

Environment

Initiatives Based on the TCFD Recommendations

The Kyuden Group considers climate change to be a major challenge for management, and will fulfill its accountability to stakeholders by utilizing the TCFD recommendations in analyzing risks and opportunities, and by enhancing information disclosure in line with the framework of the recommendations.



TCFD: Task Force on Climate-related Financial Disclosures
This task force was established by the Financial Stability Board (FSB) at the request of the G20 Finance Ministers and Central Bank Governors Meeting. In June 2017, TCFD issued a set of recommendations to encourage the disclosure of information related on the financial impacts of climate-related risks and opportunities, to aid investors in making appropriate investment decisions.

1. Governance and Risk Management

Response System for Climate Change (risk and opportunity assessment and management process)

To promote carbon neutrality and other ESG-related initiatives, in July 2021 we set up the Sustainability Promotion Committee, which is chaired by the president.

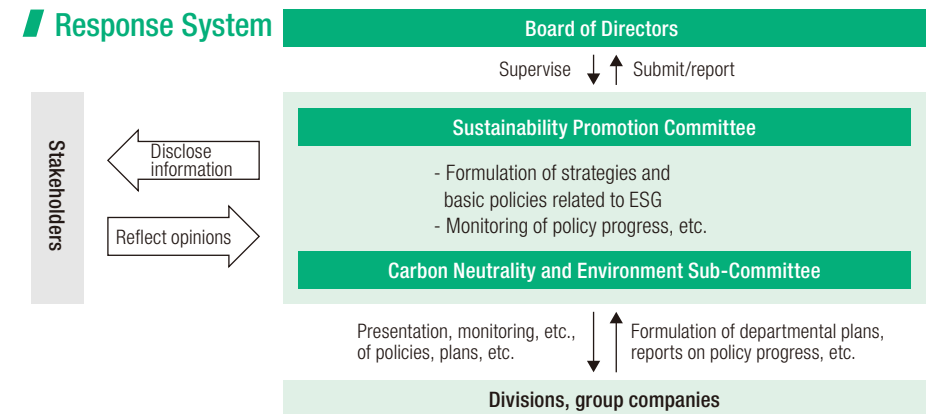
In addition to the formulation of strategies and basic policies related to ESG (identification of major challenges), discussions on specific measures, and management of policy progress, the Committee is also tasked with discussing and supervising strategies and risks related to climate change. The Committee meets more than twice yearly, and the results of their discussions are reported without delay to the Board of Directors. The Board of Directors supervises all activities related to ESG.

Underneath the Sustainability Promotion Committee is the Carbon Neutrality and Environment Sub-Committee. From a more specialized standpoint, this Sub-Committee discusses all matters related to environmental issues, including carbon neutrality.

Through platforms such as these, we have been able to improve and reinforce our assessment and management of climate change risks and opportunities, and we will look to link this to the sustainable growth and enhanced corporate value of the Kyuden Group.

Our Action Plan to Achieve Carbon Neutrality, announced in November 2021, takes into account our goals for 2050 and our revised management (environmental) targets for 2030. The plans were deliberated by the Sustainability Promotion Committee and then decided upon by the Board of Directors.

Response System



Sustainability Promotion Committee

Structure
Chairperson: President
Vice-chairperson: Director in charge of ESG
Committee members: External directors, executive directors of relevant divisions, etc.

Frequency
Twice yearly in principle, and additionally as necessary

Carbon Neutrality and Environment Sub-Committee

Structure
Chairperson: Director in charge of ESG
Vice-chairperson: Executive Director of Corporate Strategy
Department and Executive Director of the District Symbiosis Division
Committee members: Directors of relevant divisions, etc.

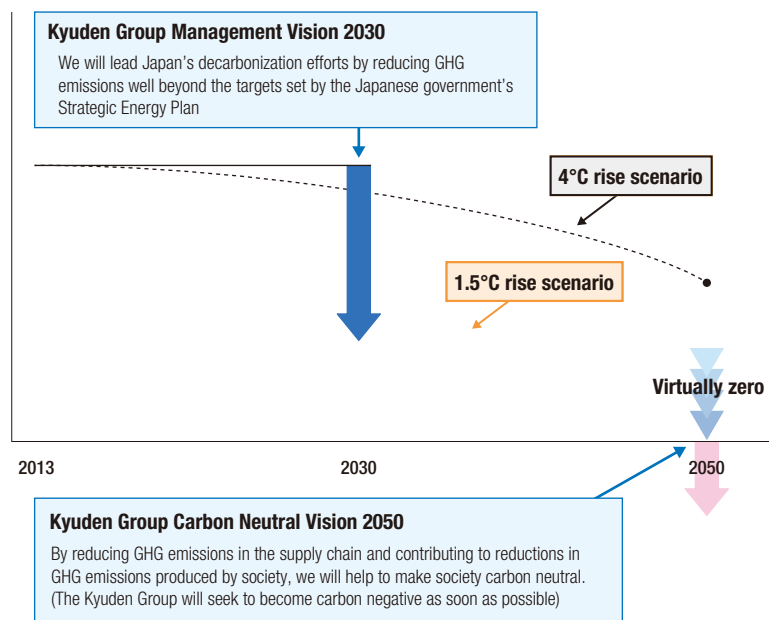
Frequency
Twice yearly in principle, and additionally as necessary

2. Strategy (risks/opportunities and countermeasures)—Climate Change Countermeasures Based on Scenario Analysis

(1) Assumptions behind consideration

Target periods	2030 and 2050
Envisioned scenarios	1.5°C rise scenario The Intergovernmental Panel on Climate Change (IPCC)'s 6th Assessment Report (scenario outlined in SSP1-1.9) and the International Energy Agency (IEA)'s World Energy Outlook (WEO) Net Zero by 2050, and the Japanese government's 6th Strategic Energy Plan
	4°C rise scenario The Intergovernmental Panel on Climate Change (IPCC)'s 6th Assessment Report (scenario outlined in SSP5-8.5)

Greenhouse gas (GHG) emission reduction



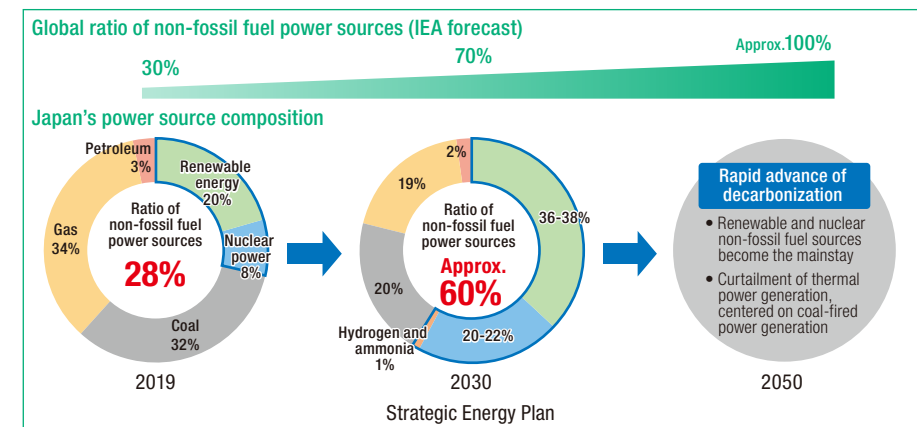
(2) Factors affecting forecasts and the electricity business

Supply Side 1.5°C rise scenario

- The IEA forecast* presupposes that non-fossil fuel based power generation will spread more widely around the world, and that by 2050, most electricity will be produced with non-fossil fuel power sources.
- Japan aims for carbon reduction by achieving the power source composition (energy mix) for 2030 indicated in the country's 6th Strategic Energy Plan and expects the rapid advance of decarbonization of power sources after 2030.

*IEA WEO Net Zero by 2050

Prediction Model: Changes in electrical power source composition



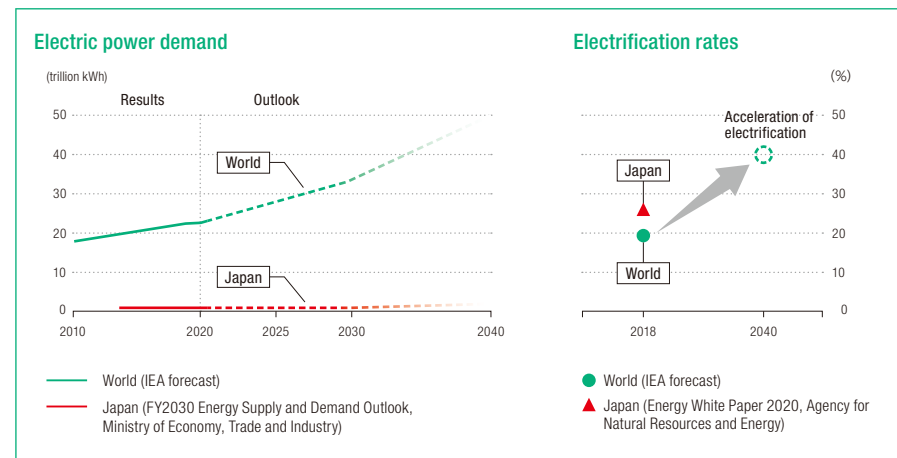
Major factors affecting the electricity business

- Growing demands for strengthened global warming regulations aimed at decarbonization (fading out of inefficient coal-fired power generation, etc.)
- Increased value of non-fossil fuel power sources, heightened need for large-scale adoption of renewable energy, decreased acceptance of fossil fuel use
- Low assessment of CO₂-emitting businesses from investors
- Heightened need for carbon reduction/decarbonization technology, and progress in practical application of technology
- Expanding investment in decarbonization technologies in line with the ambitious investment targets set by the government, such as those of the Green Growth Strategy

Demand Side 1.5°C rise scenario

- According to forecasts by IEA*¹, global electrical power demand will continue to grow steadily even after 2030, and electrification rate growth will accelerate.
- It is likely that Japan will step up its energy-saving efforts to reduce overall demand for electricity by 2030. However, with efforts to be carbon neutral by 2050, electricity demand is predicted to increase by around 30–50% over current levels through measures such as the promotion of electrification.

*1 IEA WEO Net Zero by 2050

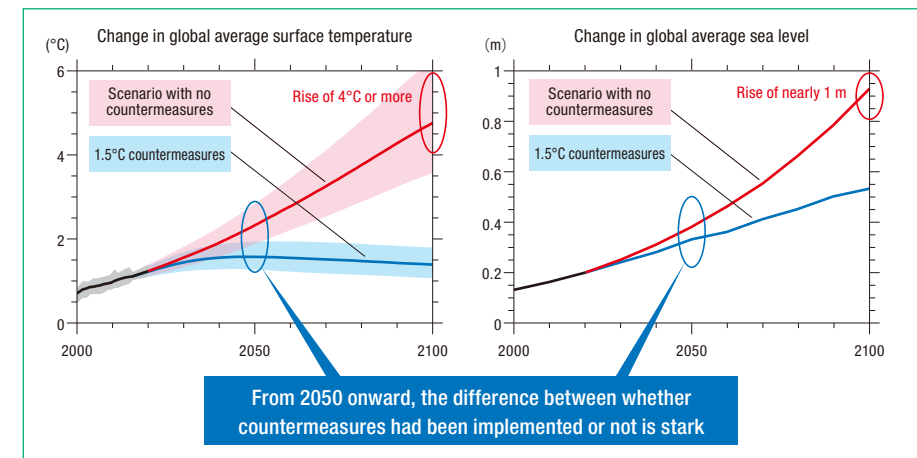
Prediction Model: Electrical power demand and electrification rate**Major factors affecting the electricity business**

- Expansion of electrification in all sectors (household, commercial, industrial, transportation, etc.) due to factors such as increased social awareness of the environment and government regulations and policy guidance
- Further expansion of decentralized energy systems
- Progress in energy conservation

Climate Disasters 4°C rise scenario

- According to IPCC predictions*² without the enforcement of global warming countermeasures, the global average surface temperature is predicted to rise by 4°C or more and the average sea level by nearly one meter by 2100. There is concern that intensifying weather disasters and other physical risks will emerge, particularly after 2050, unless sufficient climate change countermeasures are taken.

*2 IPCC 6th Assessment Report

Future Prediction Model: IPCC (prediction of global average surface temperature rise and average sea level rise)**Major factors affecting the electricity business**

- Increase in torrential rains, flooding, and storms, intensification and prolongation of high temperatures/heat waves
- Increased damage to customers' facilities and electric power supply facilities
- Inoperability of resource development areas
- Increasing need for disaster prevention and mitigation

(3) Risks/opportunities and countermeasures

Analysis of risks and opportunities

Impacting Factors		Risks and Opportunities		Impact level	
1.5°C case	Supply side	(A) Policy measures/regulation	<ul style="list-style-type: none"> Increased costs and investments associated with strengthening of greenhouse gas emission regulations 	Transition risks	Minor to medium
		(B) Technology	<ul style="list-style-type: none"> Decreased grid stability associated with large-scale introduction of renewable energy/distributed power sources Technical adaptation to increasing distributed power sources 	Transition risks	Minor to medium
		(C) Market	<ul style="list-style-type: none"> Loss of customers and withdrawal of investment associated with decreased acceptance of fossil fuel power generation Decrease in electricity sales due to the expansion of decentralized energy systems 	Transition risks	Minor to medium
		(D) Determination	<ul style="list-style-type: none"> Deterioration of corporate image due to passive stance on climate change initiatives 	Transition risks	Minor to medium
		(E) Products/services	<ul style="list-style-type: none"> Progress in electrification in all sectors associated with government support policies Proliferation of new energy services utilizing digital technologies 	Opportunities	Major
		(F) Energy sources/resource efficiency	<ul style="list-style-type: none"> Expansion of opportunities to develop and adopt zero-emission power sources in association with government support policies Advances in low-carbon and decarbonization and expansion of opportunities for profit through the practical application of innovative technologies such as decarbonization technologies, storage batteries, and next-generation energy Emergence of various businesses related to the value chain of hydrogen, ammonia, etc. 	Opportunities	Major
Demand side		(G) Products/services	<ul style="list-style-type: none"> Meet ever-diversifying customer needs and increasing demand for carbon-free electricity Expansion of demand for low-carbon and decarbonization technologies in emerging countries, etc. 	Opportunities	Major
		Climate disasters	Climate disasters	(H) Climate disasters	<ul style="list-style-type: none"> Increased facility damage associated with increasing and intensifying climate disasters Acute risk Increasing difficulty of fuel procurement associated with inoperability of resource development areas Acute risk Decrease in hydroelectric power generation due to changes in precipitation (droughts) Chronic risk
(I) Resilience and toughness	<ul style="list-style-type: none"> Improved evaluation of business operators with regard to climate change response Increasing need for disaster prevention and mitigation 			Opportunities	Minor

Consideration of measures based on analysis results

Direction of measures based on analysis results

(1) Make renewable energy a mainstream power source (B • D • F • G)	<ul style="list-style-type: none"> Promote the development of offshore wind power and biomass in addition to geothermal and wind power, power sources that are our strengths Develop an aggregation business using integrated technologies for decentralized energy solutions, including FIT-expired power sources, storage batteries, and EVs
(2) Proactively expand overseas (A • B • C • D • E • F • G)	<ul style="list-style-type: none"> Utilize technologies and expertise cultivated in Japan and elsewhere to expand energy-related businesses in countries around the world Provide energy services that best suit the specific topographical conditions and customer needs
(3) Maximize the utilization of nuclear energy (A • C • F)	<ul style="list-style-type: none"> Through means such as improving the utilization rate of existing reactors, maximize the utilization of nuclear energy for which safety is the highest priority Consider next-generation reactors with superior safety features
(4) Net zero CO ₂ emissions from thermal power (A • C • D • F • G)	<ul style="list-style-type: none"> Manufacture and co-fire (exclusively use) hydrogen and ammonia by utilizing surplus electricity from renewable energy sources Realize net zero CO₂ emissions from thermal power plants through technologies such as CCUS
(5) Transition to next-generation power transmission and distribution networks (B • F)	<ul style="list-style-type: none"> Wide-area operation of power transmission and distribution networks, including the development and reinforcement of interconnection lines and transmission systems, based on the national government's master plan Upgrade supply and demand operation and grid stabilization technologies through the use of digital technology
(6) Maximum electrification (E • G)	Household: All electrification Commercial: Electrification of air-conditioning, hot water supplies, and kitchen equipment Industrial: Electrification of heat demand in a wide range of temperatures Transportation: EV sharing and expansion of charging infrastructure
(7) Co-creation of a zero-carbon society with local communities: (C • E • F)	<ul style="list-style-type: none"> Contribute to the construction of regional energy systems that combine grid power, local and urban renewable energy, and energy storage sites Contribute to resolving regional and societal issues and help bring about a zero-carbon society
(8) Disaster countermeasures and systems (H • I)	<ul style="list-style-type: none"> Consider countermeasures based on the national government's response policy Improvement of response capability

Formulate plans for concrete actions

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Realization of sustainability

[Reference 1] Total amount of investment for reduced carbon/decarbonization in power sources

Total investment over the past five years (FY2016-2020)

Approx. 800 billion yen

(about 150 billion yen of which is related to renewable energy)

Total investment over the next five years (FY2021-2025)

Approx. 500 billion yen

(about 250 billion yen of which is related to renewable energy)

[Reference 2] Financial impact of climate-related risks and opportunities

Annual financial impact of the stable operation of nuclear power stations*1

Approx. 30 billion yen/reactor

Sales of non-fossil fuel energy certificates due to the stable operation of non-fossil power sources

Approx. 6-13 billion yen if 10 billion kWh are sold

Disaster recovery costs

Approx. 6 billion yen

(actual results for FY2020)

*1 Simulation based on outcomes such as fuel cost reduction effects, etc.

TOPICS

IEA warns that rapid reduction in nuclear power use will jeopardize energy security and the achievement of global warming prevention goals

In a report*2 published by the IEA, there is a warning that a rapid reduction of nuclear power generation capacity in developed countries will lead to increased CO₂ emissions. The report also states that the continued use of nuclear power will have the effect of increasing energy security and maintaining low electricity prices, and therefore recommends that existing nuclear power plants be operated for as long as they are safe.

*2 "Nuclear Power in a Clean Energy System" (May 2019)
(Source: Federation of Electric Power Companies of Japan website)

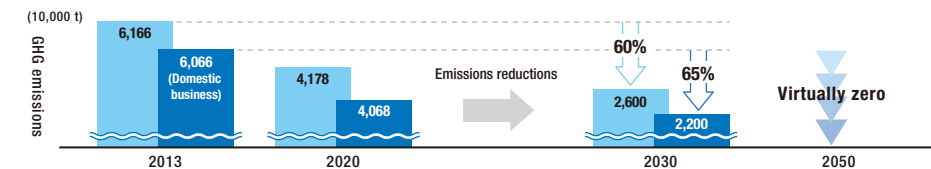
3. Indicators and Targets—Setting Climate-related Targets

As an industry leader in low- and carbon-free projects, we are taking on the challenge of reducing GHG emissions produced in our supply chain to virtually zero, while also contributing to raising the electrification rate for Kyushu. Through these and other measures, we will make a substantial difference to the amount of GHG emissions society produces. Doing so will help us to make Kyuden Group overall carbon negative as soon as possible after 2050. Furthermore, as mid-term targets toward the realization of carbon neutrality by 2050, we have established a set of management (environmental) targets for 2030 that go far beyond those announced by the Japanese government. Now, we are formulating more concrete plans for how to achieve these.

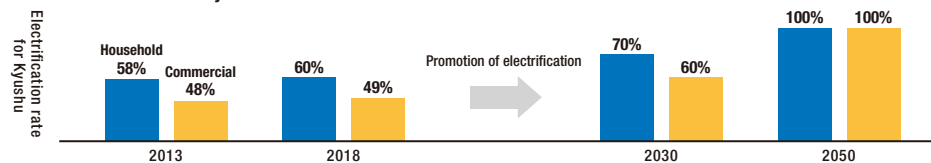
For more details, see [Home > For investors > IR library > Integrated Report / Annual Report > Integrated Report FY2021](#)

	Vision for long-term goals and KGI (2050)	Mid-term targets (2030)
Supply	Reducing supply chain GHG emissions to virtually zero	<p>Reducing supply chain GHG emissions by 60% and by 65% for our domestic business (compared to FY2013 levels)</p> <p>KPI</p> <ul style="list-style-type: none"> Positioning renewable energy as a main power source <ul style="list-style-type: none"> Amount of renewable energy developed: 5,000 MW (domestic and international) Lowering the carbon intensity of thermal power <ul style="list-style-type: none"> Achievement of Energy Conservation Act benchmark indices (Index A/Index B/Coal-only index) Establishment of technology to allow cofiring with 1% hydrogen and 20% ammonia
Demand	Contributing to reducing GHG emissions in society Helping to achieve 100% electrification in Kyushu by 2050.	<p>Contributing to the electrification of Kyushu (Household: 70%; Commercial: 60%)</p> <p>KPI</p> <ul style="list-style-type: none"> Household: Incremental increase of electricity 1.5 TWh (Total for 2021–2030) Commercial: Incremental increase of electricity 1.6 TWh (Total for 2021–2030) Transportation: Conversion of all company cars to EVs (excl. special purpose vehicles)

Greenhouse gas (GHG) emissions



Electrification rate for Kyushu



FY2020 GHG emissions

(10,000 t)

Scope 1	Scope 2	Scope 3	Total
2,211	0.01	1,967 (1,857)	4,178 (4,068)

*Numbers in parentheses denote domestic business figures

Breakdown of Scope 3 emissions

- Category 2: 105 (Capital investment)
- Category 3: 1,721 (Fuel consumption of energy produced by other companies that we purchase, etc.)
- Category 15: 110 (Overseas power generation businesses)
- Other: 31 (Purchasing goods, transporting/processing waste, etc.)

Environmental Management

The Kyuden Group, as a corporate group whose operations impact the environment, has a sincere commitment to caring for the environment.

That is why environmental preservation is a key business focus and why environmental management is promoted across all of our operations, ensuring that the growth of our business does not come at the expense of the environment. And, in order to concretely express our attitude toward, and guiding principles for, environmental action, we have established the Kyuden Group Environmental Charter.

Kyuden Group Environmental Charter

—A Commitment to Environmentally-Friendly Corporate Activity—

The Kyuden Group develops globally-focused initiatives geared towards protecting the earth's environment and cultivating harmonious local coexistence in order to achieve a more sustainable society.

1. We seek appropriate responses to global environmental challenges and to make effective use of resources so that our business activities will contribute to a better future.
2. We strive for harmonious coexistence with society by engaging in activities which will enrich local environments.
3. We work to raise environmental awareness and to become a corporate group that earns the trust of its customers.
4. We are proactive about disclosing environmental information and facilitating communication with the community.

Revised June 2018

Environmental Action Policies

Based on the Kyuden Group Environmental Charter, our basic policy for the medium-to-long term is aimed at steadily implementing environmental management to balance business operations and environmental preservation, and is made up of five basic pillars: initiatives to address global environmental issues, initiatives to establish a recycling society, local environment preservation, collaborating with communities, and promoting environmental management. In accordance with this policy, we will contribute to the realization of a sustainable society through our environmental activities, while always taking biodiversity into account.

Environmental Action Plan

Based on the Kyuden Group Environmental Charter, each fiscal year we formulate a Kyuden Group Environmental Action Plan to ensure steady promotion of environmental management. The Kyuden Group Environmental Action Plan comprises our Environmental Action Policies, Environmental Targets, and specific action plans. We also identify priority issues, and in addition to incorporating them into the medium-term management plans of each division, we set and announce targets for each fiscal year, as well as the medium to long term.

Further, through analysis, assessment, and reviews of our environmental activities based on the PDCA cycle, we are working to improve and enhance our environmental initiatives.

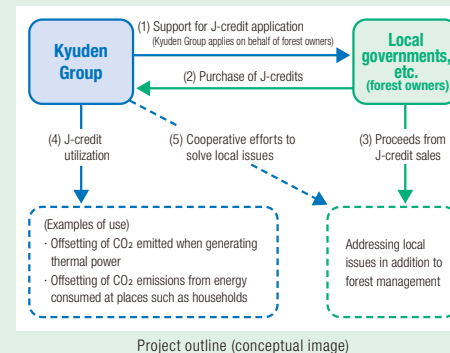
TOPICS Project to create and utilize J-credits through the utilization of forest resources

As one of the specific actions of Kyuden Group Carbon Neutral Vision 2050, we are engaged in the J-credit* Creation and Utilization Project that Utilizes Forest Resources. **P22-25**

This project supports the creation of J-credits from forests owned by local governments, etc., and uses the resultant J-credits to offset carbon emissions from thermal power generation and other sources for which the achievement of zero CO₂ emissions is difficult. In addition, we will also draw on the technology that has been cultivated through over a century of forest management of the Kyuden Group (Kyushu Rinsan Corporation and others) to propose comprehensive solutions to address various issues in forest management, such as forest resource visualization services using information and communication technology.

Based on a comprehensive partnership agreement entered into between Hisayama Town, Fukuoka Prefecture, Kyushu Electric Power, and Kyushu University Urban Institute, we are piloting this project in a town-owned forest in Hisayama Town to confirm its feasibility and effectiveness. Based on the results of the piloted project in Hisayama Town, we will finalize the method of this project and expand it to other areas, and also consider the establishment of carbon offset methods other than those derived from forests.

*A scheme in which the national government awards credits by (1) certifying the amount of CO₂ emission reduction through the introduction of energy-saving equipment and the use of renewable energy and (2) the amount of CO₂ absorption increase achieved through proper forest management.



Field survey in Hisayama Town (town-owned forest)

Development of Zero-emission Activities for Waste Materials

Based on the Kyuden Group Environmental Charter, the Kyuden Group has been engaged in zero waste emission activities since 2001 to promote the 3Rs (reduce, reuse, recycle) as well as the proper management and disposal of waste to create a recycling-oriented society.

We are also working to promote green procurement and to steadily complete the disposal of polychlorinated biphenyl (PCB) waste within the legal deadline.

Proper Management and Disposal of Waste (industrial waste)

Industrial waste generated by the Kyuden Group includes byproducts of thermal power generation (coal ash and gypsum) and debris such as the materials that are removed in the process of construction work. In addition to ensuring appropriate management and disposal of this industrial waste, we also practice the 3Rs: reduce, reuse, and recycle.

Efforts to Reduce Waste

At power plants operated by Kyushu Electric Power, we undertake careful maintenance and risk management of power generation facilities. Through the formulation and implementation of appropriate construction plans in line with the above, we are working to reduce the amount of waste we generate.

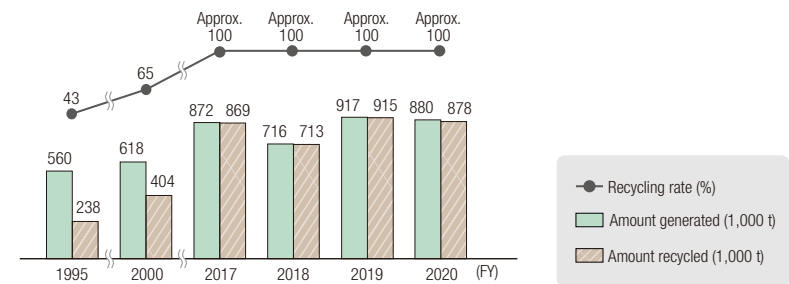
Efforts to Reuse Waste

For power equipment and materials that are removed during power distribution work, Kyushu Transmission and Distribution assesses whether their performance and quality meets the requirements for reuse. Equipment and materials that meet the requirements are then reused.

Efforts to Recycle Waste

In FY2020, the Kyuden Group recycled nearly all of the 880,000 tons of industrial waste we generated. As a result of its unique properties, all coal ash—which accounts for the majority of this industrial waste—is effectively used as a raw material in the creation of cement.

● Amount of industrial waste generated and recycling rates



Green Procurement

At the Kyuden Group, in FY2002 we introduced a Green Procurement System that aims to ensure we only purchase environmentally friendly products and materials. And so, through collaboration with our clients, we are making every effort to procure environmentally friendly products and materials.

Appropriate Management of Polychlorinated Biphenyls (PCBs)

For the electronic equipment we own that use a high concentration of PCBs, we undertake scheduled detoxification treatment at Japan Environmental Storage & Safety Corporation's PCB waste treatment facilities.

Further, for electronic equipment that uses only a small amount of PCB pollutant, we undertake scheduled detoxification treatment at certified disposal companies.

Until its disposal, PCB waste is strictly stored and managed in line with the Waste Management and Public Cleansing Law and others.

● Amount of toxic waste (PCB waste) treated

Unit: tons

	FY2017	FY2018	FY2019	FY2020
High concentration	2.9	0.9	0.5	0.01
Low concentration	422.0	399.9	570.4	237.9
Total	424.9	400.8	570.9	237.9

Water Resources

Water resources are fundamental to the Kyuden Group's business activities. At not only our hydroelectric power plants but also at our thermal power and nuclear power plants, we use large amounts of water as coolants and for other uses. As such, limitations on water supplies due to droughts or other issues are expected to have huge impacts on the Group's businesses.

As a business that uses water resources, we will continue to comply with permitted amounts of water intake based on relevant laws and ordinances, and are working to reduce the amount of water we consume by, for example, recirculating water at our power plants.

Further, each of our worksites and Group companies is engaged in water-saving efforts at their offices to reduce the total amount of water consumed.

Water Risk Assessments

Water resources are essential for the power generation businesses of the Kyuden Group, and as such we conduct the following risk management activities.

In the hydroelectric power generation businesses, we discharge the necessary amount of water to maintain the river environment downstream from the dams and weirs of our hydroelectric power plants. In addition, when drawing water from rivers for our power generation, we ensure strict compliance with permitted amounts of water intake based on relevant laws and ordinances.

Further, when river levels are predicted to rise due to heavy rainfall, we take actions such as discharging water from our dams in advance based on flood control agreements we have concluded with the national government and others to provide maximum cooperation to the extent possible to prevent regional disasters. In our thermal power generation businesses, we are working to reduce water intake volume by collecting and reusing the water required for power generation. Moreover, both our thermal power and nuclear power generation facilities use seawater as indirect cooling water, so we monitor things such as water temperature differences of the intake and discharge water.

We have also determined the current and future level of water stress in regions in which our facilities are located using the WRI Aqueduct (3.0) tool, which verifies water-related risks, the results of which are as follows.

According to the Baseline Water Stress results provided by this tool, in the Kyushu region where the Kyuden Group operates power plants using freshwater and seawater, at most, the water stress level is Low-Medium. As such, it is thought that the frequency of water-related risks is low.

