant operation

Through continued efforts in 2016 to strengthen facility and operation safety, KHNP achieved the following outstanding performance in NPP operation : world's lowest unplanned loss rate (1.29%) for three consecutive years, world's lowest number of unplanned auto-stops (0.2 cases/unit), and zero failures due to human error for five consecutive years.

* Unplanned loss rate : Ratio of energy losses due to unplanned events such as generator breakdowns

KHNP wins the Grand Prize in the public enterprise sector at the Korea Logistics Awards



KHNP was awarded the Grand Prize in the public enterprise sector at the 19th Korea Logistics Awards in May 2016. The award was given in recognition of KHNP's outstanding performance in procurement through efforts to improve the company's purchasing system and establishing a supply chain management system attuned to the NPP business.



Trusted Global Energy Leader

KHNP's aspirations go beyond being the country's largest power generator. We will take meaningful steps toward sustainable growth following our mid to long-term management strategies and our vision of building Korea into an energy powerhouse. Through a transparent governance structure and close communication with our stakeholders, KHNP will rise to become recognized as a "Global Energy Leader."



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Vision 2031 : KHNP's Management Strategy for
Becoming a Global Energy Leader

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Management Activities for National Growth and People's Happiness

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Governance Structure Ensuring Checks and Balances

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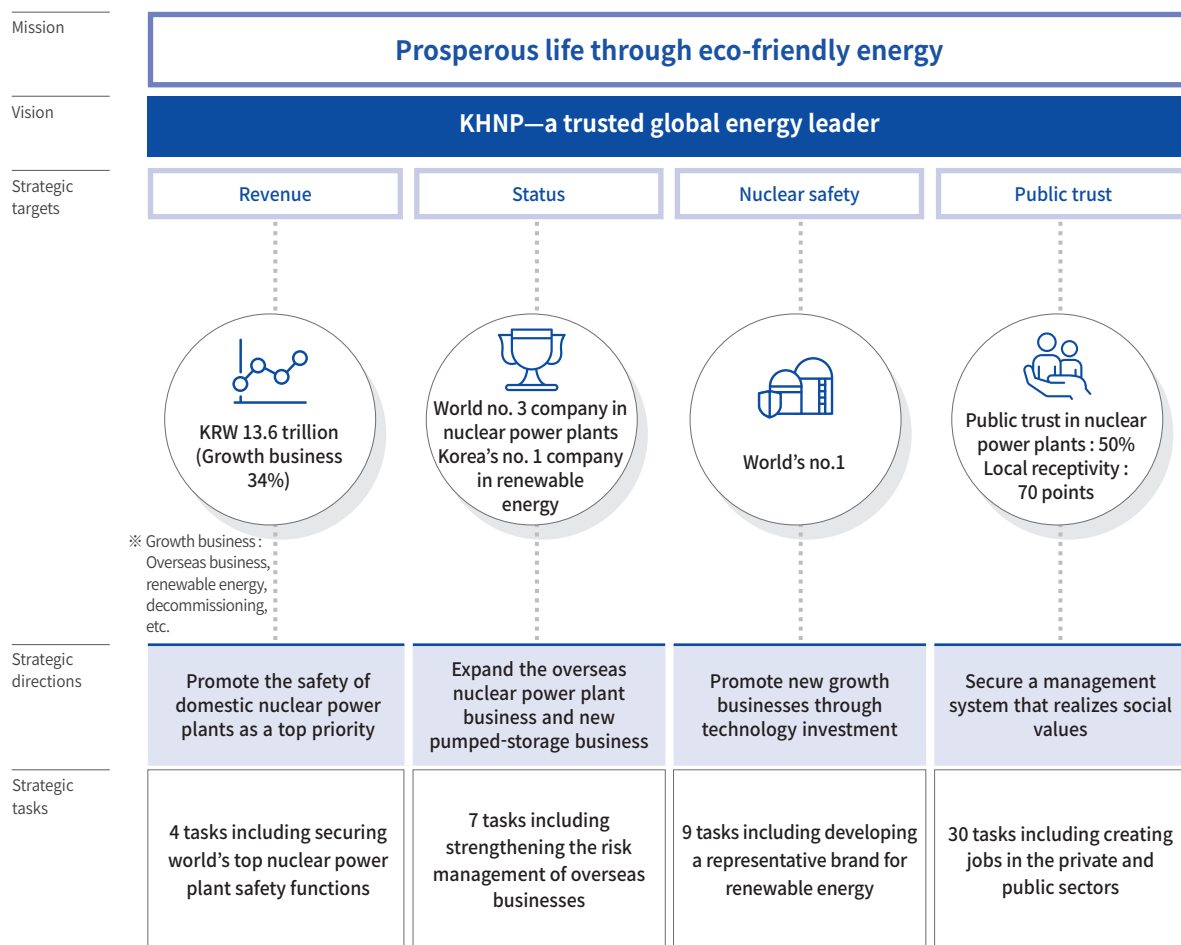
Sustainability Management Based on Stakeholder Communication

Vision 2031 : KHNP's Management Strategy for Becoming a Global Energy Leader

Mid to Long-term Management Strategy for the Future

In response to the rapidly-changing energy market and management environment in the face of the Fourth Industrial Revolution, KHNP has newly established its "2031 mid to long-term management strategy." Under the vision of becoming a "trusted global energy leader," the new management strategy encompasses specific targets such as KRW 13.6 trillion in sales, operation of 18 NPPs in Korea and 13 overseas, respectively, and becoming the world's no. 3 company in NPPs and Korea's no. 1 company in renewable energy. In order to attain these goals, KHNP will diversify its business portfolio centered on new growth businesses, such as overseas NPPs and renewable energy, and fulfill its social responsibilities as a public enterprise by effectively undertaking government projects, all while maintaining safety in operating its NPPs.






2031 Mid to Long-term Business Strategy



*2031 mid to long term management strategy is to reflect the 8th Basic Plan for Long-term Electricity Supply and Demand

Five Core Values

KHNP pursues its vision through the five core values of "T.R.U.S.T.," which encompass KHNP's determination to become an enterprise that wins the TRUST of the Korean public and all stakeholders. All of KHNP's employees fully share this goal and do their best to realize this vision.

Core values	Definition	Features	Performance in 2016
Technology 	Seeking to be the world's most competitive enterprise in the field by creating an environment that values and cultivates professionals, and making relentless efforts to develop and improve technologies to successfully accomplish our duty.	<ul style="list-style-type: none"> Value professionals Continued improvement efforts Pursuit to be the world's best 	<ul style="list-style-type: none"> Unplanned loss rate : 1.29% (As of the end of December 2016) Number of unplanned auto-trips : 0.2 cases/unit (As of the end of December 2016) Rate of decommissioning technology secured : 80% Attained RPS target for five consecutive years Industrial property rights : 265 Overseas business sales in 2016 : KRW 382.1 billion On-time completion of UAE business process : 76.2% UAE OSSA (for 10 years after completion of NPP #4) : \$600 million Secured hydro power business rights in Athmuqam, Pakistan
Respect 	Making an effort to understand and accept the different values and opinions of employees, including creating a corporate culture of participation and cooperation through open communication to achieve a common goal.	<ul style="list-style-type: none"> Acceptance of differences Open communication Participation and cooperation 	<ul style="list-style-type: none"> Grand Prize in the public enterprise sector at the 2016 Korea Logistics Awards Grand Prize in the shared growth sector at the 2016 Sustainability Management Awards Win-win finance support in 2016 : KRW 323.2 billion Direct purchasing of SME products in 2016 : KRW 782.3 billion
Ultimate Safety 	Promoting safety as the top priority in all decision-making and business affairs based on an accurate understanding of nuclear safety, and pursuing perfection in establishing safety management systems through continued improvement efforts.	<ul style="list-style-type: none"> Prioritize safety as the most important value Safety internalization Improvement of safety systems and processes 	<ul style="list-style-type: none"> Nuclear facility safety performance index : 99,924 points NPP construction industrial accident rate : 0.07% Safety Management Grand Prize at the 2016 Global Standard Management Awards Rated "excellent" in the 2016 National Cyber Attack Response Training ISO22301 certified for business continuity in Disaster and Safety Management
Social Responsibility 	Contributing to enhancing the quality of life through eco-friendly management by acting with a strong sense of responsibility toward the country and the public as a public enterprise and actively communicating with our stakeholders.	<ul style="list-style-type: none"> Emphasis on public interest Stakeholder engagement and satisfaction Eco-friendly management Corporate social responsibility activities 	<ul style="list-style-type: none"> Purchasing of eco-friendly products in 2016 : 90.7% Environmental performance index in 2016 : 285 points (11% higher than previous year) Grand Prize in corporate social contribution sector at the 1st Korea Crime Prevention Awards Social Contribution Grand Prize for Greatest Executive Leadership Prime Minister's Commendation in social contribution sector at the National Sharing Grand Award Commendation of the Minister of Interior and Safety for earthquake and typhoon relief
Timeless Integrity 	Maintaining fairness in all business affairs in accordance with principles and standards based on integrity and ethics, and establishing business processes that guarantee transparency.	<ul style="list-style-type: none"> Integrity Principles and standards Transparent business processes 	<ul style="list-style-type: none"> Presidential commendation as an exemplary enterprise in gender equality Certified for family-friendly management for six consecutive years Selected as most outstanding enterprise in human resource development for three consecutive years by the Ministry of Employment and Labor Rated Grade 1 in an integrity assessment Rated Grade 1 in an assessment of anti-corruption plans

Management Activities for National Growth and People's Happiness

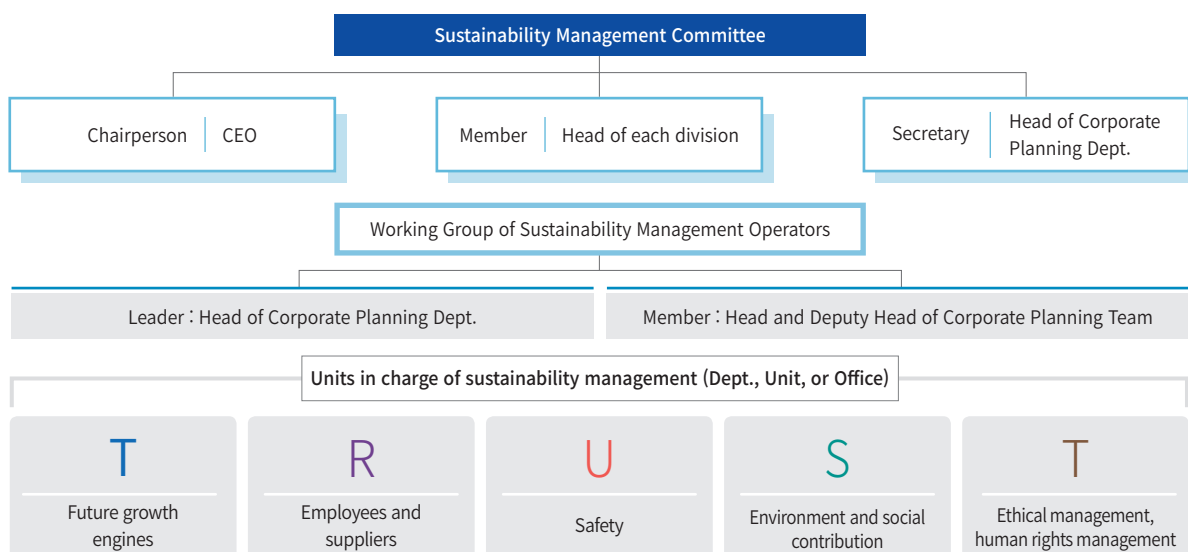
Sustainability Management Pursuing Five Core Values

KHNP operates under its sustainable management strategies with the goal to become a global energy leader that generates values in the economy, environment, and society. These strategies are rooted in “T.R.U.S.T,” the five core values of our 2030 mid-term management goals. KHNP fulfills its social responsibilities as it achieves key management goals and raises environmental and social performances by faithfully implementing sustainable management strategies.






Strategic Directions	Grow into a global energy leader contributing to national growth and public happiness by generating economic, environmental and social values				
	Technology	Respect	Ultimate Safety	Social Responsibility	Timeless Integrity
Tasks	<ul style="list-style-type: none"> Secure world-class NPP technology Expand overseas NPP projects Diversify business portfolio 	Employees <ul style="list-style-type: none"> Improve the organizational culture and create a GWP Cultivate professional manpower Suppliers <ul style="list-style-type: none"> Support shared growth 	<ul style="list-style-type: none"> Prioritize safe NPP operation first Improve the reliability of NPP facilities Enhance risk management capabilities to reassure the public 	Environment <ul style="list-style-type: none"> Strengthen the environmental management system Minimize environmental impacts Respond to climate change Society <ul style="list-style-type: none"> Implement social contribution activities 	<ul style="list-style-type: none"> Enhance the ethical management system Establish a culture of ethics and integrity Promote a culture of respect for human rights

Sustainability Management Organization

KHNP carries out consultation and decision-making on major sustainability management issues through the Sustainability Management Committee. To facilitate the execution of sustainability management, the Planning Team handles tasks such as sustainability reports, education, and an annual review of various initiatives. To maintain an effective communication system among the relevant departments—the operators for each area of “T.R.U.S.T”—we share information on key performance and conduct monitoring activities on a regular basis.



Major Sustainability Management Performances

	Indicator	Unit	2015 Results	2016 Results	2017 Targets
 Technology	R&D Investment	Billion KRW	3,236	4,185	4,945
	Overseas Sales	Billion KRW	3,196	3,822	3,386
	RPS Execution	GWh	2,161	2,440	2,661
 Respect	Labor-Management Relationship	Points	3.31	3.45	3.41
	HR Support (Including Atom Mentor)	Persons	48	51	50
	Overseas/Domestic Marketing Support	Cases	503	534	550
	Financial Support for SMEs	Billion KRW	867	1,099	1,150
	Performance Sharing Tasks	Cases	81	103	110
 Ultimate Safety	Unplanned Auto-Stop	Cases/Unit	0.13	0.16	0.31
	Radioactive Dose	Man-Sv/Unit	0.36	0.44	≤ 0.55
	Comprehensive NPP Safety Performance Index*	Points	99.858	99.924	100
	Operating NPP Safety Management Index	%	3.078	4.3	≤ 8.01
	Seismic Performance (new)	Cases	New	New	7
 Social Responsibility	Dandelion Spore Fund	Billion KRW	100	142	188
	Local community's receptivity	Points	54.7	56	56
	Environmental performance index	Points	257.6	285.9	314.5
 Timeless Integrity	Integrity index	Grade	2	1	1
	Assessment of Anti-Corruption Plans	Grade	1	1	1
	KHNP-BEX	Points	85.6	86.9	88.4

* Due to changes in calculation methods for the nuclear facility safety performance index, the 2015 results and 2016 targets show different figures compared to the previous report.

Governance Structure Ensuring Checks and Balances

Composition of the BOD

The Board of Directors (BOD) is the supreme decision-making body of KHNP : it not only reviews major management strategies but also supervises overall business operations. The BOD, which may have up to 15 directors, is composed of six executive directors and seven non-executive directors as of December 31, 2016. The BOD guarantees a three-year term for the CEO and a two-year term for other directors and allows them to serve consecutive terms on a yearly basis : this encourages responsible decision-making and pro-active participation in management activities. The independence of the BOD is ensured by electing the chairperson among non-executive directors and having non-executive directors make up the majority of the BOD according to relevant regulations.

Operation of the BOD and Subcommittees

The BOD makes decisions on management activities in line with government policies, matters stipulated by the relevant laws and regulations or the articles of association, and important matters regarding basic corporate principles and business execution. Six subcommittees are operating under the BOD : they offer management consultation and professional support, facilitating the operational efficiency of the BOD. The BOD convenes at regular meetings according to an annual plan and responds to urgent matters by holding ad hoc meetings as necessary.

Executive Directors

Name	Position
Lee, Kwan-sup	President & CEO
Nam, Joo-Sung	Auditor General
Jun, Young-taik	CFO & Executive Vice President
Jun, Hwee-Soo	CNO & Executive Vice President
Yoon, Cheong-ro	Executive Vice President of : Quality & Safety Division
Lee, Yong-Hi	Executive Vice President of Project Division

Non-executive Directors

* Upon expiration of their term, executives perform their duties until the appointment of a replacement.

Name	Position	Term
Cho, Seong-hee	Director of Research Council of Energy and Resources Industrial Development	~ Oct. 16, 2016
Ryu, Seung-kyu	(Former) Member of the 13 th and 14 th National Assembly	~ Mar. 14, 2017
Lee, Jin-ku	(Former) 4 th and 5 th Chairperson of the Gyeongju-si Assembly	~ Feb. 21, 2018
Cho, Seong-jin	Professor at Kyungsoong Univ.	~ Sept. 28, 2018
Lee, Sang-jick	Non-executive Director of the Korea Institute for Advancement of Technology	~ Sept. 28, 2018
Seo, Joung-hae	Dean of Business Administration at Kyungpook National University	~ Sept. 28, 2018
Kwon, Hae-sang	(Former) Minister of the Korean Mission to the OECD	~ Feb. 21, 2019

Subcommittees and Expert Groups

Categorization	Composition	Role	Major Activities in 2016
Audit Committee	1 executive 2 non-executives	Audit of business and accounting	<ul style="list-style-type: none"> 11 meetings and deliberation sessions Established annual audit plans and reported on self-audit results Site-centered communication activities with on-site department employees (4 times, 8 offices)
Executive Recommendation Committee	4 non-executives 2 external experts	Recommendation of executive candidates	<ul style="list-style-type: none"> 8 meetings Conducted screening of CEO with expired term, executive auditor, and non-executive candidates
Non-executive Directors Committee	7 non-executives	Discussion of BOD operation	<ul style="list-style-type: none"> Discussed means to promote the BOD's activities and operational efficiency by holding video conferences on a regular basis
Financial Management Expert Group	1 executive 2 non-executives	Consulting on finance & management	<ul style="list-style-type: none"> Consultation on mid to long-term financial plans and management goals Made suggestions on management efficiency including the adjustment of functions of the public enterprise, financial soundness, and liability reduction
Press Relationship Expert Group	1 executive 2 non-executives	Consulting on PR	<ul style="list-style-type: none"> Made suggestions for regional PR activities and corporate branding following the relocation of the Head Office
Local Community Development Expert Group	1 executive 2 non-executives	Consulting on regional & civil complaints	<ul style="list-style-type: none"> Requested strategic CSR activities based on a selection and concentration strategy (Residential environment improvement project, etc.) Requested a re-examination of a win-win cooperation project in Gochang and initiation of specialized regional projects

Fair and Transparent Appointment

The Executive Recommendation Committee is composed of non-executive directors and external experts to ensure its independence and transparency. The Committee selects candidates for the CEO, the executive auditor, and non-executive directors through fair procedures. The Committee conducts a thorough review of the candidates' qualifications, selects professionals in relevant fields who have no conflicts of interest with KHNP, and then makes the final recommendations to the Management Committee. The CEO and the executive auditor are appointed by the President upon the resolution of the General Meeting of Shareholders and the request of the Minister of Trade, Industry and Energy. Non-executive directors are appointed by the Minister of Strategy and Finance; executive directors are appointed by the CEO at the General Meeting of Shareholders with no separate recommendation procedure.

Non-executive Directors' Professionalism and Communication

Non-executive directors check and monitor activities of the management. Non-executive directors who have special interests in a specific agenda item are not entitled to exercise their voting rights. Seven non-executive directors who account for the majority of the BOD are professionals with extensive experience in the fields of business operation, corporate management, media, and community relations. They monitor and provide consultation on important matters relating to KHNP's business management. To facilitate better understanding of KHNP's businesses for newly nominated non-executive directors, they are invited to domestic and overseas power plants and capacity-building workshops.

Operation of the BOD

	Unit	2014	2015	2016
No. of meetings	Times	10	9	11
Resolved agendas	Cases	50	58	48
Rate of preliminary reviews	%	100	100	100
Amended and resolved items	Cases	2	2	1
Reported agendas	Cases	16	13	14
Attendance rate	%	94	97	92

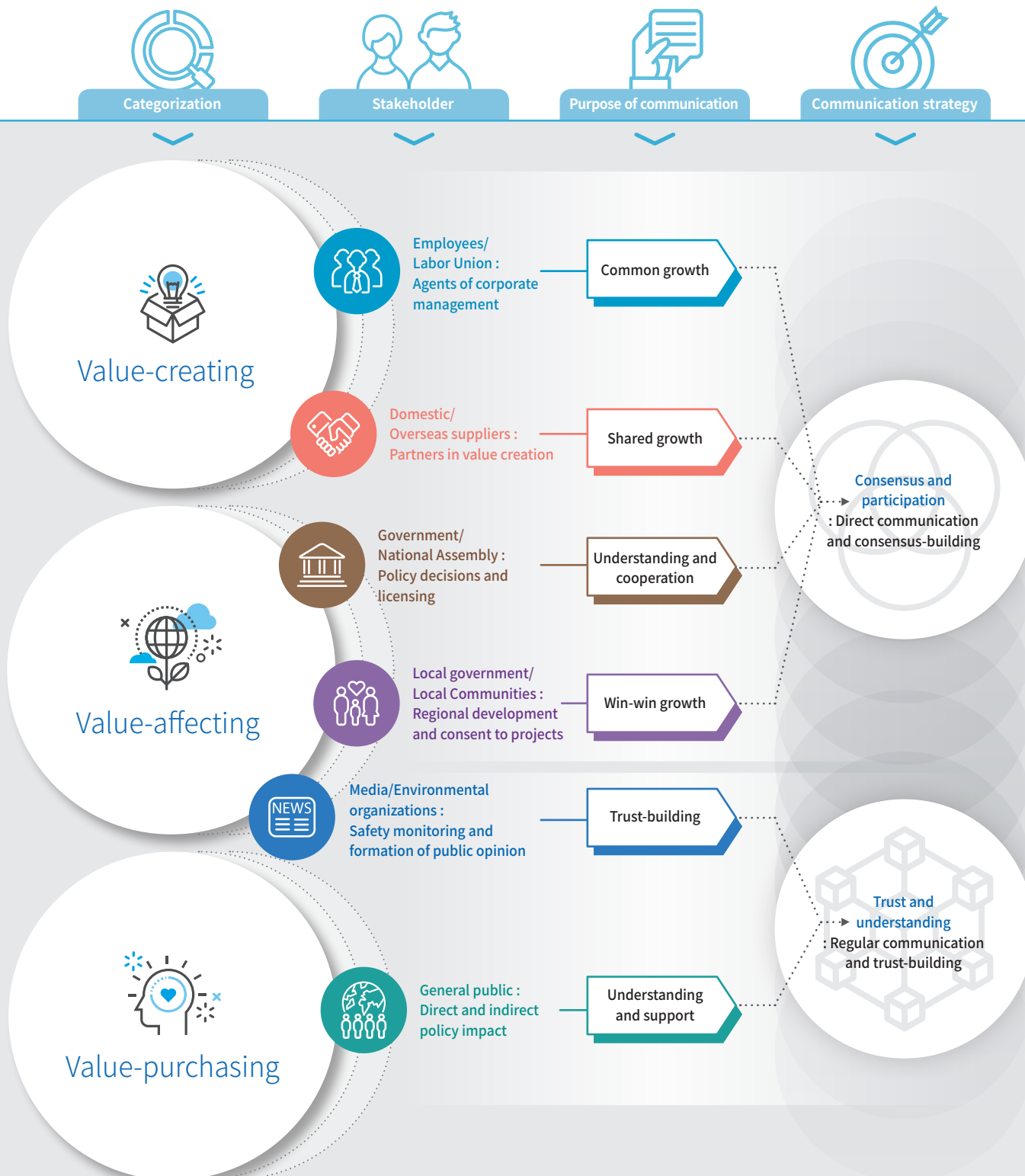
Remuneration and Compensation

The BOD remuneration limit complies with "Executive Wage Guideline" that the Minister of Strategy and Finance established through deliberation and conclusion of the Management Committee, and upon resolution by the General Meeting of Shareholders. The total remuneration of the directors in 2016 is approximately KRW 1.26 billion, and the remuneration for each director is dependent on a regular executive performance evaluation. The kind, basis, and total amount of remuneration of executive directors who receive remuneration above criteria are disclosed separately to ensure transparency.

	No. of members	Unit	Total Remuneration	Remuneration per Member	Remarks
President & CEO	1	Thousand KRW	222,620	222,620	CEO
Executive Director	5	Thousand KRW	831,625	166,325	
Non-executive Director	7	Thousand KRW	210,000	30,000	KRW 2.5 million per month for service allowance

Sustainability Management Based on Stakeholder Communication

In pursuit of sustainability management that enables our stakeholders to grow with us, we pay close attention to their concerns and reflect them in our sustainability management activities.



For systematic communication, KHNP categorizes stakeholders into six groups under three types—“value-creating,” “value-influencing,” and “value-purchasing”—according to the flow of stakeholder values. KHNP then establishes communication strategies and purposes based on this planning. KHNP collects stakeholder opinions through communication channels for each group and actively reflects them in its management activities.



Creating a Participatory Culture through Stakeholder Interviews

Stakeholder Interviews

Through stakeholder engagement, KHNP continues to grow as an enterprise trusted by the public. We have interviewed professionals in their respective fields to gather stakeholder opinions on our sustainability management activities for each of our five core values of “T.R.U.S.T.”



Professor Chung Bum-Jin
(Department of Nuclear Engineering,
Kyunghee University)

“KHNP needs higher technological competitiveness, more human resources, and a wider global network to be the world’s TOP enterprise.”

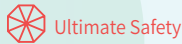
Korea has pursued a “mid & entry strategy” to achieve the early acquisition of nuclear technologies. As a result, we localized nuclear technologies in a short period of time and have reached a level where we can domestically develop NPPs. However, there is a dearth of basic resources on nuclear power. In order for KHNP to become a dominant player in the world market, it needs to actively invest its resources in acquiring technologies. Securing more professionals in the field of nuclear power and strengthening its global network are also instrumental for successfully operating NPP businesses in all areas including construction, operation, and sales. Employees must play an active role in establishing and executing sustainability management strategies and finding means to expand businesses abroad. KHNP is at a point where it needs to look beyond the present and prepare for the future with a strong vision.

“KHNP must build a sustainable industrial ecosystem through shared growth policies in preparation for changes in industry trends.”

Thanks to KHNP’s “Process Innovation Support Project,” KOWEL Co., Ltd. was able to achieve 111% of its target productivity. We have also made our way into the UAE market through the Korea Nuclear Partners (KNP), a cooperative group consisting of KHNP and its suppliers. KHNP pays close attention to suppliers’ concerns by holding seminars on a regular basis. Through these efforts, I believe KHNP is doing very well in terms of pursuing shared growth with its suppliers. I do, however, want to stress the importance of continuity in KHNP’s shared growth efforts. By being prepared for future changes in industry trends, KHNP will be able to continue its shared growth efforts even in the face of various policy changes. I hope to see KHNP become a sustainable company that grows hand in hand with its suppliers as a leading public enterprise.



President Sung Chang Won
(KOWEL Co., Ltd.)



Ultimate Safety



Chief Oh Jung-Yeon
(KEPCO E&C Nuclear Division,
KEPCO E&C)

“I hope to see KHNP enhance the safety of its nuclear power plants by promoting manufacturers and securing engineering professionals.”

By conducting thorough pre-inspections of NPPs and gathering feedback, KHNP is actively responding to changes in the regulatory environment, while making continued efforts to secure their safety against natural disasters such as earthquakes. While it is true that design and manufacturing technologies are more important now than ever due to stricter regulatory requirements, the loss of experienced technical professionals following various changes in the NPP business should also be considered an important factor that may have a significantly negative impact on securing human resources. In this regard, KHNP must come up with diverse human resource development policies to attract talent. It must also secure globally competitive design and manufacturing technologies by identifying the technological vulnerabilities of domestic NPP manufacturers and providing institutional support. I hope that KHNP will grow into a sustainable company with a globally competitive level of NPP safety through strict on-site management and supervision as well as efforts to secure and cultivate talented individuals.

“The Happiness Plus, Hopeful Wings Project provides support to children in need of care in the local community.”

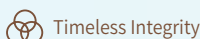
The Korea National Council on Social Welfare (SSN) has been undertaking the “Happiness Plus, Hopeful Wings” project, a part of KHNP’s corporate social responsibility program intended to provide support to local childcare centers. Since 2012, the project has donated school buses and improved library facilities in local childcare centers. It has also provided various cultural experience programs, play activities, and reading activities for local children. As of the end of 2016, KHNP has donated 260 school buses to childcare centers nationwide and built libraries in 143 of them. Children from these childcare centers have accomplished many achievements including performing in orchestras and participating in reading debates. SSN will hold contests to develop more efficient educational programs for children so that we can continue to deliver more hopes and dreams to children in need, spreading KHNP’s core value of social responsibility by building a safer, happier world.



Social Responsibility



Chief Mo Ok-Hee
(Korea National Council on
Social Welfare, Social Service
Network Dept.)



Timeless Integrity



Chief Yun Soong-Ho
(Head of Planning Team,
Corporate Planning
Department, KHNP)

“KHNP needs to make continued efforts to improve its human rights management system and build a wider consensus.”

As a result of KHNP’s relentless efforts to create a corporate culture of integrity, it was rated Grade 1 in the anti-corruption initiative assessment and the integrity assessment by the Anti-corruption and Civil Rights Commission in 2016. In line with the government policies, KHNP recently obtained the ISO 37001 certification, proving the effectiveness of its ethical norms and systems. Furthermore, it seeks to expand its culture of ethics by re-establishing its ethical management goals and strategies, as well as strengthening anti-corruption activities and educational programs in response to the Improper Solicitation and Graft Act. Internally, KHNP has designated organizations in charge of establishing its human rights management system, undertaken self-assessments in ten areas, and devised human rights policies including anti-discrimination in employment. Notably, it established the Charter of Human Rights Management, proclaiming its commitment to respect for human rights, and has already laid the foundation for a wider consensus on human rights management and a human rights-friendly corporate culture.

Sustainability Issues

KHNP manages sustainability management issues based on our five core values of “T.R.U.S.T.”

Based on advanced “Technology,” we will “Respect” our stakeholders, place the utmost importance on “Ultimate Safety” as a corporate citizen fulfilling our “Social Responsibility” and practicing a culture of “Timeless Integrity.”



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Core Sustainability Management Issues

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Technology

KHNP's Technological Capacity Leading the Future

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Respect

KHNP, Realizing the Value of Shared Growth

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Ultimate Safety

KHNP, a Corporation Built on Safety and Trust

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Social Responsibility

KHNP, Building a Clean Future

KHNP, Building an Inclusive and Happy Society

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Timeless Integrity

KHNP, a Corporation of Integrity and Ethics

KHNP, Building a Culture of Respect for Human Rights



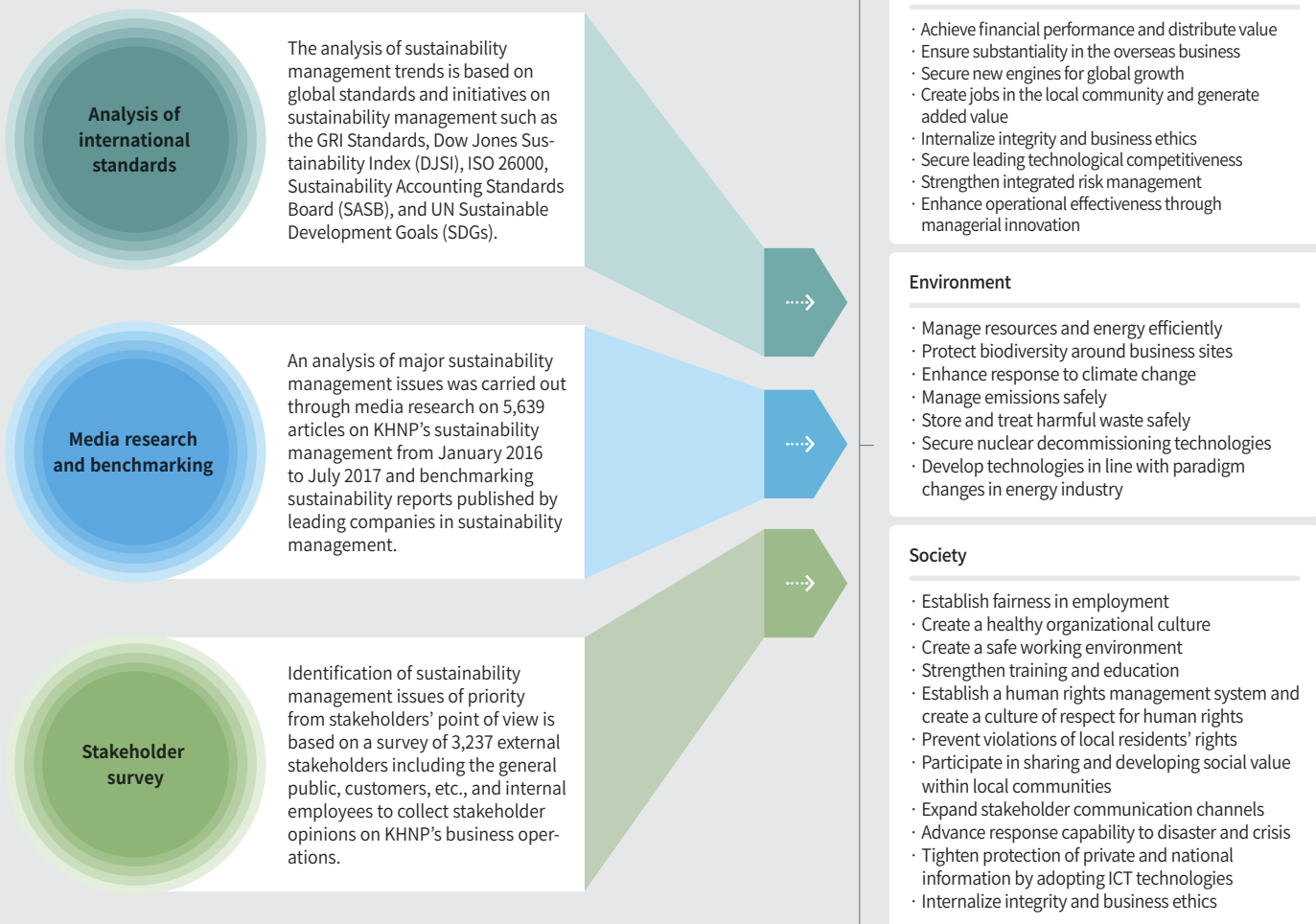
Core Sustainability Management Issues

To successfully execute sustainability management, it is important to identify stakeholder interests and industry trends, draw core issues, and then manage and report on them. In this regard, we conducted a materiality analysis to identify core issues.



Step 1 Form a Sustainability Management Issue Pool

An issue pool of 26 sustainability management issues was formed, covering economic, environmental, and social areas through an analysis of international standards on sustainability management, media research, and an internal and external survey.



Among the numerous sustainability management issues, those with high relevance to the energy industry and KHNP's businesses as well as those of interest to stakeholders were drawn as core issues through a step-by-step assessment. This assessment process was undertaken in accordance with the principles of the Global Reporting Initiative (GRI) Standards and encompassed stakeholder inclusiveness, sustainability context, materiality, and completeness.



Step 2 Conduct a Materiality Analysis

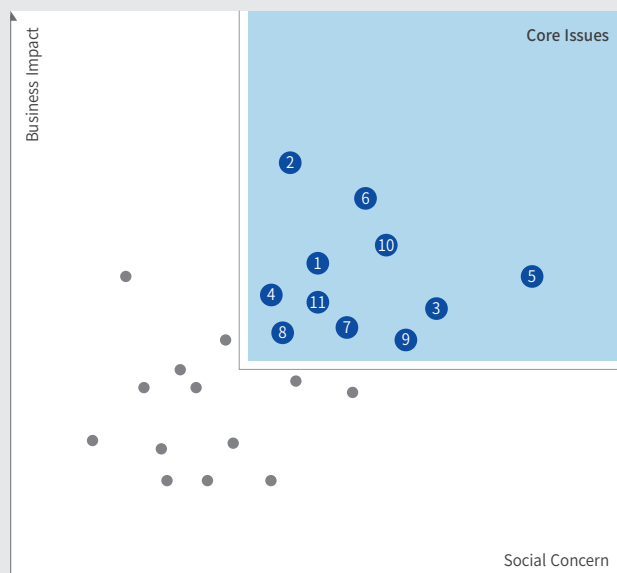
Core issues were drawn upon review by sustainability management experts and KHNP's working-level employees, in consideration of their social importance.

Social Concern

Impact of each issue on external stakeholders' activities and decision-making, and their interest in each issue.

Business Impact

Order or priority based on internal strategies to identify relevance between management strategies and CSR issues, and impact on business.



Step 3 Determine Core Reporting Issues

As a result of the materiality analysis, 11 core issues were drawn which were categorized and organized into the following list in accordance with the GRI Standards Core reporting format.

No.	Core Issues	GRI Standards	List
1	Ensure substantiality in overseas businesses	Topic 201 : Economic performance	Technology
2	Secure new engines for global growth		
3	Promote genuine shared growth with suppliers	Non-GRI	Respect
4	Expand stakeholder communication channels		
5	Create a safe working environment	Topic 403 : Industrial safety and health	Ultimate Safety
6	Advance response capability to disaster and crisis		
7	Enhance response to climate change	Topic 305 : Discharge	Social Responsibility
8	Store and treat harmful waste safely	Topic 306 : Wastewater and waste	
9	Develop technologies in line with paradigm changes in the energy industry	Non-GRI	
10	Participate in sharing and developing social value within local communities	Topic 413 : Local community	Timeless Integrity
11	Internalize integrity and business ethics	Topic 205 : Anti-corruption	

Technology

KHNP's Technological Capacity Leading the Future



The world's first third-generation
pressurized water reactor

Completed
the construction of

APR1400

(Korean new light
water reactor)



Timely execution of
the UAE business

76.2%



Signed an Operating Support
Services Agreement (OSSA)
with the UAE

\$600million

(Expected to yield profit
for the next 10 years)

in Athmuqam,
Pakistan

Won hydro power
**Business
Rights**



Report Context

Leading nuclear power plant (NPP) companies around the world are carrying out relentless efforts to develop safe and efficient core technologies, in addition to securing new growth engines for the future. They are strategically expanding the low carbon power supply in line with government policies, while securing decommissioning technologies in a timely manner and striving to converge existing technologies with those of the Fourth Industrial Revolution. In Korea, more companies are expanding their businesses into overseas markets based on the technologies and experiences they accumulated through the domestic NPP business. KHNP's expansion into the global market, in particular, is expected to enhance profitability and contribute to promoting Korea's status in the world market by overcoming the limits of the domestic electricity market.

Our Progress

KHNP focuses on technology development in accordance with four major strategic directions: enhancing nuclear safety, creating growth engines, securing stability in the power supply, and promoting facility reliability. In particular, KHNP is concentrating its resources on developing technologies that will enhance the safety of its NPPs against severe accidents, while building a solid foundation for expanding its businesses into the renewable energy field. Since exporting four Korean light water reactors (APR 1400) to the UAE in December 2009, KHNP stands as the only company the world to carry out the construction of four units simultaneously. As of the end of 2016, 76.2% of NPP construction in the UAE has been completed and KHNP has secured a source of long-term profit in the overseas market by signing an operating support services agreement (OSSA).

Our Plan

In line with its mid to long-term business strategy until 2031, KHNP will strengthen its business capacity and expand its new energy businesses to realize its vision of becoming a "trusted global energy leader." In preparation for the future of the electric power industry, KHNP will place more importance on new businesses such as photovoltaic and wind power, diversify its business portfolio and pursue NPP construction deals in foreign markets. KHNP will strengthen export competitiveness by diversifying its business models in decommissioning and construction operation technologies, while actively adopting technologies of the Fourth Industrial Revolution technologies to become a global energy leader.

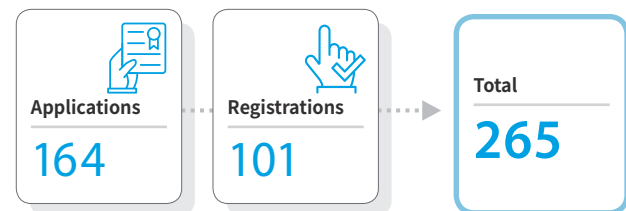
Lead World-class NPP Technology Development





R&D Plans

R&D Strategy System

In order to achieve its R&D vision, KHNP is strengthening its core competency in line with four major R&D strategies: enhancing nuclear safety, creating growth engines, securing stability in the power supply, and promoting facility reliability. KHNP will take a step-by-step approach in securing technologies in 14 major areas including safety enhancing technologies, with the goal of commercializing them. The company will also conduct joint research with the U.S. Electric Power Research Institute (EPRI), promoting performance-oriented R&D through a selection and concentration approach.

Industrial Property Rights Status in 2016



R&D Vision	Lead Global Top-Class Nuclear Power Plant Technology Development (Global Top Nuclear Energy Tech-Value Creator)			
Strategic	 Enhance nuclear safety	 Generate growth momentum	 Secure safety in the power supply	 Raise facility reliability
Main Technology	1. Safety enhancement 2. Radiation safety management 3. Response to natural disasters	4. Export NPPs 5. Decommissioning 6. Hydro power and pumped-storage 7. Renewable energy	8. Operation 9. Construction	10. Material degradation evaluation 11. Raise equipment reliability 12. Hydrochemistry 13. Inspection and equipment 14. Hydro power facility management
Major Performance	<ul style="list-style-type: none"> Established the NPP situation room Exceeded 10,000 cases of on-site technical assistance 	<ul style="list-style-type: none"> Implemented tasks reflecting proposals from the general public 	<ul style="list-style-type: none"> Promoted open innovation through industry-academic and SME cooperation 	<ul style="list-style-type: none"> Engineering standardization Established a comprehensive CGID system

Strengthening competitiveness in Korean NPP technologies

APR 1400 is a domestically-developed third generation pressurized light water nuclear reactor. KHNP succeeded in the commercial operation of APR 1400, the first among other competing third generation models including those from the U.S. and France, thus proving the excellence of Korea's technologies and construction capabilities. With KHNP's extensive experience and technological superiority, it can construct NPPs with 40% higher capacity, while dramatically reducing the frequency of core degradation and strengthening seismic design standards. KHNP has signed an agreement to construct four NPP units in the UAE and has utilized its vast experience and knowledge in NPP construction to build a sustainable business foundation. On August 14, 2014, KHNP obtained the standard design certificate from the Nuclear Safety and Security Commission for the next generation reactor APR+, seven years after launching its development in August 2007. Based on Korean standard NPP OPR 1000 and the Korean new light water reactor APR 1400 exported to the UAE, the APR+ has been upgraded in terms of its structural safety.



Securing Momentum for Future Growth through Renewable Energy Business

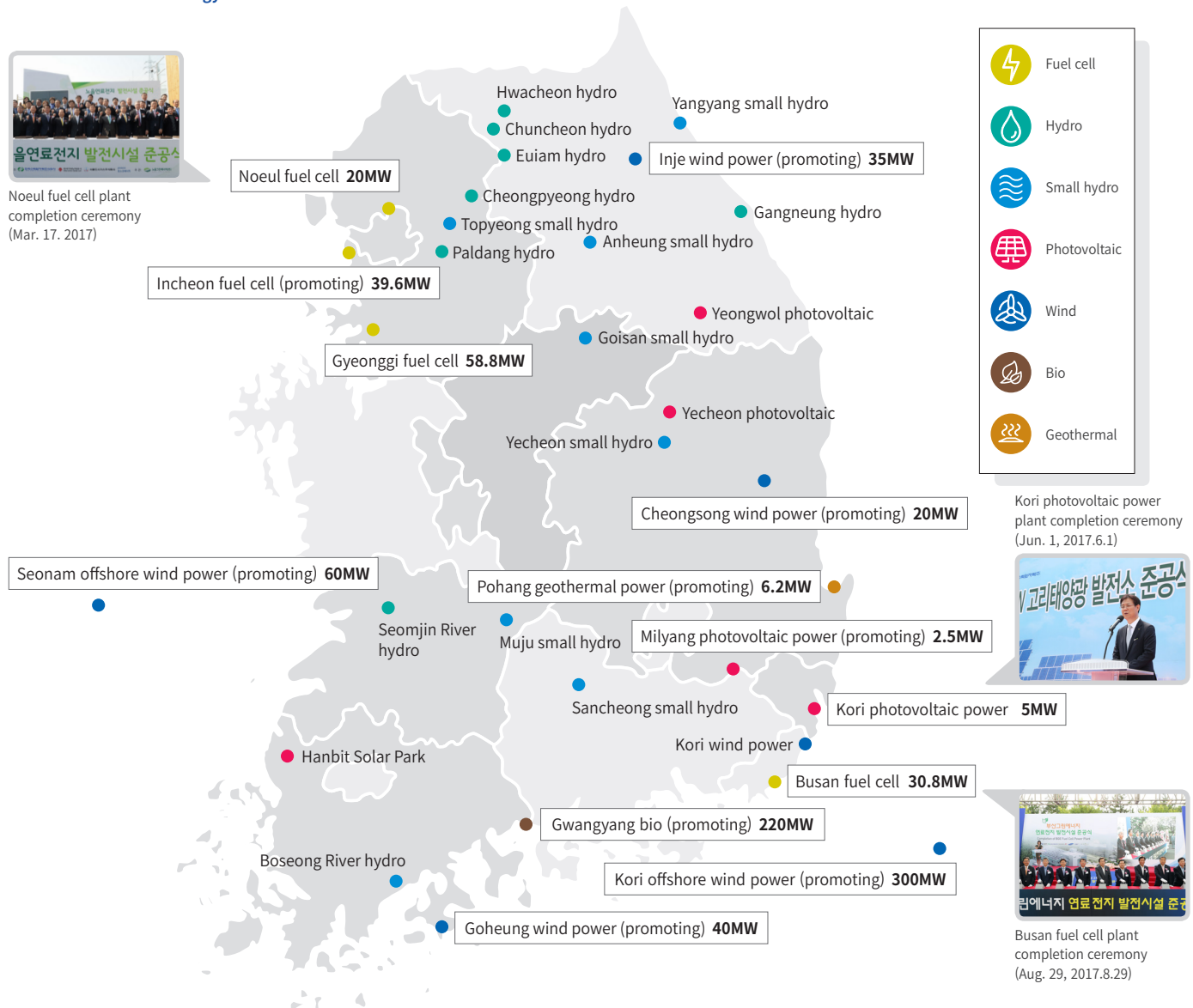
Developing New Energy Businesses

Implementation System

By meeting the government's policy demands and being at the forefront of implementing government policies, KHNP is actively developing new businesses in renewable energy. In 2017, the company formed the foundation for promoting renewable energy businesses by expanding and elevating the status of the former New Energy Project Office to the New Energy Project Department.

KHNP will continue to play an active role in implementing government policies regarding renewable energy by making organizational adjustments and expanding investments in this area to strengthen the momentum for its future growth, all the while providing a stable supply of electricity to the Korean public.

KHNP Renewable Energy Business Status






Major Performance in Each Strategic Task

Implementation of Government Policies | In implementing government policies to promote educational welfare and address energy blind spots in our society, KHNP has established a special purpose company for photovoltaic and energy efficiency. Domestically, it actively promoted government policies in the local community, helping increase local residents' understanding of related issues. Internationally, KHNP carried out various efforts to export renewable energy resulting in the winning of hydro power plant business rights in Pakistan.

KHNP-initiated Tasks | KHNP is constructing photovoltaic power plants on unused land for its NPPs and on the rooftops of its hydro and pumped-storage power plants. With the goal of completion in December 2017, KHNP is in the process of installing a 545kW photovoltaic system on the rooftops of its five business sites.

It also actively undertook internally-initiated tasks such as replacing 25 corporate cars with electric cars, installing 14 charging stations, and adopting the energy storage system (ESS) in 2016.

Investment in Renewable Energy | In line with government policies on promoting renewable energy, KHNP is undertaking measures to produce eco-friendly electric power. First of all, the company assesses the validity of new businesses such as photovoltaic power, wind power, and fuel cells by conducting thorough site inspections and economic feasibility analyses. Afterwards, it holds conferences with local residents in a bid to resolve their complaints or concerns regarding license application.

	Implementation of government policies	KHNP-initiated tasks	Investment in renewable energy
			
Project name	<ul style="list-style-type: none"> Establishment/Financing of SPC : Photovoltaic power in schools project, Energy efficiency project, New electric power business fund Strategic promotion of government policies Export of renewable energy (e.g., hydro) 	<ul style="list-style-type: none"> Photovoltaic power generation Advanced glass greenhouse demonstration Development of a Lithium-ion battery standard for NPPs Purchasing of electric cars, installation of charging stations, and establishment of ESS Construction of zero-energy buildings Adoption of seawater desalination facilities 	<ul style="list-style-type: none"> Goheung/Cheongsong wind power, Seonam offshore wind power Incheon fuel cell New fuel cell Pohang geothermal Korea photovoltaic power generation Gwangyang biomass
Major performance	<ul style="list-style-type: none"> Established and financed SPC (KRW 41.7 billion) Secured local receptivity by promoting understanding Secured hydro power plant business rights (350MW) in Athmuqam, Pakistan 	<ul style="list-style-type: none"> Began construction of rooftop photovoltaic systems (5 business sites / 545kw) (Mar. '17) ESS (8 units / 6MWh / Completed in Dec. '16) Electric cars and charging stations (25 cars, 14 stations / Aug. '16) Fast chargers (17 units / Completed in Feb. '17) Established zero energy building plans (Nov. '16) Promoted new business convergence projects (83 times) 	<ul style="list-style-type: none"> Kori photovoltaic (KRW 7.1 billion / Completed in Jun. '17) Samnangjin photovoltaic (validity exam / Oct. '16) Seonam offshore wind power (financed KRW 4.5 billion / May. '16.) Cheongsong/Goheung wind power (shareholder agreement / Mar. '17.3) Noeul/Busan fuel cell (financial agreement / '16.6) Pohang geothermal (launched field test stage 2 / '16.6) Gwangyang biomass (BOD resolution / Aug. '16)

Expanding into the Global Market

Expanding Overseas Businesses

Expanding the Nuclear Power Plant Business

KHNP has started tapping into the European market and is already participating in the NPP business in the Czech Republic. Using its wide-ranging technologies and extensive experience in the NPP business, KHNP is expanding into overseas markets by diversifying its business portfolio. In 2016, KHNP established an organization in charge of the NPP deal in the Czech Republic and seconded an employee to provide support from the local unit. The company prepared and submitted the preliminary bid for the Czech NPP in cooperation with relevant organizations. KHNP also provides training, supplies equipment, and offers technical support to NPP operators in China and Canada. This is made possible by its superior technologies in NPP operation and maintenance. In 2016, KHNP undertook a project in China providing construction technology support for Yangjiang #5 and 6, in addition to signing two contracts for NPP operation/maintenance and training/education for Chinshan NPPs. Finally, KHNP has strengthened its business capacity by forming strategic partnerships with Switzerland, Belgium, and Ukraine, exploring various export channels.

Diversifying Overseas Businesses

The global hydro power market is expected to grow to 722GW by 2035. In its pursuit of businesses overseas, KHNP has established customized strategies for each country in consideration of the differing investment environments. In October 2016, KHNP succeeded in signing a hydro power plant contract (350MW) in Athmuqam, Pakistan, the largest scale service to be ordered by a Pakistani government agency. Such an achievement was made possible by the collaboration of KHNP and a private company, each contributing its technologies in power plant operation and extensive construction experience, respectively. In order to contribute to the export of domestic businesses as a global company, KHNP will continue to work closely with domestic companies in pursuing hydro power businesses overseas.

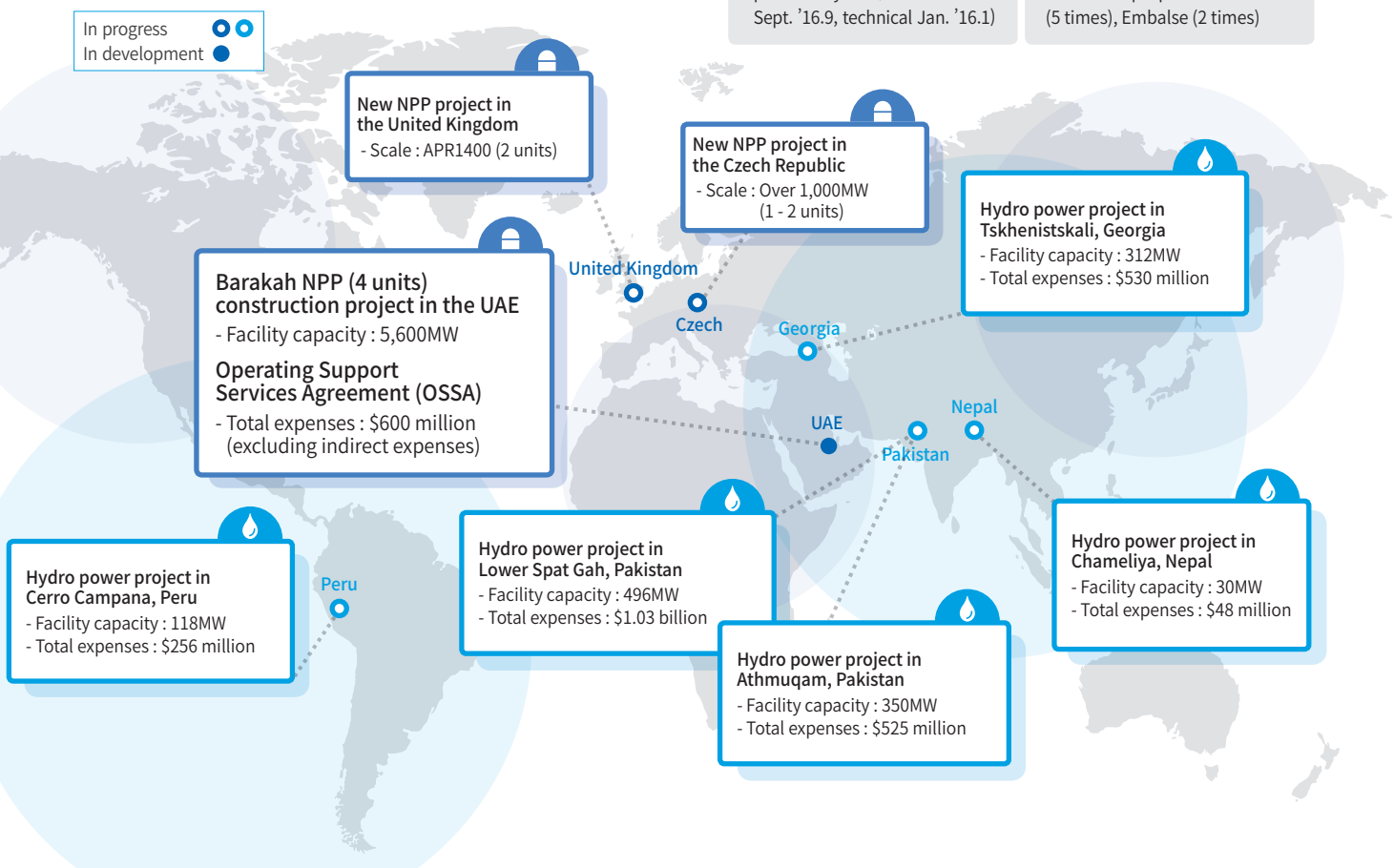
Key Performance in Overseas Business

Nuclear power plant in the Czech Republic

- Submitted written intention of participation (Jul. '16.7) and preliminary bid (commercial Sept. '16.9, technical Jan. '16.1)

Construction and operation technologies

- Sales : Yangjiang #5, 6 (\$0.9 million), Chinshan NPP (\$60,000)
- Submitted proposal: CNNO (5 times), Embalse (2 times)



Successful Completion of a NPP Project in the UAE and Major Performance

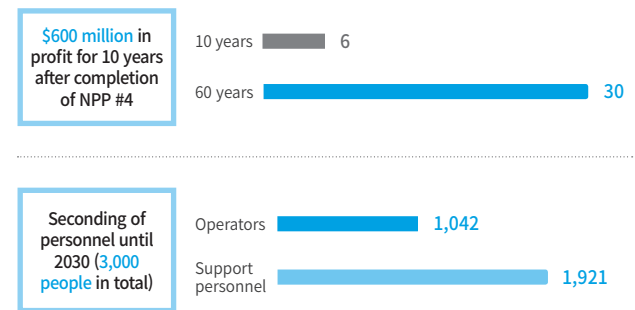
Successful Construction and Trial Operation of a Nuclear Power Plant

In 2009, Korea's KEPCO consortium led by KHNP won the bid to build NPPs in Barakah, UAE, triumphing over the world's most advanced nuclear competitors including the U.S., France, and Japan, thanks to KHNP's competitiveness in its APR 1400 nuclear reactors. By winning this bid, KHNP contributed to Korea's first export of NPPs and has made Korea the sixth nation in the world to export NPPs overseas. Since embarking on construction in 2010, 76.2% of construction has been completed as of the end of 2016. In the case of the first NPP in Barakah, construction and trial operation have almost been completed. Fuel cell installation and power ascension testing is expected to be carried in 2018. The construction and trial operation of Units 2 to 4 will take place successively, with the goal of completing the entire project in 2020.

After completing the construction of Unit 4 in 2020, KHNP will second a maximum of 440 qualified NPP operators and other operating personnel each year until 2030. Furthermore, KHNP will explore new areas of long-term cooperation with the UAE such as operation-related purchasing, quality management, and technical assistance, to generate additional profits.

Operating Support Services Agreement (OSSA) with the UAE

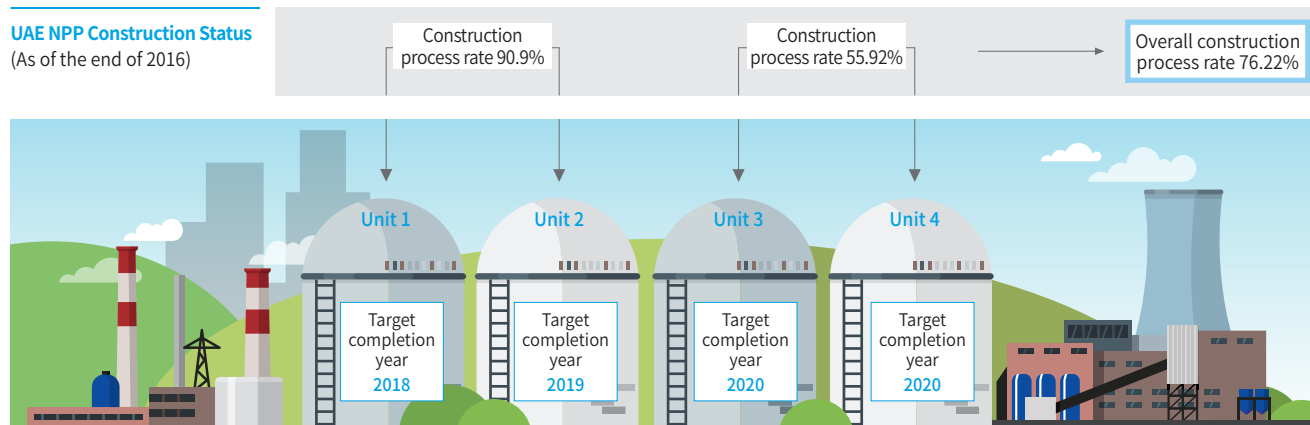
(Unit : \$ 100 million, people)



Operating Support Services

By signing a \$600 million (excluding indirect expenses) operating support services agreement (OSSA) with the UAE in July 2016, KHNP accomplished the historic feat of exporting operation services in the amount of KRW 1 trillion for the first time in the history of NPPs.

UAE NPP Construction Status (As of the end of 2016)



UAE NPP Business Status

Major Events

Signed the main contract for the UAE NPP project	December 2009
Undertook foundation excavation for the main building	September 2011
Obtained a construction license for #1 and 2	July 2012
Undertook the first concrete casting for reactor #1	July 2012

Date

Major Events

Installed reactor #1	May 2014
Undertook initial energization for reactor #1	March 2015
Undertook a cold hydraulic test	February 2016
Loaded nuclear fuel in reactor #1	May 2018
Completed construction of reactor #1	December 2018

Date

Respect

KHNP, Realizing the Values of Shared Growth

in the Public Enterprise
Sector at the 2016 Korea
Logistics Awards

Awarded the
Grand Prize



in support of
win-win finance in 2016

KRW **323.2** billionKRW



in the Shared Growth
Sector at the 2017
Sustainability
Management Awards

Awarded the
Grand Prize



in direct purchasing of
SME products in 2016

KRW **782.3** billionKRW

Report Context

Changes in the global business environment and the convergence of industries caused by the acceleration of technological development have blurred the notion of individual companies, leading to the emergence of a corporate ecosystem where business players “grow together.” Social demands are also rising for companies to fulfill their social responsibilities and government policies are calling for companies to pursue shared growth. To succeed, companies must perceive the growth of their suppliers as their own growth, while establishing a virtuous cycle in which companies grow together with their suppliers by providing diverse forms of support and cooperation.

Our Progress

Through its shared growth implementation system, KHNP makes various efforts to create a sound business ecosystem in the NPP industry. The company creates a culture of fair competition by disclosing the contract information of its suppliers and improving the contract system, while supporting their expansion into the domestic and overseas markets by utilizing its resources and infrastructure. KHNP has also increased its financial and R&D support for suppliers to help improve their business environments and technological capacity. Finally, by finding and promoting new suppliers, KHNP contributes to the overall development of the NPP industry.

Our Plan

As a trusted public enterprise in the global energy industry, KHNP has actively implemented shared growth strategies in the domestic and global business environment. By including shared growth in its mid to long-term business goals and establishing a strategic roadmap, KHNP will continue to strive to achieve shared growth. The company will increase the effectiveness of its shared growth efforts by identifying the needs and satisfaction level of its suppliers and operating a consultative group of relevant organizations.

Creating a Sound Industrial Ecosystem through Fair Trade

Shared Growth Implementation System

Through its shared growth implementation system, KHNP provides equal opportunities to suppliers and promotes fair competition. This system was established in careful consideration of the needs of SMEs, government policies, and KHNP's own business goals. Under the vision of becoming a "Global Top KHNP that establishes a sound ecosystem in the NPP industry," KHNP has established four major strategic directions and core tasks.

Vision	Global Top KHNP that Establishes a Sound Ecosystem in the Nuclear Power Plant Industry			
Strategic Directions	"KHNP —SMEs' partner in achieving their big dreams"			
	World-class Lead shared growth	Innovation Differentiate through innovation	Transparency Create a culture of clean and transparent shared growth	Harmony Create an ecosystem for coexistence
Strategies	Strengthen market support	Enhance SMEs' technological capacity	Promote fair competition	Expand the NPP ecosystem
Core Tasks	<ul style="list-style-type: none"> Support strategic export Increase public purchasing 	<ul style="list-style-type: none"> Energize R&D support Customized support according to the corporate lifecycle 	<ul style="list-style-type: none"> Improve the purchasing system Reinforce support for win-win finance 	<ul style="list-style-type: none"> Develop new suppliers Promote suppliers
Review and Feedback	<ul style="list-style-type: none"> Utilize KHNP K-PGI A general index of 8 measurement indicators including the SME product purchasing rate (40%) and SME satisfaction level (60%) Various communication channels for analyzing supplier needs (Direct communication) CEO conference, working-level conferences, etc. (Indirect communication), Homepage, Facebook, blog, etc. (Research) Satisfaction survey, etc. 			

Creating a Culture of Shared Growth through Promoting Fair Competition

Expanding the Disclosure of Contract Information

KHNP enhances the transparency of procurement by increasing the level of disclosure of its purchasing standards. The scope of disclosure was expanded from quality class since 2015, contract amounts of over KRW 100 million since January 2016, and generic class since December 2016, to narrow the information gap among bidders. KHNP also discloses all order plans related to subjects of electronic procurement at least seven days in advance, as well as items from of private contracts executed with the same company twice or more in the past ten years.

Improving the Contract System

By monitoring and supervising unfair competition such as bid rigging, KHNP creates a culture of fair trade and continuously improves its contract system to enhance the transparency and efficiency of procurement. The company fundamentally blocks the same bidder from placing more than one bid using the same IP or MAC address, and does not allow the simultaneous placing of multiple bids. Human errors are also prevented by establishing a statistics-based price calculation system. KHNP also offers an open communication space for suppliers within the electronic commerce system, handling their complaints and concerns that may arise in the contract process.

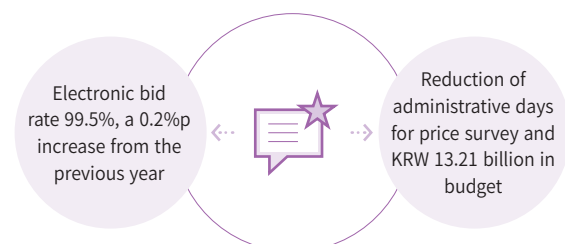
Strengthening Supervision on Payment and Settlement for Second and Third-tier Suppliers

KHNP was the first to adopt a win-win settlement system, creating an environment where second and third-tier suppliers can promptly and safely collect their debts. It also undertakes strict supervision on the settlement of labor expenses and subcontractor fees through a system that verifies direct payment to subcontractors. These efforts led to KHNP earning a perfect score in the 2016 Public Enterprise Shared Growth Evaluation for the index concerning the "Fee Payment Verification System."

Performance in Contract Information Disclosure in 2016

Purchasing Standard information Total of 1,613 cases Prior disclosure	Information on order plans Total of 173 cases External disclosure	Disclosure of information on private contract items - 4.4% increase from 2015 - 76 submissions of opinions on private contract items - 39 cases of opinions registered and reflected
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Performance in Improving the Contract System in 2016








Creating a Sound Industrial Ecosystem through Fair Trade

Reinforcing Support for Domestic and Global Markets

Domestic Market Support

KHNP works with SME suppliers, helping them expand their domestic markets by supporting their participation in exhibitions, holding purchasing consultations, and expanding public purchasing. In 2016, it provided support to 285 suppliers for participating in seven major exhibitions including Power Generation Korea (PGK) which led to purchasing consultations in the amount of \$4.2 billion. It also manages public purchasing as an internal assessment index, offering consulting and conducting performance evaluations for offices with weak performance. Other efforts include giving additional points for products of female-owned business at pre-qualification, lowering the entry barrier for KHNP's female-led suppliers.

Performance in SME Product Purchasing (Unit: KRW in 100 million)

Item	2015	2016	Increase/ Decrease rate
SMEs 	5,673	7,823	38%
Technology development 	383	492	28%
Social enterprise 	103	165	60%
Social cooperative 	6.7	10.4	55%
Female-owned business 	893	1,272	42%

Supporting Overseas Markets

By actively utilizing its infrastructure, KHNP provides wide-ranging support for its small and medium-sized suppliers to expand into overseas markets. First of all, KHNP provided consulting and representation services to suppliers through the Korea Nuclear Partners (KNP) and established joint offices in the UAE and other countries to work as bridgeheads for export. Its "One Stop Service" offers support from vender registration and certification to bidding and post-management. KHNP also carries out other multiple export support strategies through the marketing of the "WITH KHNP" brand.

* Korea Nuclear Partners (KNP): A company jointly financed by KHNP (29%) and 29 suppliers (71%) with the aim of systematically supporting the export of Korean power plant services to overseas markets.

Korea Nuclear Partners (KNP) Performance

Provided consulting to five companies with high export potential

Resulted in KRW 11.6 billion in exports

Export Support System

Companies seeking export opportunities

- Support for participation in exhibitions held overseas
- Provided support for participation on 9 occasions

Companies in the initial stages of export

- Support establishing overseas branch offices
- Provided support to 10 companies (70% of KOTRA participation fees)

Exporting companies

- Support applications for PL insurance overseas
- Provided support to 18 companies in a year
- Share export performance (10 years)

"WITH KHNP" for Invigorating the NPP Ecosystem

In recognition of the company's shared growth efforts to invigorate the NPP ecosystem, KHNP was awarded the Grand Prize in Shared Growth at the 11th National Sustainability Management Awards in 2017. Purchasing KRW 780 billion of SME products -55% of its domestic purchasing in 2016 -KHNP was the largest source of demand in the NPP industry. KHNP established the Korea Nuclear Partners (KNP), through which it provided mid to long-term support to suppliers to expand their export opportunities. As a result, the total exports by KNP members increased by 213% compared to the previous year. Other shared growth efforts include offering support for obtaining certifications such as KEPIC or ASME and consulting for lowering the entry barrier into the NPP industry.



Expanding Support for Win-win Finance

In an effort to improve the business environment of small and medium-sized enterprises, KHNP has expanded support for win-win finance, such as extending the scope of loans for suppliers and improving the down payment system. With a loan fund of KRW 210 billion-1.9 times larger compared to the previous year-KHNP expanded the eligibility requirements from first and second-tier suppliers to include local SMEs. It also increased the corporate loan limit from KRW 1 billion to 2 billion, made it mandatory to give notice of down payments, and improved the down payment management system. All of this was done to enhance the liquidity and business efficiency of SMEs.

Financial Support including Loans

(Unit: 100 million KRW)



Expanding R&D Support

To enhance the technological competitiveness of SMEs and build win-win relationships, KHNP actively provides R&D support. Notably, KHNP held a public contest on safe nuclear technology development for the first time, receiving 221 ideas from the general public and implementing 79 of them as actual tasks. It also established a roadmap for hydro and pumped-storage power generation technology development, identifying core technologies and 80 R&D tasks in five areas to cooperate with SMEs. Finally, it implements customized support projects for SMEs in different stages of the corporate lifecycle from inception to growth and all the way to maturation.

SME Capacity-building Support Projects

Inception	[Support for obtaining ISO certification] Entry into the NPP industry / Maximum of KRW 3 million [Support for Win-win Supporters] Promoting start-ups' growth into strong small companies
Growth	[Industrial innovation] Expanding consulting for standard management quality management techniques (30 companies in 2015 to 45 companies in 2016)
Maturation	[Process innovation] Support of a maximum of KRW 80 million for process improvement such as adopting new processes (Provided KRW 200 million in support to 15 companies since being first adopted in 2016)

Expanding the NPP Ecosystem by Developing and Cultivating New Suppliers

KHNP actively develops and cultivates new suppliers in an effort to deal with the declining number of suppliers, a result of reinforced NPP quality standards and the high entry barriers of the NPP industry. The company holds seminars and on-site visits for local companies in Gyeongju and shipbuilding companies to promote the NPP industry and find new suppliers. KHNP also offers the Shared Growth Academy, job capacity-building training, and quality mentoring, contributing to the expansion of the NPP ecosystem.

Performance

Developing New Suppliers	Promoting Companies	Supporting Entry into the NPP Industry
<ul style="list-style-type: none"> Promoting the NPP industry Holding corporate seminars for local (Gyeongju) and shipbuilding companies O/H on-site visits to NPP sites 	<ul style="list-style-type: none"> Offering training through the Shared Growth Academy Supporting job capacity-building training Offering quality mentoring 	<ul style="list-style-type: none"> Supporting registration as qualified suppliers Supporting the obtainment of KEPIC and ASME Code certifications

KHNP Takes Home the Public Enterprise Grand Prize at the Korea Logistics Awards

In recognition of its outstanding achievements in supply chain management, innovation, and procurement, including the establishment of a sound supply chain and stable operation of NPPs, KHNP was awarded the Grand Prize in the public enterprise sector at the 19th Korea Logistics Awards in 2016. By establishing a customized supply chain management system, KHNP improved the transparency of its procurement process and enhanced quality management. KHNP will continue its efforts to become a globally competitive player in the NPP industry by managing a sound equipment supply chain system and operating safe NPPs.



Ultimate Safety

KHNP, a Corporation Built on Safety and Trust



Nuclear facility safety
performance index

99.924 points
(The highest score earned)



for business continuity
in the disaster and
safety sector

Obtained the
ISO22301 certification

in safety management at
the 2016 Global Standard
Management Awards

Won the **Grand Prize**



in the 2016 National Cyber
Attack Response Training

Rated **Excellent**

Report Context

The issue of nuclear safety has become part of the global agenda since the earthquake and Fukushima nuclear disaster of March 2011. In Korea, public concerns over the safety of nuclear power plants have been rising following the earthquake that struck Gyeongju in 2016. Against this backdrop, KHNP is doing its absolute best to secure safety in the construction and operation of its nuclear power plants using its advanced technological capacity. It will continue to make thorough preparations for the unexpected such as natural disasters and acts of cyber terrorism through strict supervision and monitoring activities to win public trust.

Our Progress

By placing the utmost importance on the core value of safety, KHNP carries out safety inspections and monitoring, as well as safety education and awareness raising activities, building a culture of safety both at the institutional and practical level to achieve Zero-Critical Accidents. Furthermore, the company designs and builds safe nuclear power plants by fully abiding with the principles of Defense In Depth and Multiple Levels of Protection, etc. to ensure the protection of lives and properties from the threat of disasters.

Our Plan

KHNP will always do its utmost to enhance the safety of its nuclear power plants by implementing and promoting safety improvement measures. In ensuring the safe operation of nuclear power plants, KHNP will apply safety inspection results to improving safety levels and expand the functions and authority of internal organizations in charge of safety monitoring. Furthermore, the company will disclose the implementation status of improvement measures, safety inspection results, and NPP operation status in a transparent manner, while actively promoting nuclear safety to win the trust and confidence of the public.

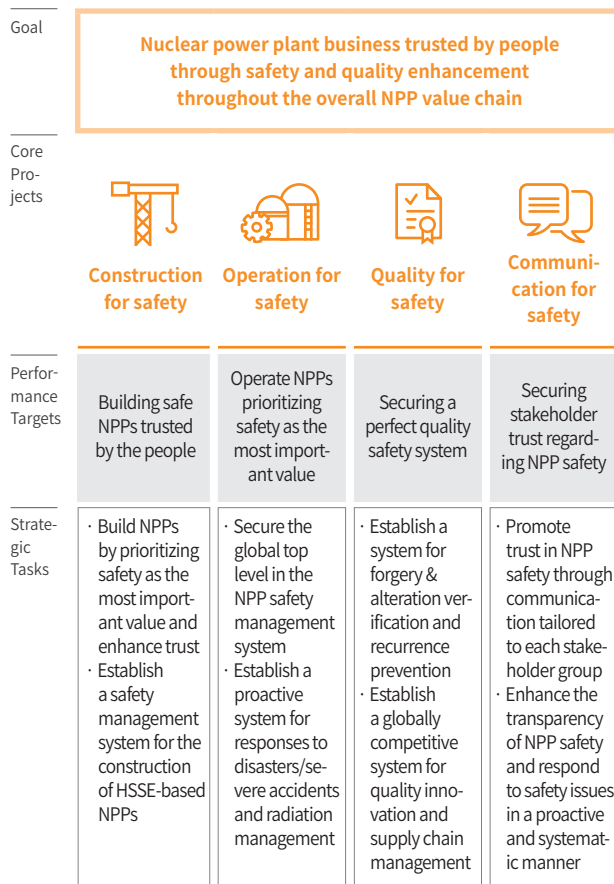
Establishing a Safety Management System that People Trust

Safety Management Strategy System

To gain the public's full trust in the safety of nuclear power plants by improving safety in all stages of the NPP value chain, KHNP has established and implemented safety management strategies in a systematic manner. Notably, KHNP is upgrading its safety management system to a globally competitive level by obtaining and maintaining the KOSHA 18001* and OHSAS 18001* certifications.

* KOSHA 18001: Certified for the Head Office and all offices

* OHSAS 18001: Certified for five sites including the Head Office (Kori, Hanbit, Wolsong, Hanul, Hang River Hydro Site) and five pumped-storage power plants (Samnangjin, Cheongsong, Muju, Sancheong, Yecheon)



Operate Safety Supervision and Inspection System

Domestic and Overseas Safety Inspection Operating System

KHNP is subject to regular safety inspections by the government as well as domestic and international regulatory agencies, in addition to its own safety assessments conducted on a regular basis. Areas of improvement identified by all such inspections are promptly reflected in operating the company's NPPs, thereby securing a globally competitive level of NPP safety.

Inspection by International Agencies

Inspected by	WANO*	INPO*/WANO	IAEA*
Method	Safety inspection (Peer Review)	Technology exchange (TEV/TSM)	Safety inspection of operating NPP (OSART)
Period	Every 4 years	When necessary	When necessary
Purpose	Enhancing NPP safety and operational performance by analyzing areas of improvement for domestic NPPs against the highest global standards	Providing technological assistance in areas of weakness identified by safety inspections	Inspecting the safety of operating NPPs against international standards
Performance in 2016	Hanul #3 Five NPPs including Hanul #1	WANO TSM: 10 times INPO TEV: 7 times	

Inspection by Domestic Agencies

Inspected by	KHNP (Internal Safety Assessment)	NSSC	Regulatory Agency (KINS)
Method	RIMS / ORION*	Regular inspection	Commissioned inspection
Period	Regularly	Planned maintenance	Frequently
Purpose	Risk monitoring and management for power operation or preventive maintenance	Manage functions of facilities subject to inspection so that they meet technical standards	
Performance in 2016	Conducted on a regular basis in all NPPs	13 units including Hanbit #6	

* WANO: World Association of Nuclear Operators

* INPO: Institute of Nuclear Power Operations

* IAEA: International Atomic Energy Agency

* RIMS: Risk Monitoring System for power operation.

* ORION: Outage Risk Indicator of Nuclear Power Plants for preventive maintenance.

Performance in Safety Inspections

Highest level in WANO safety inspection

- Hanul #3 rated "excellent"
- Five NPPs including Hanul #1 rated "satisfactory" in follow-up inspections



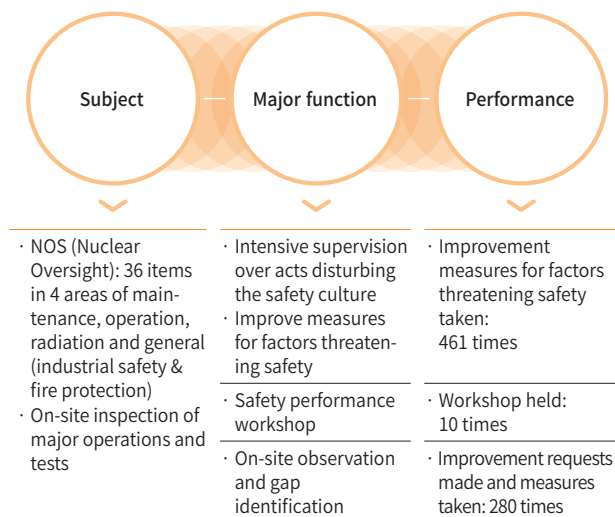
Rated "satisfactory" in regular inspections by regulatory agencies

- All NPPs subject to regular inspections rated "satisfactory" by KNRB

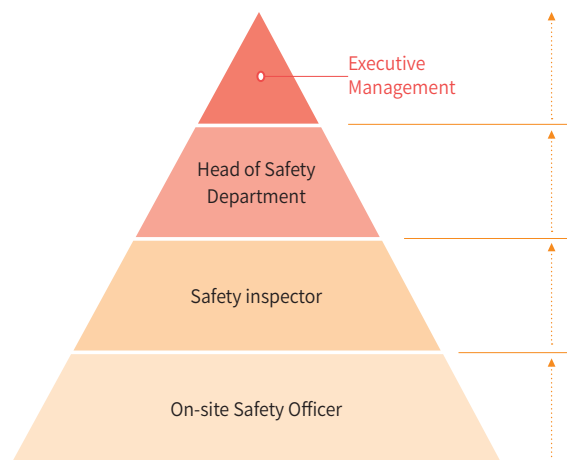
Strengthening the Function of Nuclear Oversight (NOS)

In order to strengthen the functions of NPP safety monitoring and supervision, KHNP has adopted the nuclear oversight (NOS) system, an advanced NPP operational technique, through which observation standards for each operational areas are established, on-site tests and operations are closely observed to identify areas of improvement, and improvement measures are taken accordingly. When a case is reported, it is reported from the safety manager through the safety inspector to the management, enabling independent oversight over NPP safety in compliance with relevant regulations.

Roles and Performance of Nuclear Oversight (NOS)



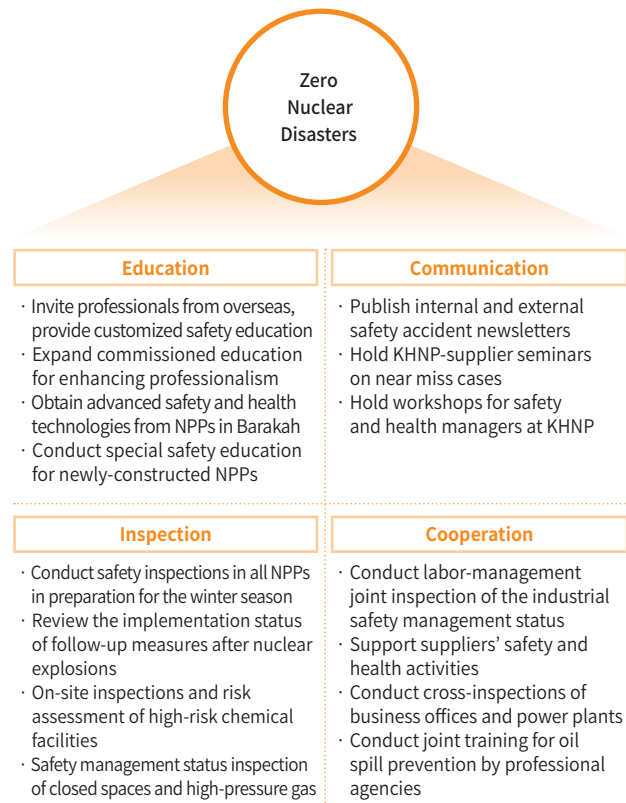
Safety Inspection Results Reporting System



Establishing a Safety-First Culture

Establishing a Preventive Safety Management System

By establishing a safety management system for the prevention of severe and safety accidents, KHNP vigorously works toward zero-severe accident and disaster rate reduction. To this end, KHNP pursues the core strategies of education, inspection, communication, and cooperation.



Safety Culture Education

KHNP provides customized training to all employees from newly-recruited staff to managers on theories of safety culture, professionalism, and safety leadership. Meanwhile, the company expanded the scope of safety culture education for suppliers in 2016, offering training not only to executives but to workers as well. Furthermore, KHNP has made it mandatory for labor managers to complete a four-hour safety experience training prior to participating in any on-site work at construction sites. In 2016, 4,216 employees of suppliers received safety training provided by KHNP. Through these preventive safety management efforts, KHNP promotes both knowledge and awareness of safety.

Programs to Promote the Safety Culture

KHNP runs programs promoting safety culture such as the Safety Moment, Safety Suggestion System, Manager Observation, and Safety Culture Practice Indicator, aimed at fulfilling safety culture and enhancing safety awareness among employees.

Program	Purpose	Performance	Best Practice
Safety Moment	Develop safety-conscious messages and send them before major meetings	<ul style="list-style-type: none"> · (HQ) Executive management meetings held by the heads of departments and offices: 24 times · (Offices) Average of 200 meetings per power plant 	Developing and sharing case-oriented safety messages
Safety Suggestion System	Create an environment in which anyone can raise concerns over safety issues	<ul style="list-style-type: none"> · Additionally installed proposal boxes in power plants in trial operation 	Contributing to preventing human errors by proposing "valve handling in groups of two"
Manager Observation	Enhance job capabilities by preventing human errors and identifying/improving unreasonable business practices	<ul style="list-style-type: none"> · 400 times on average per power plant · Developed an e-learning program for manager observation 	Contributing to zero-safety accidents through manager observation when performing chemical-related work
Safety Culture Practice Indicator	Monitor the level of the safety culture, analyze weaknesses, and encourage improvement	<ul style="list-style-type: none"> · Reviewed practice indicators 12 times on average per power plant · Increased efficiency by improving several items and scoring system 	Improving the safety culture index by notifying all employees of a low-performance index and following up with improvement measures

Cooperation Programs for Safety and Health

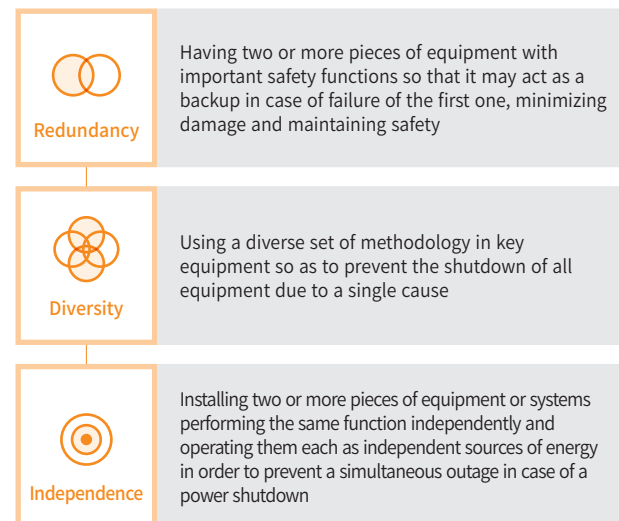
Recently, KHNP has been promoting safety and health cooperation programs in an effort to respond to the demands of government policies emphasizing the responsibilities of the ordering party, expand the safety culture, and reduce accident rates of its suppliers. In particular, KHNP's NPP headquarters and Han River hydro power site, which qualified for business sites with 100 or more employees, provided support to its suppliers in the areas of risk assessment and technical assistance. In recognition of its performance in 2016, KHNP's Hanbit NPP headquarters was rated grade A, the highest grade.

Securing the Highest Level of Facility Safety

Complying with Nuclear Power Plant Construction Principles

Nuclear power plants are designed based on the concept of Defense In Depth, referring to the designing of nuclear facilities with multiple layers of defense to prevent the release of radiation to adjacent areas in the case of an accident. KHNP prevents failure or abnormal conditions in all of the company's nuclear facilities by applying designs that exceed safety standards. Even if an abnormal condition were to occur, it is automatically detected and blocked by reactor protection facilities, preventing the condition from escalating into a severe accident. As such, KHNP is fully committed to protecting the lives and properties of its employees and the public by strictly complying with fundamental principles in designing and constructing nuclear power plants.

Design Standards for Nuclear Safety Facilities



Establishing and Advancing the Cyber Security System

KHNP strengthens the monitoring of its security system and advances document management in order to fundamentally prevent cyber threats in NPP operation.

Security System	Key Points	Performance
Monitoring of Cyber Threats	Big data-based threat response monitoring and analysis system : Linkage analysis of logs of 125 security equipment	Security control monitoring per day (2014: 10,000 / 2015: 4 million / 2016: 700 million)
Prevention of Cyber Terror Prevention	<ul style="list-style-type: none"> · PC comprehensive certification management system · Dualization of the Anti-APT* system · Threat information sharing system 	<ul style="list-style-type: none"> · National Cyber Attack Response Training held by the National Intelligence Service Rated the highest level, "excellent" among 125 public enterprises
Response to Hacking Emails	<ul style="list-style-type: none"> · Regular training for response to hacking emails (For all employees, 250 people/day, 91 times, 22,779 people) 	<ul style="list-style-type: none"> · Rate of opening hacking emails as part of training held by the Ministry of Trade, Industry and Energy (2014: 8% / 2015: 0.4% / 2016: 0.0%)
Document and Data Management	<ul style="list-style-type: none"> · Launched establishing a document centralization system · Established a supplier document transmission system 	<ul style="list-style-type: none"> · Established a cloud-based cooperation and communication system · Prior control of nuclear document leakage

*Advanced Persistent Threat (APT): Computer hacking targeting a specific business entity or private organization

Securing the Highest Level of Facility Safety

Strengthening the Safety of Nuclear Facilities

KHNP's safety equipment are built based strictly on nuclear power plant design principles and are prepared against earthquakes. KHNP also devises various safety measures so that its NPPs remain safe in case of natural disasters such as floods and tsunamis, or any other accidents including an aircraft collision. As a result of such efforts, in December 2016, KHNP began the commercial operation of Shin-Kori #3, the world's first third generation NPP built with upgraded safety designs and technologies. KHNP will continue its safety-enhancing efforts so that the general public can fully trust in the safety of NPPs.

Developing New Seismic Design Technologies and Strengthening Proactive Response to Disasters

Key Measures	Development of New Technologies	Effect
Development of a Seismic Force Reduction System	· Developed a seismic force reduction system in case of an earthquake exceeding design standards (7.0)	Reduces seismic force to 7.0 in case of an earthquake with magnitude of 7.3
Improvement of Flood Protection Measures against Natural Disasters	· Increased the installation height of the Alternate Alternating Current Diesel Generator (AAC DG) to 3 meters in case of power outage · Removed penetration seals and openings on the walls of structures under 3 meters above ground for flood protection	Prevents flooding in case of a tsunami or flood and supplies emergency power
Anti-aircraft Collision Design	· Increased the thickness of major structures including the nuclear reactor building (12.5%), auxiliary building (25%), and spent fuel storage (50%) through aircraft collision simulation · Installed blast-proof doors and blast-proof dampers to prevent the spread of fire caused by a crash · Installed shock-reducing facilities in a remote shutdown room	Strengthened structure wall thickness - Nuclear reactor building: 12.5% - Auxiliary building: 25% - Spent fuel storage: 50%

★ Best Practice

KHNP Proves the Safety of Domestic NPP Technologies by Completing the Construction of the World's First Third Generation Light Water Reactor

In December 2016, KHNP began the commercial operation of APR 1400-installed Shin-Kori #3. APR 1400 is a third generation pressurized water reactor developed with domestic technologies with advanced safety in comparison to the Korean standard nuclear power plant OPR 1000 in terms of earthquake resistance, core damage frequency, and large-scale radiation leakage frequency. Furthermore, KHNP extended the operator grace time from 10 to 30 minutes and station blackout response time from 4 to 8 hours, securing enough time to respond to emergency situations. KHNP proved the superiority of the company's safety facility design and technologies by succeeding in the operation of Shin-Kori #3, the world's first third generation nuclear power plant.

Major Safety Design Features in APR 1400

Key Measures	Safety-enhancing Design Features	
	OPR 1000 (Korean Standard NPP)	APR 1400 (Korean Light Water Reactor)
Core damage frequency	Less than once in 10,000 years	Less than once in 100,000 years
Large-scale radiation leakage frequency	Less than once in 100,000 years	Less than once in 1 million years
Seismic Design	Earthquake magnitude: 6.5	Earthquake magnitude: 7.0
Operator grace time	10 minutes	30 minutes
Station blackout response time	4 hours	8 hours
Safety injection system	2 systems	4 systems
Passive autocatalytic recombiner	21	30

* Additional on-site installation of external reactor vessel cooling facilities, seismic design raw water collection tanks and portable diesel driven pumps

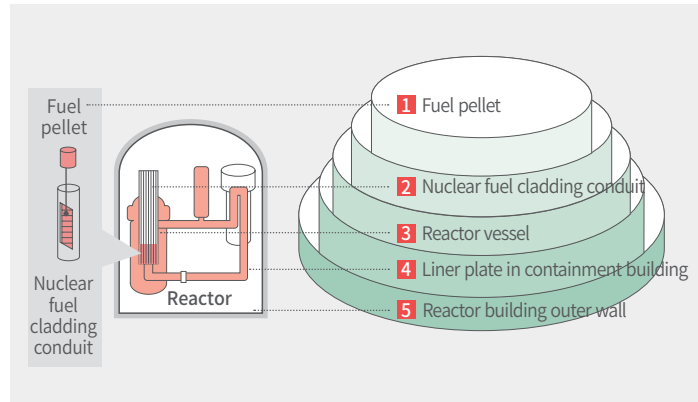


Multiple Barriers (Five-layer Protective Wall)

1 Protective wall's: Fuel pellet
Initially seals off most of radioactive material generated during nuclear fission.

2 Protective wall's: Nuclear fuel cladding conduit
Composed of zirconium alloy, resistant to heat, radiation and corrosion, and seals off even small amount of gaseous radioactive material leaked from the fuel pellet.

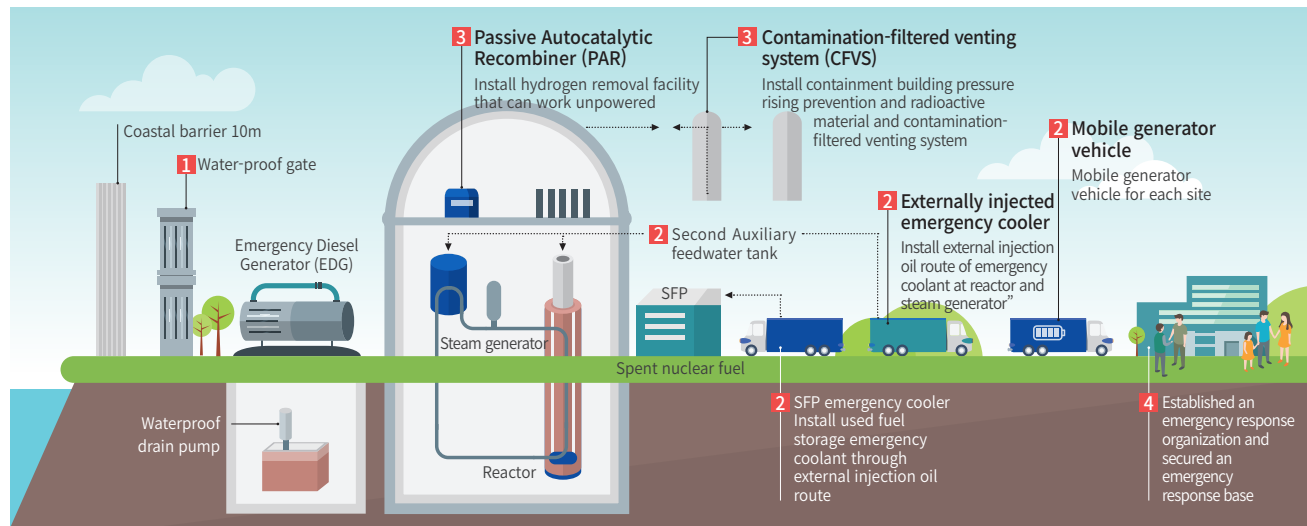
3 Protective wall's: Reactor vessel
Made of steel in 20-25cm thickness, the reactor vessel completely seals off any and all radioactive material in the case of leakage due to any defect of the nuclear fuel cladding.



4 Protective wall's: Reactor building internal steel plate
The 6mm-thick steel plate inside the reactor building acts as a strong protective wall.

5 Protective wall's: Reactor building outer wall
The 120cm-thick steel concrete outer walls of the reactor building prevents any leakage of radioactive material under all circumstances.

Multi-layered Protection System and Improvement Plans



1	2	3	4
Securing NPP safety in case of the most severe natural disasters <ul style="list-style-type: none"> Improve the seismic performance of the safe shutdown system (~2018) Improve the seismic performance of nine systems Complete improvement in 21 units Install water-proof doors (~2018) Install waterproof doors for flood protection in the emergency diesel generator room, etc. 	Preventing the escalation of flooding or power failure into a severe accident <ul style="list-style-type: none"> Installed an external injection pipe for SFP* emergency coolant Fire engine and portable diesel driven pump Install an external injection pipe for emergency core coolant (~2018) Utilize fire engines and portable diesel driven pumps Build second auxiliary feedwater tank (~2019) Secure a source of auxiliary feedwater meeting safety levels Install a second auxiliary feedwater storage tank in Hanul #1 Mobile generator vehicle (~2019) Secure a mobile generator vehicle for each unit 	Minimizing radiation leakage by protecting the reactor building from over pressurization in the case of a severe accident <ul style="list-style-type: none"> Install filtering and venting facilities in the reactor building Remove radioactive substances within the reactor building without electric power supply using a two-layer filter Install a hydrogen sensor (~2018) Install a hydrogen sensor for monitoring the hydrogen concentration level (Completed installation of a non-electric hydrogen removal facility) 	Strengthening emergency response and minimizing damage in the case of a large-scale leakage of radioactive substances <ul style="list-style-type: none"> Newly established emergency response organization (~2017) Newly established emergency response expert team (SAFE-T) to support the implementation of accident management strategies and operation of accident response facilities Recruited 30 accident management experts Secure an emergency response base (~2021) Establish a master control facility with seismic isolation functions on NPP sites above sea level with no possibility of being flooded Play the role of control tower in emergency response and damage control

*SFP : Spent fuel storage pool

Implementing the Comprehensive Seismic Safety Action Plan Following the 9.12 Earthquake

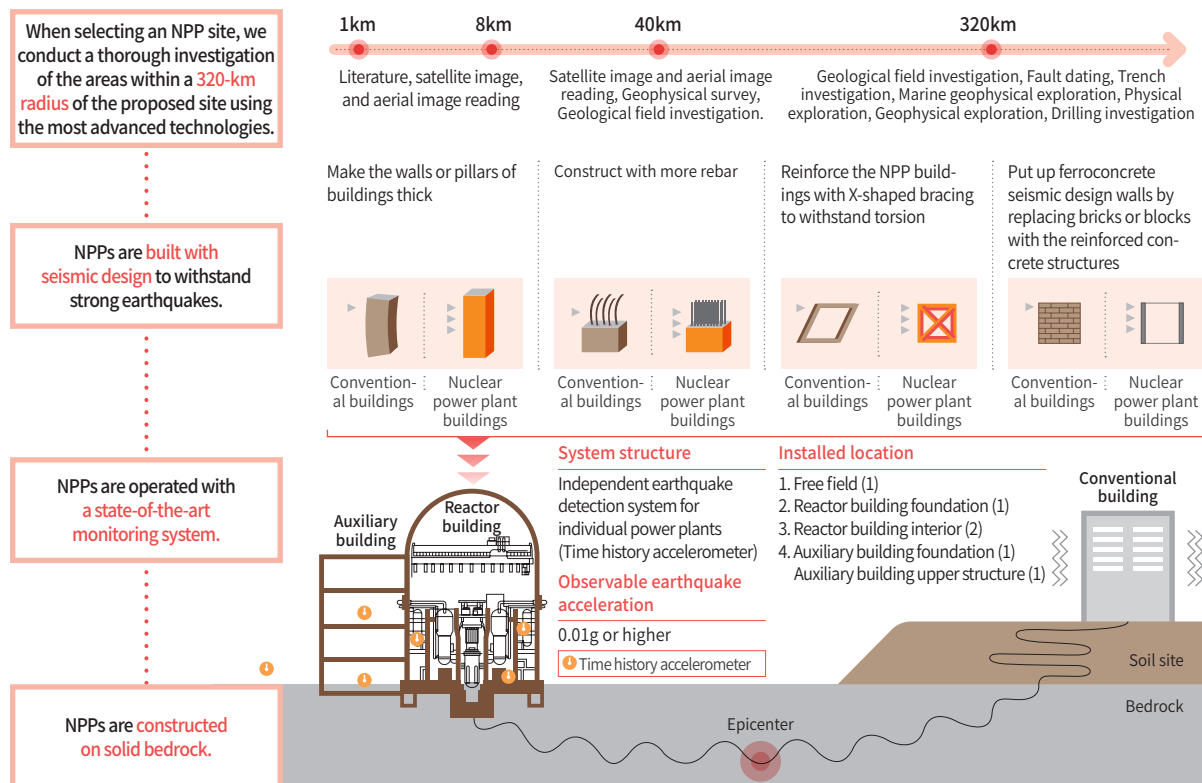
Following the two earthquakes that struck Gyeongju on September 12, 2016, the Korean government announced the Comprehensive Measures for Earthquake Prevention in December of the same year. In connection with these measures, the Ministry of Trade, Industry and Energy announced the Comprehensive Measures for Seismic Safety of Energy Facilities. In January 2017, KHNP established the Comprehensive Seismic Safety Action Plan consisting of 21 tasks in four areas of earthquake and geology, seismic performance, emergency response and others, in order to secure public trust and strengthen the safety of the company's NPPs. As of August 2017, KHNP has completed four tasks and will successfully carry out all 21 tasks by 2020.

Comprehensive Seismic Safety Action Plan

Earthquake and Geology	Seismic Performance	Emergency Response and Others
<ul style="list-style-type: none"> Safety evaluation of NPPs in southeast regions (government-led, Dec 2020) Tomographic survey of areas adjacent to the Wolsong site and probabilistic seismic hazard analysis (Dec 2019) 	<ul style="list-style-type: none"> Reinforce the seismic performance of core facilities* in operational NPPs (0.3g level) Completed seismic reinforcement (22 units, ~Feb 2017), seismic reinforcement in progress (3 units: Kori #2, Hanul #1 and 2) Reinforce the seismic performance of core facilities in NPPs to be constructed (0.5g level) Conduct evaluations of the capability of all NPPs to respond to natural disasters exceeding design standards (stress test) (Jun 2019) 	<ul style="list-style-type: none"> Construct a Complex Emergency Response Center with seismic isolation functions (Dec 2020) and improve the earthquake response process (Jun 2018) Underwent safety inspections by international agencies such as IAEA (Aug 2017) and established the Earthquake Response Research Center (Dec 2017) Completed establishment of an earthquake response organization and recruited personnel

*Facilities that safely shut down and maintain nuclear power plants in case of an emergency (telemeters, pumps, pipes, etc.)

Why are our Nuclear Power Plants Safe from Earthquakes?



Social Responsibility

KHNP, Building a Clean Future



Designation as a
green company

9 offices

(As of September 2017)



Performance in purchasing
of eco-friendly products

90.7%

Environmental
performance index in 2016

285 points

(11% increase from the
previous year)



Electric car
purchase rate in 2016

54%



Report Context

At the Paris Climate Conference (COP21) in December 2015, member states agreed on adopting the post-2020 climate regime which obligates both developed and developing countries to set greenhouse gas (GHG) emission reduction targets. Under this vision, all countries around the world will jointly make an effort to respond to the environmental challenges we face. Companies are also required to manage their environmental impact and prepare preventive measures. To this end, KHNP will pursue strict environmental management and devise various measures for clean nuclear power in accordance with the new global energy paradigm.

Our Progress

KHNP's environmental management system is based on ISO 14001, an international standard on environmental management. In an effort to minimize its environmental impact, KHNP monitors emissions on a regular basis and manages the emission concentration of pollutants below legal limits. In addition, the company strictly manages hazardous waste and radioactive waste to ensure safety in neighboring areas, while actively implementing tasks in line with its four major strategic directions for responding to climate change.

Our Plan

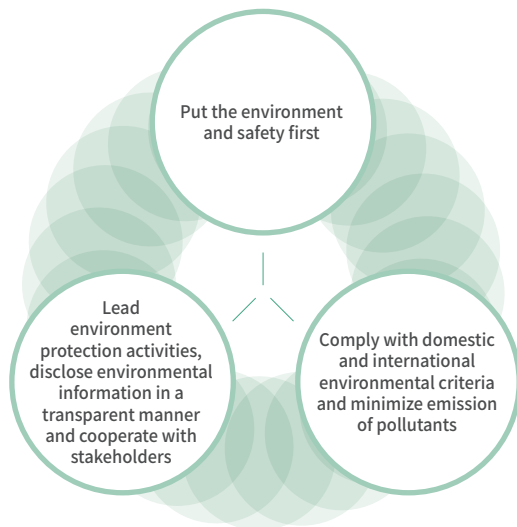
To minimize the environmental impact of NPP operation, KHNP will measure and manage the environmental risk of all its nuclear facilities. It will respond to the post-2020 climate regime by having more of its business sites designated as green companies and taking continuous measures to implement the Comprehensive Measures for Climate Change.

Establishing a Proactive Eco-friendly Management System

Eco-friendly Management Strategy

In order to realize the vision of becoming a “Trusted global energy leader,” KHNP will establish an advanced environmental management system and carry out environment protection activities, playing a leading role in achieving Korea’s sustainable development and preserving the environment.

Basic Directions of Eco-friendly Management



Environmental Management System

Pursuant to the Environmental Impact Assessment Act, KHNP establishes measures to reduce environmental impact by predicting and analyzing the impact of nuclear power plants on the natural environment, living environment, as well as society and the economy throughout their entire lifecycle from construction to operation. KHNP’s environmental impact assessment report, in particular, reflects its environmental impact reduction measures and the opinions of local residents, and is prepared after a public hearing and upon the approval of relevant government agencies. KHNP constructs and operates its NPPs in compliance with the approved assessment report. Meanwhile, KHNP’s nuclear environment management is implemented in two areas – the general environment and marine environment – in accordance with ISO 14001, the international standard for environmental management.



Key Businesses and Plans

Major Performance in 2016

- Obtained the redesignation of business sites designated as green companies with expired designations (Wolsong and Hanul sites, Chuncheon hydro power plant)
- Secured the technology for handling high-concentration organic spent regenerated brine in condensate polishing plants (CPP)
- Devised measures for the stable reuse of wastewater from NPPs and conducted on-site demonstration tests
- Devised follow-up measures following evaluations of aged chemical tanks



Major Business Plans in 2017

- Renew ISO 14001 certification (valid for three years)
- Establish a self-diagnosis system for the chemical and environmental risks of all NPPs (standard guidelines)
- Conduct an off-site consequence analysis of facilities handling hazardous chemicals from NPPs and establish risk management plans
- Establish the first set of comprehensive measures for response to climate change and implement follow-up measures (2017-2021)
- Pursue the redesignation of business sites as green companies with expired designations (Muju, Yangyang, Cheongpyeong pumped-storage plants)



Implementing Eco-friendly Management for Future Generations

General Environment Management

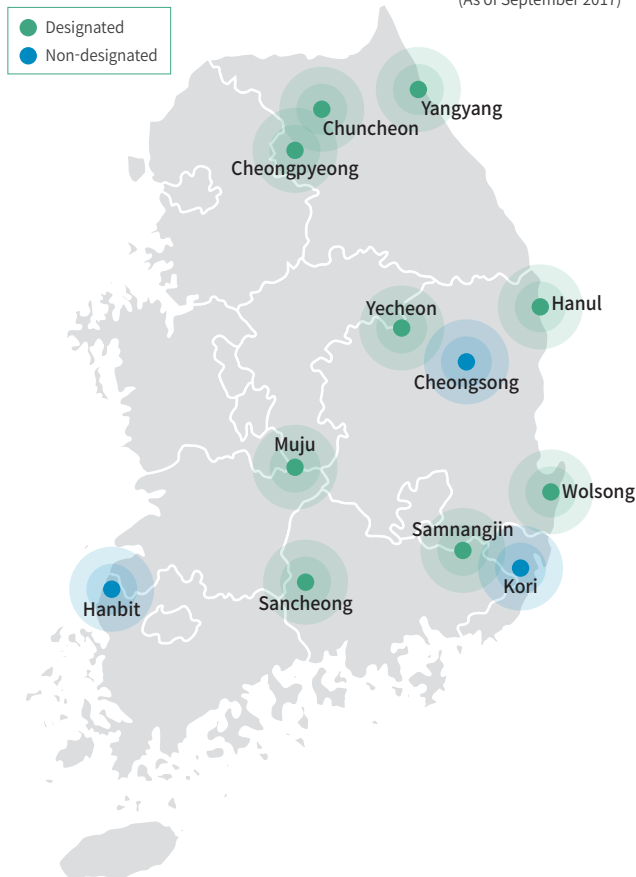
KHNP manages all environmental pollutants generated from its nuclear power plants in a lawful manner in accordance with the relevant environmental laws and regulations. Currently, KHNP operates sewage and wastewater disposal facilities as well as waste storage and treatment facilities, while continuously monitoring the ecosystems surrounding NPPs in accordance with the company's internal guidelines regarding environmental surveys of NPP surroundings.

KHNP is Designated as a Green Company

Companies with a healthy environment management system and outstanding performance in environmental protection through green management such as the reduction of resources, energy, and pollutants are designated as green companies by the Ministry of Environment, following a standard procedure of assessment. As of September 2017, nine of KHNP's business sites have been designated as green companies.

Status of Business Sites Designated as Green Companies

(As of September 2017)



Wastewater and Waste Management

All sewage and wastewater generated in KHNP's power plants are discharged after being handled through sewage and wastewater treatment facilities. The quality of discharged water is strictly managed real-time via the tele-monitoring system (TMS) in accordance with KHNP's own standards which are 50% more stringent than those defined by law. Furthermore, waste is categorized into general waste, designated waste, and construction waste, and undergoes thorough management throughout the entire process from generation to final treatment. Finally, KHNP reduces the emission of air pollutants such as greenhouse gases by building or expanding waste storage facilities in each NPP site, in addition to categorizing waste by type, characterization, and treatment methods for thorough management.

Hazardous Chemical Substances Control

KHNP uses hazardous chemical substances for corrosion prevention and water treatment in its power plant systems. To prevent chemical accidents and strengthen its response capacity, KHNP has developed the "NPP-customized Standard Emergency Response Guideline for Chemical Accidents" and applies it to the company's business sites. It also conducts regular safety inspections of chemical storage facilities within NPPs jointly with safety experts. Since 2015, KHNP has adopted and applied at company level a risk management system for the diagnosis and evaluation of risk factors in hazardous chemical substances.

Radioactive Waste Control

Safe and strict management of radioactive waste generated from nuclear power plants is extremely important, irrespective of how small the source or amount. Accordingly, KHNP handles radioactive waste generated from its operational NPPs by safely transferring it to the radioactive waste treatment facility located in Gyeongju. High-level radioactive waste such as used fuel, is temporarily stored for a certain period of time in a storage facility with special equipment before being disposed in accordance with the government's basic plans for High Mid Low management. KHNP will prepare follow-up measures in preparation for when storage facilities become saturated with spent nuclear fuel, while continuing its efforts toward the safe management of high-level radioactive waste. In the case of mid and low-level radioactive waste, it is collected in safety-verified drums and stored inside a temporary storage facility within a nuclear power plant. Waste not contaminated by radioactive substances or contaminated below the standard limit is disposed of through incineration and burial upon approval of the regulatory authorities.

Implementing Eco-friendly Management for Future Generations

Management of the Marine Environment

KHNP plays an active role in protecting the marine environment through physical, chemical, and biological surveys and management of the waters surrounding its nuclear power plants. In particular, the company has installed and operated a bathythermograph, water quality analyzer, and flow meter around the intake and discharge channels of the Kori, Hanbit, Wolsong, and Hanul plants. Observation results from this equipment are subject to wireless remote monitoring and disclosed real-time via the Internet and the promotion and exhibition center of each NPP.

Marine Environment Survey and Management Items

Physical survey and management

- Regular survey of water temperature, salinity, transparency, sea water flow (current direction, current speed, tide, etc.), coolant, intake and discharge channels, and water temperature of the waters near NPPs
- Seasonal survey of water temperature, salinity, and sea water flow near NPPs

Hydro chemical survey and management

- Seasonal survey of hydrogen ion concentration (pH) in sea water, suspended solids (SS), dissolved oxygen (DO), residual chlorine, nutrient salts, chemical oxygen demand (COD), ignition loss of ocean deposits, grain-size composition, and heavy metal.
- Semi-annual survey of specific harmful substances or heavy metal (copper, chrome, etc.)

Biological survey and management

- Seasonal survey of the distribution and standing crop of zooplankton and phytoplankton (including chlorophyll), benthic organisms, marine plants and fish species composition, and standing crops
- Seasonal survey of the kind, number, and weight of organisms colliding with the intake screen
- Seasonal survey of the kind and number of organisms drawn into the cooling system

Marine Water Quality Near Nuclear Power Plants

(Unit: mg/L)

Item	Plant	2014	2015	2016
Dissolved Oxygen (DO)	Kori	7.6	7.9	7.6
	Wolsong	8.1	8.4	8.2
	Hanbit	8.5	8.5	8.1
	Hanul	8.4	8.0	8.4
Chemical Oxygen Demand (COD)	Kori	1.3	1.7	1.8
	Wolsong	1.5	1.6	1.8
	Hanbit	1.7	1.5	1.8
	Hanul	1.6	1.8	1.3
Phosphate (PO ₄ -P)	Kori	0.01	0.01	0.01
	Wolsong	0.01	0.01	0.01
	Hanbit	0.02	0.02	0.02
	Hanul	0.02	0.01	0.01

Average Standing Crops of the Macroalgal Community Near NPPs

(Unit : g·dry-wt/m²)

Item	Plant	2014	2015	2016
Number of Species	Kori	48	51	58
	Wolsong	52	52	60
	Hanbit	27	26	26
	Hanul	87	86	87
Average Biomass	Kori	211	192	201
	Wolsong	204	189	181
	Hanbit	4	3	3
	Hanul	101	93	88

Management of Heated Effluents

Seawater is used as an indirect cooling water to cool down and condense the steam used to rotate generators by passing through condenser tubes in nuclear power plants. This seawater, returned to the sea at a temperature 7°C higher than that of intake waters, is called heated effluents. While heated effluents have a positive impact on the reproduction of warm water fish which has high commercial value, it may also negatively affect cold water plants such as sea mustard or seaweed. Accordingly, KHNP ensures the compensation of damage in accordance with legal procedures if any damage is caused due to heated effluents. Meanwhile, KHNP releases fish and shellfish cultured using heated effluents to the waters near NPPs and carries out various activities to preserve marine resources and increase income for local residents. As of August 2016, KHNP has released 8.99 million fish, 17.04 million abalones, 88.8 million crustaceans, 12.32 tons of shellfish, and 0.83 million sea cucumbers, having high added value and adaptable to the characteristics of the natural marine life in the sea.



Aquaculture Farm Using Heated Effluents from Wolsong Nuclear Power Plant

Special Page

Material flow at a glance

KHNP strictly monitors and manages the use and discharge of resources used to operate its nuclear power plants. Through various and continuous eco-friendly management activities, the company reduces the amount of resources used and minimizes the discharge of waste.

Fuel Consumption

(Unit : kgU)

		2014	2015	2016
Fuel	Light water reactor (enriched uranium)	373,523	343,358	436,837
	Heavy water reactor (natural uranium)	359,617	278,635	307,968

Energy Consumption

(Unit : 10 x TJ)

	2014	2015	2016
Direct energy (fuel)	15	50	73
Indirect energy (electricity)	7,660	6,038	6,102
Total energy consumption	7,675	6,088	6,175

Environmental Investment

(Unit : Billion KRW)

	2014	2015	2016
Environmental investment	78	11	5.7
Purchase of green products	163	227	196

Water Consumption

(Unit : thousand tons)

	2014	2015	2016
Underground water	29	56	40
Industrial water	2,772	2,368	1,877
Water supply	1,075	827	819
Surface water	3,951	4,828	4,977
Total water consumption	7,827	8,079	7,714

Hazardous Chemicals Emission

(Unit : tons)

	2014	2015	2016
Hazardous chemicals consumption	7,537	7,406	7,391
No. of hazardous chemical emissions (cases)	0	0	0

* Chemical Safety Information Sharing System by the National Institute of Chemical Safety

Wastewater Discharge and Recycling (Unit : thousand m³)

		2014	2015	2016
Nuclear power plants	Wastewater discharge	3,742	3,783	4,051
	Recycled water	419	502	496
	Recycling rate (%)	11.5	13.3	12.3

GHG Emission

(Unit : thousand tCO₂-eq)

	2014	2015	2016
Scope 1	33	65	94
Scope 2*	3,720	2,933	2,963
Total emissions	3,753	2,998	3,057

* Usage of necessary external electric power for pumped-storage and safe nuclear operations

Water Pollutants Emission

(Unit : kg*)

		2014	2015	2016
Nuclear power plants	COD	18,566	18,504	20,987
	SS	4,667	3,096	3,276
	T-N	33,476	39,085	41,704

* Emissions intensity x Emissions volume

Self-disposal of Radioactive Waste (Unit: drums)

	2014	2015	2016
Self-disposal performance	1,320	1,410	609

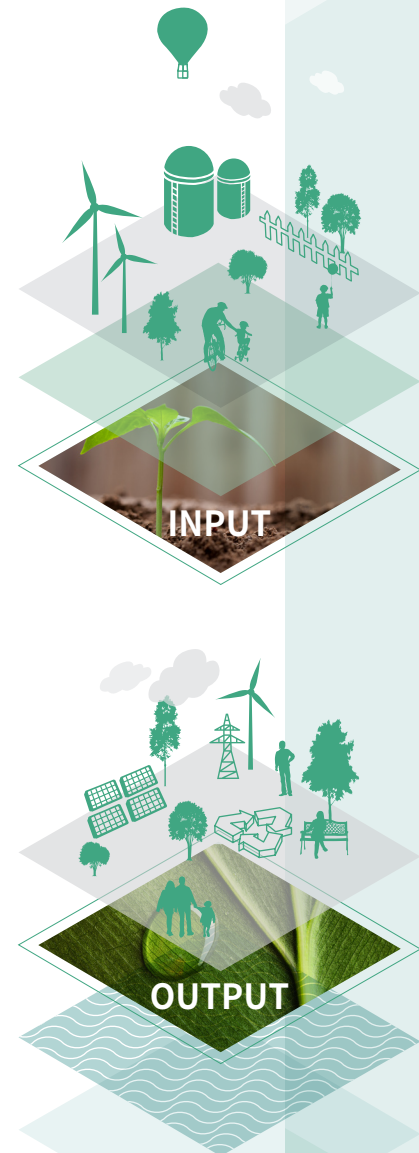
Waste Discharge (Unit: tons)

		2014	2015	2016
Nuclear power plants	General waste	9,769	10,045	10,817
	Designated waste	571	735	1,037
	Total waste	10,340	10,780	11,853
	Recycling rate (%)*	70.1	68.2	67.2

* Recycling rate compared to the amount of general waste

※Environmental Data Estimation Criteria

- "Nuclear power plants" report aggregated data of energy input and water supply for operating the Kori, Hanbit, Wolsong, and Hanul plants and their data of emissions.
- Hydro and pumped-storage power plants which do not emit pollutants aggregate environmental data centered on energy consumption and GHG emissions.
- Hydro power plants (10 units in Cheongpyeong, Uiam, etc.) and pumped-storage power plants (7 units in Muju, Samnangjin, etc.) were included in data estimation.

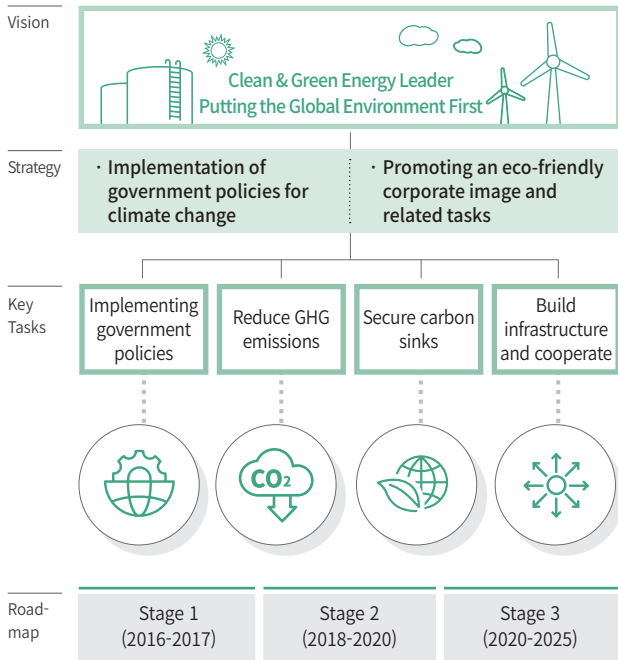


KHNP's Efforts to Respond to Climate Change

Establishing a Climate Change Response System

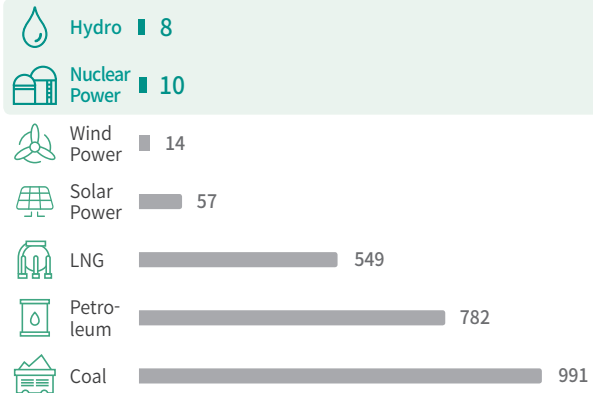
In accordance with its corporate philosophy of "Making Life Prosperous through Eco-friendly Energy," KHNP has established a climate response roadmap, implemented on a step-by-step basis. In particular, the company actively responds to climate change issues by identifying four core areas and key implementation tasks.

Climate Change Response Roadmap

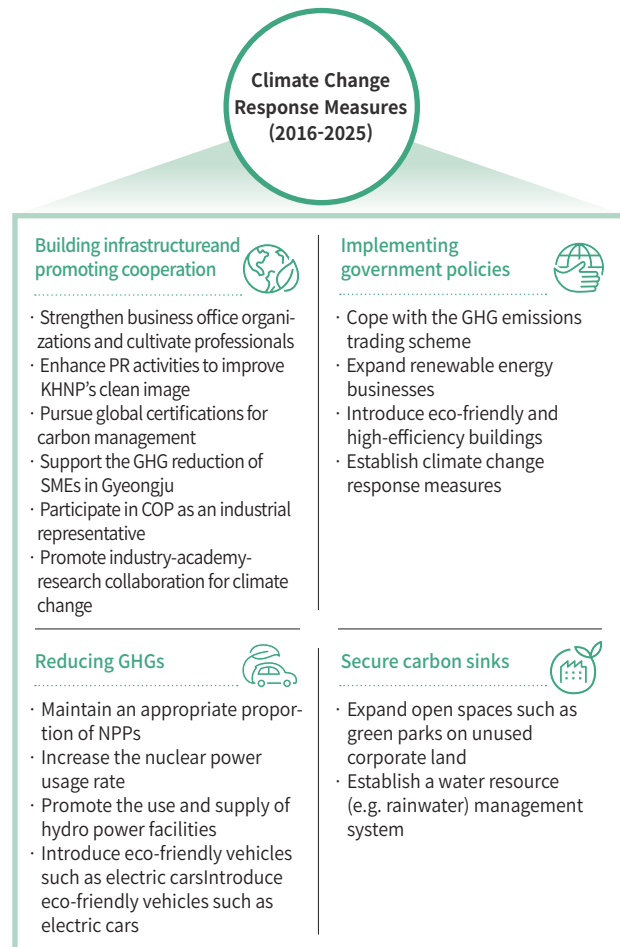


GHG Emissions by Power Source

(Unit : g/kWh)



Four Main Areas and Tasks for Response to Climate Change



Contributing to the Reduction of GHG Emissions

KHNP contributes to reducing GHG emissions by generating energy from nuclear power, hydro power, and pumped-storage power which emit significantly low amounts of GHGs. Operation of nuclear and hydro power plants, however, causes the indirect emission of GHGs as electricity needed for power generation is supplied from external sources. Accordingly, KHNP implements relevant government policies and responds to climate change by operating a GHG inventory management system and preparing measures regarding the carbon emissions trading scheme.

Establishing a Response System for Carbon Emissions Trading

The carbon emissions trading scheme was implemented in 2015 and enables companies to trade emission allowances with other companies.

Depending on the extent of GHG emissions they can reduce, companies autonomously decide whether to buy or sell emission allowances in order to meet their reduction targets. In response to the emissions trading scheme, KHNP operates a GHG emissions reduction system at the company level and conducts joint projects with other companies in the same industry.

Operating a GHG Inventory Management System

KHNP systematically and effectively manages its GHG emissions through a GHG inventory management system, capable of automatically calculating emissions by inputting self-reported emissions or using emission factors and a calculation formula.

KHNP's Energy Reduction Activities

In response to the global energy crisis caused by an escalating increase of demand for electricity and high oil prices, KHNP actively takes part in Korea's efforts to reduce energy consumption through its annual plans for the reduction of energy consumption.

Energy Consumption Reduction Activities



- Attach automatic power-off timers on vending machines
- Use high-efficiency energy materials such as power-saving office supplies and appliances
- Use products with low standby power
- Maintain indoor temperatures at an appropriate level
- Conduct a public enterprise energy audit (Identify causes for energy loss and improve efficiency)

Energy Consumption Reduction Education and Promotion



- Participate in contests for energy-saving ideas and catchphrases
- Announce best practice cases in reducing energy consumption
- Participate in awards hosted by the government and related agencies for energy saving
- Conduct commissioned education in Korea for energy managers

Establishment and Implementation of Energy Consumption Reduction Plans



- Organize and operate energy saving committees at each office
- Designate and operate the department and person in charge of energy saving
- Establish energy-saving plans and report performance
- Participate in government-KHNP joint energy reduction guidance and inspections
- Conduct performance assessments of generation facilities and improve/manage performance

Energy Consumption Reduction Campaign



- Hold "Month of Energy Saving" events
- Install banners and signboards with energy reduction messages
- Use in-house broadcasting and conduct employee training for energy saving

Social Responsibility

KHNP, Building an Inclusive and Happy Society



Won the
**Presidential
Commendation**

at the 2nd Korea Crime
Prevention Awards



Won the
Grand Prize

in the social contribution
sector for Greatest
Executive Leadership

Won the
**Prime Minister's
Commendation**

in the social contribution sector for the
National Sharing Grand Award



Won the
**Commendation
of the Minister of
Interior and Safety**
for contributions to earthquake
and typhoon relief

Report Context

Although the top priority of companies in the past was to generate economic profits, now they are also required to achieve sustainable growth and development. Companies are expected to realize economic, environmental, and social sustainability. Society now demands that they continuously and systematically carry out social contribution activities related to their corporate vision and strategy, rather than hold one-time events just for show. This is the reason why fulfilling corporate social responsibilities and pursuing win-win growth with the local community are very important issues in the nuclear industry. KHNP will therefore initiate various social contribution activities along with business projects generating sustainable values.

Our Progress

KHNP fulfills its corporate social responsibilities by establishing a social contribution system and strategic targets based on industrial specificity and core competency. The company strives to become a trusted public enterprise that meets the needs of the public and government policies. As part of these efforts, KHNP promotes the receptivity of the local community to nuclear power through win-win cooperation activities that reflect the characteristics and needs of the areas near nuclear power plants.

Our Plan

KHNP will continuously implement its three major social contribution strategies and enhance its corporate brand value by upgrading its social contribution projects both in quantity and quality. It will also secure more communication channels for various groups of stakeholders, such as beneficiaries and local governments, to reflect their needs and increase their satisfaction. KHNP will improve its social contribution implementation system by closely cooperating with professional agencies and securing global capacity, ultimately contributing to building a safe and happy world for all.

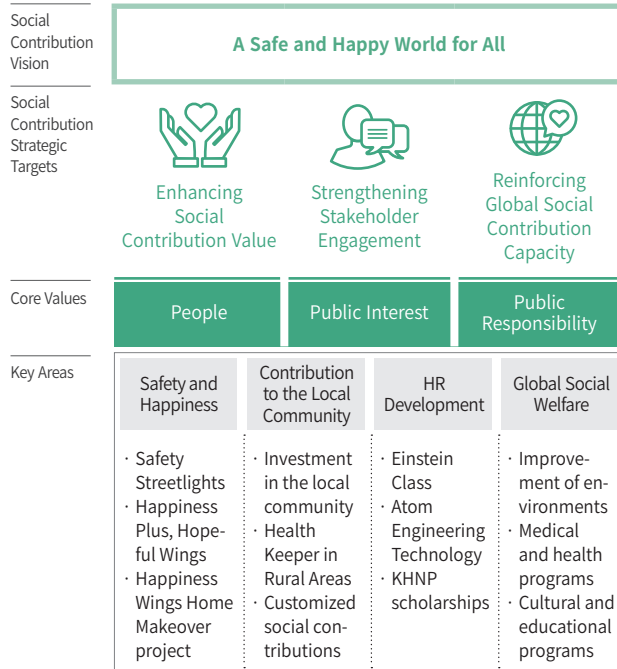
Establishing a Strategic Social Contribution System

Social Contribution Strategy

In addition to fulfilling the company's primary role as a national energy supplier, KHNP is committed to carrying out its corporate social responsibilities through its social contribution strategy implementation system. Under the vision of creating "A safe and happy world for all," KHNP implements various social contribution activities in four key areas : "Safety and happiness," "Contribution to the local community," "HR development" and "Global Social Welfare."

KHNP Social Contribution Slogan

"Love for Neighbors, Hope for Society"



Social Contribution Organization and Resources

KHNP Social Volunteer Group (SVG)

Since it was launched in 2004, the KHNP Social Volunteer Group (SVG) has systematically carried out various social contribution activities under the leadership of the CEO, head of the SVG, and through the main and local secretariats. The SVG comprises sub-groups per volunteer area and function such as social, medical local, regional, global, and senior volunteer groups, and it is committed to fulfilling social contribution through the practice of sharing.



Financial Source for social contribution Activity, "Dandelion Spore Fund"

KHNP carries out its social contribution activities through the Dandelion Spore Fund, consisting of two sub-funds, "Love Fund," raised from employees' voluntary donations, and "Matching Grant," which is the company's sharing and donation fund. As of 2016, the Dandelion Spore Fund has raised KRW 14.2 billion and was used for various social contribution activities.

KHNP Social Volunteer Group Emblem

The SVG emblem, shaped like a "dandelion spore," symbolizes the love and hope spreading across the society, while the colors "blue" and "green" signify the spirit of hope and a loving heart, respectively.



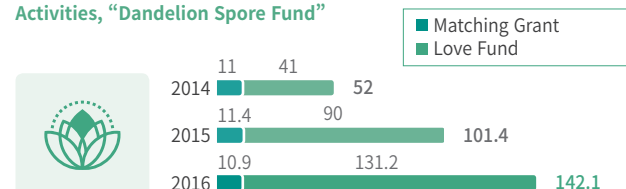
Volunteer Service Hours per Employee

(Unit : hours)



KHNP Financial Source for Social Contribution Activities, "Dandelion Spore Fund"

(Unit : KRW 100 million)



Undertaking CSR activities to send messages of hope to our society

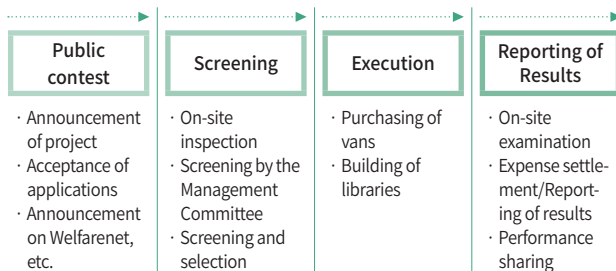
Safety and Happiness

KHNP builds a safe and happy world for all.

Happiness Plus, Hopeful Wings

KHNP's Happiness Plus, Hopeful Wings project is an initiative to provide a pleasant learning environment for local children and young adults from low-income families by cooperating with non-profit welfare organizations. In 2016, KHNP donated 95 vans, built 55 "Hopeful Wings" libraries, and provided cultural experience opportunities to 433 local children.

Happiness Plus, Hopeful Wings Project Process



Happiness Plus, Hopeful Wings Project Performance (Accumulative from 2012 to 2016)

245
vans



16centers
Improvement of facilities in



Libraries in
147centers



Cultural experience opportunity to
583children



Photovoltaic Power Safety Streetlights

KHNP installs photovoltaic power safety streetlights in low-security regions nationwide. In 2016, it contributed to building a social safety net by installing 317 streetlights in eight regions including Seosan-si, Chungcheongnam-do and Gyeongju-si, Gyeongsangbuk-do. In recognition of its contribution to crime prevention in local communities, KHNP was awarded the Presidential commendation at the 2nd Korea Crime Prevention Awards hosted by the Korea National Police Agency in October 2017.

Photovoltaic Power Safety Streetlight Project Performance

Classification	2014	2015	2016	Total
Number of Regions	1	6	6	13
Number of Streetlights	37	253	317	607
Amount (KRW 100 million)	3	20	30	53

Photovoltaic Power Safety Streetlight Installation Regions



Happiness Wings Home Makeover Project

The Happiness Wings Home Makeover Project is a joint effort by KHNP and Habitat Korea to renovate old homes for low-income families and welfare facilities in low-income regions. Since the project was launched in June 2016, KHNP has supported the renovation of the homes of 66 low-income families—including multiple-child families, multicultural families, and vulnerable households—in Gyeongju and Ulju-gun, as well as four welfare facilities. Renovation efforts included refinishing the floors, repainting the walls, and redoing the bathrooms and kitchens of the homes and welfare facilities.

Blindness Prevention Project

Through its Blindness Prevention Project, KHNP supports expenses for the eyesight restoration operations for recipients of national basic livelihood security and the near poverty group. The project also provides eye exams for free of charge to local residents, enhancing the quality of life for local residents who are at risk of blindness due to cataracts, glaucoma, and retinal detachment. In 2016, KHNP supported operation expenses for 527 people and provided free eye exams to 1,812 local residents living near power plants.

Happiness Plus, Hopeful Wings Project
Van Donation Ceremony



Happiness Wings Home Renovation Project



HR Development

KHNP is committed to developing human resources through various projects.



Einstein Class

KHNP holds the Einstein Class, a program providing academic and career counseling to local middle and high school students through university students selected as volunteer mentors. Initially launched in 2010 and celebrating its eighth year, the Einstein Class has provided an opportunity for both mentors and mentees to share both their dreams and concerns about their future careers. By holding performance evaluations and surveys, KHNP continues to improve the quality of the program.

Atom Engineering Technology Class

In cooperation with the Korea Engineering Academy, KHNP holds the Atom Engineering Class twice a year for future scientists. Over 100 volunteer teachers from within the company teach fun science classes for some 2,000 local children.

Number of Einstein Class Program Beneficiaries (Unit: people)

Classification	2014	2015	2016
Mentees 	297	390	328
Mentors 	40	52	51

Mentor-Mentee Class



Atom Engineering Class



Global Social Welfare

KHNP provides support for developing countries to help them improve their living environment, education, and cultural activities as part of the company's contribution to solving various social problems around the world.

Global Social Welfare

By providing various forms support to developing countries—improving their living environment, education, and cultural activities—KHNP contributes to solving social problems in each country. In 2016, KHNP organized a global volunteer group in industrial-academic cooperation with Seoul National University, installing drinking water facilities using rainwater and providing science education for local middle school students in Binh Dinh, Vietnam. KHNP formed another global volunteer group with a university in Gyeongju to build a library, donate books, and provide science education in Tien Giang, Vietnam. In August 2017, the volunteer group visited Dukovany, Czech Republic, where KHNP plans to export nuclear power plants, to carry out various volunteer activities including improving welfare facilities for senior citizens, the disabled, and children by painting wall murals, and promote educational and cultural exchange.

Global Volunteer Activities through Industrial-Academic Cooperation

Classification	Region	Description	University	No. of Volunteers
Winter Season	Vinh Dinh, Vietnam	Drinking water facilities using rainwater, Education	Seoul National University	41
Summer Season	Vinh Dinh, Vietnam	Drinking water facilities using rainwater, Education	Seoul National University	60
Summer Season	Tien Giang, Vietnam	Library construction, Education	Dongguk University, Uiduk University, Gyeongju University	55
Summer Season	Dukovany, Czech Republic	Facility improvement, Education, Cultural exchange	Dongguk University Gyeongju Campus (Chamsarang Sharing Center)	36

Support for Building a Library in Tien Giang, Vietnam



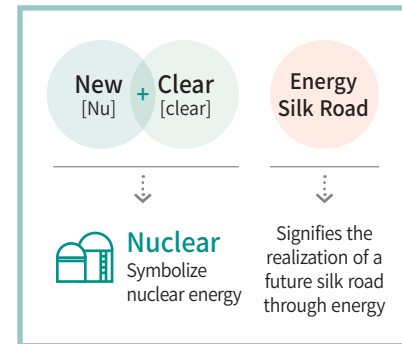
Painting murals in Oslavou, Czech Republic



Special Page : Contribution to the Local Community

New & Clear Energy Silk Road

After relocating the company's Head Office to Gyeongju, Gyeongsangbuk-do in 2016, KHNP announced the "New & Clear Energy Silk Road" as its future energy slogan, along with the Comprehensive Plan for Gyeongju Development. The plan is promoted by focusing on its five key projects and ten social initiatives aimed at promoting economic, cultural, welfare, and educational development. By continuously developing new projects, KHNP will strive toward achieving win-win growth both for the company and the local community in Gyeongju.

**Five Key Projects for Regional Development in Gyeongju****Attract nuclear energy suppliers to Gyeongju**

As of the end of July 2017, 53 nuclear power suppliers including KEPCO KDN and AREVA Korea have completed the relocation to Gyeongju. KHNP's target is to attract 100 companies to Gyeongju by 2020.

Establish a Nuclear Site Personnel Training Center

KHNP plans to establish a nuclear site personnel training center in Gyeongju to cultivate on-site personnel by providing training in NPP maintenance and general functions to the unemployed, KHNP employees, and supplier employees.

Establish a Dormitory for Students Studying in Seoul

KHNP plans to establish a dormitory in Eungbong-dong, Seoul, with the capacity to accommodate 1,000 university students from NPP regions.

Promote the MICE Industry

KHNP helps promote the MICE industry in the region by holding corporate meetings and exhibitions. In 2016, KHNP held 67 events including the 2016 kick-off meeting, annual company meeting, and workshops.

Support KHNP Women's Football Team

In March 2017, KHNP founded the KHNP Women's Football Team, the eighth women's business football team in Korea, based in Gyeongju. Consisting of five coaches and 27 players, the KHNP Women's Football Team played in the WK League opening game on the home ground at Gyeongju Football Park in April 2017.

KHNP, Achieving Win-win Growth with the Local Communities

KHNP's Activities to Achieve Win-win Growth with the Community

KHNP's efforts to achieve win-win growth is not limited to Gyeongju where the company's Head Office is located, but also includes regions near all nuclear power plant sites and business offices. The company continuously invests in economic, cultural, environmental, and HR development to achieve long-term growth alongside the local community. It also assists the development of each local community through various means, such as carrying out volunteer work for the socially vulnerable, dispatching Health Keepers to rural areas, and offering a helping hand to areas in need.

Investing in the Local Community

In response to the trust and support shown by the local community and its residents, KHNP continuously carries out various social contribution activities for the long-term development of the local community to realize economic cooperation, culture promotion, HR development, and environmental protection.

Investment in the Local Community

(Unit: KRW 100 million)



3rd Concert of the Wolsong Choir



Donation Ceremony in celebration of the foundation of the Seed Youth Orchestra



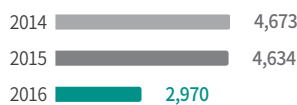
Donation for Earthquake Disaster Relief in Gyeongju

Health Keepers in Rural Areas

KHNP has been providing health exams to residents in farming and fishing villages since 2007. In 2016, KHNP's Health Keepers performed basic exams, conscious sedation endoscopy, abdominal ultrasonography, and other cancer tests offered at general hospitals for a total of 2,970 residents.

Number of Beneficiaries of Health Keepers

(Unit: persons)



Free Eye Exams



Health Keepers 1



Health Keepers 2

Regional Social Contribution Activities

Through its social volunteer group (SVG), KHNP carries out various regional social contribution activities, including offering a helping hand during busy farming seasons, sharing food with local senior citizens, delivering lunchboxes, environmental clean-up activities, and offering programs to those who lack opportunities for cultural activities. The SVG participated in disaster relief activities in regions hit by earthquakes and typhoons, while KHNP donated KRW 500 million for earthquake relief in Gyeongju and typhoon relief in Ulsan.



Typhoon relief activities

Best Practice

Automatic Blood Pressure Monitors for Local Senior Citizens

As part of its efforts to support the health of senior citizens living in regions with low medical resources, KHNP has installed automatic blood pressure monitors in local community centers and welfare facilities for senior citizens. Launched in August 2017, this project will continue to install more automatic blood pressure monitors in 536 community centers and welfare facilities for senior citizens in Gyeongju-si by June 2018.

Timeless Integrity

KHNP, a Corporation of Integrity and Ethics



Rated **Grade 1**
in an Integrity
Assessment

Awarded the
**Presidential
Commendation**
in the Anti-corruption Sector



Rated **Grade 1**
in the Anti-corruption
Initiative Assessment for two
consecutive years



ISO 37001
certification
for KHNP's anti-corruption
management system



Report Context

Major policy reforms in Korea have recently been enacted to build a fairer society where justice can prevail. The five-year policy roadmap announced by the Korean government in July 2017 sets forth “Ending injustice” and “Anti-corruption reforms” as its top priority tasks. KHNP will respond by actively participating in anti-corruption reforms : the company will operate task forces (TF) in each division and establish related organizations such as the Anti-corruption Conference and the Anti-corruption Committee. To meet the demands of the times, companies are required to take the initiative in rooting out corruption and bribery and do their part in building a fair and just society.

Our Progress

KHNP prevents employees from taking part in ethical misconduct through its ethical management system, which reflects the trends in ethical management and the characteristics of the nuclear industry, as well as reinforcing its ethical risk prevention system. The company also augments employees' integrity awareness by offering ethical programs on a regular basis and expanding its ethical management participation programs. In recognition of such efforts, KHNP was awarded Grade 1, the highest grade in the 2016 Anti-corruption Initiative Assessment and the Integrity Assessment, in addition to receiving the Presidential Commendation in the anti-corruption sector for spreading a culture of integrity.

Our Plan

KHNP will continue its efforts to further advance its ethical management policies and systems and ultimately build an unrivalled culture of integrity and ethics. To achieve this goal, KHNP will reinforce its participatory ethical management programs and efficiently operate ethical management education, making company-wide efforts to internalize ethical awareness among its employees. Based on its employees' integrity, KHNP will fundamentally root out corruption, while spreading a culture of integrity and ethics throughout the nuclear industry.

Strengthening a Trust-based Ethical Management System

Advancing the Ethical Management System

Establishing an Ethical Management Strategy

Pursuing its vision of becoming a “Global T.O.P Ethical Enterprise” in ethical management, KHNP endeavors to create a culture of integrity and ethics by advancing its ethical management system and internalizing ethical awareness among its employees. KHNP has been encouraging its employees’ voluntary participation through policy reforms so that they can proudly enact the company’s ethical management efforts not as compulsory, regulatory restraints but as a leading paradigm.



Re-establishing Ethical Management Infrastructures

Preventing the Recurrence of Corruption in the Nuclear Industry

KHNP implements various policy measures to fundamentally prevent corruption in the nuclear industry. To eradicate corrupt ties in the nuclear industry, KHNP prohibits 2nd level or higher retirees from being reemployed by suppliers for at least three years. KHNP also bans any corporate investment related to its business and makes property registration mandatory for second-level or higher employees and their spouses.

Elaborating Ethical Norms

In an effort to become an enterprise fully trusted by the people, KHNP continuously improves its ethical management policies and systems. In 2016, KHNP updated the company’s Code of Ethics to reflect the Improper Solicitation and Graft Act, clearly stipulating the prohibition of giving and receiving of bribes. KHNP also re-established disciplinary measures by reflecting the Act and other laws and regulations.

Operating the Ethical Risk Prevention System

KHNP operates the Improper Solicitation and Graft Act system, while making adjustments to its business trip system and the education and training guidelines, to prevent any ethical risks that may arise in business operation.

Operating the Improper Solicitation and Graft Act System

- Expert Q&A
- Provide comprehensive services in reporting, counseling, and self-assessment

Amending Reporting Guidelines and Improving the External Lecture System

- Reflect the Improper Solicitation and Graft Act and amend the guidelines concerned to advance the external lecture system
- Increase the level of understanding by including the reporting manual in the system

Amending the R&D Expense Guidelines

- Clarify the classification of consultation, subdivision of classes, payment standards, and service agreement standards

Establishing the Departmental Bank Account Management System

- Register departmental bank accounts and check balances to prevent financial accidents

Amend Business Trip Standards

- Reduce eligibility for the use of KTX executive first class, set accommodation fee limits by region, etc.
- Set international accommodation fee limits, lower meal expenses for all ranks, etc.

Amending the Education and Training Guidelines

- Reflect the Improper Solicitation and Graft Act and set a cap on honorariums for public officials

Spreading a Transparent Culture of Integrity and Ethics

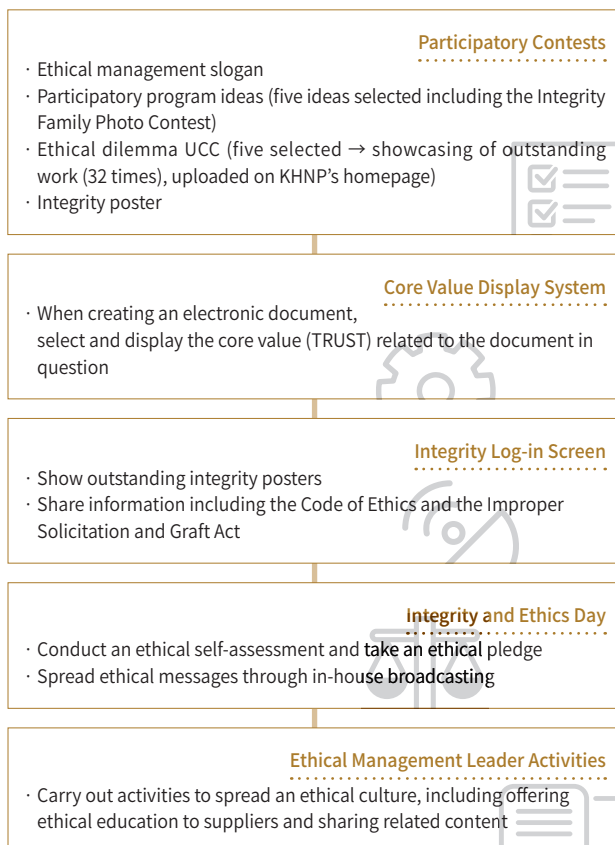
Realizing a Participatory Culture of Integrity and Ethics

Creating a Participatory Environment through Leading by Example

KHNP executives encourage all employees to participate in ethical management by consistently prioritizing integrity and ethics and setting an example. While the CEO took a formal pledge to fully comply with the Improper Solicitation and Graft Act, 2nd level or higher executives also took an oath to abide by the Code of Ethics. Furthermore, KHNP held an ethical pledge ceremony in the presence of the heads of department and office and first business office staff, including those newly assigned to their posts.

Operating Regular Integrity and Ethics Programs

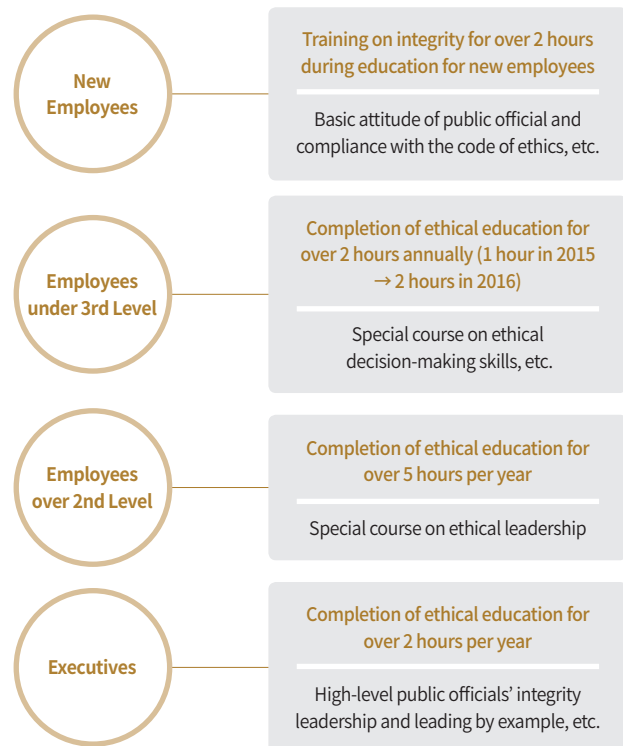
KHNP operates various integrity and ethics programs—including ethical management idea contests and Code of Conduct quizzes—to encourage employees to voluntarily participate.



Reinforcing the Internalization of Ethical Awareness among Employees

Lifecycle Ethical Education

From newly-hired employees to executives, every KHNP employee must complete the ethical education lifecycle without exception. Newly hired employees, in particular, receive education on the basic mindset and code of ethics required of public enterprise employees. Executives are educated on the kind of ethical leadership required of high-level public officials, thereby reinforcing their ethical awareness so that they can lead by example.



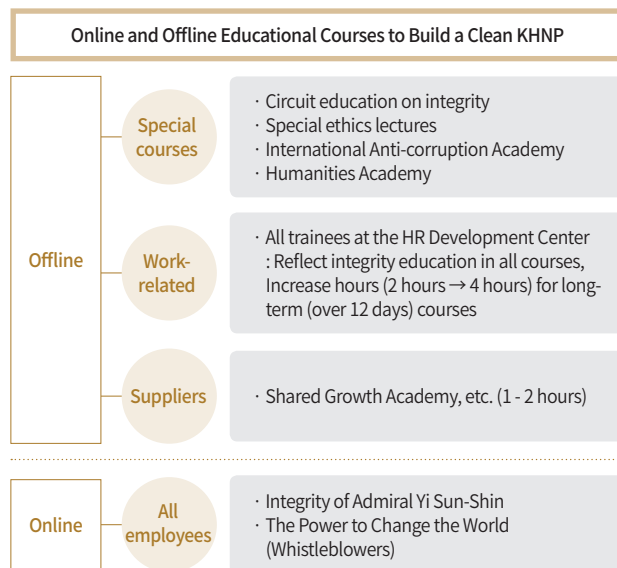
2016 Ethical Dilemma UCC Winners

"Do you really want to be a shameless adult?" (Grand Prize)
 "Back to the beginning" (Runner-up)



Expanding Customized Integrity and Ethics Education

KHNP offers various online and offline educational courses to reinforce ethical awareness among its employees.



Ethical Education Play

KHNP uses various forms of ethical education programs such as plays to attract more engagement by the trainees and improve the programs' effectiveness. By using new forms of education that are interesting and fun for the trainees, KHNP endeavors to internalize ethical awareness among its employees.



Ethical Education Play

Monitoring of Ethical Management and Major Performance

Reinforcing Internal and External Reporting and the Control Process

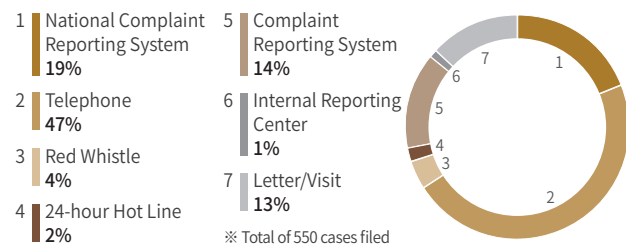
Using numerous channels such as the national complaint reporting system, the in-house reporting system, and the Executive Auditor Hotline, KHNP receives internal and external sources and reduces potential management risks. In 2016, KHNP received 550 complaints through various channels. The company launched audits on seven of those cases, six of which were concluded by taking professional disciplinary measures.

KHNP has also strengthened internal control by reinforcing monitoring through the KHNP Integrity Ombudsman System, which consists of external experts and the Advisory Committee. It also bolsters management control functions by encouraging non-executive directors' participation and suggestions in managerial matters.

Complaint Reporting and Handling Process



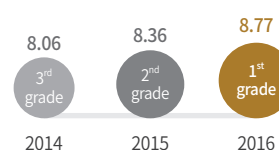
Complaints Filed through Various Channels



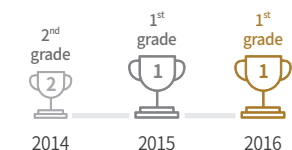
Internal and External Evaluations of Ethical Management

Based on its anti-corruption management reforms, KHNP received the highest grade in the anti-corruption initiative assessment and the integrity assessment by the Anti-corruption and Civil Rights Commission (ACRC) in 2016. Considering that KHNP earned Grade 5 in both 2012 and 2013, receiving the highest grade in 2016 shows the dramatic increase in KHNP's corporate integrity.

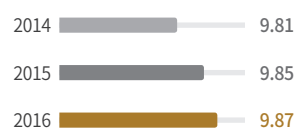
ACRC Integrity Assessment



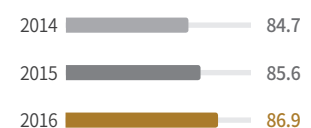
ACRC Anti-corruption Initiative Assessment



Self-assessment of Integrity



KHNP-BEX*



*KHNP-BEX : KHNP's self-assessment index on the level of ethics

Timeless Integrity

KHNP, Building a Culture of Respect for Human Rights



Presidential Commendation

for outstanding achievement
in gender equality



Certified for family-friendly
management for

**6 consecutive
years**

Most outstanding company in
national human resources development hosted
by the Ministry of Employment and Labor

for
**3 consecutive
years**



Industrial Accident
Rate in Nuclear Power
Plant Construction

0.07%
(0.08% in 2015)

Report Context

Human rights management is rapidly gaining recognition as a global standard in corporate management. Companies are now required to serve as corporate citizens with high respect for human rights. Recently, the National Human Rights Commission of Korea (NHRCK) stressed the need to establish the National Action Plan for the Promotion and Protection of Human Rights (NAP) to prevent human rights violations by companies. The NHRCK also recommended that companies establish the NAP and suggested that public enterprises undertake key tasks such as establishing human rights management systems and relief processes for victims of human rights violations. NHRCK also recommends that companies reflect human rights management performance in the management assessment of public enterprises. It is expected that companies will follow suit and implement various systems to prevent human rights violations.

Our Progress

Since joining the UN Global Compact in 2007, KHNP has enacted various efforts to protect the human rights of its employees. In 2017, KHNP established and declared the Charter of Human Rights Management, confirming the company's strong commitment to human rights management at the company level. KHNP continuously identifies and takes actions for factors related to human rights violations, particularly in discrimination in employment, industrial safety, and supply chain management. The company also promotes a culture of respect for human rights through internal and external human rights education.

Our Plan

KHNP will continue to comply with the human rights principles of the UN Global Compact. It will also build a culture of respect for human rights both at home and abroad by selecting key management items to actively implement the UN Sustainable Development Goals (SDGs). The SDGs were developed to resolve universal issues for humanity and deal with issues such as poverty, food security, good health and well-being, quality education, gender equality, and female empowerment.

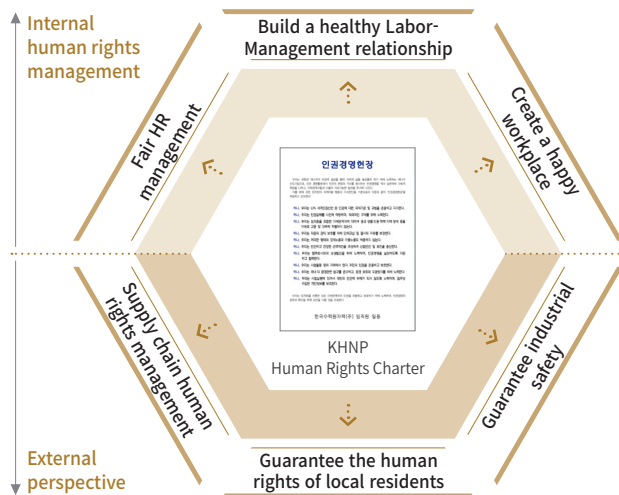
Efforts to Spread a Culture of Respect for Human Rights

Establishing a Human Rights Management System

Strategic Directions for Human Rights Management

In order to prevent human rights violations against its major stakeholders including employees, KHNP fully complies with the human rights principles of the UN Global Compact. The company continuously identifies and improves factors of human rights violations against employees, suppliers in contractual relationships with KHNP regarding product purchasing and service agreements, and local residents living near nuclear power plants. As part of its efforts to prevent human rights violations, KHNP established the Charter of Human Rights Management in 2017 and had all its employees take a pledge to protect human rights.

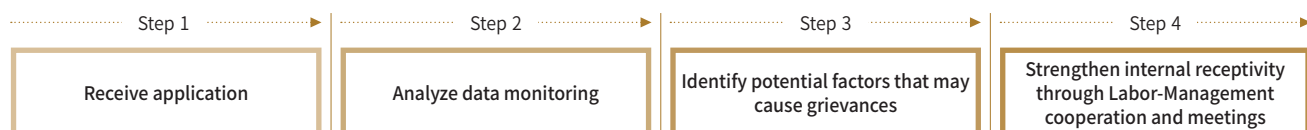
KHNP's Human Rights Management



Handling Human Rights Grievances

KHNP operates a grievance settlement system to hear employees' complaints and handle grievances. Using the data collected in the system, the company analyzes factors that cause complaints and grievances. KHNP then prepares measures to resolve them, ultimately resulting in improvements in the grievance settlement index.

Grievance Settlement System



Building a Culture of Respect for Human Rights

Guaranteeing Industrial Safety

KHNP implements a full range of safety management measures to prevent industrial accidents at nuclear power plant sites. When operating a newly-constructed NPP, KHNP designates an organization in charge of on-site safety and health. It also reduces accident risks by conducting an intensive inspection of the safety and health management status. To build safety awareness, KHNP sends out Safety Moment materials at official events and meetings during the construction of nuclear power plants. Finally, the company provides mandatory safety experience education to labor management personnel before on-site work to enhance their safety awareness.

Improving the Safety Ethics Promotion System

KHNP has implemented improvements for the Employee Concerns Program(ECP) system to protect whistleblowers and promote a culture of reporting. KHNP has also introduced the safety mileage system to strengthen prevention activities by motivating its employees, while distributing the "Safety Culture Notebook," which states the details of the ECP procedure, explains about the protection provided for whistleblowers, and introduces the safety mileage system.

Supply Chain Human Rights Management

To widely spread an organizational culture upholding human rights of employees to suppliers, KHNP grants additional advantage points in credibility item one of details of eligibility evaluation for product purchase. It also grants additional advantage points to companies owned or managed by the disabled, certified as a family-friendly company, or exemplary subcontractor in transaction practice.

Establishing an Advanced Labor-Management Relationship

In pursuit of its vision of "Creating a future for labor and management through respect and cooperation," KHNP has established strategies to build an advanced Labor-Management relationship by cooperating with internal and external experts. To better execute the strategies, it assigns an organization in charge of labor relations at each business site. KHNP then responds immediately to labor issues through the Special Committee on Labor-Management Relations.

Efforts to Promote a Culture of Respect for Human Rights

When a Labor-Management issue occurs, KHNP promptly responds through face-to-face communication and stabilizes Labor-Management relations through leader-to-leader communication on a regular basis, Labor-Management Joint Committee meetings, and Labor-Management meetings.

Creating a Happy Workplace

Creating a Work Environment of Gender Equality | Through various efforts, KHNP seeks to build a corporate culture that guarantees gender equality and promote gender equality awareness among its employees. Notably, it was the first public enterprise to establish a sexual harassment counseling and reporting center. KHNP also carries out activities to internalize and promote women's rights by offering "lifecycle education" to help employees deal with life before marriage, pregnancy, child-rearing, and returning to work. In recognition of these efforts, KHNP received the Presidential Commendation at the 2017 Gender Equality Week Ceremony hosted by the Ministry of Gender Equality and Family.

Gender Equality Committee

KHNP expanded the former "Women's Committee" to the "Gender Equality Committee," which is divided into three subcommittees for gender equality, family-friendliness, and corporate culture. In 2016, the tasks selected at the Gender Equality Committee were reflected in KHNP's mid to long-term strategies for establishing a family-friendly corporate culture. This has laid the foundation for a culture of gender equality so that it can firmly take root and grow throughout the company.



KHNP wins the Presidential Commendation at the Gender Equality Week Ceremony

Promoting Family-friendly Management | KHNP offers various family-friendly programs to create a stable work environment where employees can enjoy a healthy balance between work and family. Every Wednesday and Friday is designated as "Family Day," which is when employees are encouraged to leave work on time by automatically turning off the computers at the close of business. KHNP also encourages male employees to go on parental leave, and team staff to use at least 12 days of annual leave, as part of the company's efforts to firmly establish a practically family-friendly management.

KHNP also implements a customized, flexible time system in response to the various changes in working conditions, such as an increase in the number of employees who are in a long-distance marriage after KHNP's relocation to Gyeongju. As a result of its continuous efforts in family-friendly management, KHNP has been certified as a family-friendly company for six consecutive years since it was first certified in 2011. In 2016, the company received a perfect score on all items in the certification evaluation.

Performance in Flexible Work Hours

(Unit : people)

Classification		2015	2016
Alternative work schedule system		89	133
Flex time type		3,351	6,116
Flexible Working system	Flexible working time	68	2,364
	Compressed work type	-	52
Total number of employees		3,508	8,665

Fair and equal hiring

Fair HR Employment

KHNP's Social Equality Employment

KHNP endeavors to achieve balanced development in the local community by employing local talent, while continuously expanding open employment in line with government policies to build a competency-centered society. KHNP has greatly contributed to job creation in the local community by operating an employment support network and increasing the regional employment quota. It has also expanded social equality employment for women and the disabled, thus securing flexibility and diversity in the workplace.

Employment in Permanent Positions

(Unit : people)

Classification	2014	2015	2016
Female	114	260	139.5
Disabled	3	9	10
Local talent (Non-metropolitan region/Relocated region)	453/77	824.25/113.75	538.5/127.5
High school diploma	195.5	158	147.5

Anti-discrimination in Employment

To prevent any potential discrimination in employment, KHNP continuously identifies areas of improvement and takes measures regarding seconded personnel, temporary positions, and unlimited contract positions. First of all, the company has strengthened self-inspections and education to fundamentally prevent certain forms of employment, such as illegal secondment. Second, KHNP maintains the appropriate number of temporary workers by adopting a target management system. Third, it resolves discriminatory factors toward unlimited-term contract workers by applying legitimate human resources policies and reducing any differences in treatment, including payment rates.

Temporary Positions and Unlimited Contract Positions (Unit: persons, %)

	Classification	2014	2015	2016
Temporary Positions ¹⁾	No. of temporary workers	230	254	217
	Ratio	2.14	2.28	1.84
Unlimited Contract Positions ²⁾	Employed	0	0	11
	Transition	11	7	7
	Total	28	33	44

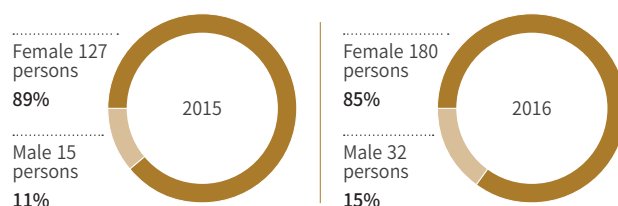
1) KHNP complies with the "Guidelines on Personnel Management of Public Enterprises" by the Ministry of Strategy and Finance, which states that temporary workers shall be less than 5% of the total number of employees.

2) The difference in the number of currently employed unlimited contract workers is caused by the resignation of former unlimited contract worker(s).

Securing and Cultivating Female Talent

Securing female talent in the nuclear industry is particularly challenging because it tends to involve dangerous on-site work and shift work at power plant facilities. Nevertheless, KHNP is actively promoting an alternative work schedule system, appointing more female executives, and encouraging the use of parental leave to both employ and cultivate female talent.

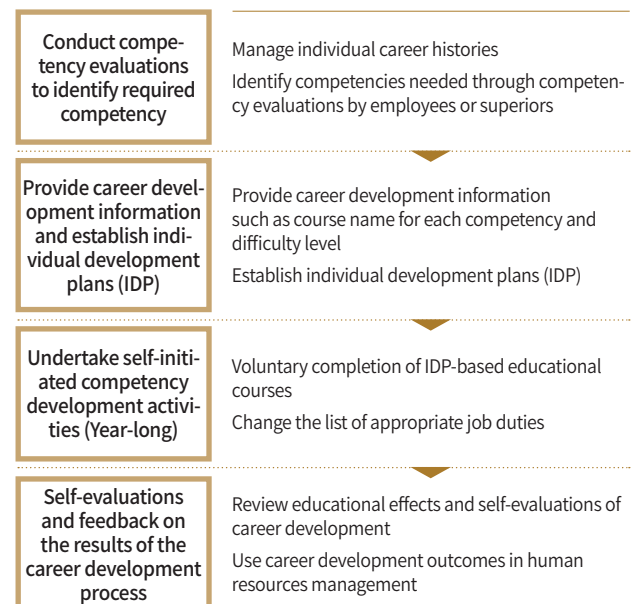
Number of Employees on Parental Leave



Strategic HR Development

KHNP CDP Centered on Work Competency

KHNP applies a customized career development system for different occupational groups such as managers and working-level staff.



Customized Capacity-Building Programs

To promote occupational professionalism among its employees, KHNP conducts selective training through a selection and concentration strategy. KHNP provides standardized OJT to help its newly-employed staff to adapt to their new environment and increased the number of hours for basic training in line with international standards. The company intensively improves employees' work competency through on-site-oriented action competency training, the university-affiliated CEO program, and core professional system. KHNP is also expanding informal learning using various educational platforms such as academic organizations, smart learning, and self-learning.

Education Expense per Employee

(Unit: KRW millions)

Classification	2014	2015	2016
In-company education	1.07	1.49	1.9
External education	0.78	1.06	1.36
Total	1.85	2.56	3.26

Towards a Sustainable Future

We put safety first because people are important to us.

Our devotion and commitment to safety has enabled us to build nuclear facilities that are among the safest in the world.

We unlock the door to a future of hope with safety as the key.

Every day, we try to find better answers by focusing on renewable energy and reinforcing our business capacity in nuclear decommissioning.



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Preparing for a New Future

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Securing the World's Top Nuclear Safety

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Expanding Renewable Energy Businesses for Tomorrow

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Creating New Growth Engines through
Decommissioning Businesses

Preparing for a New Future

What Changes Are We Facing?

World Energy Prospects

According to a report by the International Energy Agency (IEA), world energy demand will continue to grow until 2040, and the proportion of fossil fuels will gradually decrease. Following the Paris Agreement of December 2015, there are stronger demands for all countries to reduce GHG emissions and the use of fossil fuels. Accordingly, it is expected that the use of nuclear energy, natural gas, and renewable energy will continuously increase as countries make more efforts to replace fossil fuels. Nuclear power is a particularly low-carbon alternative to fossil fuels, and the IEA forecasts that power generation by nuclear power plants will rise from the current figure of 10% to 17% by 2050.

World Energy Consumption and Demand Prospects

	Unit	2013	2020	2025	2030	2035	2040
OECD	Mtoe	5,324	5,344	5,264	5,210	5,175	5,167
Total	Mtoe	13,559	14,743	15,503	16,349	17,166	17,934

Prospects for Domestic Energy Supply and Demand

Since its inauguration in 2017, the new Korean government has emphasized the energy transition policy that requires less fossil fuels and nuclear power generation, as opposed to more LNG and renewable energy. Following a heated public debate on the suspension of nuclear power plant construction in Korea, the government has decided to resume the construction of Shin-Kori #5 and 6, choosing to gradually decrease the rate of nuclear power generation instead. The government has also established the 8th Basic Plan for Long-term Electricity Supply and Demand, which suggests mid to long-term policy directions to stabilize electric power supply and demand, as well as strategic directions to minimize the burden of GHGs. KHNP will actively respond to future changes in the supply and demand of electric power that will be brought by the 4th Industrial Revolution, which is both a global trend and one of the 100 tasks recently announced by the government.

Why Is KHNP Important?

Roles and Responsibilities of Nuclear Power Suppliers

Following the earthquake and tsunami that struck Japan in March 2011, the Fukushima nuclear power plant lost control, leading to a hydrogen explosion and leakage of a large amount of nuclear radiation. What followed was a retreat of the global nuclear industry, with European countries such as Switzerland, Germany, and Belgium announcing the gradual phase-out of nuclear power or the revocation of plans to construct additional nuclear power plants. Notwithstanding these circumstances, the fact remains unchanged that nuclear power is a stable source of energy when faced with climate change and the increasing global demand for electric power. In fact, developed countries including the United Kingdom and the United States are building more nuclear power plants than before, and in other parts of the world, such as Saudi Arabia, the Czech Republic, and Poland, new nuclear power plants are under construction. Furthermore, Japan is looking to restart nuclear reactors at the Fukushima Daiichi site where the disaster had taken place. Given that nuclear power still accounts for a high proportion of the total domestic electricity production in Korea at 29.3% (as of June 2017), KHNP will do its very best to play its part in contributing to national economic growth and development.





How Will KHNP Realize Its Values?

Economics of Nuclear Power Plants and Promotion of Exports

The debate on the economics of nuclear power is becoming increasingly heated based on the concept of Levelized Cost of Energy (LCOE), which adds the social and environmental costs of power-generating assets to their unit generation cost. According to the Korea Energy Economics Institute, the LCOE in Korea was USD 40.42/MWh in 2015, which indicates higher economic competitiveness compared to other developed countries (40 - 53% compared to the U.S., UK, and Japan). This figure demonstrates the increasing need to promote overseas nuclear power plant businesses in the face of growing uncertainties in the domestic nuclear market due to the recent energy transition policy. In 2016, KHNP signed an Operating Support Services Agreement and an Investment Business Agreement for NPPs under construction in the U.A.E., and actively promoted the export of NPPs by initiating overseas NPP projects in the UK, the Czech Republic, Poland, and the Philippines. Using its extensive experience in building and operating NPPs for the past seven decades—such as winning a Pakistani government contract in October 2016 to build a hydro power plant (350MW) in Athmuqam—KHNP is also promoting its hydro power businesses in Vietnam, Pakistan, Nepal, Peru, and other Asian and South American countries, tapping into their abundant water resources and promising growth potential. Building on its own success, KHNP will continue to expand its businesses overseas.

Securing Permanent Shutdown and Decommissioning Technology

Kori #1, the oldest nuclear reactor in Korea which had been in operation for 40 years, was permanently shut down as of June 2017. Through decommissioning, Kori #1 will disappear into history, but KHNP will turn this into an opportunity to complete the lifecycle of the nuclear power plant industry and lead the domestic decommissioning industry. By acquiring the decommissioning technologies required for the shutdown of Kori #1, KHNP will secure a track record and seek business opportunities overseas, turning the decommissioning of Kori #1 into an opportunity for creating new growth engines for the future.

Expanding the Use of Renewable Energy

Since the Paris Agreement, numerous efforts have been made in Korea to reduce GHG emissions. Korea has set its 2020 target of reducing GHG emissions by 37% from business-as-usual (BAU) levels, and will implement various policies to reduce energy consumption, improve energy efficiency, and expand the use of renewable energy. Korea has also increased the mandatory supply rate for renewable energy from 4% in 2017 to 28% in 2030, with the target of increasing power generation from renewable energy to 20% by 2030. Following the new energy paradigm and government policies, KHNP is in the process of establishing business plans for expanding the use of renewable energy, such as the self-construction of photovoltaic and wind power systems. Through these efforts, KHNP seeks to secure a competitive advantage in the area of renewable energy and meet the renewable portfolio standard (RPS) requirements in a stable manner.

Securing the World's Top Nuclear Safety

KHNP has developed a variety of NPP safety systems by combining state-of-the-art technologies such as Artificial Intelligence (AI), the Internet of things (IoT), and Big Data. By expanding its business areas from NPP operation and maintenance to construction and security, KHNP will accelerate the application of the 4th Industrial Revolution technologies to the safe and efficient operation of its NPPs.

Establishing the Smart E-Tower

KHNP has applied new technologies such as Big Data, IoT, and AI to the E-Tower (NPP control room) so that the status of key facilities can be monitored online through the advanced early warning system. The company also uses machine learning to detect anomalies at the early stages and notifies on-site operators of any status changes, securing the safety of its NPP operation.

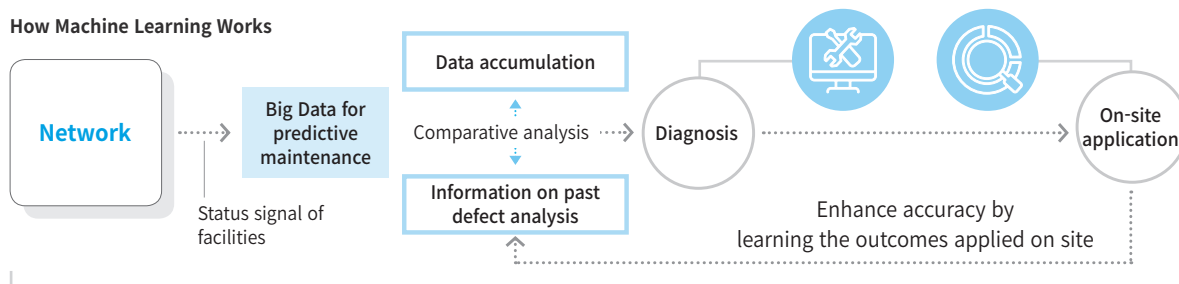


Smart E-Tower			
Applied Technologies	Scope	Functions	Performance
AI + Machine Learning + Big Data	Comprehensive monitoring of 24 NPPs	Monitoring and comparison of actual vs. predicted value per second (2.2 billion arithmetic operations/day)	<ul style="list-style-type: none"> Detected signs of machine failure and took counter-measures - Medium Catch : 14 cases, Small Catch: 268 cases - Secured golden time in case of safety-related situations - Prevented the escalation of accidents by controlling the E-Tower during the earthquake in Gyeongju

Developing an Automatic Preventive Maintenance System

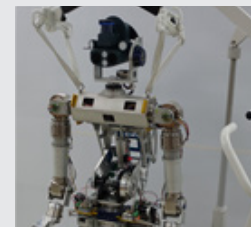
KHNP further advances its NPP maintenance system by developing an automatic preventive maintenance system using Big Data and robots. This new system assesses the life span of NPPs real-time by installing additional smart sensors on key on-site facilities and receiving data from the Central Assessment Center, and it will be applied at NPP sites starting in 2018. Once completed, the system will enable the maintenance of key facilities before they break down, dramatically reducing the frequency of anomalies and further enhancing the safety of NPPs.

How Machine Learning Works



Development of Remote Control Robots for Emergency Measures in Case of Extreme Disaster

KHNP is in the process of developing remote control robots to take emergency measures in case of a nuclear power plant accident. Bringing together the latest technologies such as IoT, state-of-the-art robot technologies, and virtual reality, this project will enable the use of robots and 3D scanners to access the site of a nuclear accident, such as the Fukushima Daiichi plant. This prevents humans from taking on the risk of scanning the site and sending data. Operators and engineers will be able to accurately assess and judge the situation in virtual reality and take the necessary emergency measures using robots.



Remote control robot for emergency measures in case of an NPP accident

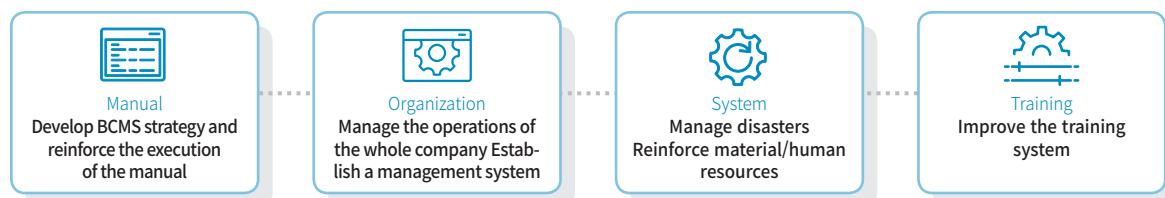


Establishing a Competitive Disaster Management System meeting International Standards

KHNP has established The MOST, a disaster management system meeting international standards, to enhance its emergency response capacity for disasters including earthquakes. Rated the highest grade in the National Infrastructure Management Assessment by the Ministry of Public Safety and Security and winning the Ministerial Commendation in 2015, KHNP's disaster management system has been recognized as among the best in Korea. In 2016, KHNP established the Business Continuity Management System (BCMS)* in its Head Office, the Wolsong site, the Hanul site, the Han river site, and the Yangyang pumped-storage power plant. The company also obtained ISO 22301 certification for its BCMS. KHNP will undertake continuous efforts to safely operate its nuclear power plants and win public trust by reinforcing its crisis management capacity.

* Business Continuity Management System (BCMS) : Overall process to maintain the continuity of core business functions in times of disaster

Disaster Management System (The MOST)



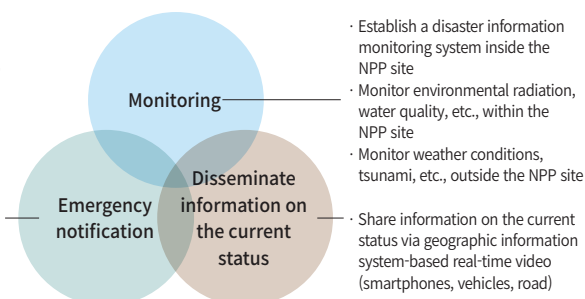
Strengthening the Capacity to Respond to Complex Disasters

Developing and Operating a Comprehensive Disaster Response Platform

As the first power supplier in Korea, KHNP has developed a comprehensive disaster response platform using electronic map engines and mobile portability. This platform will enable KHNP to respond to any disaster in a prompt and accurate manner from monitoring to emergency notification and sharing of emergency information.

Comprehensive Disaster Response Platform

- Send alerts via existing cable-based broadcast systems
- Apply or combine new technologies (LTE) of wireless broadcasting systems



- Establish a disaster information monitoring system inside the NPP site
- Monitor environmental radiation, water quality, etc., within the NPP site
- Monitor weather conditions, tsunami, etc., outside the NPP site
- Share information on the current status via geographic information system-based real-time video (smartphones, vehicles, road)

Reinforce Complex Disaster Response Training

KHNP considers a variety of potential disaster situations to decide the best course of action in emergencies. The company conducts complex disaster response drills that link general disasters and nuclear disasters. By reinforcing its emergency response preparedness, KHNP perfects its response to complex disasters.

Disaster Response Drill in 2016

Natural & Social Disasters Disaster response and safety drill (34 times) Spot disaster response drill (30 times) Individual drill at NPP and hydro plants (310 times) Firefighting drill (685 times)	Nuclear Disasters Spot drill (39 times) Company-wide drill (11 times) Joint drill (Twice)	Protection of Cyber Terrorism Cyber terror response & recovery drill (5 times) Control system attack response drill (11 times) Cyber-attack response drill (9 times) Facility protection drill (12 times)	Emergency Drill for NPP Operators Unusual situation response drill (228 times) Emergency response drill (228 times) Serious accident response drill (114 times)
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Strengthening the Professional Capacity of Disaster Managers

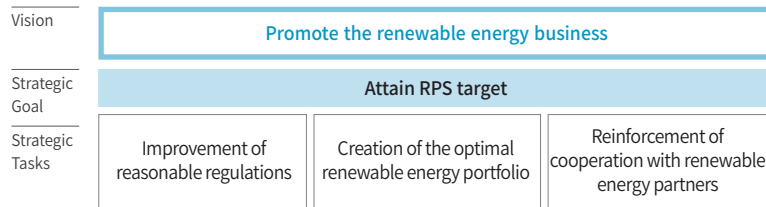
KHNP will further strengthen the expertise and work capabilities of its disaster and safety personnel through various education and training programs including external and internal education and workshops.



Expanding the Renewable Energy Business for Tomorrow

Implementation of the Renewable Energy Business

In response to changes in the global energy paradigm, KHNP has defined renewable energy as one of the pillars of its future growth and focused on R&D and business expansion. KHNP is strategically implementing three tasks—improvement of reasonable regulations, creation of the optimal renewable energy portfolio, and reinforcement of cooperation with relevant organizations dealing in renewable energy—to expand its renewable energy business. KHNP will continue to expand the company's renewable energy business according to its mid to long-term business development roadmap.



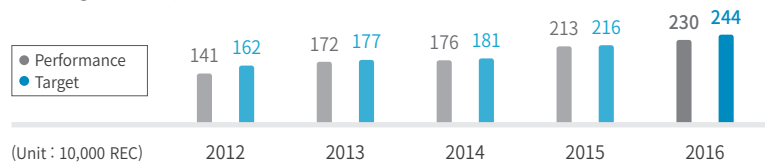
2030 Mid to Long-term Roadmap for Renewable Energy Business Development

Power Source	'18	'19	'20	'21	'22	'23	'24	~	'30	Total
Photovoltaic	97	310	92	54	130	100	400	1,650	406	3,239
Wind		120		295		40		890	400	1,745
Fuel cell	40	140	60		40	20	40	540	80	960
Bio			220			100				320
Others	6					13		1,320		1,339
Total	143	570	372	349	170	273	440	4,400	886	7,603

Implementing the Renewable Portfolio Standard (RPS)

KHNP enacts various efforts to actively implement its renewable portfolio standard (RPS) system, including the construction of independent facilities, joint development projects with private companies, and securing the renewable energy certificate (REC) through the spot market. As a result of these efforts, KHNP has met the RPS target for five consecutive years.

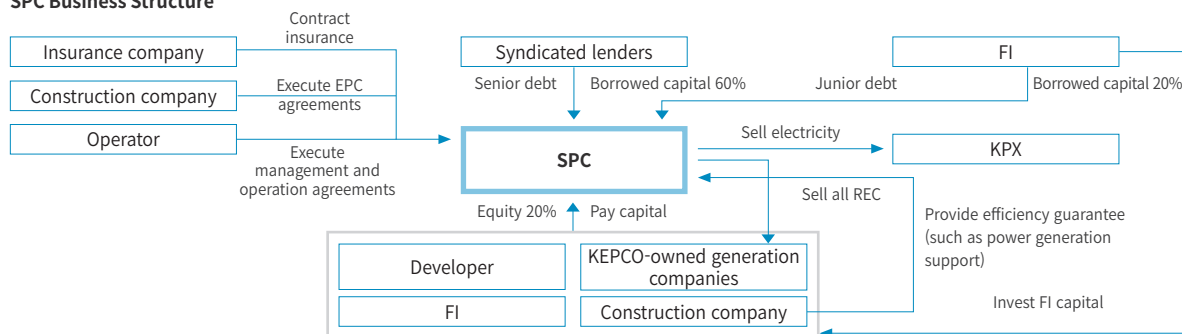
RPS Target and Implementation



Strengthening Cooperation with Renewable Energy Partners

Until its renewable energy business reaches a certain level, KHNP will work closely together with leading companies that have the necessary technologies and competitiveness in the industry. This cooperation with renewable energy partners has led to the establishment of special purpose companies (SPCs), reducing business risks and increasing business flexibility. The wind power plants in Goheung and Cheongsong, the fuel cell plant in Incheon, the biomass power plant in Gwangyang, and the geothermal power plant in Pohang will all be handled as joint development projects by establishing SPCs.

SPC Business Structure

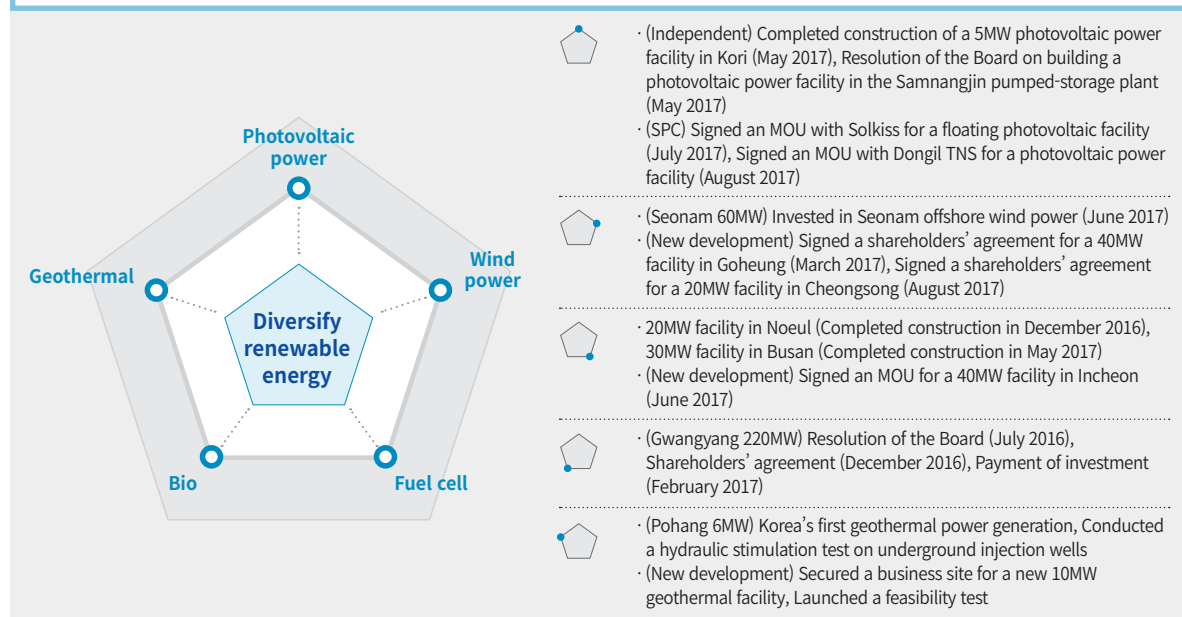


Creating the Optimal Renewable Energy Portfolio

KHNP is creating a renewable energy portfolio that includes hydro power, photovoltaic power, wind power, and fuel cell power. As of the end of 2016, KHNP has a total of 740MW renewable energy facilities, consisting of 595MW hydro power, 11.5MW small hydro power, 54.9MW photovoltaic power, 0.75MW wind power, and 78.8MW fuel cell power. The company currently has a high dependence on hydro power, which may weaken the implementation of RPS in the case of force majeure such as drought. Therefore, KHNP will relieve the centralization on hydro power and disperse risk by diversifying its portfolio.

Diversify the portfolio of future power sources

Stable REC through the timely construction of renewable energy facilities





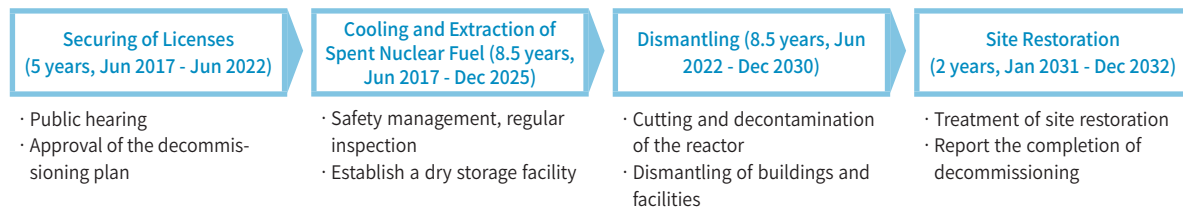
Creating New Growth Engines through Decommissioning Businesses

Decommissioning Process

Decommissioning includes all the activities for the dismantling and decontamination of a nuclear facility and site. This involves a great deal of work to remove regulatory controls after a NPP's operation is permanently suspended. Decommissioning is generally executed in four stages : planning, safety management, decontamination and dismantling, and site restoration.

Decommissioning Plans for Kori #1

Kori #1, Korea's first commercially operated nuclear power plant, was permanently shut down on June 18, 2017. The decommissioning process is expected to be completed by 2032. Through the decommissioning of Kori #1, KHNP will keep the track record of the plant and complete its lifecycle in the NPP industry. According to relevant official announcements, decommissioning costs are expected to amount to KRW 63.47 billion. The financial resources for this cost are reserved by KHNP by reflecting the levelized cost of energy for the duration of its NPP operation.



Developing Decommissioning Technologies

KHNP seeks to strengthen the competitiveness of the NPP industry by promoting the decommissioning industry and meeting the government's policy demands such as the management of spent nuclear fuel. Accordingly, KHNP has established a roadmap toward the goal of "promoting the NPP industry by completing its lifecycle and securing future growth engines." In 2016, KHNP secured 80% of the technologies needed for decommissioning Kori #1, and made general preparations for decommissioning other plants. KHNP has already secured approval for the preparatory decommissioning plans for Shin-Kori #5 and 6 and Shin Hanul #1 and 2.

Decommissioning Process

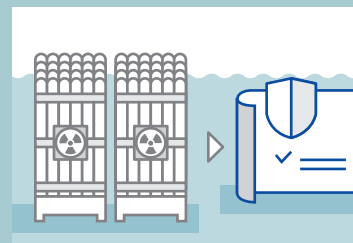
Stage 1 Preparation

For 2-3 years before permanent shutdown, licenses for operation change are obtained. Plans are established for the maintenance and management of permanently shut-down nuclear facilities and the safety management of spent nuclear fuel.



Stage 2 Safety Management

Spent nuclear fuel is taken out of a nuclear facility once it has been safely cooled for at least five years in a storage facility. At this stage, licenses are obtained for the approval of decommissioning, and then decommissioning contracts are prepared.





Strengthening Business Capacity in Decommissioning

Following the decision to permanently shut down Kori #1 and the government policy to promote decommissioning, KHNP will strengthen its business capacity by cultivating approximately 200 experts to secure decommissioning technologies. Education and training will be conducted in four areas : practical training in NPP post-management, industrial-academic cooperation professional training, HR development in the industry, and other domestic and overseas commissioned training. Through this training, KHNP will cultivate professionals and secure the basis for independence in the decommissioning business.

Decommissioning Education System

Practical training in NPP post-management

- Develop and run a practical training program in nuclear decommissioning and spent nuclear fuel
- Develop e-learning content for the "General Nuclear Decommissioning" course

Industrial-Academic cooperation professional training

- Promote professional training in cooperation with universities and graduate schools in Korea
- Promote industrial-academic cooperation with Busan University and Chosun University

HR development in the decommissioning industry

- Develop and run an SME course for HR development in the decommissioning industry
- Support the 2016 Decommissioning Consortium

Other domestic and overseas commissioned training

- Promote commissioned training in nuclear post-management with domestic and overseas institutes
- Operated 11 courses in 2016
- Run a short-term expert program

KHNP is building a global network by holding workshops and business meetings, as well as executing agreements with decommissioning agencies in the United Kingdom and Spain. At the 2016 Decommissioning Business Forum held in Bexco, Busan, attended by over 350 people from the Ministry of Trade, Industry and Energy, local governments, industry, and academia, KHNP shared information and discussed current issues in decommissioning. It also held the KHNP-EPRI International Decommissioning Workshop, securing technologies and information-sharing channels with approximately 70 participants, including those from the Electric Power Research Institute (EPRI). KHNP is further strengthening its global network in decommissioning by cooperating with numerous global institutes.

Strengthening international cooperation

Joined OECD/NEA Decommissioning Cooperation Program (Dec 2016)

- Joined the information sharing and cooperation program run by OECD/NEA
- Participating countries/institutes : 14 member states, 1 non-member state, 27 EC institutes

Signed a Cooperation Agreement with ENRESA (Mar 2017)

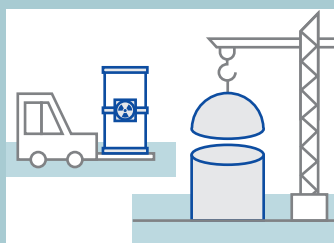
- Signed an agreement for information-sharing and mutual cooperation with ENRESA (Spanish radioactive waste management agency) in the areas of decommissioning and waste disposal

Signed an MOU with NDA (Apr 2017)

- Signed an MOU for information-sharing and mutual cooperation with the UK Nuclear Decommissioning Authority (DNA) on supply chain management and HR development

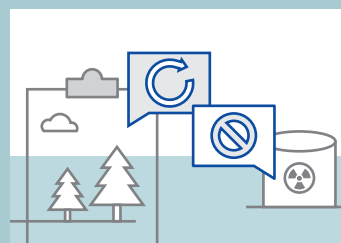
Stage 3 Decontamination and Dismantling

Upon approval of decommissioning and after the removal of spent nuclear fuel is completed, radioactive equipment and structures are dismantled. Radioactive waste generated at this stage is decontaminated, processed for volume reduction, and packaged before being transferred to a radioactive waste treatment facility.



Stage 4 4 Restoration of Land

Final land assessment is conducted to measure residual radiation, and then the final land status report and decommissioning completion report are prepared and submitted. Regulatory authorities terminate the operation approval after a decommissioning completion evaluation.





Appendix

- 76** KHNP Performances
- 80** UN Sustainable Development Goals(SDGs)
- 81** Global Reporting Initiative(GRI) Standards Index
- 83** Third Party Assurance Statement
- 85** Participation in Initiatives and Memberships

KHNP Performances

Economy

Financial Performances (Financial Statement)

Economic Performances

(Unit : KRW 100 million)

Classification	2014	2015	2016
Sales	95,035	107,470	112,771
Operating income	25,206	37,917	38,472
Net income	14,405	24,571	24,721

Financial Position

(Unit : KRW 100 million)

Classification	2014	2015	2016
Assets			
Current assets	42,402	55,650	60,632
Non-current assets	452,433	456,878	469,593
Total assets	494,835	512,528	530,225
Liabilities			
Current liabilities	25,940	27,502	31,882
Non-current liabilities	252,546	248,737	243,897
Total liabilities	278,485	276,239	275,779
Equity			
Paid-in capital	107,045	107,045	107,045
Surplus	109,757	129,680	147,401
Other equity	-699	-668	-367
Total equity	216,350	236,289	254,446

Investment in R&D

Classification	Unit	2014	2015	2016
Investment in R&D	KRW 100 million	3,031	3,236	3,984
R&D against sales	%	3.2	3	3.5

Distribution of Economic Value

	Unit	2014	2015	2016
Government - Corporate Tax Payment(Government Subsidy)	KRW 100 million	4,637(12)	8,218(3)	7,986(-)
Employees - Avg. compensation per employee	Thousand KRW	79,947	80,746	88,920
Local Communities - Social contribution expenses : Dandelion Spore Fund	KRW 100 million	52	100	143
Suppliers - Supports for SMEs	KRW 10 million	206	302	512

Financial Stability

Financial Information

Classification	Unit	2014	2015	2016
Interest coverage rate	Multiples	4.32	7.11	7.95
Reliance on borrowings	%	19.93	18.96	16.49
Debt to equity ratio	%	128.7	116.9	108.4
Total assets turnover rate	%	38.5	35.4	43.6

Credit Rating

Organization Name	Credit Rating(2016)	
S&P	AA	Stable
Fitch	AA-	Stable
Moody's	Aa2	Stable
Korea Ratings, Korea Investors Service, NICE Investors Service	AAA	Stable

Major Operating Performance

Classification	Unit	2014	2015	2016
NPP usage	%	85	85.3	79.7
No. of unplanned auto-stops	(Cases/unit)	5(0.22)	3(0.13)	4(0.16)
Power sales	Billion kWh	1,550.43	1,614.95	1,588.10
Investment in plant construction	KRW 100 million	21,312	24,039	21,897

Retirement Pension Management

(Unit : KRW 100 million)

Classification		2014	2015	2016
Defined Contri- bution(DC)	Savings	43	70	62
	Payment	32	61	24
Defined Benefit (DB)	Savings	18	56	115
	Payment	11	28	30

KHNP Performances

Environment

Major Environmental Performance

Energy Consumption by Business Site

(Unit : 10×TJ)

Classification	2014	2015	2016
Nuclear power HQ	1,268	1,425	1,611
Pumped storage plant	6,388	4,641	4,534
Hydro power plant	5	6	6
Other special business units	15	16	23
Total	7,676	6,088	6,174

Energy Consumption in 2016

(Unit : 10TJ)

Classification	2014	2015	2016
Fuel	16	50	72
Electricity	7,660	6,038	6,102
Steam	-	-	0
Total	7,676	6,088	6,174

GHG Emission by Business Site

(Unit : 1,000tCO₂eq)

Classification	2014	2015	2016
Nuclear power HQ	641	731	839
Pumped storage plant	3,103	2,256	2,203
Hydro power plant	2	3	3
Other special business units	7	8	12
Total	3,753	2,998	3,057

Direct/Indirect GHG Emissions

(Unit : 1,000tCO₂eq)

Classification	2014	2015	2016
Scope 1	33	65	94
Scope 2	3,720	2,933	2,963
Total Emissions	3,753	2,998	3,057

Waste Treatment

(Unit : tons)

Classification	2014	2015	2016
Recycling	6,843	6,854	7,273
Incineration	815	936	1,020
Land-fill	2,581	2,990	3,557
Others	101	0	3
Total waste amount	10,340	10,780	11,854

Green Product Purchase

(Unit : Thousand KRW)

Classification	2014	2015	2016
Total purchase	17,399,575	24,213,830	21,652,902
Green product purchase	16,252,203	22,688,359	19,635,397
Green product purchase ratio	93	94	91

Eco-friendly Power Generation Plan

(Unit : GWh)

Classification	2015	2016 Plan	2016 Results
Mandatory supply [A]	2,662	2,882	2,882
Carry-over [B]	515	559	560
Implementation performance	Photovoltaic	324	429
	Hydro	601	784
	Fuel-cell	723	774
	Wind	-	-
	Geothermal	-	-
	Biomass	-	-
	External purchase	1,028	907
	Total [C]	2,676	2,894
	Implementation performance for the year[D=C-B]	2,161	2,335
	Implementation rate [E=D/A] (%)	81.2	81
			84.7

Society

Employment Status

(Unit : people)

Classification		2014	2015	2016
Total		9,816	10,842	11,507
Gender				
Male		8,845	9,640	10,218
Female		971	1,202	1,289
Female employee ratio(%)		10	11	13
Age Group				
20s		1,199	1,773	2,047
30s		3,350	3,725	3,805
40s		3,184	3,188	3,220
50s & older		2,083	2,156	2,435
Region				
Korea		9,476	10,299	10,806
Overseas		340	543	701
Business Site				
Head office		1,290	1,245	1,363
NPP site		6,789	7,594	7,884
Hydro & pumped storage		763	773	809
Other sites		974	1,230	1,451
Position				
Executives	Total	6	6	6
	Male	6	6	6
	Female	-	-	-
1 st Level	Total	186	185	201
	Male	186	185	201
	Female	-	-	-
2 nd Level	Total	723	742	778
	Male	718	734	769
	Female	5	8	9
3 rd Level	Total	2,495	2,684	2,743
	Male	2,424	2,604	2,659
	Female	71	80	84
4 th Level	Total	5,372	6,157	6,466
	Male	4,732	5,313	5,575
	Female	640	844	891
Others	Total	1,034	1,068	1,313
	Male	779	798	1,008
	Female	255	270	305

Classification		2014	2015	2016
Employment type				
Permanent	Total	9,802	10,810	11,463
Temporary	Total	39	37	45
Others	Total	230	254	217
No. of disabled employee hired				
No. of Disabled Employees		984	1,209	1,289
No. of Disabled Employment Rate(%)		3.1	3.1	3.1
Employment and Retirement Status				
New Employees	Total	681	1,369	821
	Male	564	1,109	682
	Female	117	260	139
Regular retirement*	Total	204	218	0
Voluntary retirement	Total	11	7	30
Turnover and Retirement*	Total	17	6	2
	Male	16	5	2
	Female	1	1	-

* No regular retirement in 2016 due to extension of retirement age

* Indicates the number of resignees among newly-hired employees in 2017

KHNP Performances

Society

Employee Education

Classification	Unit	2014	2015	2016
Total No. of Trainees	Total	19,447	23,311	23,316
	Male persons	17,766	21,144	21,200
	Female	1,681	2,167	2,116
Total Education Hours	Total	1,568,079	2,132,955	2,201,458
	Male hours	1,432,534	1,934,675	2,001,668
	Female	135,545	198,280	199,789
Total Education Expense (per Male/Female Trainees)	Total KRW 100 million	317	380	422
	Male	289.6	344.7	383.7
	Female	27.4	35.3	38.3
Total Education Cases (per Male/Female Trainees)	Total cases	1,337	1,200	1,383
	Male	1,221	1,088	1,257
	Female	116	112	126
Average Education Expense per Person	Total Thousand KRW/persons	3.41	3.91	4.22
	Male	3.41	3.91	4.22
	Female	3.41	3.91	4.22
Education Hours per Person	Total	168.52	219.62	220.3
	Male hours	81	91	94
	Female	81	91	94
No. of Ethical Management Education (Excluding Duplicate Cases)	Total	6,565	6,739	8,839
	Male persons	5,990	6,015	7,880
	Female	575	724	959
No. of Ethical Management Education (Excluding Duplicate Cases)	Total	3,109	2,342	2,503
	Male persons	-	2,055	2,167
	Female	-	287	336
No. of Sexual Harassment Prevention Education (Indivisible by gender)	Total cases	39	56	46

Occupational Health and Safety

Classification	Unit	2014	2015	2016
No. of Ethical Management Education (Excluding Duplicate Cases)	cases	3	0	0
Nuclear Industrial Disaster Rate	%	0.16	0.14	0.09

Advancement of Labor-Management Relations

Collective Agreement to Correct Irrational Labor Practices

KHNP agreed to provide rational compensation and welfare system in compliance with the government's guide by reestablishing collective agreement process and shortening the period of meetings for collective agreement. These activities contributed to advancing collective agreement and improving labor-management relations. A total of 6,812 persons, or 64% of total employees, are union members.

Status of Labor Union

Classification	Unit	2014	2015	2016
No. of employees covered by the labor union & labor-management council	cases	6,123	6,812	6,911
Ratio of employees covered by the labor union & labor-management council	%	62	64	60

UN Sustainable Development Goals(SDGs)

Implementation of the SDGs

The Sustainable Development Goals (SDGs) are 17 goals and 169 targets set by the United Nations aimed at responding to the economic, environmental and social issues around the globe. Effective as of September 28, 2015, when they were signed by 193 Member States at the UN General Assembly, the SDGs will guide the global development agenda of the international community for the next 15 years from 2016 to 2030. KHNP will actively participate in meeting the SDGs to strengthen sustainable development.



1. No Poverty

- Providing free meals and daily necessities to low-income groups
- Global social contribution activities (living condition improvement in developing countries, supports for cultural activities, etc.)



2. Zero Hunger

- Sisterhood with local villages around power plants
- Purchase of local specialties
- Supports in farming season



3. Good Health and Well-being

- Employee health checkup and EAP
- Visit for consulting service
- Operation of emergency centers
- Creation of happy workplace
- Health Keeper in Rural Areas



4. Quality Education

- Employee training
- Education volunteering in Binh Dinh, Vietnam
- Talent cultivation programs such as Einstein Class, Atom Engineering Class, etc.



5. Gender Equality

- Operating the Gender Equality Committee
- Maternity protection and gender equality systems



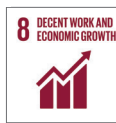
6. Clean Water and Sanitation

- Installing rainwater tanks, water filters and drinking fountains in Binh Dinh, Vietnam



7. Affordable and Clean Energy

- Supply of nuclear power
- Supply of renewable energies such as water, wind, and photovoltaic power



8. Decent Work and Economic Growth

- Open recruitment
- Advanced labor-management culture
- Safety and health management for employees and suppliers
- Creation and distribution of economic value
- Job creation in the private sector



9. Industry, Innovation and Infrastructure

- Safety-focused management
- Sustainable NPP operation



10. Reduced Inequalities

- Social contribution activities at home and abroad
- No discrimination in employment and human resources management



11. Sustainable Cities and Communities

- Supports for and cooperation with local communities around NPPs
- Social contribution activities for local communities
- Safe treatment of nuclear waste



12. Responsible Consumption and Production

- Purchase of SMEs' products
- Purchase of environmental products



13. Climate Action

- Reduction of GHG emissions
- Securing carbon sinks
- Energy saving activities
- Response to emissions trading scheme



14. Life below Water

- Usage of waste heat
- Survey and control of marine water quality around NPPs
- Marine environment monitoring system



15. Life on Land

- Nuclear waste management
- Hazardous chemicals management
- Wastewater management



16. Peace, Justice and Strong Institutions

- Ethical management system
- Principles and educations for anticorruption
- Personal information protection and information security



17. Partnerships for the Goals

- Application to and endorsement of UNGC
- Membership activities including WANO

**SUSTAINABLE
DEVELOPMENT
GOALS**

Global Reporting Initiative(GRI) Standards Index

GRI STANDARDS UNIVERSAL STANDARDS (GRI 100)				
Topic	No.	Title	Page	Note
GRI 101 : Foundation				
GRI 102 : Organizational Profile	102-1	Name of the organization	5	
	102-2	Activities, brands, products, and services	6	
	102-3	Location of headquarters	6	
	102-4	Location of operations	6, 31	
	102-5	Ownership and legal form	6	
	102-6	Markets served	6, 31	
	102-7	Scale of the organization	6	
	102-8	Information on employees and other workers	6, 78	
	102-9	Supply chain	6, 33-36	
	102-10	Significant changes to the organization and its supply chain	1	
	102-11	Precautionary Principle or approach	1	
	102-12	External initiatives	1, 80, 85	
	101-13	Membership of associations	85	
GRI 102 : Strategy	102-14	Statement from senior decision-maker	3-4	
GRI 102 : Ethics and Integrity	102-16	Values, principles, standards, and norms of behavior	13-14	
GRI 102 : Governance	102-18	Governance structure	17-18	
GRI 102 : Stakeholder Engagement	102-40	List of stakeholder groups	19-20	
	102-41	Collective bargaining agreements	19-20	
	102-42	Identifying and selecting stakeholders	19-20	
	102-43	Approach to stakeholder engagement	19-20	
	102-44	Key topics and concerns raised	19-20	
GRI 102 : Reporting Practice	102-45	Entities included in the consolidated financial statements	5-6, 76	
	102-46	Defining report content and topic Boundaries	1, 83-84	
	102-47	List of material topics	25-26	
	102-48	Restatements of information	1	
	102-49	Changes in reporting	1	
	102-50	Reporting period	1	
	102-51	Date of most recent report	1	
	102-52	Reporting cycle	1	
	102-53	Contact point for questions regarding the report	86	
	102-54	Claims of reporting in accordance with the GRI Standards	1, 83-84	
	102-55	GRI content index	81-82	
	102-56	External assurance	83-84	
GRI 103 : Management Approach	103-1	Explanation of the material topic and its Boundary	25-26	
	103-2	The management approach and its components	27, 33, 37, 44, 51, 57, 61	
	103-3	Evaluation of the management approach	27, 33, 37, 44, 51, 57, 61	

GRI STANDARDS_ECONOMIC PERFORMANCE (GRI 200)

Topic	No.	Title	Page	Note
GRI 201 : Economic Performance	201-1	Direct economic value generated and distributed	76	
	201-2	Financial implications and other risks and opportunities due to climate change	44, 49-51	
	201-3	Coverage of the organization's defined benefit plan obligations	76	
GRI 205 : Anti-corruption	205-1	Operations assessed for risks related to corruption	58-60	
	205-2	Communication and training about anti-corruption policies and procedures	58-60	

GRI STANDARDS_ENVIRONMENTAL PERFORMANCE (GRI 300)

Topic	No.	Title	Page	Note
GRI 302 : Energy	302-1	Energy consumption within the organization	77	
GRI 303 : Water	303-1	Water withdrawal by source	48	
GRI 305 : Emissions	305-1	Direct(Scope 1) GHG emissions	48	
	305-2	Energy indirect(Scope 2) GHG emissions	48, 77	
GRI 306 : Effluents and Waste	306-2	Waste by type and disposal method	48	

GRI STANDARDS_SOCIAL PERFORMANCE (GRI 400)

Topic	No.	Title	Page	Note
GRI 401 : Employment	401-1	New employee hires and employee turnover	78	
GRI 403 : Occupational Health and Safety	403-2	Injury rate (IR) of all employees, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	79	
	404-1	Average hours of training per year per employee	79	
GRI 404 : Training and Education	404-2	Programs for upgrading employee skills and transition assistance programs	79	
GRI 405 : Diversity and Equal Opportunity	405-1	Diversity of governance bodies and employees	17-18, 79	
GRI 412 : Human Rights Assessment	412-2	Employee training on human rights policies or procedures	62-64, 79	
GRI 413 : Local Communities	413-1	Operations with local community engagement, impact assessments, and development programs	52-54	

GRI Sustainability Topics for Sector (Electric Utilities)

Aspects	Index	Title	Page	Remarks
Research and Development	EU8	Research and development activity and expenditure aimed at providing reliable electricity and promoting sustainable development	16, 28, 76	
Plant Decommissioning	EU9	Provisions for decommissioning of nuclear power sites	73-74	
Employment	EU17	Days worked by contractor and subcontractor employees involved in construction, operation & maintenance activities		All suppliers' employees engaging in the construction, operation, and maintenance of NPPs comply with legal working hours (8 hours a day) in accordance with the Labor Standards Act.
	EU18	Percentage of contractor and subcontractor employees that have undergone relevant health and safety training	39-40	We do not calculate relevant ratios, while conducting safety trainings for suppliers.
Access	EU28	Power outage frequency	14, 16	
	EU30	Average power outage duration	76	

Third Party Assurance Statement

Preface

KFQ was engaged by KOREA HYDRO & NUCLEAR POWER Co., LTD (further 'KHNP') to provide limited assurance on the 'KHNP Report 2017' (further 'the Report'). Our responsibility is to perform a limited assurance engagement and to express a conclusion based on the work performed. We conducted its assurance based on completeness of the data and information provided by KHNP. KHNP is responsible for all contents within the Report including the reporting principles and standards.

Independence

KFQ is not involved in the preparation of any part of the Report, other than providing an assurance opinion, and there has been no interest between KHNP and us. We have no biased opinion on stakeholders of KHNP.

Assurance Standards

KFQ has designed and implemented assurance according to the following standards.

- AA1000 Assurance Standard (2008)
- AA1000 Accountability Principles Standard (2008)
- GRI Standards
- GRI G4.0 EUSS (Electricity Utilities Sector Supplement)
- ISO 26000

Assurance Scope

KFQ identified the followings as its scope:

- KHNP's sustainable management activities and performances of the headquarter and all business establishment (domestic and overseas) described in the Report
- Compliance with the guidelines according to GRI Standards Core Option
- Application of GRI G4.0 EUSS
- GRI Standards compliance assessment regarding contents of the Report and assurance principles of reporting quality
- Application of Type 1 assurance approach according to AA 1000 APS 2008 and AA 1000 AS 2008 to assess compliance with inclusiveness, materiality and responsiveness principles and reliability of sustainability performance information. The term 'Moderate Assurance' used in AA 1000 AS is designed to be consistent with 'Limited Assurance' as articulated in ISAE 3000.
- Core subjects in ISO 26000

Assurance Procedures

KFQ designed procedures to have reasonable assurance of the Report's critical errors or inappropriate information. We verified the reliability of the contents, processes and systems of data generation and report preparation.

Document Review

We reviewed the reliability of non-financial data in respect of the 'Sustainability' by cross-checking the Report with GRI Standards, quantitative data of KHNP, and internet & media research information. We also confirmed whether or not the financial information mentioned in the Report was correctly derived from internal documents and the audited financial statements from business report on All Public Information In-One (<http://www.alio.go.kr>).

On-site Verification

We visited KHNP headquarter and conducted on-site verification to confirm reliability of the sustainability activities and performance data contained in the Report and to evaluate the effectiveness of the reporting process. We performed verification in the accuracy topic of the aggregated data from KHNP.

These procedures included the following:

- Materiality assessment process, stakeholders inclusiveness, key issues, internal response procedures, and etc.
- Assessment of data analysis and descriptions and sustainable management performance in the Report
- Consistency between the financial data contained in the Report and the audited financial statements 2016
- Interviews with relevant staff responsible for providing information in the Report

Resolution of Findings

We confirmed that some errors, inappropriate information, and ambiguous expressions found during on-site visit were properly reflected in the final Report.

Limitations

The Report has been prepared solely for KHNP in accordance with the terms of our engagement. We do not accept or assume responsibility to anyone other than KHNP for our conclusions we have reached in the statement. Completeness and responsiveness of sustainability performance information presented in the Report have inherent limitation due to their nature and the methodology used for determining, calculating and estimating such data.

Opinion

Based on the verification activity stated herein, KFQ confirmed that the Report meets the GRI Standards 'Core Option'. According to the principles of AA 1000 APS 2008 and AA 1000 AS 2008, inclusiveness, materiality and responsiveness, sustainability performance information were assessed and we could secure reasonable grounds to provide Type 1 level of assurance with the following confirmation:

1. (Stakeholders Inclusiveness) KHNP subdivided six stakeholders into three groups related to the major issues of sustainable management. To hear any concerns and opinions from them, KHNP had a customized communication strategy for each stakeholder group and reflected their responses and opinions to its sustainable management activities.
2. (Sustainability Context) In terms of sustainability, KHNP continues to actively respond to the economic, environmental and social effects that stakeholders requires based on the core issues. In particular, shared growth activities are closely linked to realize the company's five core values and promote sustainable management strategies. This is a good example of complying with the core subject of 'Community Involvement and Development' presented in ISO26000.
3. (Materiality) KHNP established issue pools and reviewed by internal guidelines and external assessment criteria (GRI Standards guideline, DJSI, ISO 26000, UN SDGs, media coverage, benchmark, and issue analysis) incompliance with the materiality assessment process. As a result, KHNP appropriately reflected that eleven key topics derived from the process along with key performance in 2016.
4. (Completeness) KHNP applied reporting scope, boundary and temporal criteria. We confirm that the Report is suitable for stakeholders to assess sustainability performance.

Recommendation for Improvement

For further advanced sustainable management, KHNP needs to strengthen its reporting on ongoing management and response of key topics raised by stakeholders. KHNP is expected to be reflected in the sustainable management activities through setting up of key indicators of social responsibility linked with 'Vision 2030' and systematic monitoring. In future publications, we recommend that the company's response to the fourth industrial revolution and the strategy for creating future growth engines related to new energy businesses will be systematically linked to mid- and long-term management strategies for solving domestic and international social problems.

November 2017 Seoul, Korea

CEO **Nam Dae Hyun**

Korean Foundation for Quality (KFQ)



AA1000
Licensed Assurance Provider
000-80



Nam Dae Hyun

Participation in Initiatives and Memberships

Join and Support the UN Global Compact

KHNP joined the UN Global Compact, an international initiative for corporate social responsibilities, in March 2007. In line with the initiative, we have been complying with its 10 principles in 4 sectors of human rights, labor, environment and anti-corruption.



Human Rights

Principle 1

Businesses should support and respect the protection of internationally proclaimed human rights.

Principle 2

Businesses should make sure that they are not complicit in human rights abuses.



Labor

Principle 3

Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.

Principle 4

Businesses should uphold the elimination of all forms of forced and compulsory labor.

Principle 5

Businesses should uphold the effective abolition of child labor.

Principle 6

Businesses should uphold the elimination of discrimination in respect of employment and occupation.



Environment

Principle 7

Businesses should support a precautionary approach to environmental challenges.

Principle 8

Businesses should undertake initiatives to promote greater environmental responsibility.

Principle 9

Businesses should encourage the development and diffusion of environmentally friendly technologies.



Anti-corruption

Principle 10

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

Memberships

Domestic				Overseas
Gyeongju Chamber of Commerce & Industry	Hydro and Pumped Storage Power Research Society	Korea Industrial Asset Management Association	Korea Suggestion System Association	CANDU Procurement Audit Committee (CANPAC)
Climate Change Center	Korea Society for New and Renewable Energy	Korea Smart Grid Association	Earthquake Engineering Society of Korea	Candu Owners Group (COG)
Public Institution Audit Committee	Council for Development of Fuel Cell Industry	Korea New and Renewable Energy Association	Korea Standards Association	Framatome Owners Group (FROG)
Korea Council of Public Organization Internal Auditors Daegu-Gyeongbuk Branch	Korea Business Council for Sustainable Development	Korea Society for Energy & Climate Change	Korea Society for Quality Management	International Hydropower Association (IHA)
The Korean Society of Mechanical Engineers	Korea Association of Conflict Solution	The Korean Society for Energy	Korea Project Management Association	Nuclear Energy Institute (NEI)
The Korean Association for Radiation Protection	IIA KOREA	Korean Women Nuclear Energy Professional Association	Korea Plant Industries Association	Nuclear Procurement Issues Committee (NUPIC)
Korea Welding Connection Association	Korea International Trade Association	Korea Nuclear Energy Promotion Agency	Korean Institute of Nuclear Materials Management	Pressurized Water Reactor Owners Group (PWROG)
Korean Institute of Electrical Engineers (KIEE) Electricity Generation Research Group	Korea Association for Radiation Application	Korea Atomic Industrial Forum	Korea Water Resources Association	World Association of Nuclear Operators (WANO)
Korea Electric Association	Korea Society for Radioactive Waste	Korean Nuclear Society	Korea National Committee on Large Dams	World Nuclear Association (WNA)
Future Energy Forum	Korean Society for Nondestructive Testing	Korea Nuclear Association for International Cooperation	Korea Academy of Nuclear Safety	World Nuclear Fuel Market (WNFM)
Sea-forest Outreach and Opportunity Program	Korea Industrial Technology Association	Korea Electrical Manufacturers Association	Korea Photovoltaic Industry Association	World Energy Congress (WEC) Korea
Korea Exchange Emission Permits Market	Korea Industrial Technology Association	The Korean Institute of Electrical and Electronic Material Engineers		

Korea Hydro & Nuclear Power Co., LTD
Sustainability Report 2017

RELIABLE GLOBAL ENERGY LEADER, **KHNP**

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