Examples of Action-Oriented Solutions to Local Challenges [Ishikari, Hokkaido] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Supply of renewable energy to data centers and other facilities to develop industrial clusters and leverage renewable energy potential to the region's advantage

環境省

A specified power transmission and distribution project utilising photovoltaics and woody biomass will supply renewable energy to data centers and other facilities that will be concentrated in the Ishikari Bay New Port area, which functions as an industrial base, with the aim of decarbonising the area and further developing industrial clusters.

Basic Data

○Location

Public facilities in the Ishikari Bay New Port area and Hanakawakita district (Ishikawa City central core area)

○Energy (Includes facilities to be installed as of June 2022)

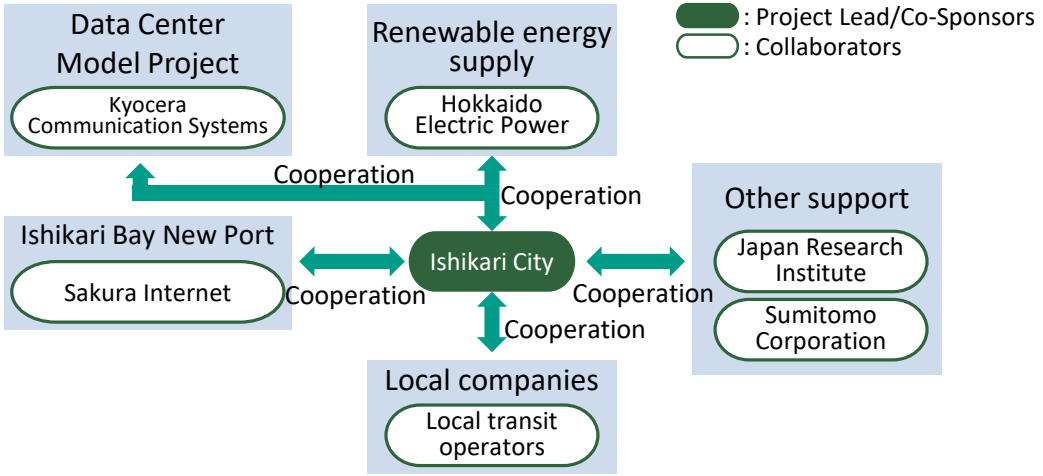
Photovoltaics: 2,669 kW (3,080 MWh*)

Wind power: 4,050 kW

Biomass: 151,500 kW (469,539 MWh*)

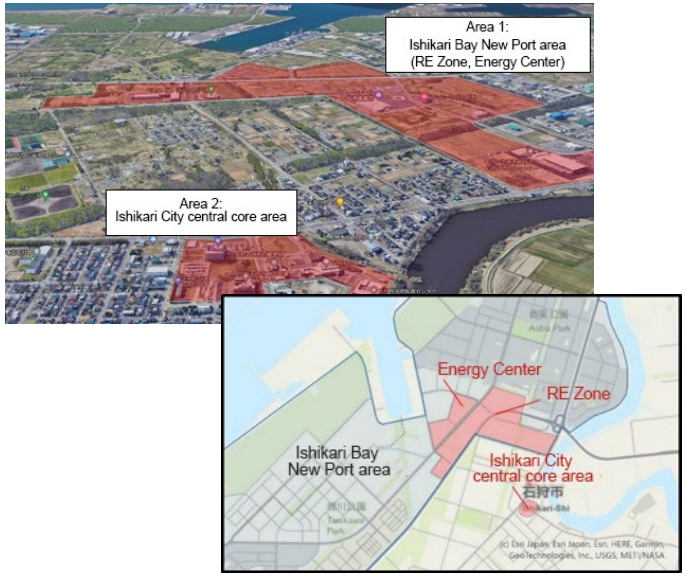
*Calculated only for facilities to be installed

Structure and system



Action-Oriented Solutions to Local Challenges

- Supply renewable energy to develop industrial clusters in industrial bases
  - A specified power transmission and distribution project utilising photovoltaics and woody biomass will supply renewable energy to a new data center that will be built in the Ishikari Bay New Port area and surrounding facilities.
  - The project will increase the availability of renewable energy in the development of industrial clusters through the introduction and use of new and post-FIT power sources. Plans are also in place to expand the regulatory capacity of the local area through the use of hydrogen, large storage batteries and demand response.
- Decarbonise and enhance the resilience of public facilities and local transport
  - The introduction of photovoltaic systems in five public facilities will promote the private consumption of electricity. With the installation of storage batteries, power will be shared between the five facilities to further improve the region's self-sufficiency rate for renewable energy in the future.
  - In this project, official vehicles will be switched over to EVs and car sharing will be promoted to reduce greenhouse gas emissions in the transportation sector, and storage batteries mounted on vehicles will be used to achieve resilient administrative functions in the event of a disaster.



Location map of Decarbonisation Leading Area
(Source: Ishikari City)

Examples of Action-Oriented Solutions to Local Challenges [Shikaoi, Hokkaido] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Simultaneous promotion of decarbonisation, sustainable agricultural growth, and disaster prevention measures with the effective use of biogas derived from livestock manure

Biogas generated from processing livestock manure will be used to decarbonise the town and simultaneously promote sustainable agricultural growth, ensure a livable environment with respect to odors and water quality, improve energy self-sufficiency rates, and support disaster prevention measures.

Basic Data

○Location

Area around town hall, Urimaku area, Lake Shikaribetsu area, energy supply area (Naka-Shikaoi Biogas Plant, Urimaku Biogas Plant, No.3 Biogas Plant, etc.) and other public facilities in Shikaoi Town

○Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 637 kW（735 MWh）

Biomass: 2,540 kW （18,376 MWh）

Hydrogen fuel cells: 20 kW（88 MWh）

Methane co-generation：10 kW（44 MWh）

Structure and system

Area	Point of contact	
Lake Shikaribetsu	Fusui (Hotel operator, open)	Lake Shikaribetsu Nature Center
	Fukuhara (Hotel operator, closed)	Kamishihoro Ranger Office
Energy supply	Shikaoi H2Farm	Local PPS
	Biogas Plant User Guild for the Installation of No.3 Plant	Dairy farmers
Other	Town residents	JA Shikaoi, farmers
	Chamber of Commerce and Industry	Geopark

Action-Oriented Solutions to Local Challenges

- Use livestock manure to promote decarbonisation and sustainable agricultural growth and secure a livable environment
  - In addition to the existing Naka-Shikaoi Biogas Plant, the No.3 biogas plant (1,500 kW) will be newly constructed to decarbonise the town through the use of biogas generated from processing livestock manure, promote sustainable agricultural growth, secure a livable environment by targeting odors, and improve self-sufficiency rates for energy.
  - Hydrogen produced at the Naka-Shikaoi Biogas Plant will be transported to areas around town hall in curdles and supplied to fuel cells that will make it possible to supply electricity and heat in both normal times and in emergencies.
- Reduce outflow of capital and create new jobs with power supplied by local PPS
  - Renewable power supplied to all public facilities via a local PPS will help achieve the local production of electricity for local consumption, control the outflow of energy capital outside the region, and create new jobs.

Naka-Shikaoi Biogas Plant (Source: Shikaoi Town)

Examples of Action-Oriented Solutions to Local Challenges [Akita Prefecture] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Local circulation of energy costs and improved management of sewerage systems through the effective use of biomass derived from sewage and other materials

環境省

In this project, digestion gas, photovoltaics and wind power will be introduced to sewerage-related facilities and electricity will be supplied to public facilities through private transmission lines with controls in place for supply and demand. Sewerage service fees will be reduced and jobs created with improvements to the management and operation of sewerage works.

Basic Data

◯Location

Public facilities located in the Mukaihama area of Akita City in the central western part of Akita Prefecture

◯Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 5,500 kW （6,002 MWh*）

Wind power: 3,800 kW （6,174 MWh*）

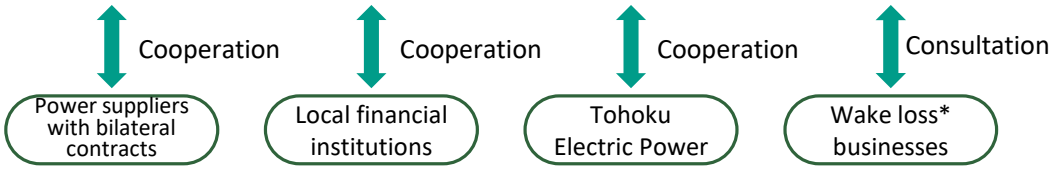
Digestion gas: 800 kW（6,073 MWh*）

*Calculated only for facilities to be installed

Structure and system

Federation of Decarbonisation Leading Area Stakeholders (Provisional name)

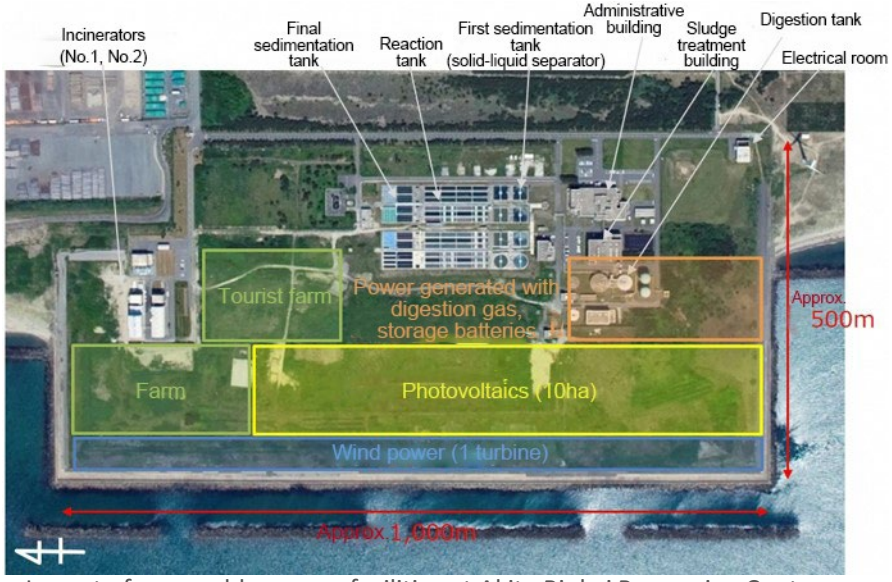
- President: Private company representative
  Vice-President: Director, Akita Prefecture Construction Department
- Members: Consumers (Akita Prefecture Construction Department; Tourism, Culture and Sports Department; Industrial and Labor Affairs Department; City Environment Department)
  Designated administrator (Company assigned to maintain and manage user facilities)
  Business operators (Companies implementing renewable energy projects selected through open recruitment)



* : Wind power loss

Action-Oriented Solutions to Local Challenges

- Use biomass generated from sewage effectively to improve the management of sewerage works
  - The use of biomass generated from sewage, such as digestion gas, will improve management of sewerage works, reduce sewage fees paid by residents, create new jobs, and promote agriculture and the local circulation of resources through the use of resources, such as producing compost from sewage sludge.
- Install and accommodate renewable energy equipment in public facilities to realise the local circulation of energy costs paid by prefectural residents
  - Digestion gas, wind power and photovoltaics will be installed on-site at the Akita Rinkai Processing Center, and photovoltaics will be installed on-site at the sludge reclamation center. Renewable power will be supplied to public facilities and other locations within the area using private transmission lines, while supply and demand will be controlled through the use of storage batteries and energy management systems.
  - Energy costs paid by prefectural and city residents will be circulated locally through the active use of renewable energy in clusters of public facilities with high energy costs in the prefecture.



Layout of renewable energy facilities at Akita Rinkai Processing Center
(Source: Akita Prefecture)

Examples of Action-Oriented Solutions to Local Challenges [Sado, Niigata] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Solutions to energy supply issues specific to remote islands with the introduction of independent and distributed renewable energy centrally managed through EMS

環境省

Decarbonisation will be achieved through the installation of renewable power generation equipment and storage batteries in disaster prevention, tourism and educational facilities and on abandoned farmland, as well as through centralised management using EMS. Vulnerabilities to energy disasters unique to remote islands, such as the loss of power supply during a disaster, will also be addressed.

Basic Data

○Location

Public and private facilities related to disaster prevention, tourism and education in Sado City (125 facilities)

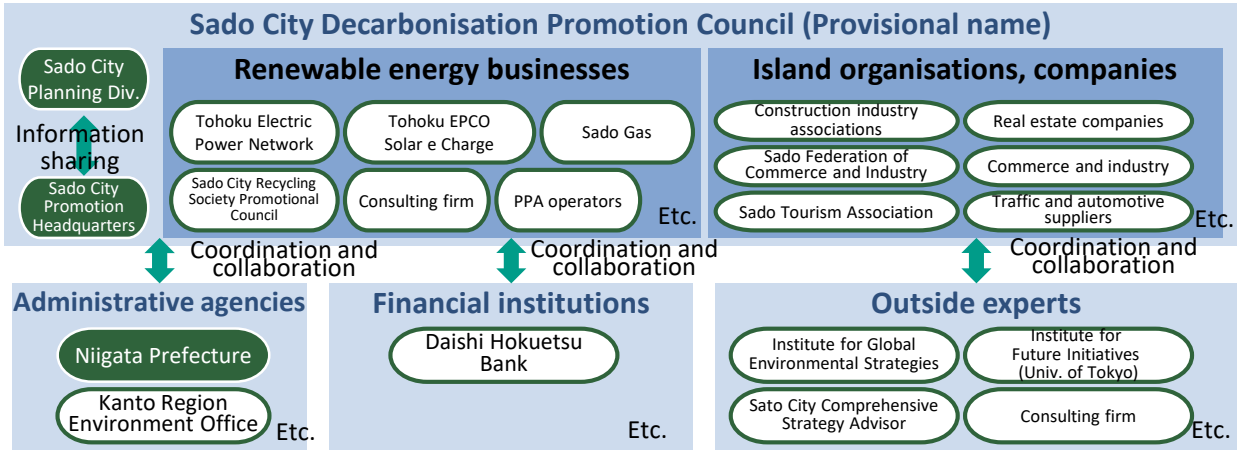
○Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 9,313 kW（10,399 MWh）

Biomass: 380 kW （2,964 MWh）

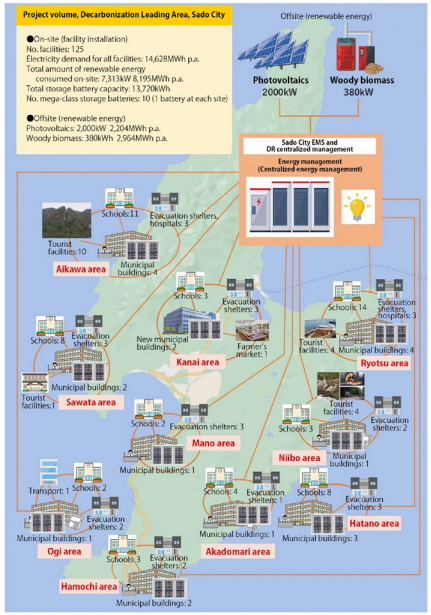
Structure and system

: Project Lead/Co-Sponsors
: Collaborators



Action-Oriented Solutions to Local Challenges

- Solve energy supply challenges on remote islands through the introduction of independent and distributed renewable energy centrally managed with EMS
  - Photovoltaics and storage batteries will be installed on the rooftops on 125 public and private facilities related to disaster prevention, tourism and education in the entire city area. Photovoltaics will also be installed offsite on abandoned land. Woody biomass will be introduced, and large storage batteries will be specifically installed at key disaster prevention bases.
  - Decarbonisation will be promoted through the use of an EMS to centrally manage the installed equipment and facilities, supply renewable energy, adjust demand, and share electricity between facilities.
  - This project will help resolve energy supply challenges specific to remote islands, such as the loss of power sources during a disaster, and that have no grid connections to the mainland and are dependent on fossil fuels procured off the island. The development of a decarbonised and biodiverse island will also help control the outflow of energy charges with the design of an environmental brand, increase opportunities for employment through the promotion of renewable energy-related industries, and revitalise the local economy.



Overview of initiatives in the Decarbonisation Leading Area (Source: Sado City)

Examples of Action-Oriented Solutions to Local Challenges [Sakai, Osaka] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Solutions to New Town challenges (aging populations and deteriorating infrastructure) through the introduction of next-generation ZEH+ housing

環境省

This project aims to promote the construction of 180 next-generation ZEH+ housing units in Senboku New Town, which is facing issues such as the dramatic aging of its population and deteriorating infrastructure. The results from this project are expected to serve as a model in other parts of Japan to resolve New Town challenges through decarbonisation.

Basic Data

◯Location

Urban area and Senboku New Town area within Sakai City

◯Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 9,556 kW （13,295 MWh*）

*Calculated only for facilities to be installed

Structure and system

Sakai City Consortium to Promote Carbon Neutrality (Provisional name)

<Roles>

- Consider and implement decarbonisation-related activities
- Promote the development of technology (products and services) and invest in business that will contribute to decarbonisation, create jobs, and exchange information on ways to revitalise the region
- Conduct studies and research related to the promotion of decarbonisation

<Members>

Sakai City / Osaka Pref. / Academic experts / Civic groups / Energy suppliers / Transport operators / Housing developers / Financial institutions / Etc.

Urban Area WG | **Izumigaoka Area WG** | **WG on Utilisation of Land for Public Housing**

: Project Lead/Co-Sponsors
: Collaborators

Action-Oriented Solutions to Local Challenges

- Create a model to resolve New Town challenges through the supply of ZEH+
  - All 180 new housing units in Senboku New Town will be converted to next-generation ZEH+ high-performance housing on land made available for use in conjunction with the reconstruction of prefectural housing, with the aim of improving electricity self-sufficiency rates and resilience of individual houses and improving health with better insulation performance. This project can be expanded throughout Japan in the future as a model for resolving New Town challenges that are being faced around the country, such as dramatically aging populations and deteriorating infrastructure, through decarbonisation.
  - High-efficiency, large-scale cogeneration systems and high-efficiency, large-scale air-conditioning and heat source equipment will be installed in the area around Izumigaoka Station where district heating and cooling is conserving energy throughout the area. Public facilities will be renovated to be more energy efficient, and photovoltaic equipment and gas cogeneration systems will be installed in line with redevelopment.

Image of initiatives at site (Source: Sakai City)

Examples of Action-Oriented Solutions to Local Challenges [Yonago, Tottori] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Securing renewable energy sources and resolving local issues, such as weeds and pests, through the establishment of an offsite PPA on dilapidated and abandoned farmland

This project aims to decarbonise public facilities through the establishment of a PPA company to introduce photovoltaics to public facilities and dilapidated and abandoned farmland in Yonago and Sakaiminato City in collaboration with the private sector and other stakeholders. The project is expected to resolve local challenges, such as pests and deteriorating farmland landscapes.

Basic Data

○Location

Central city area in Yonago City, sightseeing spots in Sakaiminato City, public facilities and dilapidated and abandoned farmland in both cities

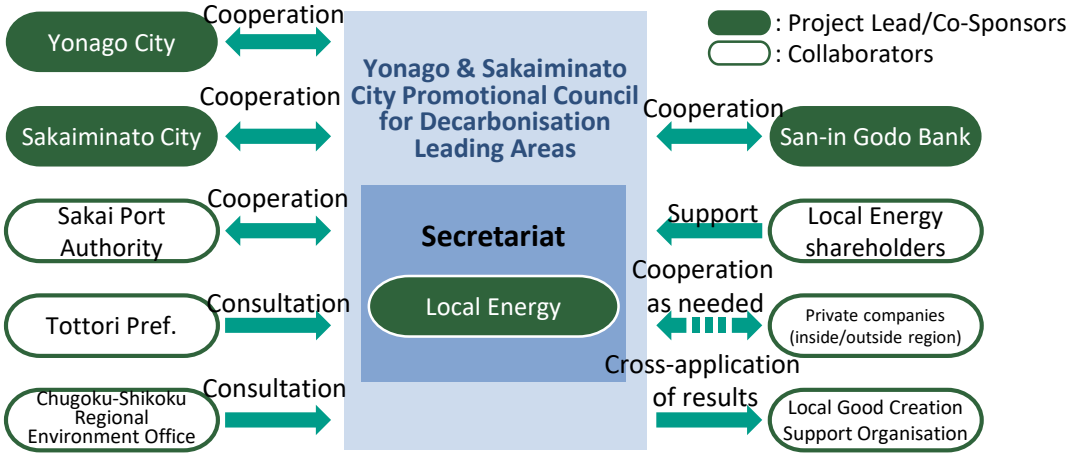
○Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 14,000 kW (16,979 MWh/year)

Waste-to-energy: 4,000 kW (12,624 MWh/year)

Digestion gas: 49 kW (360 MWh/year)

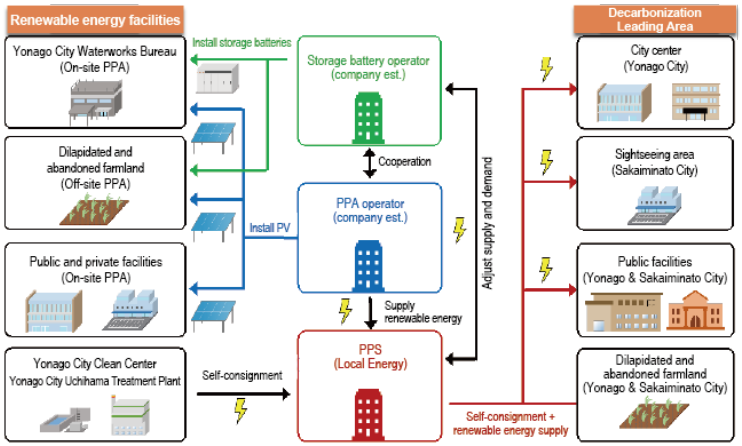
Structure and system



Action-Oriented Solutions to Local Challenges

- Resolve the issue of deteriorating landscapes with the establishment of an offsite PPA on dilapidated and abandoned farmland
  - The project will both secure renewable energy for supply to public facilities and resolve local challenges, such as deteriorating landscapes caused by weeds and damage from pests, with the establishment of a PPA company to utilise dilapidated and abandoned farmland in Yonago and Sakaiminato City in collaboration with Local Energy and San-in Godo Bank.
  - The project can be expanded in the future to other areas with dilapidated and abandoned farmland.
- Installation of photovoltaics and storage batteries in Yonago City's Waterworks Bureau facilities to strengthen BCP
  - Electricity can be supplied to waterworks facilities, even in a disaster, with the installation of photovoltaics and storage batteries on sites where the Waterworks Bureau's facilities are located to strengthen BCP, with the aim of achieving zero carbon in waterworks facilities and reducing electricity costs.

Dilapidated and abandoned farmland and pest damage (Source: Yonago City)



Overall image of initiatives (Source: Yonago City)

Examples of Action-Oriented Solutions to Local Challenges [Maniwa, Okayama] * Select Cases from List of Decarbonisation Leading Areas (1st Round)

Revitalisation of wood industries and strengthening resilience through the application of woody biomass using underutilised resources to generate electricity

環境省

In this project, the woody biomass power plant will be expanded to supply the city with renewable energy using underutilised local resources, such as fast-growing trees on abandoned farmland, and revitalising industries by creating demand for wood. The project will also help strengthen resilience through the introduction of new power sources, including photovoltaics.

Basic Data

○Location

Public facilities in Maniwa City

○Energy (Includes facilities to be installed as of June 2022)

Photovoltaics: 2,295 kW (2,205 MWh*)

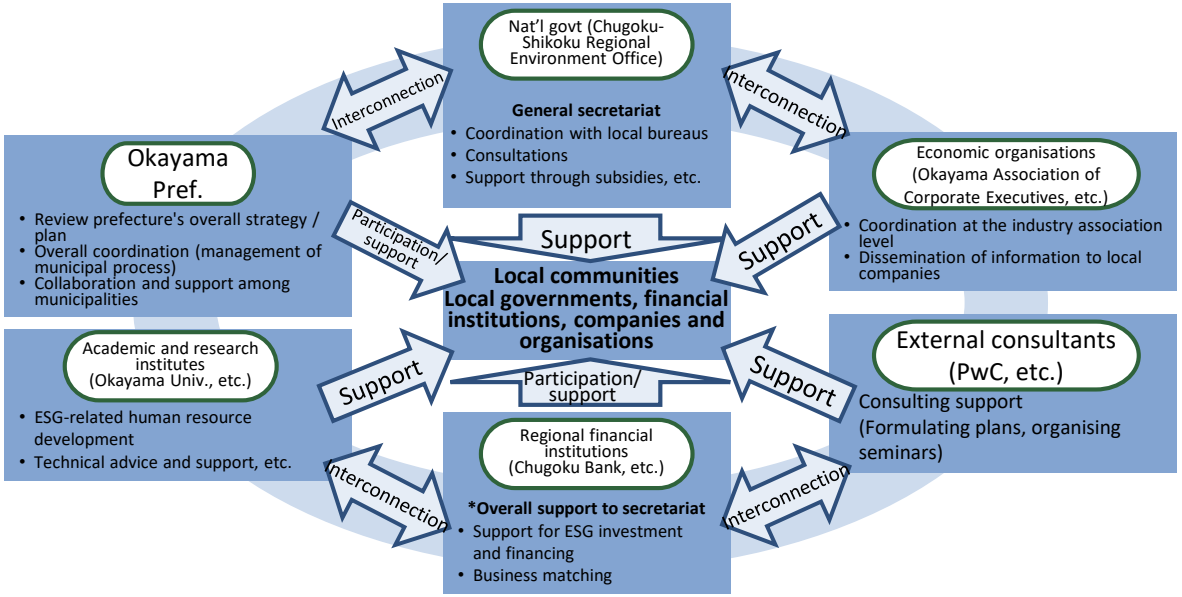
Woody biomass: 10,000 kW (79,200 MWh*), 1 furnace

Biogas: 250kW (1,293 MWh*)

Small hydropower: 4.7 kW

*Calculated only for facilities to be installed

Structure and system



Action-Oriented Solutions to Local Challenges

- Use underutilised local resources for woody biomass to generate electricity and revitalise the wood industry
  - Create a set scale of stable demand for wood by expanding woody biomass power plants that use underutilised local resources, such as broadleaf forests and fast-growing trees on abandoned farmland, and promote the revitalisation of the wood industry, which accounts for 30% of the manufacturing industry in Maniwa City.
- Reduce combustible waste and develop low-cost agriculture through the production and use of methane gas and bio-liquid fertiliser from food and human waste
  - Food waste, human waste, septic tank sludge and other materials will be fermented at facilities for recycling organic waste and recycled into methane gas and bio-liquid fertilizer, which will lead to a reduction in combustible waste.
  - Promote the private consumption of biogas through the use of biogas power generation equipment installed at a food waste recycling facility.
  - Achieve low-cost agriculture and build a regional resource recycling system through the use of bio-liquid fertiliser on farmland in the city.

Image of food waste recycling facility
(Source: Maniwa City)

Examples of Action-Oriented Solutions to Local Challenges [Shimokawa, Hokkaido]

Creation of industries and employment and enhancing childcare support by supplying heat generated from woody biomass within the region

Heat from woody biomass is supplied to 30 public facilities and housing units to promote resettlement and used for growing shiitake mushrooms to create jobs. Communities can also be enriched by the use of renewable energy as heat sources, for example, providing support to families with children by using renewable energy to reduce kerosene fuel costs.

Basic Data

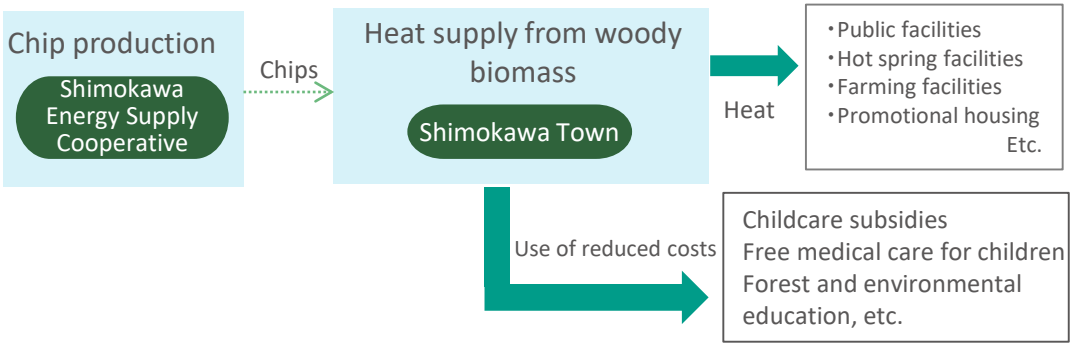
○Location

Shimokawa Town, Hokkaido

○Energy

Heat generated: 10GJ (giga-joules)/h (kW conversion: 2,800 kW/year)

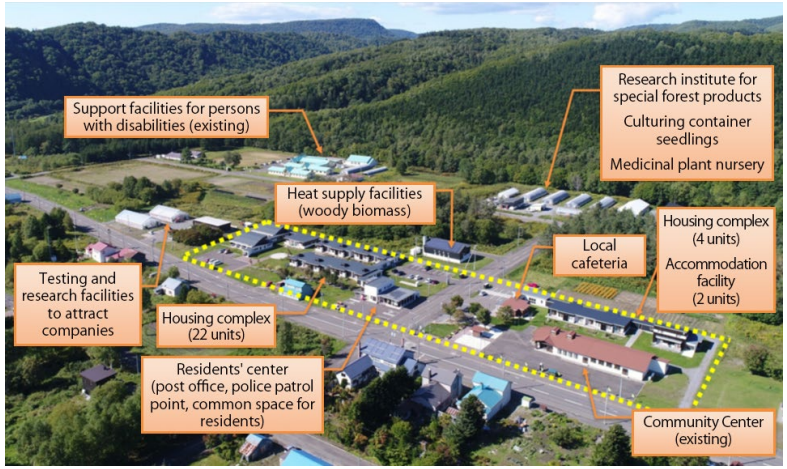
Structure and system



Action-Oriented Solutions to Local Challenges

- Use heat from renewable energy for a variety of purposes, including in public facilities, housing units, cultivating shiitake mushrooms, and to create jobs
  - Heat from renewable energy will be supplied to 30 public facilities and houses for resettlement by 10 biomass boilers that use pellets produced from unused thinned wood as fuel.
  - Seventy percent of heat demand in public facilities is derived from renewable energy. Heat from renewable energy is also used in the cultivation of mushrooms, which has created 30 jobs.

- Encourage the younger generation to put down roots with the use of saved fuel costs for childcare support
  - Converting from fossil fuels saves approximately 38 million yen, with some used to subsidise daycare fees and provide free medical care to children. Programs on forest and environmental education and forest self-care are implemented for town residents of all ages. This has helped increase the number of younger residents and significantly improved the composition of the population in the area.



Ichinohashi Biovillage (Source: Shimokawa Town)

Examples of Action-Oriented Solutions to Local Challenges [Yokohama City x 13 municipalities in the Tohoku region]

Creation of a new circulation and symbiotic model between urban and rural areas by connecting metropolitan areas and regional cities through renewable energy collaborative actions

環境省

Yokohama City and 13 municipalities in the Tohoku region concluded a partnership agreement on renewable energy. Both regions are considering the supply of renewable energy and creating vibrant communities by revitalising interactions between residents and businesses, in order to build a new model for a regional circular and ecological sphere between urban and rural areas.

Basic Data

○Location

Yokohama City + 13 municipalities in the Tohoku region (Aomori Pref: Yokohama Town, Iwate Pref.: Kuji City, Ninohe City, Kuzumaki Town, Fudai Village, Karumai Town, Noda Village, Kunohe Village, Hirono Town, Ichinohe Town), Fukushima Pref.: Aizuwakamatsu City, Koriyama City, Akita Pref.: Happo Town)

○Energy

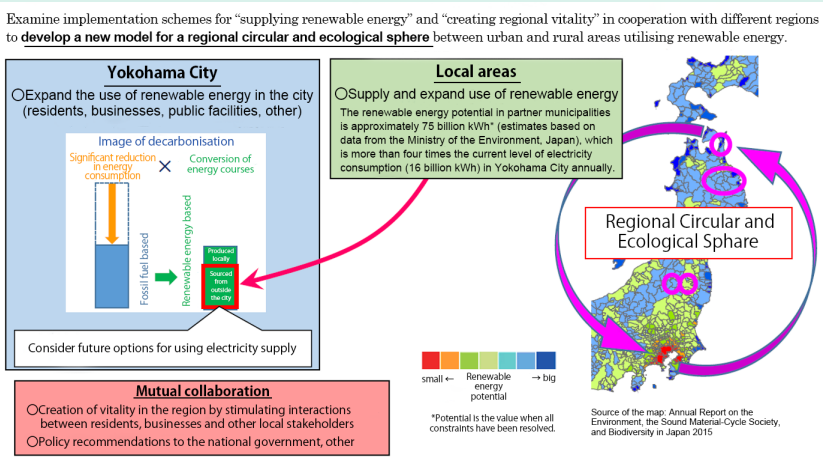
Power generated by four local public entities that have started supplying electricity

Yokohama Town: Wind power (32 MW)
Happo Town: Wind power (5 MW)
Karumai Town: Wind power (2 MW)
Aizuwakamatsu City: Wind power (16 MW)

Structure and system

Yokohama City — Collaboration agreement — 13 municipalities (Tohoku)

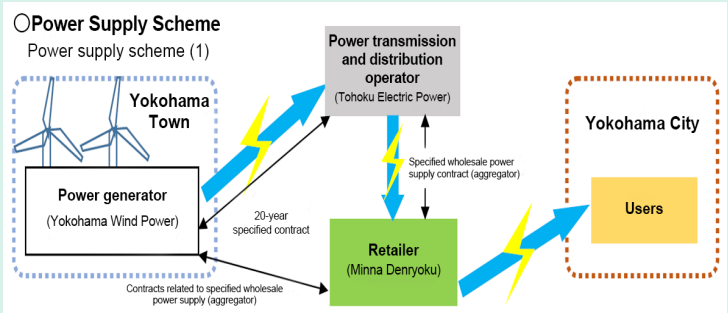
・Started with 12 municipalities in 2019; one town added in 2020
・Points of collaboration
(1) Matters related to the creation, introduction and expanded use of renewable energy
(2) Matters related to the creation of regional vitality that is mutually beneficial to both residents and local businesses by promoting decarbonisation
(3) Matters related to the development of policy proposals to the national government and other entities on renewable energy and the creation of a regional circular and ecological sphere



Action-Oriented Solutions to Local Challenges

- Achieve the supply of renewable energy through local government collaboration
  - The renewable energy potential of partner municipalities is estimated to be more than four times the amount of electricity consumed in Yokohama City annually.
  - Renewable energy is starting to be supplied to Yokohama City from power plants located in local partner municipalities through this collaboration.

<Examples of power supply contracts (as released)
(1) Yokohama Town × 6 local companies
(2) Yokohama Town x 9 local companies
(3) Happo Town x 6 local companies
(4) Karumai Town x 3 local companies
(5) Aizuwakamatsu City x 7 local companies



Examples of Action-Oriented Solutions to Local Challenges [Fukushima City, Fukushima Prefecture]

Creation of new tourism resources and employment, such as shrimp farming, using byproducts from geothermal power (heated water)

Heated water generated by geothermal power is used to farm shrimp. This is creating new business opportunities, such as the addition of farmed shrimp on the menu at a restaurant run by a local company established for the power generation project and their use in interactive shrimp fishing programs at a café.

Basic Data

◯Location

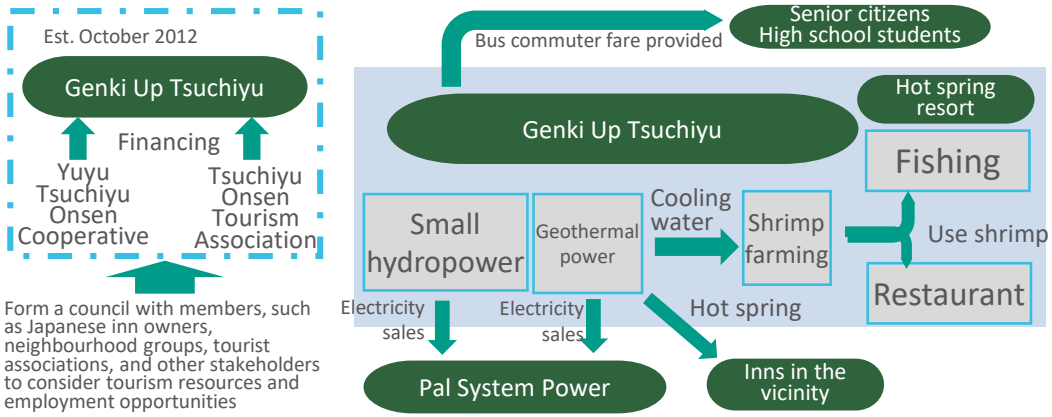
Tsuchiyu Onsen, Fukushima City

◯Energy scope

・Small hydropower: 140 kW (800 MWh/year)

・Thermal binary system: 440 kW (3,000 MWh/year)

Structure and system



Action-Oriented Solutions to Local Challenges

- Start community-wide renewable energy projects to revitalise the hot spring resort and create local jobs
  - With the formation of the Tsuchiyu Onsen Revitalisation and Renewal Council that count Japanese inn owners and neighbourhood groups among their members, projects were launched to address the development of new communities with the aim of creating new content to revitalise the hot spring resort area. Genki Up Tsuchiyu was established the following year to elaborate on plans, with small-scale hydropower and geothermal power facilities installed and put into operation in 2015.
  - To the extent possible, this project utilises local companies for the construction and maintenance of the power plant and creates jobs, while also reducing costs by about 15 million yen by employing three engineers to perform daily maintenance in-house.
- Create new tourism resources through the secondary use of energy generated from geothermal power for use in nearby Japanese inns and other locations
  - With the idea of creating tourism resources, the heated water generated from geothermal power is used in farming giant freshwater prawn that are both visually pleasing and grow quickly. Interactive shrimp fishing at a café and their appearance on the menu at a local restaurant attract 5,000 visitors each year.
  - The heated water is also supplied to nearby Japanese inns and used to melt snow on the observation deck at the power plant.
- Return revenue from projects to provide local senior citizens and high school students with bus passes and indirectly curb a population exodus outside the city
  - Bus fare to the downtown area in Fukushima City costs users between 20,000 and 30,000 yen each month, creating an environment that is not conducive for people to settle down. Therefore, revenue generated through projects is used to provide bus passes to local senior citizens and high school students, a move that will indirectly curtail the exodus of the population outside the city.

Geothermal power facility
Source: Genki Up Tsuchiyu website

Interactive shrimp fishing at cafe
Source: Genki Up Tsuchiyu website

Examples of Action-Oriented Solutions to Local Challenges [Tokorozawa , Saitama]

Use of abandoned crop fields and the local production of energy for local consumption through farming photovoltaics (FPV)

In this project, farming photovoltaics (FPV) are installed on farmland that has not been used for a number of years. A business model will be developed that combines both power generation and agriculture, such as the cultivation of blueberries and grapes for wine and fresh food using solar power facilities, while also supplying electricity generated with renewable energy to public facilities in Tokorozawa City through an electricity retailer. The project will also contribute to revitalising the local area and creating jobs.

Basic Data

◯Location

Tokorozawa-Kitaiwaoka solar power plant

◯Energy

Photovoltaics: 989kW (1,119MWh/year)

Structure and system

*1 Seibu Agribusiness
*2 HGE
*3 Tokorozawa Mirai Power

Action-Oriented Solutions to Local Challenges

- Use of abandoned crop fields
  - In this project, a farming photovoltaic facility equipped with solar power equipment for private use are installed in an area that has not been farmed for several years. Blueberries and fresh grapes for wine and eating are grown under the facility.
    If the entire area (farmland: approx. 1.7 ha, with 1.3 ha located under the FPV system) is used to grow crops, the annual amount harvested is expected to be approx. 13,600 kg by the eighth year of operations.

- Local production of energy for local consumption and lower CO_2 emissions
  - All generated electricity is sold to Tokorozawa Mirai Power and supplied to public facilities in Tokorozawa City.
    The amount of electricity supplied is about 42% of that used in the main building of city hall, which can reduce CO_2 emissions by about 500 t-CO_2e per year.


Blueberry seedlings


Viticulture


Photovoltaic power system

Source: Press release from Mitsubishi HC Capital and Seibu Holdings (July 9, 2021)

Examples of Action-Oriented Solutions to Local Challenges [Saitama City, Saitama Prefecture]

Development of microgrids powered with solar power in new residential areas, EV car sharing, and greater resilience

環境省

In this project, resilience functions are enhanced through the application of a 100% renewable energy supply model (non-fossil fuel certificates to cover shortfall). Mobility issues for residents and tourists are being resolved with the use of multi-mobility sharing services, such as EV car sharing and ultra-compact mobility.

Basic Data

○Location

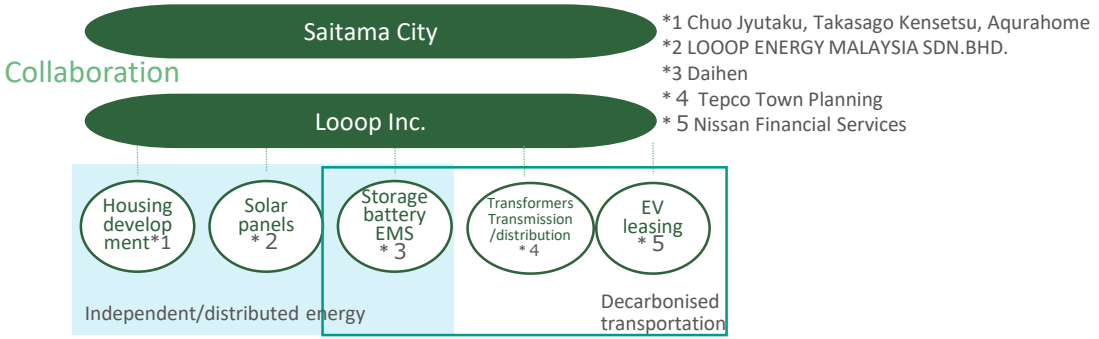
Urawa district, Saitama City (Block No.3)

○Energy

Photovoltaics: 229kW (Approx. 4.485kW × 51 residences) (280MWh/year)

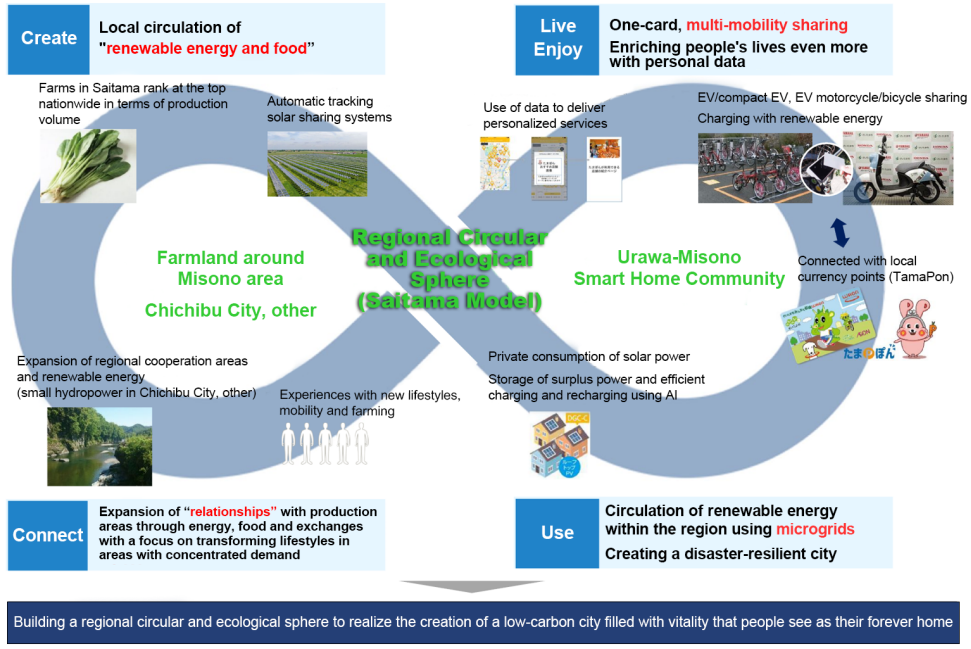
Storage battery: 125kwh

Structure and system



Action-Oriented Solutions to Local Challenges

- Ensure an uninterrupted supply of energy to city areas at all times
  - In this project, the installation of PV and other facilities and the construction of a microgrid ensures independent operation even in the event of interruptions to grid operations from private transmission lines underground. This creates an environment to maintain a supply of energy to the area at all times by allowing storage batteries in EVs to be used as emergency power sources for the area.
- EV sharing using locally produced renewable energy
  - Identify solutions to mobility issues for residents and tourists through one-stop sharing services, such as EV car sharing, ultra-compact mobility, EV motorbikes, and bicycle sharing.



Source: Press release from the Ministry of the Environment, Japan (September 26, 2019)

Examples of Action-Oriented Solutions to Local Challenges [Mutsuzawa, Chiba]

Development of microgrids to provide an uninterrupted supply of energy during disasters

This project enhances resilience functions through the application of microgrids using renewable energy that incorporate solar power and cogeneration, and the installation of utility poles underground.

Basic Data

○Location

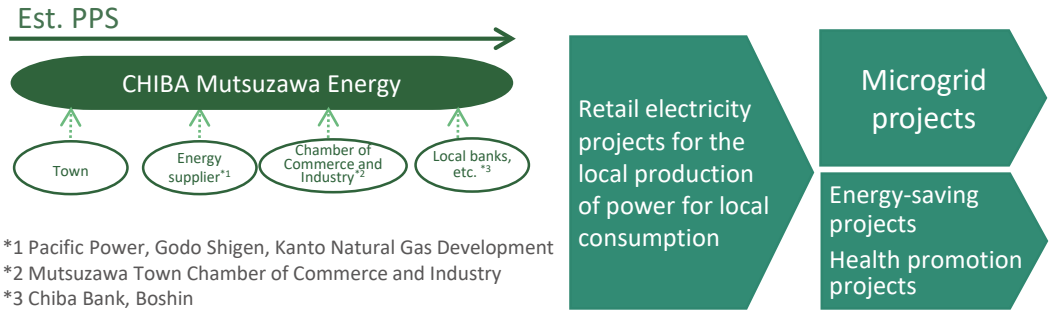
Mutsuzawa Smart Wellness Town, Mutsuzawa Town

○Energy scope

- Photovoltaics: 20kW (20MWh/year)
- Gas cogeneration: 160kW (500MWh/year)

} Housing, Roadside stations, Hot spring facilities

Structure and system



*1 Pacific Power, Godo Shigen, Kanto Natural Gas Development
*2 Mutsuzawa Town Chamber of Commerce and Industry
*3 Chiba Bank, Boshin

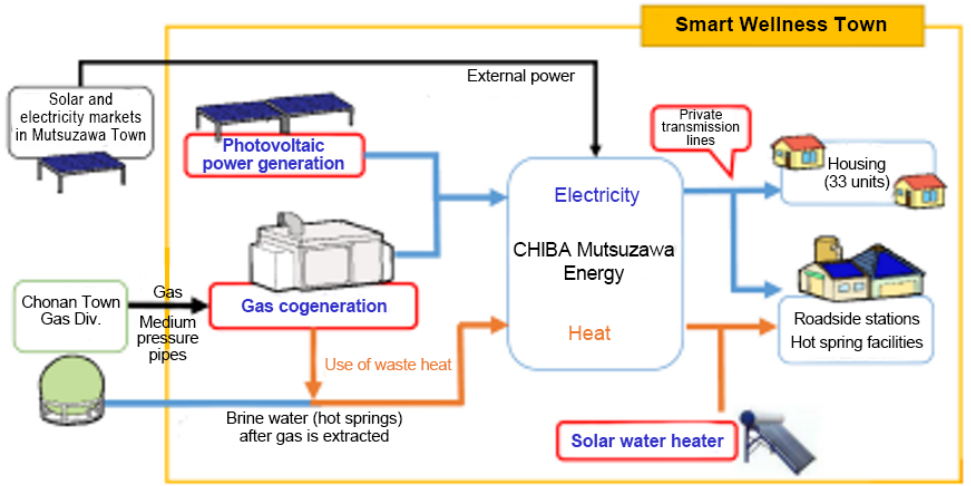
Action-Oriented Solutions to Local Challenges

- Uninterrupted local power supply during disasters with the use of a microgrid system
  - Electricity and heat generated by solar power and gas cogeneration in the town is supplied to 33 residences, roadside stations, and other facilities via private transmission lines.
  - All private transmission lines are installed underground from the perspective of the area's landscape and disaster prevention to create a residential zone with no utility poles located above ground.

<Example of disaster response / Typhoon Faxai, September 2019>

Sep 9 (~3AM): Major power outage occurs, leaving Mutsuzawa Smart Wellness Town also temporarily without power. Confirmation of little damage due to the fact that power lines are installed underground.
Sep 9 (~9AM): Gas cogeneration starts up and begins transmitting power to the roadside station and residences.
Sep 10 (~10AM): Free hot showers offered using waste heat from gas cogeneration system.
(Hot water supply continues until September 11 when power was restored.)

- Supplies electricity and heat over the entire area
  - Supply heated water from cogeneration to bathing facilities and roadside stations.
- Giving back to local communities funded by project revenue
  - Return profits from projects to local health promotion programs.



Overview of microgrid system
Source: CHIBA Mutsuzawa Energy (New Municipal PPS): Creating an energy base for disaster prevention using local resources (Pacific Power)

Examples of Action-Oriented Solutions to Local Challenges [Hinokage, Miyazaki]

Revitalising the region with hydropower projects to maintain local Kabuki traditions and expand the non-resident population

環境省

This project utilises revenue from small hydropower projects to fund the maintenance of a rural Kabuki theater by the community center. This lays the foundation for the area's recognition as a Globally Important Agricultural Heritage System and expands the non-resident population visiting the area.

Basic Data

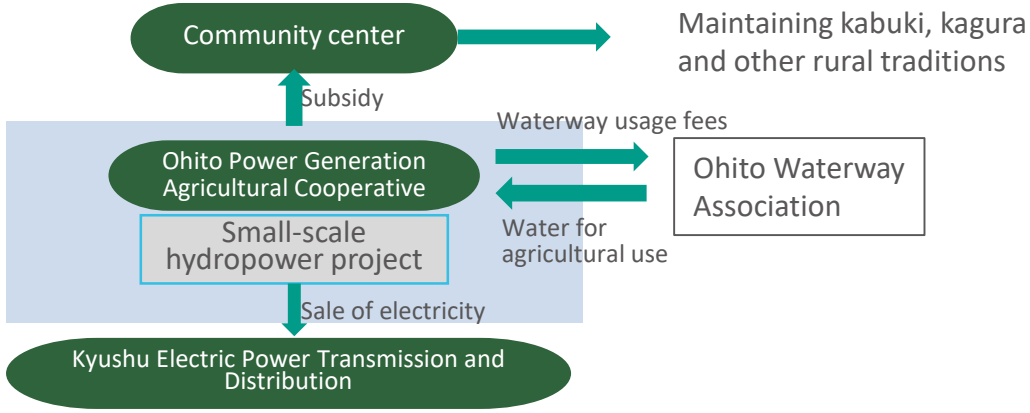
○Location

Hinokage Town, Miyazaki Prefecture (Ohitosubaru small hydropower plant)

○Energy

Small hydropower: 49.9kW (317ＭWh/year)

Structure and system

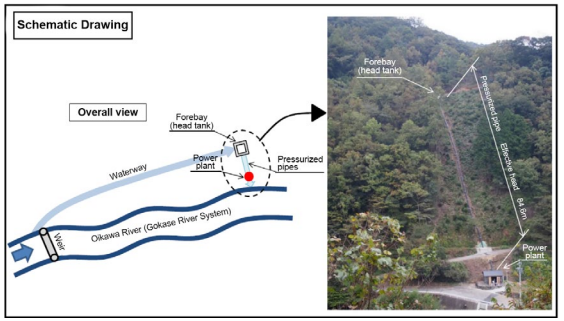


Action-Oriented Solutions to Local Challenges

- Appropriate maintenance and management of waterways through a small hydropower system
  - The Ohito Power Generation Agricultural Cooperative installed a small-scale hydropower system in waterways for irrigation in the Ohito district, which was becoming difficult to maintain because of the aging population of the area.
  - Fees for the use of the waterways paid to the Ohito Waterway Association (800,000 yen annually) help with the proper maintenance and management of waterways for irrigation and make it possible to pass on fields to the next generation.
- Returning local cultural resources to communities using revenue from projects as a source of funding
  - Revenue generated through projects is provided to local community centers as subsidies to fund the maintenance of Kyushu's only rural Kabuki theater, Ohito Kabuki, and other traditions. This helps maintain the landscape and culture of the mountain village, which was recognised as a Globally Important Agricultural Heritage System, and attract and expand the non-resident population, including visitors to the area.

Ohito Kabuki

Ohito Kagura



Small-scale hydropower facilities (Examples of renewable energy initiatives in Miyazaki Prefecture)

Source: Miyazaki Prefecture website

Examples of Action-Oriented Solutions to Local Challenges [Hita, Oita]

Promotion of forestry through the application of biomass power with unused timber from mountain forests

Local companies in Hita City have taken the initiative to build a supply chain for biomass power that will contribute to promoting forestry upstream and agriculture downstream, golf courses and other industries.

Basic Data

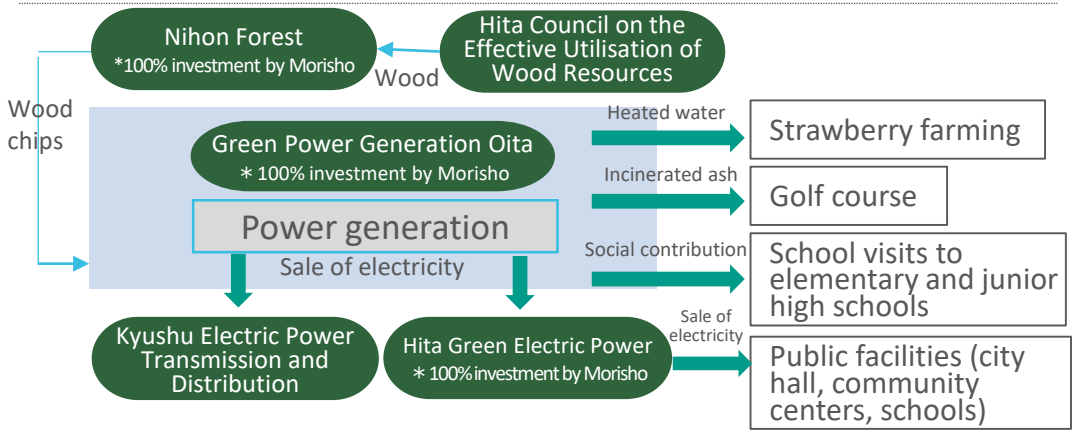
◯Location

Hita City

◯Energy

Biomass: 5,700kW (45,000MWh/year)

Structure and system



Action-Oriented Solutions to Local Challenges

- Use power generation projects to promote forestry
  - Local companies maintain prices for wood by developing original woody biomass power systems and purchasing and supporting the practice of thinning trees that would normally be discarded. This project will also contribute to the environmental conservation of mountain forests.
- Create local jobs along the power supply chain
  - Green Power Generation Oita has 15 people from the region on staff. About 100 jobs were created in the local forestry industry.
- Use heated drainage water in local industries when producing power
  - Heated water discharged during the power generation process is supplied to agricultural corporations at low cost (1 yen/day) and used to grow strawberries.
  - Incinerated ash is sold to golf courses at low cost for use in bunkers and turf sand. (Annual processing costs have fallen from 40-50 million yen to about 20 million yen.)
- Achieve local production of electricity for local consumption
  - Electricity generated by thinning trees in the region is supplied to public facilities and all elementary and junior high schools in the city.
  - School visits are also made to elementary and junior high schools.
- Achieve the use of 100% renewable energy in companies(use of non-fossil fuel certificates)
  - Non-fossil fuel certificates are used for electricity in business operations, while J-credits are used for offsetting CO_2 emissions from plants and vehicles.

Biomass power plant
Source: Green Power Generation Oita website

Examples of Action-Oriented Solutions to Local Challenges [Jumonji Chicken Company]

Use of poultry manure, used to produce fertiliser at significant cost, as a resource for biomass power to contribute to the local community

The use of poultry manure, a common issue for poultry farmers, as fuel for biomass power has significantly reduced treatment costs, including those for processing fertiliser. Half of the people employed in the power generation project are from the local community and electricity that is not used for private consumption is sold. Donations are made to the town and local fire department, and beautification activities, visits to local elementary and junior high schools and relevant administrative agencies, and other activities are also implemented through this project.

Basic Data

○Location

Karumai Town, Iwate Prefecture

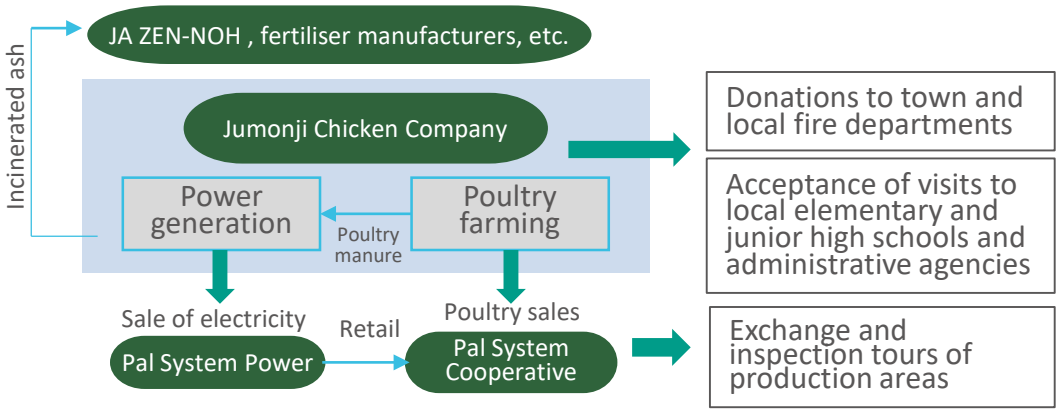
○Energy

Biomass: 6,250kW

Electricity sales: 36,000MWh/year

(Livestock waste)

Structure and system



Action-Oriented Solutions to Local Challenges

- Reduce costs and contribute to the local community by commercialising biomass power using poultry manure
  - Poultry farming generates 130,000 tonnes of manure annually. The sales of manure as fertiliser and an agent to melt snow was not profitable, so a biomass power project using poultry manure was launched, which reduced the amount of money paid out from fertiliser sales (negative earnings).
  - Incinerated ash produced in the process of generating power is sold to JA ZEN-NOH and fertiliser manufacturers for use as raw materials for fertiliser that contains high levels of phosphoric acid.
  - Half of the workers employed in the biomass power project (about 30) are from Karumai Town, and a portion of the revenue from this project is donated to the town and local fire department.
  - Visitors are also accepted from local elementary and junior high schools and administrative agencies.

Biomass power plant facilities
(Source: Jumonji Chicken Company website)