



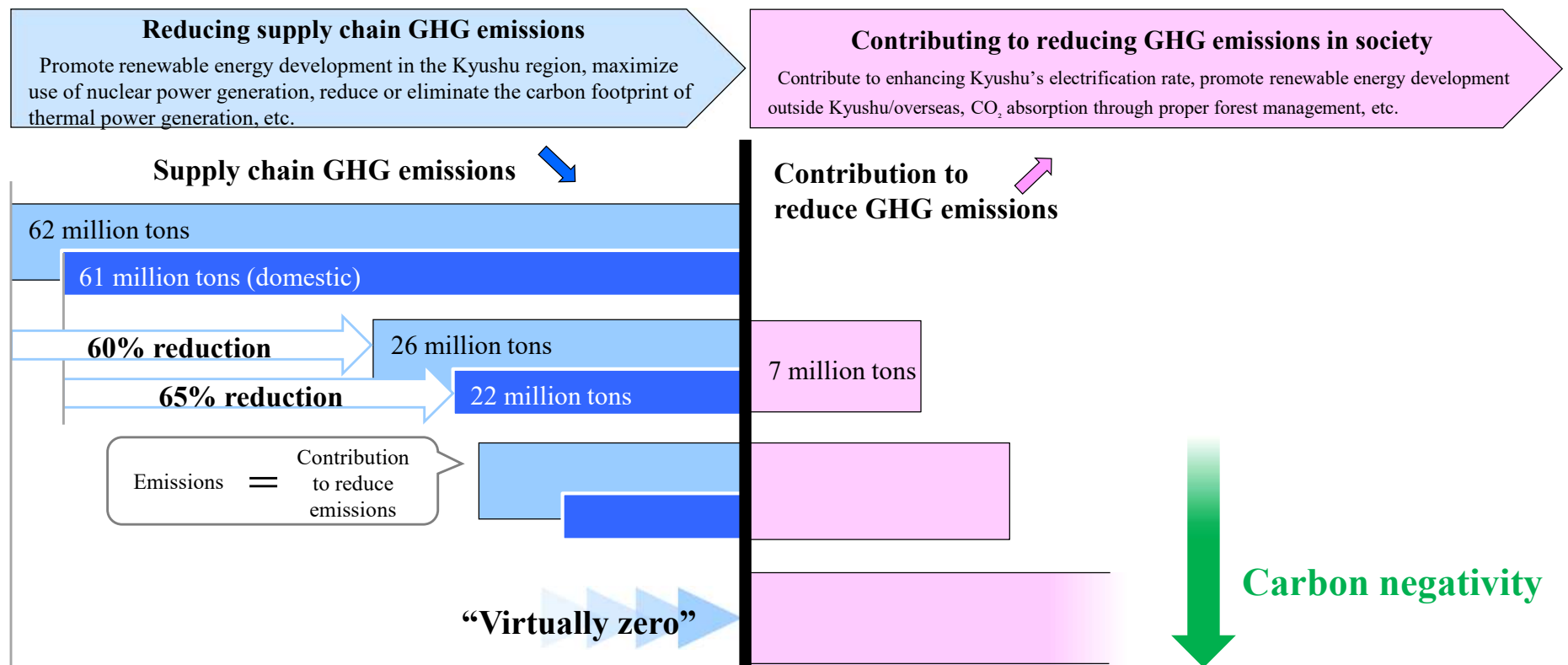
Kyuden Group

Action Plan to Achieve Carbon Neutrality

Introduction

- The social changes brought about by Covid-19 and the trend towards carbon neutrality are major turning points for the Kyuden Group, being an energy provider. In particular, we consider global warming as a major and pressing issue and therefore reducing greenhouse gases (GHG) and other measures will be taken by the Kyuden Group.
- In the “Kyuden Group Carbon Neutral Vision 2050” formulated in April 2021, the Kyuden Group declared its commitment to the challenge of achieving carbon neutrality by 2050 by continuing to “lower the carbon intensity of or decarbonize energy sources” and “accelerate the shift toward electricity-based energy consumption” as the two pillars of its effort revolving around energy supply and demand, and it strives to become a corporate group that leads the way in Japan's decarbonizing initiatives from Kyushu.
- In order to make a significant contribution to the realization of a carbon-neutral society as the industry leader in low-carbon and decarbonization, the Kyuden Group has clarified its goal for 2050, revised its management objectives (environmental objectives) for 2030 upward by backcasting, and formulated an Action Plan that includes specific action plans for achieving these targets.
- The Kyuden Group considers carbon neutrality and other changes in the business environment as a transformative opportunity to achieve further corporate growth.

● The Kyuden Group's Vision for a Carbon Neutral Society



Kyuden Group's Goals for 2050

- Kyuden Group will contribute to the realization of carbon neutrality in society by focusing on "reducing supply chain GHG emissions" and "contributing to the reduction of GHG emissions in society".

Reduce greenhouse gas (GHG) emissions from the entire supply chain to "virtually zero" during business activities.

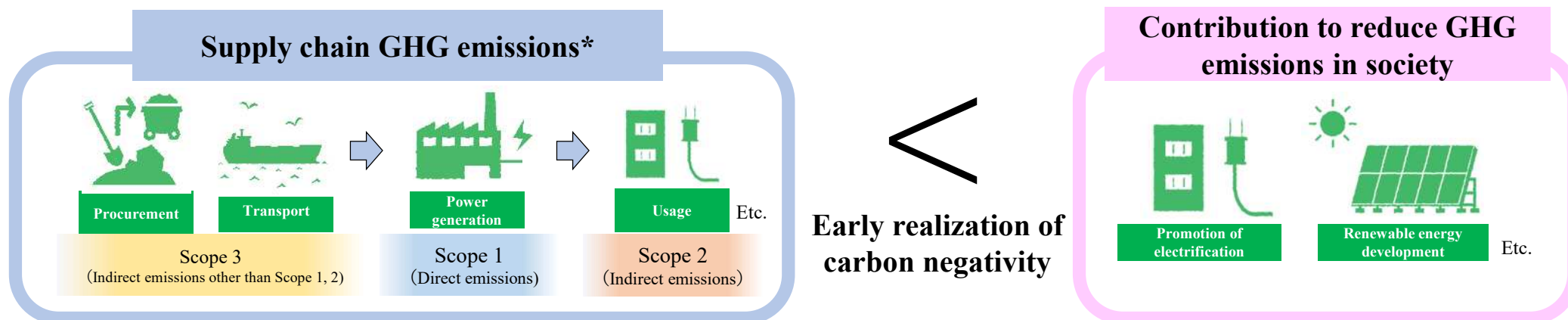
- We set goals that were based on the Japanese government's 2030 GHG emission reduction goals and the importance of reducing GHG emissions throughout the entire supply chain during business activities.
- The reduction of GHG emissions in the entire supply chain is not limited to direct emissions from the use of fuel, but also includes indirect emissions from the procurement of raw materials, transportation and distribution, and disposal, etc.
- The term "virtually zero" means to reduce the total amount of GHG emissions, then offsetting the remaining amount through "absorption and removal". We will achieve "virtually zero" by utilizing CCS technology, etc.

We will contribute to the reduction of GHG emissions in society by promoting a shift to electricity-based energy consumption to the maximum extent possible, and providing a stable supply of environmentally-friendly energy, etc.

- We will contribute to reducing emissions in the non-power sector by promoting electrification as an energy company whose main business is the supply of electricity, and we will also contribute to reducing GHG emissions in diverse ways, such as by promoting renewable energy development outside Kyushu/overseas, and CO₂ absorption through proper forest management, etc.

Through these efforts, the Kyuden group will achieve "carbon negativity" as early as possible before 2050.

- By reducing GHG emissions in society through the promotion of electrification and renewable energy development, we will create a reduction effect that exceeds the Kyuden Group's GHG emissions, thereby achieving "carbon negativity," which means that the GHG emissions of society as a whole from business activities will be reduced to a negative figure, as early as possible after 2050.



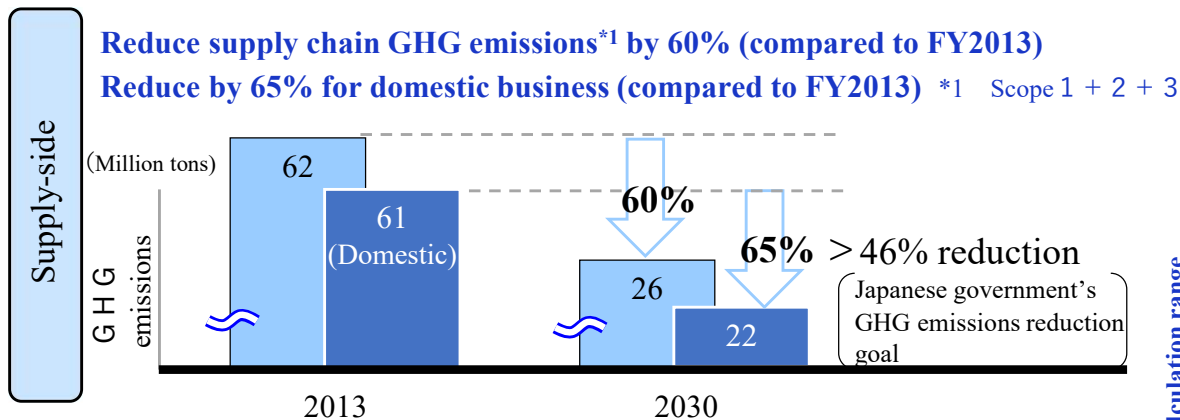
(Source) Created by Kyuden Group based on the Ministry of the Environment's "Calculation of Supply Chain Emissions"

*GHG emissions are calculated for each of the 3 Scopes with differing emissions configurations, in compliance with the GHG protocol, which is the international standard regarding the calculation and reporting of GHG emissions.

Management Objectives for 2030 (Environmental objectives)

- In order to achieve a higher level of carbon neutrality, we have revised upward our management objective (environmental objective) for 2030 as a target for both energy supply and demand (supply side/ demand side).
 - The supply-side objectives are to reduce GHG emitted through the Kyuden Group's business activities, in compliance with the GHG protocol, which is the international standard. We will reduce emissions by 60% compared to FY2013 for Scope 1 + 2 + 3, including a 65% reduction in domestic operations. The 65% reduction in domestic operations is significantly higher than the Japanese government's target of a 46% reduction in GHG emissions (compared to FY2013).
 - The demand-side objectives are to increase the electrification rate in Kyushu, as an energy provider with a presence in the region. We contribute to achieve an electrification rate of 100% in the household and commercial sectors by 2050, and to contribute to achieving 70% in the household sector and 60% in the commercial sector by 2030.

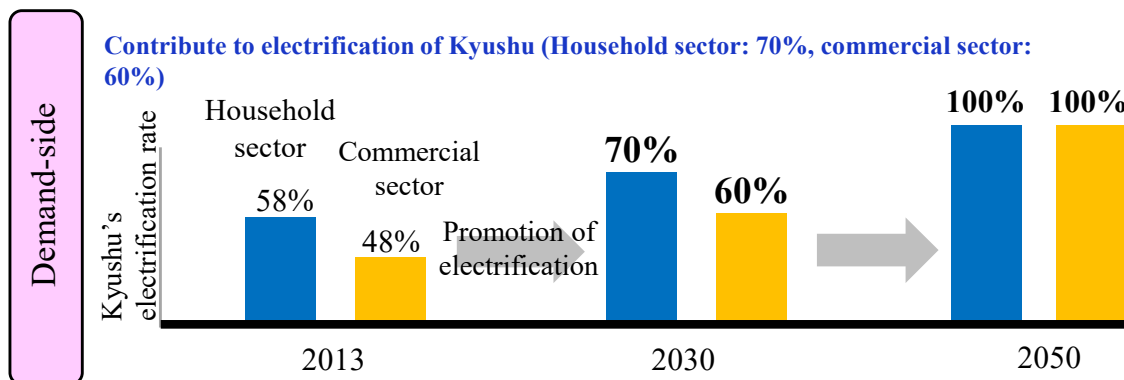
Management Objectives for 2030 (Environmental objectives)



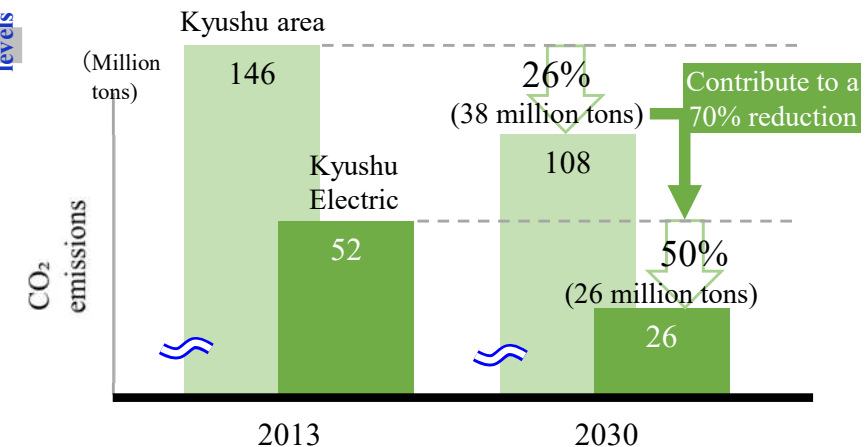
(Before revision)

Contribute to 70% (26 million tons) of the required CO₂ reduction amount*2 for Kyushu (Equivalent to 50% reduction in emissions for Kyushu Electric) (compared to FY2013)_

*2 If the Japanese government's reduction target of ▲26% (compared to FY2013) at the time the management vision was established is applied to Kyushu, the required reduction amount is 38 millions tons.



Expansion of the calculation range
 Upwards revision of the target levels



Specific Action Plan

- Kyuden Group considers the decade up to 2030 to be particularly important to achieve the goal set for 2050. It has developed a concrete action plan which is centered on “decarbonizing/lowering the carbon intensity of electricity sources” and “promoting electrification.”

● Specific Action Plan up to 2030

Decarbonizing / lowering the carbon intensity of electricity sources	Positioning renewable energy as a main power source	[Solar power]	Promotion of development, and more effective use of existing resources, such as purchasing power from post-FIT power sources	2030 KPI Positioning renewable energy as a main power source Amount of renewable energy to be developed 5,000 MW (domestic and international) Lowering the carbon intensity of thermal power Achieve the benchmark index for the Energy Conservation Act Establish technology towards co-firing of hydrogen 1% /ammonia 20% Contribution to electrification of Kyushu [Household sector] Incremental electricity 1,500 GWh (2021-2030 total) [commercial sector] Incremental electricity 1,600 GWh (2021-2030 total) [Transportation sector] Conversion company cars to 100% EV* <small>*Excluding special-purpose vehicles</small>
		[battery·pumped storage]	Establishment of integrated control technologies for distributed energy resources/development of aggregation business	
		[Wind power]	Promotion of development mainly offshore wind power generation at promising sites	
		[Hydroelectric power]	Updating of existing power stations and promotion of new development using FIT and FIP systems	
		[Geothermal power]	Promotion of new development based on geothermal power resource surveys both in and outside Kyushu	
		[Biomass]	Promotion of development and sustainable resource cycle of woody biomass	
	Active development of overseas operations	Initiatives for renewable energy, low-carbon thermal power generation, transmission and distribution projects, etc., tailored to the needs of each region		
	Maximum use of nuclear power	Continuation of safe and stable operation for maximum utilization Perform full-scale reviews at an early stage to enhance the capacity factor		
	Lowering the carbon intensity of thermal power	Phase-out of inefficient coal-fired thermal power Review/establish technology for co-firing of 1% hydrogen and 20% ammonia (Hydrogen co-firing with LNG combined thermal power, ammonia/biomass co-firing with coal-fired thermal power, etc.)		
		Review the possibility of collaboration towards building a supply chain for carbon-free fuel (hydrogen/ammonia)		
Upgrading of the transmission and distribution network	Expand interconnection of renewable energy, etc., through new system connections/enhance network utilization rate			
Promotion of electrification	Contribution to electrification of Kyushu	[Household sector]	Widespread use of all-electric housing through enhanced cooperation with housing-related businesses	
		[commercial sector]	Enhancement of individual proposals (propose economic efficiency, environmental-friendliness, and operability by estimating equipment expenses and utility costs)	
		[Industrial sector]	Technical research on heat source conversion equipment such as heat pumps, and proposing electrification across wide-ranging temperature zones in the production process	
		[Transportation sector]	Conversion of 100% of company cars to EV, and review a new business model using EV	
Promotion of carbon neutrality in the region	Contribution to resolving regional/social issues by providing Kyuden Group’s solutions towards the collaborative needs of municipalities, etc., for promoting carbon neutrality in the region and enhancing resilience			
	CO ₂ absorption through adequate forest management, creation/utilization of J-credit through the use of forest resources			

Positioning renewable energy as a main power source

2030 KPI

Amount of renewable energy to be developed
: 5,000 MW (domestic and international)

- The Kyuden Group is actively developing renewable energy that does not emit CO₂, and its goal is to develop 5,000 MW in renewable energy both in Japan and abroad by 2030.
- In addition to the development of geothermal and hydro power, which are the Kyuden Group's strengths, it is expanding offshore wind power and biomass, which have great potential for introduction, while assessing their profitability, in order to position renewable energy as a main power source.

Renewable energy development (end of November 2021)



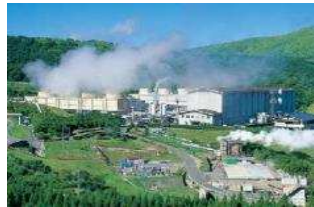
Solar 94 MW



Wind 207 MW



Hydro 1,287 MW
(excluding pumped storage
power generation)

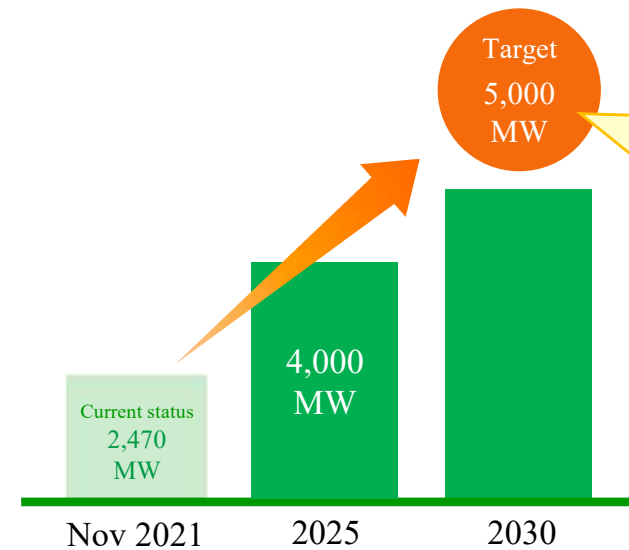


Geothermal 553 MW



Biomass 331 MW

2030 renewable energy development target (domestic and international)



The estimated electric energy is equivalent to the consumption of approximately 4.3 million ordinary households

Approx. 70% of households in Kyushu

Topics

Issuance of green bonds

- In June 2021, the Kyuden Group issued the “First Kyushu Electric Green Bond” limited to funding projects with environmental benefits, such as renewable energy development, etc., with the objectives of enhancing its stakeholders’ understanding of its efforts towards “decarbonizing / lowering the carbon intensity of electricity sources” and diversifying its financing.

Overview of the First Kyushu Electric Green Bond

Issue amount	15 billion yen	Term to maturity	10 years
Interest rate	0.310%	Issue date	June 10, 2021
Use of funds	New investment for Shintakeda Hydro Power Station, Jikumaru Hydro Power Station, and Otake Geothermal Power Station, and refinancing of existing investments		

Hydro power business: Shintakeda Power Station



Geothermal power business: Otake Power Station



Positioning renewable energy as a main power source

Solar power generation

- As for solar power generation, we are working on a mega-solar power generation project using the former site of Kyushu Electric's power plants and others.
- We will also promote efforts towards the effective use of existing resources, such as the purchasing of power from post-FIT power sources that have reached the end of their purchase period under the FIT system.



Omura Mega Solar Power Station (Kyuden Mirai Energy)

List of solar power generation facilities (end of November 2021)

		Power station	Output
Existing (Approx. 94 MW)	Domestic	Omura Mega Solar	1.99 MW
		Omura Mega Solar	17.48 MW
		Sasebo Mega Solar	10.0 MW
		Installation at offices, etc.	Approx. 2.2 MW
		Other Mega Solar plants	Approx. 57.6 MW
	Overseas	Taiwan /Tree Valley	5.13 MW
Planned (Approx. 60 MW)	Domestic	Miya River Watarai Solar Park	Approx. 60.0 MW

Battery/pumped storage power generation

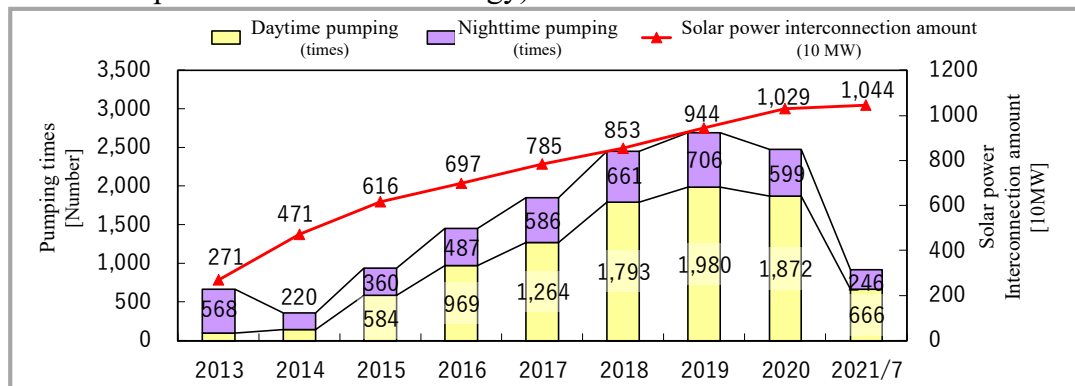
- We incorporate renewable energy to the maximum extent possible through the use of pumped storage power stations and the Buzen Battery Substation, which has one of the world's largest energy storage systems, to maximize the use of renewable energy and respond appropriately to fluctuations in output to ensure a stable supply of electricity.
- Also, we will establish integrated control technologies for distributed energy resources, such as post-FIT power sources, storage battery, and electric vehicles (EV), and develop aggregation businesses.

Large-capacity storage system (Buzen Battery Substation)



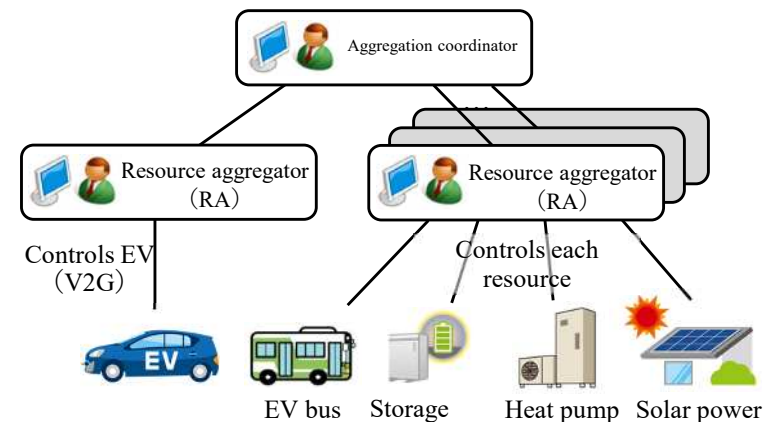
Facility	Output
NAS battery	50 MW (Capacity 300 MWh)

Changes in the frequency of pumping (increase in daytime pumping to maximize the acceptance of renewable energy)



*Total number of pumping by 8 pumped storage units. The number of daytime pumping per unit in FY2020 was 234.

Integrated control technologies for distributed energy resources



Positioning renewable energy as a main power source

Wind power generation

- Kyuden Mirai Energy and other companies are working on developing wind power generation in promising areas where long-term, stable and economical wind power generation is possible, in consideration of harmony with the surrounding environment.
- Since FY2017, a consortium led by Kyuden Mirai Energy has been working on realizing offshore wind power generation (maximum power output: approximately 220 MW) in Hibiki-nada, Kitakyushu City, Fukuoka Prefecture.
- In addition, we are actively promoting development both within and outside the Kyushu region, such as a joint project with RWE Renewables (Germany), one of the world's leading renewable energy companies, to study the feasibility of a project off the coast of Yurihonjo City, Akita Prefecture.

● Offshore Hibiki-nada wind power generation (development image)



Photo by: Vestas Wind Systems A/S



Hydro power generation

- We are working on the development of hydro power generation in harmony with the local community by comprehensively taking into account technical aspects, economic efficiency, and the location environment.
- We are promoting new development and renewal of old existing power stations using the FIT/FIP system, etc., to make effective use of unused energy.

● List of wind power generation facilities (end of November 2021)

		Power station	Output	Location
Existing (Approx. 207 MW)	Domestic	Koshikijima	0.25 MW	Kagoshima Prefecture
		Nagashima	50.4 MW	Kagoshima Prefecture
		Amami Oshima	1.99 MW	Kagoshima Prefecture
		Washiodake	12.0 MW	Nagasaki Prefecture
		Kushima	64.8 MW	Miyazaki Prefecture
		Karatsu/Chinzei	27.2 MW	Saga Prefecture
	Overseas	Inner Mongolia wind power	50.0 MW	China

● Consideration of an offshore wind power generation project off the coast of Yurihonjo City

Project developers

Kyuden Mirai Energy
RWE Renewables

Kyuden Mirai Energy × RWE

Power to realize renewable energy projects × Abundant experience and cost-cutting knowledge

● List of hydro power generation facilities (end of November 2021)

		Power station	Output
Existing (Approx. 1,287 MW)	Domestic	144 locations	1,286.811 MW
Planned (Approx. 9 MW)	Domestic	Shintakeda	8.3 MW
		Jinmaru*	+ 1.1 MW

*Increase in output associated with renewal of power generation facilities

Positioning renewable energy as a main power source

Geothermal power generation

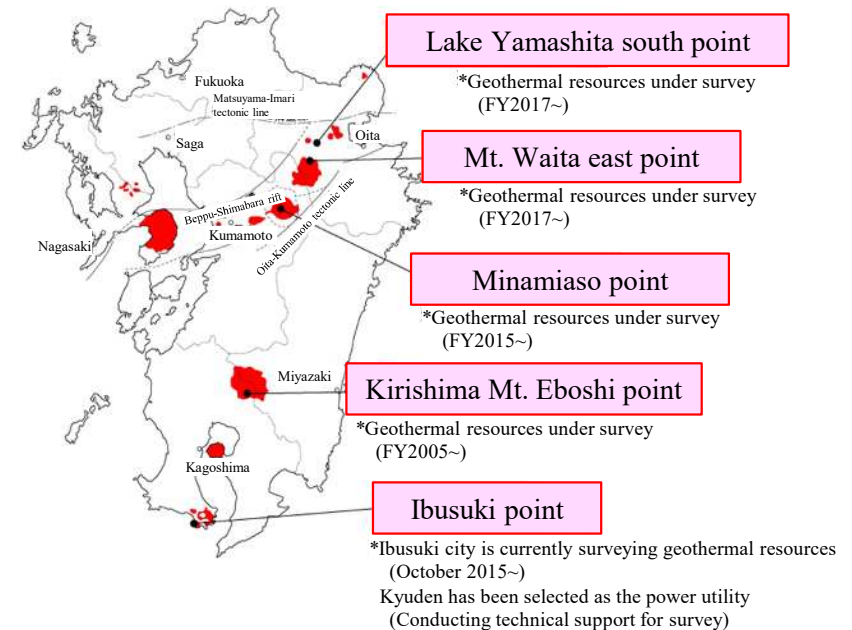
- The Kyuden Group's geothermal power generation generates approximately 220 MW in Japan, and accounts for approximately 45% of the installed capacity nationwide. Currently, geothermal power resources are being surveyed in Kyushu (5 sites) and outside Kyushu (1 site Sarukuradake, Fukushima Prefecture), and we will continue to promote development.

● List of geothermal power generation facilities (end of November 2021)

		Power station	Output	Location
Existing (Approx. 553 MW)	Domestic	Otake	13.7 MW	Oita Prefecture
		Hatchobaru	110.0 MW	Oita Prefecture
		Yamagawa	30.0 MW	Kagoshima Prefecture
		Ogiri*	30.0 MW	Kagoshima Prefecture
		Takigami*	27.5 MW	Oita Prefecture
		Hatchobaru Binary	2.0 MW	Oita Prefecture
		Sugawara Binary	5.0 MW	Oita Prefecture
		Yamagawa Binary	4.99 MW	Kagoshima Prefecture
	Overseas	Sarulla	Approx. 330MW	Indonesia

*Joint development/operation with steam supplying companies

● Survey points in Kyushu (end of November 2021)

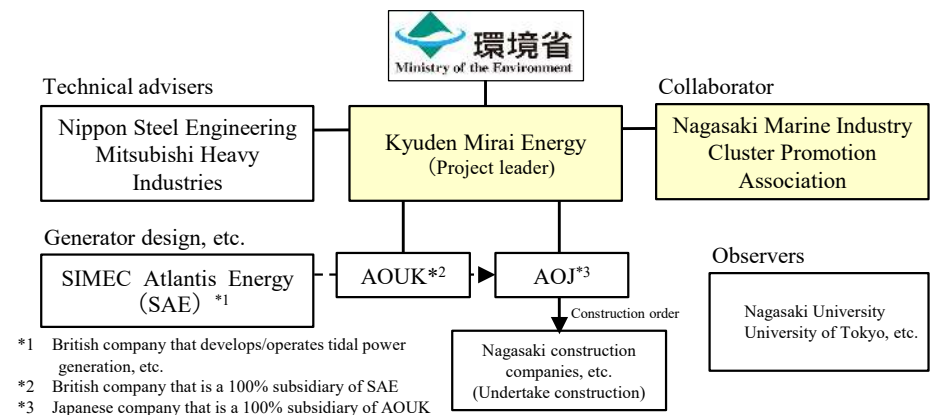


Topics Tidal power generation

- Naruseto Strait in Goto, Nagasaki Prefecture was selected in May 2019 by the Ministry of the Environment through public offering as the location for Japan's first large-scale tidal power generation (500kW) verification test, which started in January 2021. (Scheduled for completion in March 2022)
- Tidal power generation uses tidal currents (currents of seawater generated by the ebb and flow of the tide) to turn the propeller to generate power, and there is great development potential in Western Japan.



● Study framework regarding tidal power generation



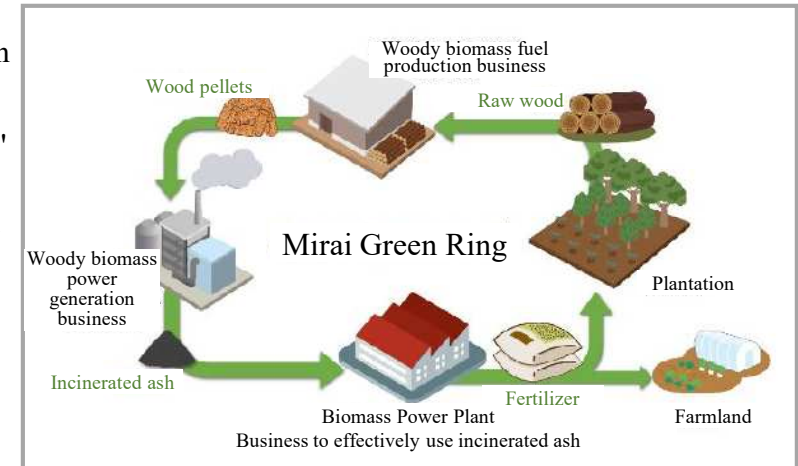
Positioning renewable energy as a main power source

Biomass power generation

- As biomass power generation uses wood chips and pellets made of nature-derived wood as fuel, it does not affect the amount of CO₂ in the atmosphere*¹ and the use of unused energy such as forest residues and livestock excrement is expected to contribute to local communities.
- Kyuden Mirai Energy, under the "Biomass Resource Recycling Concept (Mirai Green Ring)" for sustainable resource recycling of woody biomass, is promoting the commercialization of upstream wood pellet production and downstream effective utilization of incineration ash from biomass power plants, based on its existing power generation business.

*1 The CO₂ emitted from burning biomass fuel is CO₂ that was originally absorbed by plants, and so as the net amount of CO₂ emitted and absorbed is zero, the total amount of CO₂ does not increase; this is the concept of "carbon neutral" carbon cycling.

● Biomass resource cycle concept (Mirai Green Ring)



● List of biomass power generation facilities (end of November 2021)

	Power station	Main fuel	Output
Existing (Approx. 331 MW)	Miyazaki Biomass Recycle Power Plant	Poultry manure	11.35 MW
	Fukuoka Clean Energy Corporation Tobu Plant	General waste	29.2 MW
	Nanatsujima Biomass Power Plant* ²	Palm kernel shell (PKS), wood pellets, etc.	49.0 MW
	Buzen Biomass Power Plant* ²	Palm kernel shell (PKS), wood pellets	74.95 MW
	Fukuoka Woody Biomass Power Plant	Unused timber, general wood	5.7 MW
	Soyano Wood Power Plant* ²	Unused timber, lumbering end materials	14.5 MW
	Kanda Biomass Power Plant* ²	Palm kernel shell (PKS), wood pellets, etc.	74.95 MW
	Nakagusuku Biomass Power Plant* ²	Palm kernel shell (PKS), wood pellets	49.0 MW
	Oita Biomass Power Plant* ²	Palm kernel shell (PKS), Unused timber	22.0 MW
Planned (Approx. 251 MW)	Shimonoseki Biomass Power Plant	Wood pellets	74.98 MW
	Hirohata Biomass Power Plant* ²	Palm kernel shell (PKS), wood chips, etc.	74.9 MW
	Ishikari Bay New Port Biomass Power Plant* ²	Palm kernel shell (PKS), wood pellets	51.5 MW
	Tahara Green Biomass Power Plant* ²	Wood pellets, etc.	50.0 MW

Fukuoka Woody Biomass Power Plant
(Chikuzen, Fukuoka Prefecture)



©Shimonoseki Biomass Power Plant
(Shimonoseki, Yamaguchi Prefecture)



*2 Development by a SPC (Special Purpose Company) funded by the group company

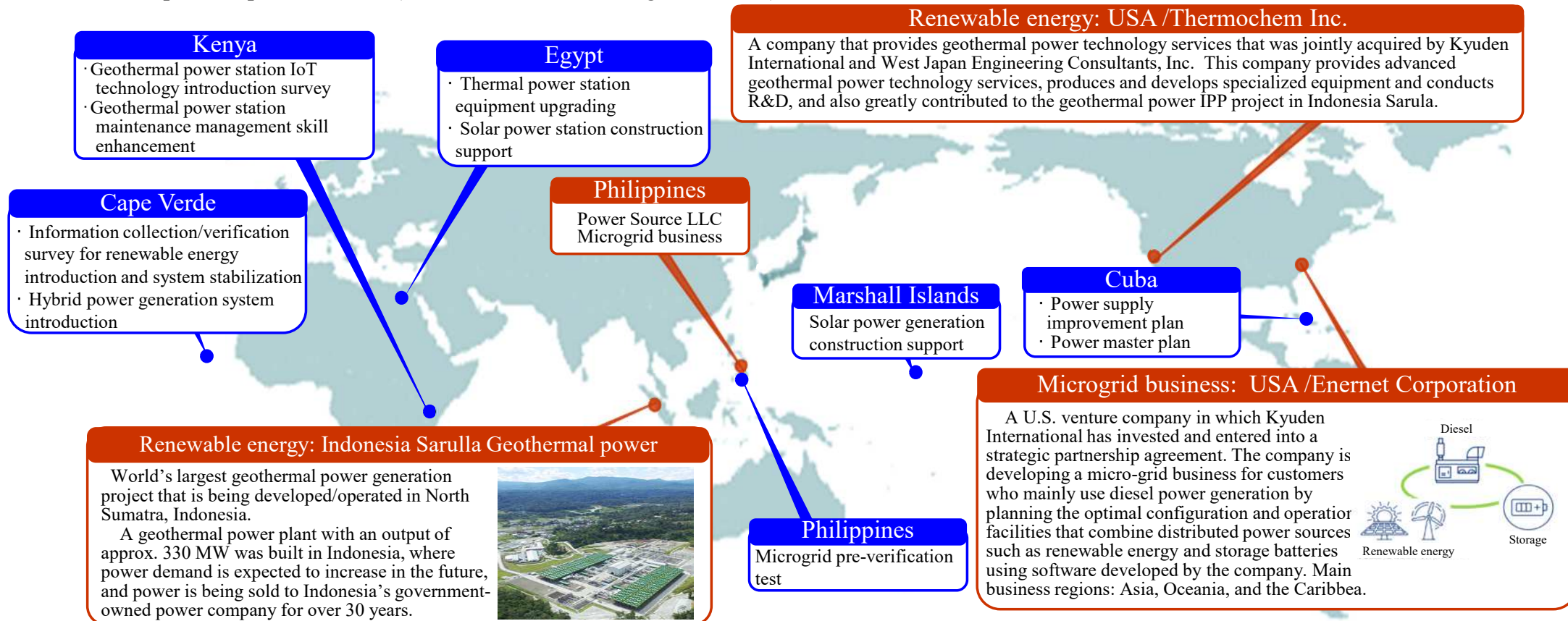
Active development of overseas business

2030 KPI

Amount of renewable energy to be developed
: 5,000 MW(domestic and international)

- We are developing energy-related businesses in countries around the world by utilizing the technologies and know-how related to the electric power business that the Kyuden Group has accumulated in Japan and overseas. We have positioned it as one of the highly promising growth businesses with an eye on future market expansion, and are actively promoting the expansion of deployment areas and business domains in order to achieve our overseas equity output target of 5,000 MW by 2030.
- In the area of renewable energy, we will promote the development of renewable energies to the maximum extent possible while carefully considering profitability and the regional characteristics of the country, aiming to develop 5,000 MW of renewable energies in Japan and overseas by 2030.
- In the area of thermal power generation, we will contribute to the reduction of GHG emissions by participating in the construction of state-of-the-art, high-efficiency thermal power plants to replace aging thermal power plants, while taking into consideration the energy situation in the countries concerned.
- We will also provide energy solutions that meet the needs of the region and the times such as micro-grid business mainly in island countries and consulting business based on our experience in Kyushu in dealing with the introduction of renewable energy.

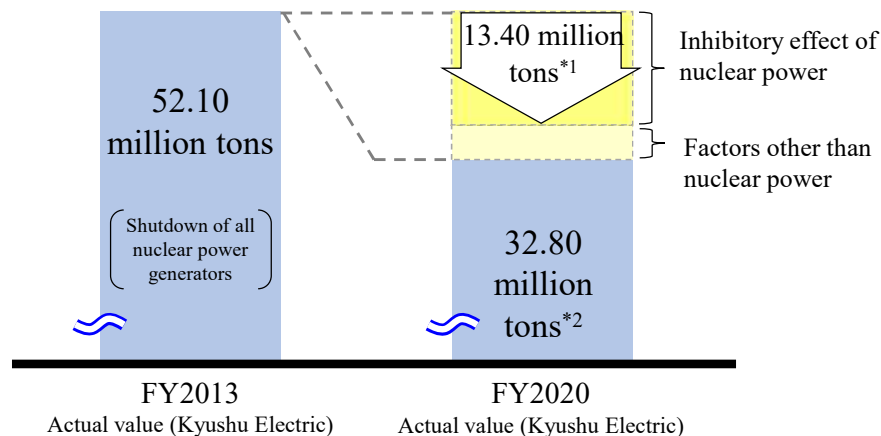
● Examples of specific efforts (blue boxes are consulting businesses)



Maximum use of nuclear power

- Nuclear power is an excellent power source in terms of CO₂ emission reduction and energy security, and from the perspective of securing stable power supply for a long period of time, we will make maximum use of nuclear power with safety as a top priority.
- We will continue to work on improving the safety and reliability of the nuclear power plants currently in operation, and continue their safe and stable operation to maximize their utilization. In addition, with safety as a top priority, we will begin full-scale studies at an early stage to improve the utilization rate of facilities.

CO₂ emission reduction effect of Kyushu Electric's nuclear power generation



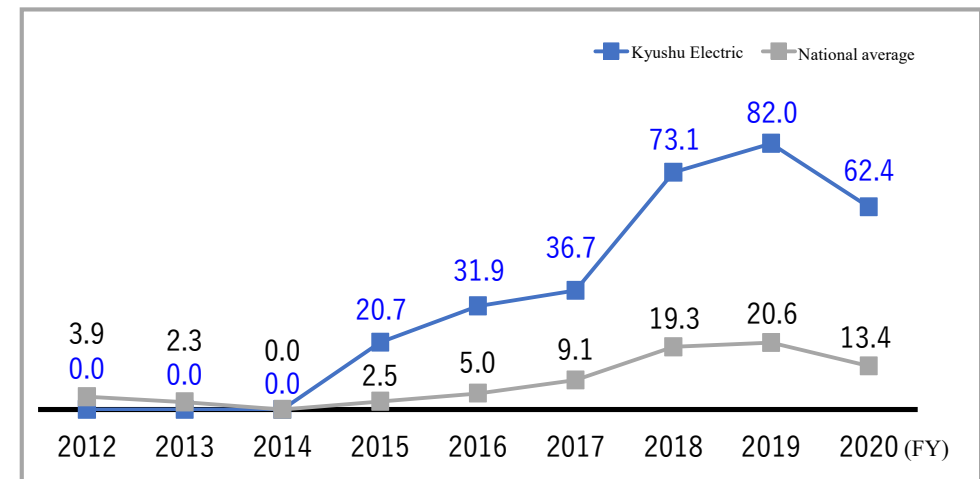
- * 1 CO₂ emission factor (after adjustment) 0.617kg-CO₂/kWh for FY2013 is used
- * 2 FY2020 results are provisional values, and definite values will be announced by the government around December

List of nuclear power generation facilities (end of November 2021)

Power station name	Output	Start of operation	Type
Genkai	Units 3, 4: 1,180 MW each	Unit 3: March 1994 Unit 4: July 1997	Pressurized Water Reactor (PWR)
Sendai	Units 1, 2: 890 MW each	Unit 1: July 1984 Unit 2: November 1985	

(Note) Genkai Unit 1 ended operation in April 2015, and Genkai Unit 2 ended operation in April 2019

Nuclear power generation capacity factor (%)



Topics

Implementation of a special inspection of Sendai Nuclear Power Station to decide whether to authorize an extension of the operating period

- The special inspection required for application for extension of the operating period based on the Nuclear Reactor Regulation Law was started on October 18, 2018 for Sendai Nuclear Power Station Unit 1, and will begin in late February 2022 for Unit 2.
- In order to operate a nuclear power station for more than 40 years after the start of operation, it is necessary to apply to the Nuclear Regulation Authority for an operation period extension authorization with the special inspection results attached, and obtain approval.
- A special inspection will be conducted, and the authorization for an operation extension will be determined based on those results.

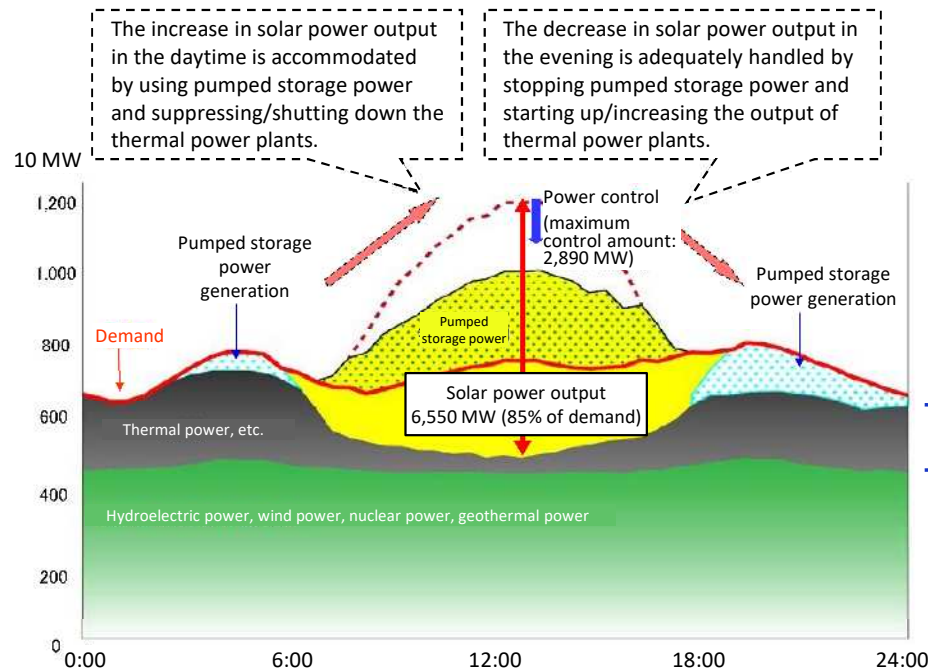
Reducing the carbon intensity of thermal power

- In the case of thermal power generation, in addition to the LNG combined cycle, which offers excellent flexibility as a power source for adjusting to fluctuations in the output of renewable energy sources, our Group has been making a significant contribution to the expansion of renewable energy through the design and operation of coal-fired thermal power plants that can handle intermediate loads.
- We will continue to proactively pursue low-carbon initiatives, such as increasing efficiency, addressing the fade-out of inefficient coal-fired thermal power plants by 2030, utilizing fuels for power generation such as hydrogen and ammonia that do not produce CO₂ during combustion, and considering the application of CO₂ capture technologies.

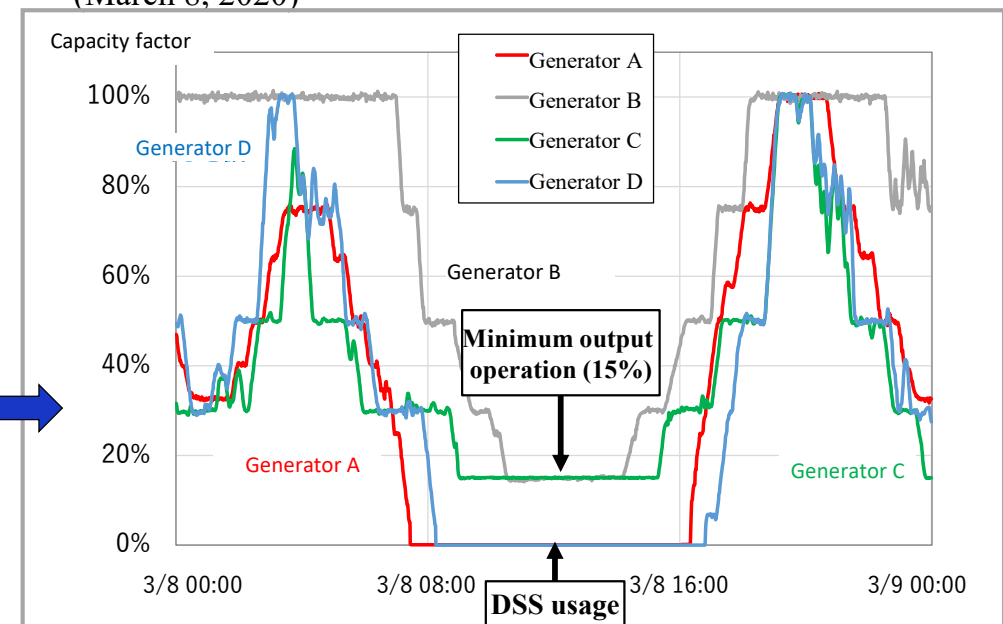
Topics

Operation of thermal power that contributes to the maximum utilization of renewable energy

- When controlling the output of solar power and other renewable energy sources, we use pumped-storage power generation, as well as shutting down or maximizing the output of thermal power units, based on the priority dispatch rules set out in the Renewable Energy Special Measures Law.
 - If a large number of thermal power stations were to be shut down during the day, there is a risk that they would not be able to increase their output in time to meet demand in the evening, when solar output is almost zero.
 - In the daytime hours, our thermal power plants are operated with a minimum output (15%), which is much lower than the grid requirement (50%), and with the DSS (Daily Start Stop) function, which is highly agile and accurate, and contributes greatly to the maximum acceptance of renewable energy and the stable supply of electricity.
- Kyushu's power supply and demand (March 8, 2020)



● Operation status of the company's coal-fired thermal power plants (March 8, 2020)



Reducing the carbon intensity of thermal power

2030 KPI

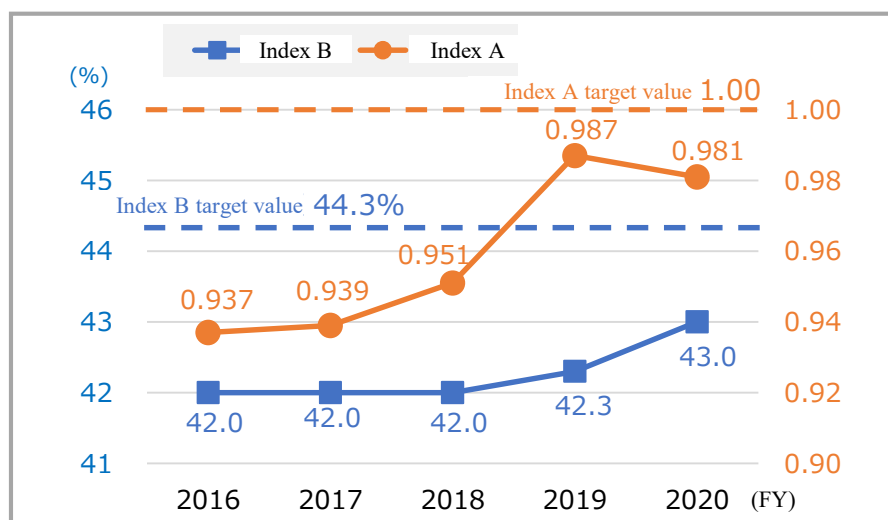
Achievement of Energy Conservation Act benchmark indices (Index A/Index B/Coal-only index)

Achievement of benchmark indices

(Response to phase-out of inefficient coal-fired thermal power)

- We aim to achieve the benchmark index of the Energy Conservation Act in 2030 by operating coal-fired and LNG-combined power plants with high thermal efficiency, including the Matsuura Power Station Unit 2, which started commercial operation in December 2019, and by utilizing carbon-free fuels.
- With regard to inefficient coal-fired thermal power plants, we aim to fade them out by 2030, taking into account the national energy policy, but also taking into account the stable supply of electricity, energy costs and the circumstances of the region where they are located.

● Change in benchmark indices



The coal-only index is subject to the Energy Conservation Act report from 2023.

● List of Kyuden's coal-fired thermal power plants (end of November, 2021)

Power station name		Output	Start of operation	Biomass co-firing
Matsuura	Unit 1	700 MW	June 1989	FY2013~
	Unit 2	1,000 MW	December 2019	
Reihoku	Unit 1	700 MW	December 1995	FY2010~
	Unit 2	700 MW	June 2003	
Kanda	New Unit 1	360 MW	July 2001	—

Topics

Study on the development of new high-efficiency thermal power

- We are currently considering the development of an LNG-fueled power plant in Kitakyushu City, Fukuoka Prefecture, in collaboration with Saibu Gas.
- The power generation method will use a cutting-edge combined cycle system, which is expected to reduce CO₂ emissions by more than 20% compared to combined cycle systems that first came out in the 1990s, and we also consider the use of carbon-free fuel (ammonia/hydrogen) in the future.

● Considered operation of a new LNG combined cycle power station

Scheduled construction location	Koyomachi, Wakamatsu-ku, Kitakyushu City
Power generation method	Gas turbine combined cycle system
Fuel	LNG (liquefied natural gas)
Start of operation	Mid-2020s

Reducing the carbon intensity of thermal power

2030 KPI

Establish technology for co-firing of 1% hydrogen and 20% ammonia

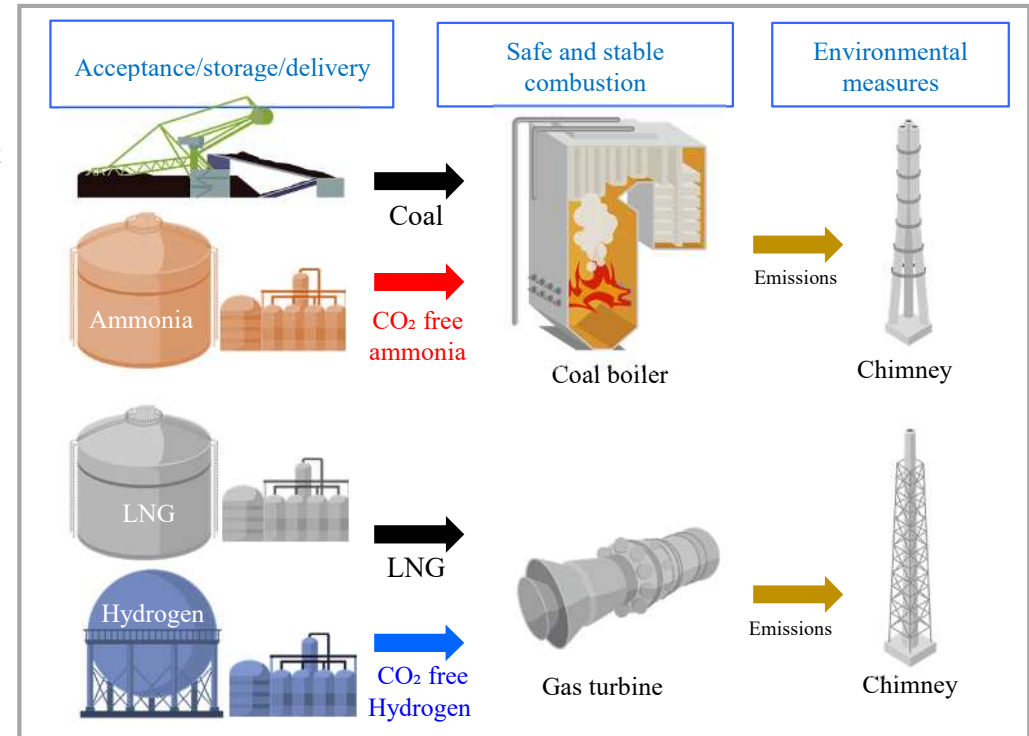
Establish technology for co-firing of carbon-free fuel

- With regard to the co-firing of hydrogen and ammonia in thermal power generation in relation to the development of new high-efficiency thermal power plants, we will keep a close eye on the innovation of "quantity, price, and supply chain", which is considered to be important for the implementation in society, and contribute to the carbon neutrality of the power supply side as much as possible while pursuing the compatibility with economic rationality.
- Specifically, we are working towards a technology for co-firing 1% hydrogen and 20% ammonia by 2030 so that electricity can be generated when carbon-free fuels are used in large quantities.

【Efforts to establish co-firing technology】

- Study of receiving, storage and dispatch facilities based on fuel properties
- Conducting tests for safe and stable combustion
- Study of environmental measures for fuel change

● Co-firing of hydrogen/ammonia



Topics

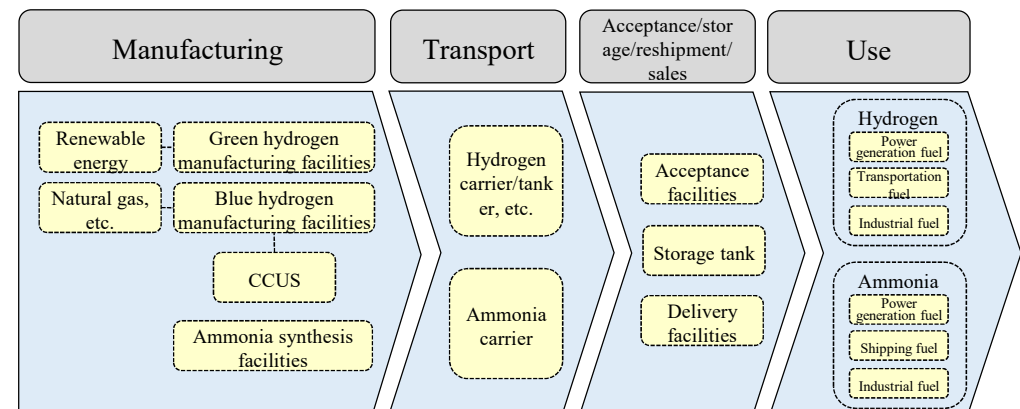
Conclusion of a memorandum regarding potential collaboration for clean ammonia

- On 27 September 2021, we signed a memorandum of understanding (MOU) with Yara International, one of the world's largest manufacturers of nitrogenous fertilizers, to discuss collaboration in the production of clean ammonia (blue ammonia and green ammonia).

【What we are considering in detail】

- Establish a supply chain from production of clean ammonia to its use in power plants
- Establishing a system for receiving and shipping clean ammonia for a wide range of uses around Kyushu

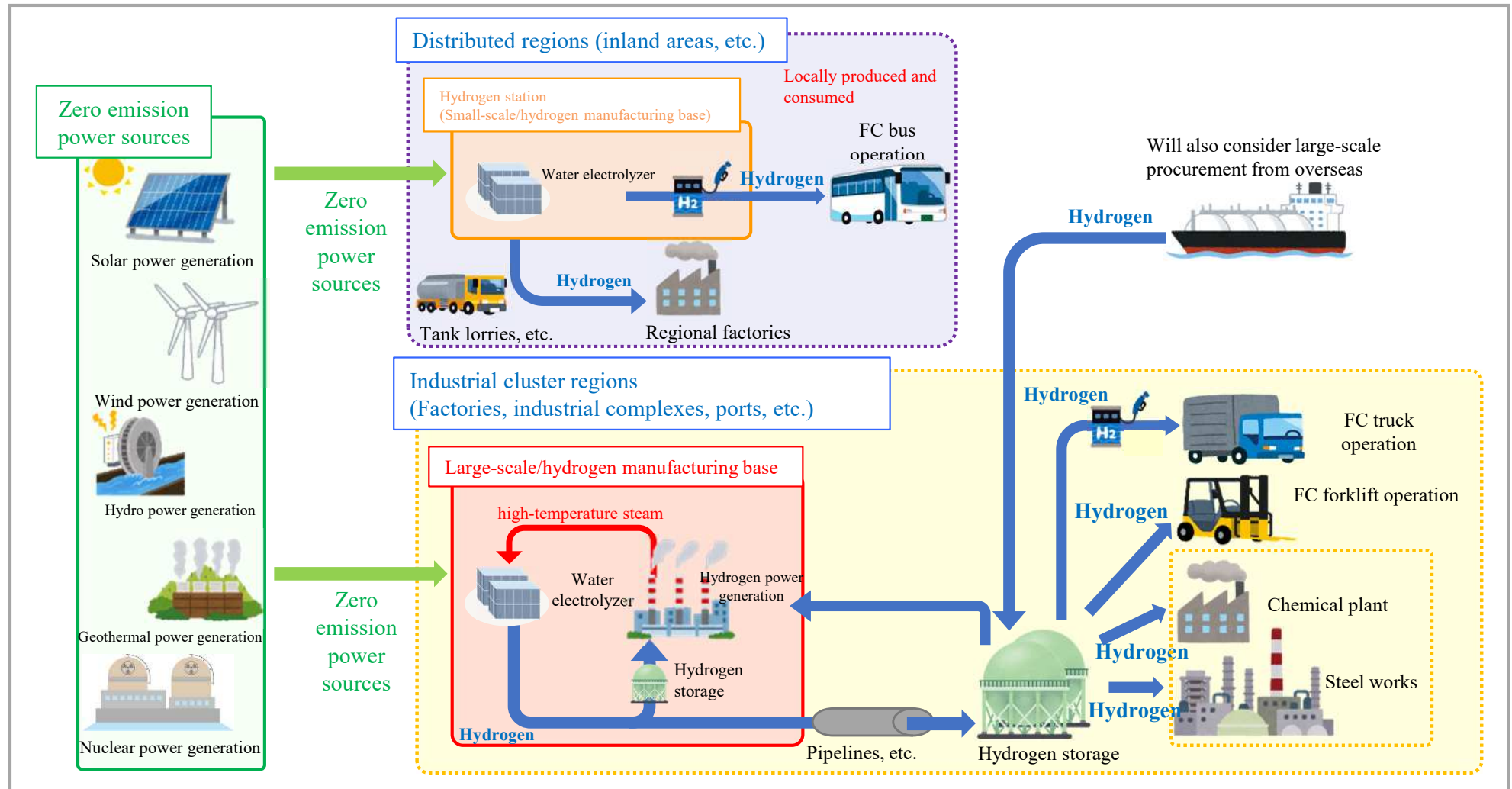
● Supply chain of hydrogen/ammonia



Topics Considerations regarding hydrogen

- We will study hydrogen production, transportation, storage and utilization of hydrogen by water electrolysis equipment, etc., utilizing the Kyuden Group's abundant zero-emission power sources. We will accelerate our efforts for social implementation.
- Specifically, we will consider demonstrations in "decentralized areas (inland areas, etc.)" and "areas of industrial concentration (factories, industrial complexes, ports, etc.)", as well as collaboration between the two areas.

● Considerations for social implementation of hydrogen



Upgrading the transmission and distribution network

Expansion of interconnection of renewable energy.

(Wide-area operation of electricity transmission and distribution network)

- In order to maximize Kyushu's renewable energy potential, we will work on wide-area operation of the transmission and distribution network, such as developing/enhancing interconnection lines and backbone systems based on the government's master plan, and maximizing the use of transmission capacity, etc.

Enhancing network utilization (upgrading of supply and demand operation and grid stabilization technology)

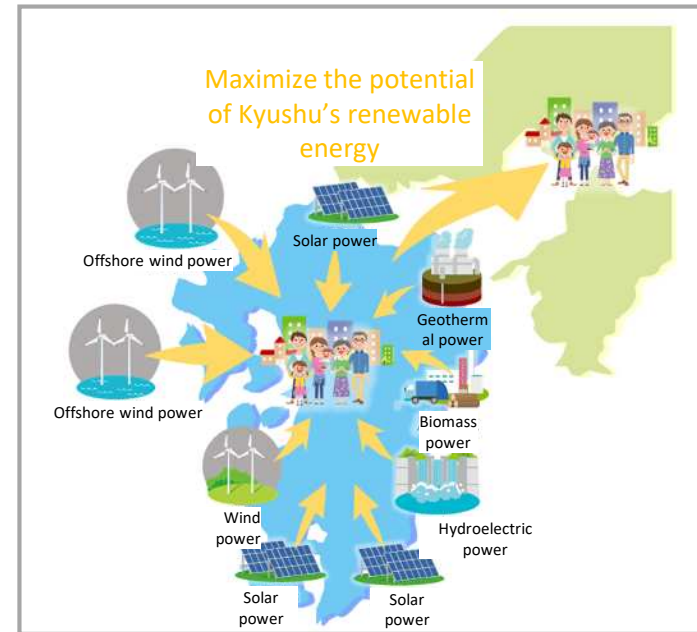
- In order to achieve a balance between the massive introduction of renewable energy and the maintenance of electricity quality, we will work on the advancement of supply and demand operation and grid stabilization technology through the use of digital technology.

Topics

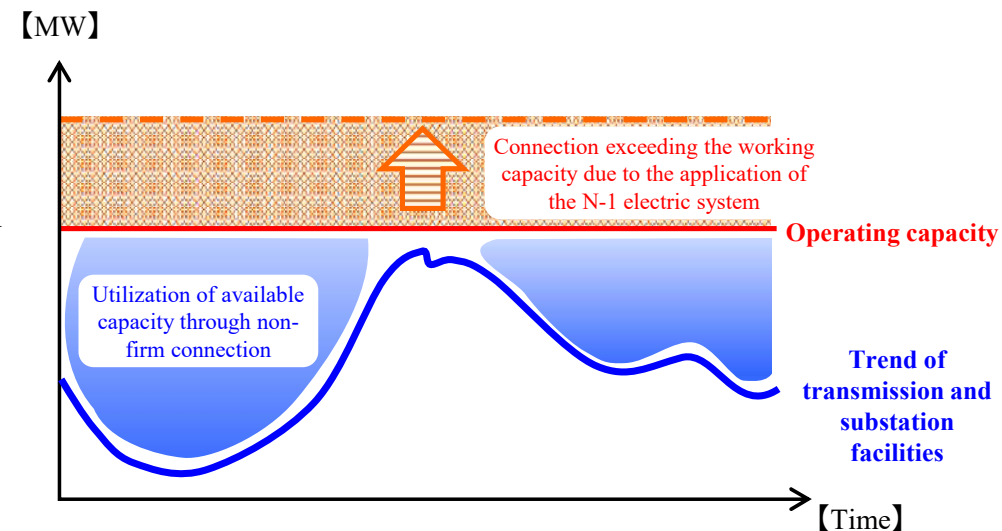
Introducing Connect & Manage

- Kyushu Electric Power Transmission and Distribution has introduced "Connect & Manage," which maximizes the use of available capacity of its existing transmission and substation facilities. This allows a larger quantity of Kyushu's renewable energy to be connected more quickly, without the need to expand transmission and substation facilities.
- Specifically, we have secured the capacity to transmit power stably even in the event of a single failure of a facility (N-1 failure), and have introduced an "N-1 power system" that instantly limits power generation in the event of an N-1 failure.
- In addition, we have started to accept "non-firm" connections on the backbone grid, in which electricity is generated during the hours when transmission and substation facilities are available and electricity generation is curtailed during the hours when they are not. (From January 2021)

Wide-area operation of the transmission and distribution network



Utilization of available capacity using Connect & Manage, etc. (image)



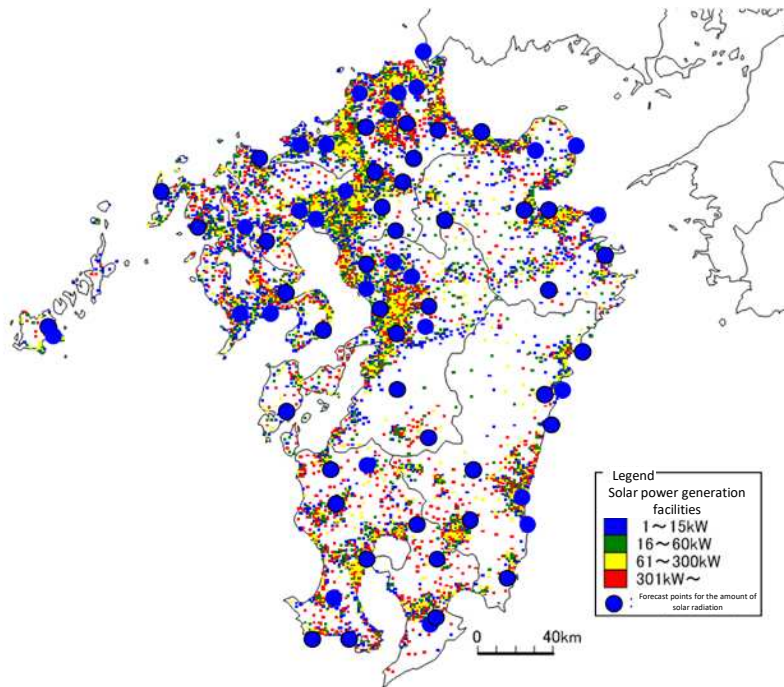
Upgrading the transmission and distribution network

Topics

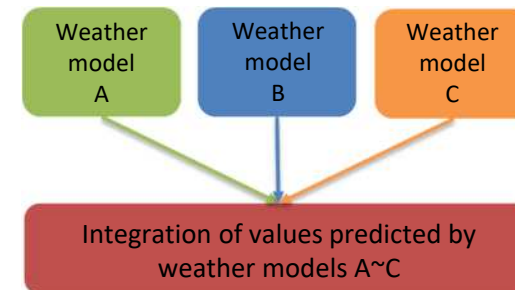
More accurate prediction of renewable energy output

- In order to maximize the use of renewable energy, Kyushu Electric Power Transmission and Distribution is working to improve the accuracy of forecasting the output of renewable energy.
- We are trying to improve the accuracy of solar radiation forecasting, which is necessary for forecasting the output of renewable energy, by subdividing the forecasting points to obtain a detailed understanding of the forecast of solar radiation at each point in Kyushu and reflecting it in the output forecast.
- We are also working to improve the accuracy of our solar radiation forecasts by using forecasts that integrate multiple weather forecasting models.

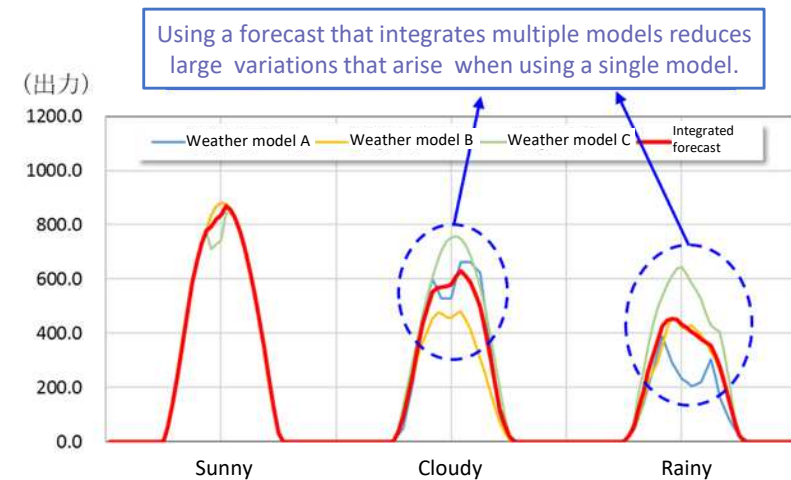
● List of predicted solar radiation points in mainland Kyushu



● Output forecast image by integrating multiple weather forecast models



(Output)



Contribution to improving the electrification rate in Kyushu

2030 KPI

Household sector: Incremental electricity 1,500 GWh (2021-2030 total)
Commercial sector: Incremental electricity 1,600 GWh (2021-2030 total)

- By combining environmentally-friendly energy sources with the Kyuden Group's resources, we will maximize electrification in Kyushu, where there is great potential for electrification, and contribute to reducing GHG emissions in society as a whole.

Household/commercial sectors

- In the household/commercial sectors, we have been promoting all-electricity and enhancing our electricity tariff menus to maximize our contribution to increasing the electrification rate in Kyushu.
- We will continue to promote all-electrification in the household sector as well as the electrification of air-conditioners, water heaters, and kitchens in the commercial sector, and will contribute to realizing a 70% electrification rate in the household sector and 60% in the commercial sector in 2030, with the aim of achieving a 100% electrification rate in Kyushu in 2050.
- Specifically, in the housing sector, we will propose all-electrification, which is "safe, secure, comfortable, economical and environmentally friendly," by strengthening cooperation with housing-related businesses.

Contribution to enhancing the electrification rate of Kyushu

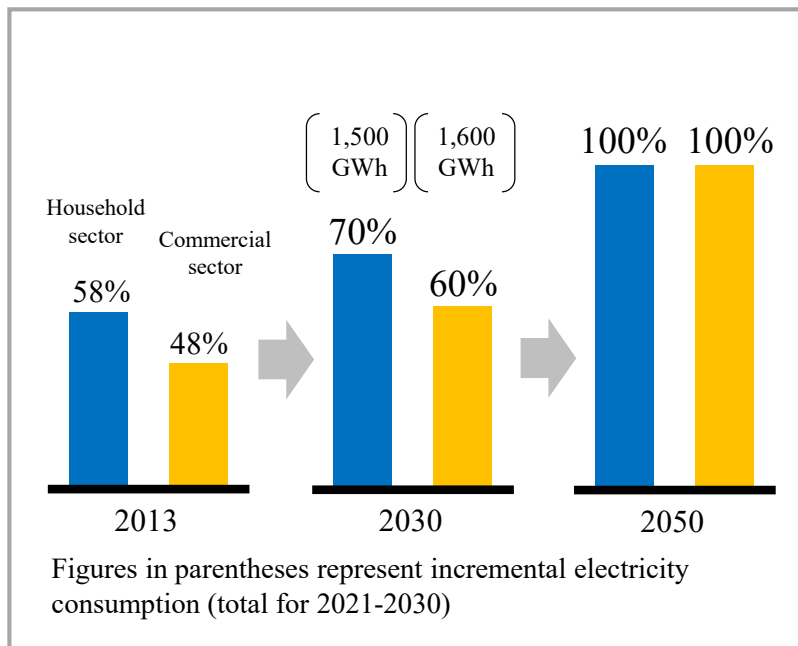
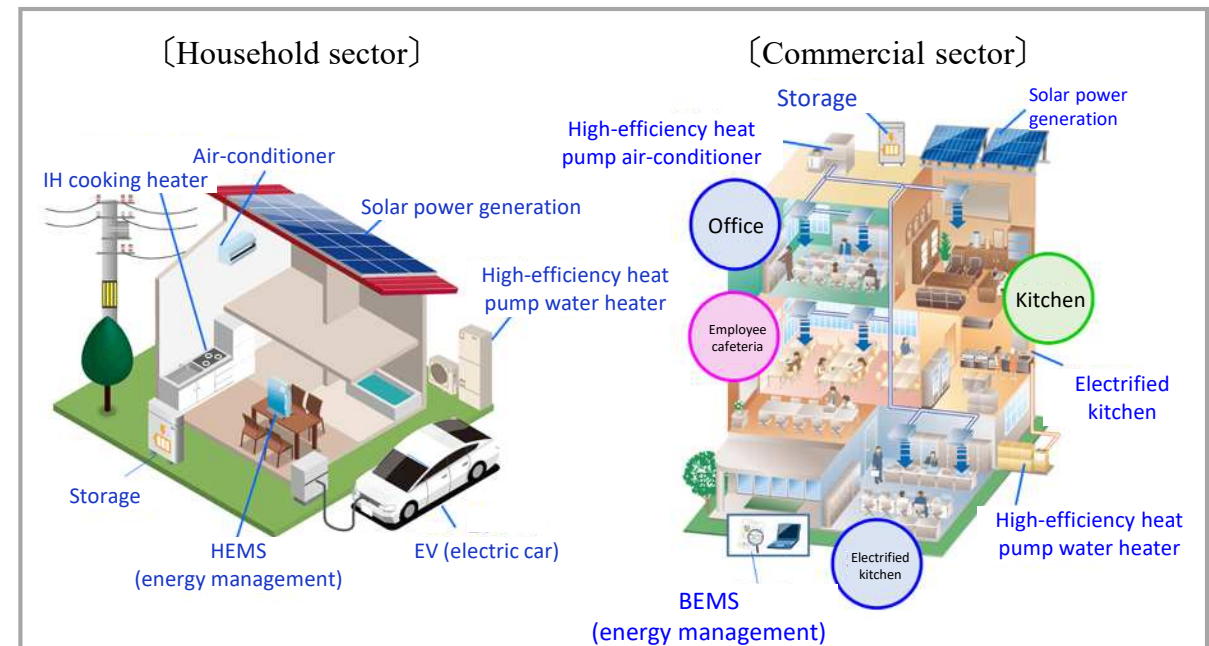


Image of total electrification in 2050



Contribution to improving the electrification rate in Kyushu

2030 KPI

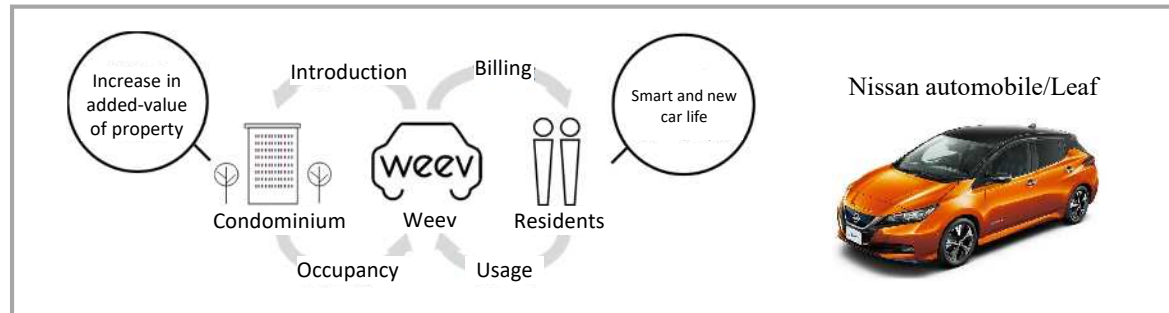
Transportation sector: Company cars will be 100% EV*

*Excluding special-purpose vehicles

Industrial/transportation sectors

- The industrial and transportation sectors are currently facing a number of technical challenges in promoting electrification, but they must be overcome if we are to achieve carbon neutrality by 2050, and we will take on the challenge of maximizing electrification while keeping a close eye on trends in technological innovation.
- In the industrial sector, we will conduct technical research on heat source conversion equipment such as heat pumps, and take on the challenge of electrification of heat demand in a wide range of temperatures (hot water, steam, heating, etc.) in production processes. In addition, we will conduct on-site surveys and studies together with our customers and propose energy-saving measures to improve energy use efficiency.
- In the transportation sector, we aim to convert 100% of company-owned vehicles to EVs by 2030. We will also provide businesses and services such as EV sharing services, expansion of charging infrastructure, and energy management using EVs in order to promote the spread of EVs.

● Exclusive EV sharing service for condominium residents

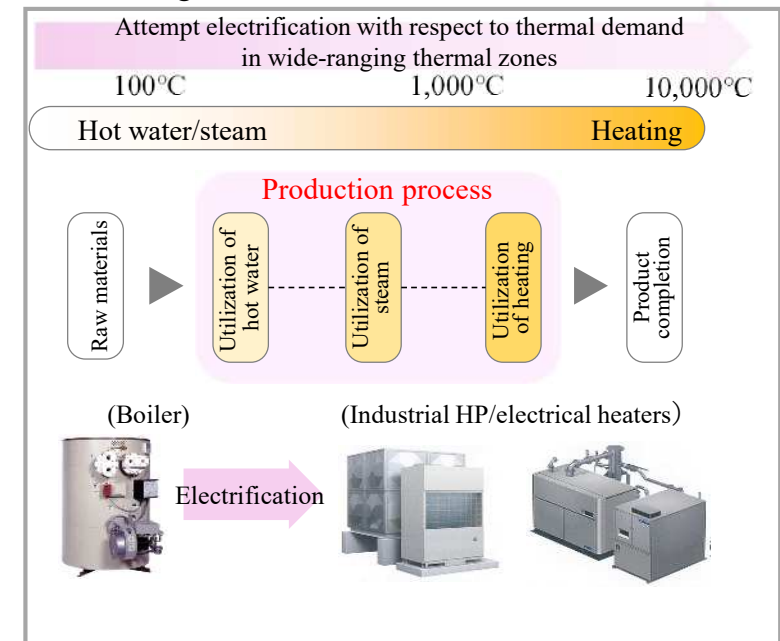


Topics

New electric vehicle (EV) charging service for housing complexes

- A new service that provides a comfortable EV recharging environment for residents of condominiums and other housing complexes by installing individual EV recharging facilities in each section of the parking lot. This new service will be launched in the Tokyo metropolitan area and Fukuoka City in fiscal 2022.
- In the future, the shift from gasoline-powered cars to EVs is expected to continue as part of the global trend toward decarbonization, but the fact that housing complexes lag behind detached housing in the provision of EV charging facilities has become a social issue.
- The Kyuden Group will promote the shift from gasoline vehicles to EVs by solving this issue through this service.

● Challenge of industrial sector electrification



● New EV charging service for housing complexes

Private EV charger "PriEV"

PriEV (Tentative name)

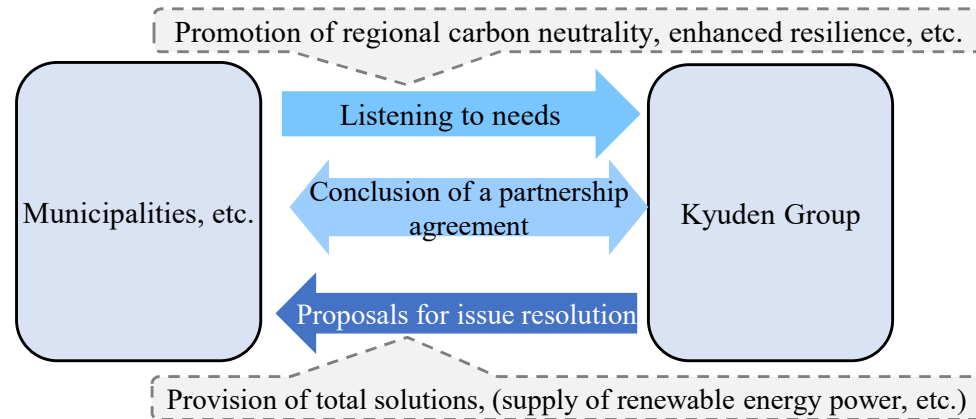
Attain a comfortable EV life with PriEV

- ◇ Realize EV charging for personal use in housing complexes, just like in single-family homes
- ◇ Convenient and safe service with "no searching" "no waiting" "no hesitation"

Promotion of carbon neutrality in local governments

- The Kyuden Group will contribute to resolving regional/social issues and co-create a zero-carbon society by providing solutions to meet the collaborative needs of local governments for promoting carbon neutrality and strengthening resilience in the region.

● Provision of total solutions



● Overview of agreements with local governments (energy-related)

	Municipalities with which partnership agreements were concluded (end of November 2021)
Fukuoka Prefecture	Hisayama, Kitakyushu, Yame, Kurate, Ogori
Nagasaki Prefecture	Togitsu, Higashisonogi
Kumamoto Prefecture	Kumamoto Prefecture, Minamiaso
Kagoshima Prefecture	Aira, Satsumasendai

Topics

Conclusion of a partnership agreement with Kumamoto Prefecture regarding measures against global warming

- On August 18, 2021, Kyuden Group concluded a partnership agreement with Kumamoto Prefecture regarding global warming countermeasures.
- Through this agreement, Kumamoto Prefecture and Kyuden will work together to achieve carbon neutrality by promoting energy conservation and energy shifts centered on electrification in the residential, industrial and commercial sectors.
- At the same time, we are supporting Kumamoto Prefecture's efforts and strengthening our collaboration by dispatching our employees to the prefectural government, using the corporate version of the hometown tax program (temporary staffing).

[Collaboration items]

- The promotion of energy shift (electrification) in the industrial/commercial sectors
- The promotion of energy conservation and energy shift (electrification) in the household sector
- The promotion of energy conservation in prefecture-owned facilities, procurement of renewable energy, and the promotion of energy shift (electrification)
- Other matters that contribute to the reduction of greenhouse gases

● Partnership agreement signing ceremony (August 18, 2021)



(Right) Governor Kabashima of Kumamoto Prefecture
(Left) President Ikebe of Kyushu Electric

Promotion of regional carbon neutrality

Topics

CO₂ absorption through adequate forest management

- Kyuden owns a total of 4,447 hectares of forest in Oita, Kumamoto, and Miyazaki prefectures, and the amount of CO₂ fixation by the forest is approximately 1.3 million tons, thanks to proper forest management led by the Kyushu Rinsan Corporation, which is part of the Kyuden Group.
- The Kyuden Group will continue its efforts to form a sustainable, recycling-oriented society by absorbing CO₂ and conservation of biodiversity, thereby contributing to the realization of a carbon neutral society.

● Overview of forest owned by Kyushu Electric

Area of forest owned by Kyushu Electric	4,447ha (equivalent to 630 baseball stadiums)
Number of trees (end of FY2020)	5.04 million trees (artificial forest only)
Amount of CO ₂ fixation (FY2020)	1.305 million tons (contribution to carbon neutrality)

- Company-owned forest “Lake Yamashita forest (Oita Prefecture)”



Topics

J-Credit creation/utilization project using forest resources

- We will support the creation of J-Credit from forests owned by municipalities, and use the J-credits created to offset carbon emissions from sources where it is difficult to achieve zero emissions.

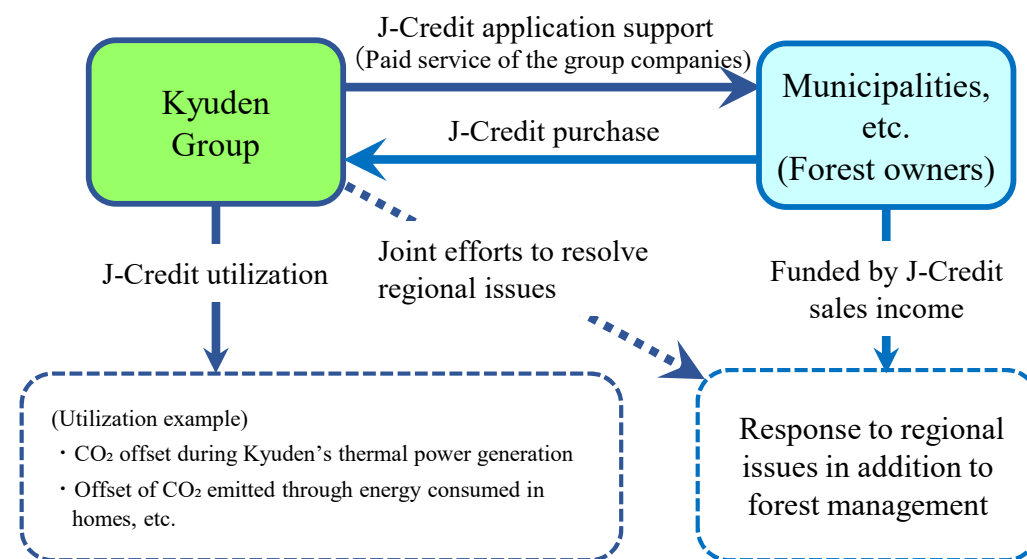
*Under this system, the government certifies the amount of CO₂ emissions reduction through the introduction of energy-saving equipment and the use of renewable energy, and the amount of CO₂ absorption increase through appropriate forest management as credits. Purchasers can use the credits to adjust their own CO₂ emission reductions.

- In June 2021, we started a demonstration project in a forest owned by the town of Hisayama, Fukuoka Prefecture, to confirm the effectiveness of the project. In the future, based on the results of the demonstration, we will establish a method and expand it to other areas.



(Right) Hisayama Mayor Nishimura
(Left) Kyushu Electric General Manager Eguchi

- J-Credit creation/utilization project using forest resources



Promotion of regional carbon neutrality

Topics

Provision of a renewable energy/CO₂ free plan

- We have been offering the "Renewable Energy ECO Plan" for business customers since September 2018, and in order to respond to the growing and diversifying needs for renewable energy and CO₂-free energy due to the accelerating decarbonization trend, we have expanded the number of renewable energy and CO₂-free plans to three since November 2021.
- In addition, in March 2021, we began offering the "Whole Renewable Energy Plan" to enable residential customers to use electricity derived from renewable energy sources.
- We will contribute to a low-carbon society as a whole by utilizing the income from non-FIT non-fossil certificates through the Renewable Energy Plan for the maintenance and expansion of renewable energy sources.

Topics

Creation of power demand using Kyushu's renewable energy

- With regard to the acceptance of renewable energy, we are promoting maximum efforts such as effective utilization of the backbone grid and refinement output control. In Kyushu, it is expected that the amount of connected renewable energy will further increase than the demand for electricity. It is necessary to create electricity demand in order to maximize the use of renewable energy in Kyushu.
- The Kyuden Group is working to create demand for data centers and other facilities in Kyushu, and is examining ways to maximize the use of renewable energy.

Topics

Fostering momentum through a "Zero Carbon Challenge Declaration" by Kyuden Group employees ~ Promotion of lifestyle innovation (behavioural change) ~

- As a member of the local community, Kyuden Group employees will declare the energy-saving/ electrification efforts they have been making in their homes and other places, with the aim of achieving carbon neutrality in the Kyushu area. ("Zero Carbon Challenge Declaration")
- These declarations, etc., will be widely spread and shared among the community/society through our homepage and SNS, etc., and will contribute to fostering momentum towards carbon neutrality.

(example of Zero Carbon Challenge Declaration statement)

- I will reduce outings and business trips through telework/remote work.
- I will commute on foot or by bicycle.

- For corporate clients

Renewable energy ECO Kiwami (Renewable energy/CO₂-free)

Renewable energy ECO Plus (Real renewable energy/real CO₂-free)

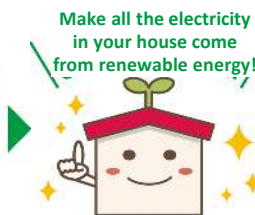
CO₂ reduction plan (Real CO₂-free)

- For household clients

Electricity rate plan
(main contract)
Plan for households

+

Electricity rate plan
(optional contract)
Total renewable energy plan



- Necessity of power demand creation in Kyushu

