

Circular and Ecological Economy

Japan's Vision for Realization of
Decarbonization and SDGs

vol. 2



Preface

Japan is facing the sweeping greying of society with falling birth rates and a shrinking population, and while the continuing exodus of the younger generation from rural areas to cities has spurred the development of urban areas, the decline of rural regions has become an issue of national concern. The accelerating, uneven distribution of the regional population and diminishing numbers in the younger and working-age generation in rural areas are having serious repercussions on environmental conservation efforts.

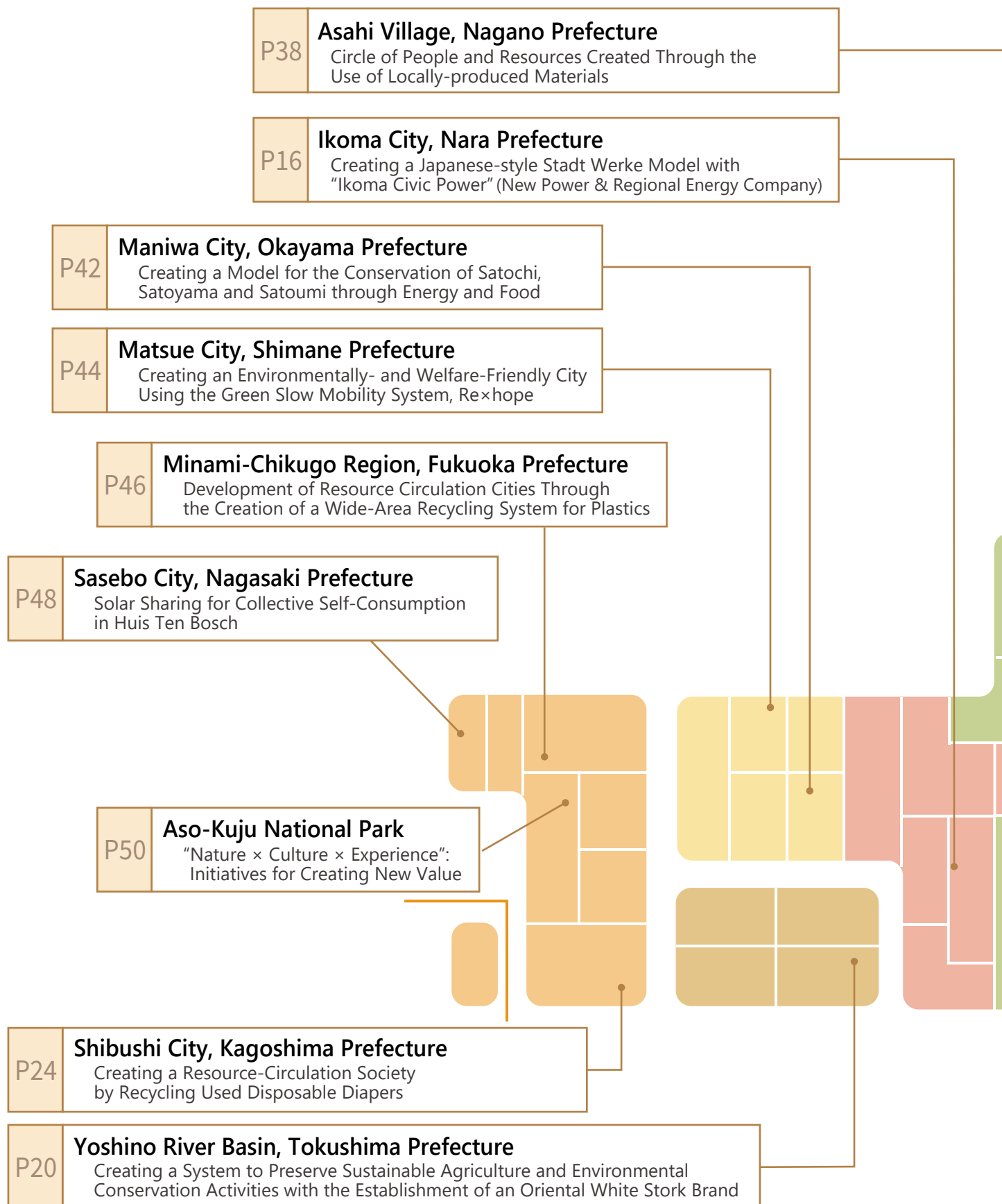
The concept of a “Circular and Ecological Economy” was proposed in the Fifth Basic Environment Plan approved by the Cabinet in April 2018. The Circular and Ecological Economy is a concept that aims to maximise the vitality of each area by leveraging regional resources, such as the beauty of the natural environment, to create self-reliant and decentralised societies and by complementing and supporting other regions in line with the unique features of each area. The Circular and Ecological Economy is one of the keys to the integrated improvement of the environment, economy and society—the three dimensions of sustainable development—and is a vision that can be put into practice at the local level to achieve decarbonisation and the Sustainable Development Goals (SDGs) as it unlocks the potential of mountainous, agricultural and fishing villages, as well as cities.

Working in tandem with various stakeholders in the region to create a Circular and Ecological Economy, which is itself a type of local SDGs, will make it possible to resolve not only environmental conservation issues, but also economic and social challenges facing the region. This collection of case studies aims to support actions for creating a Circular and Ecological Economy in different regions by showcasing 16 advanced initiatives that can serve as reference for efforts to build these areas.



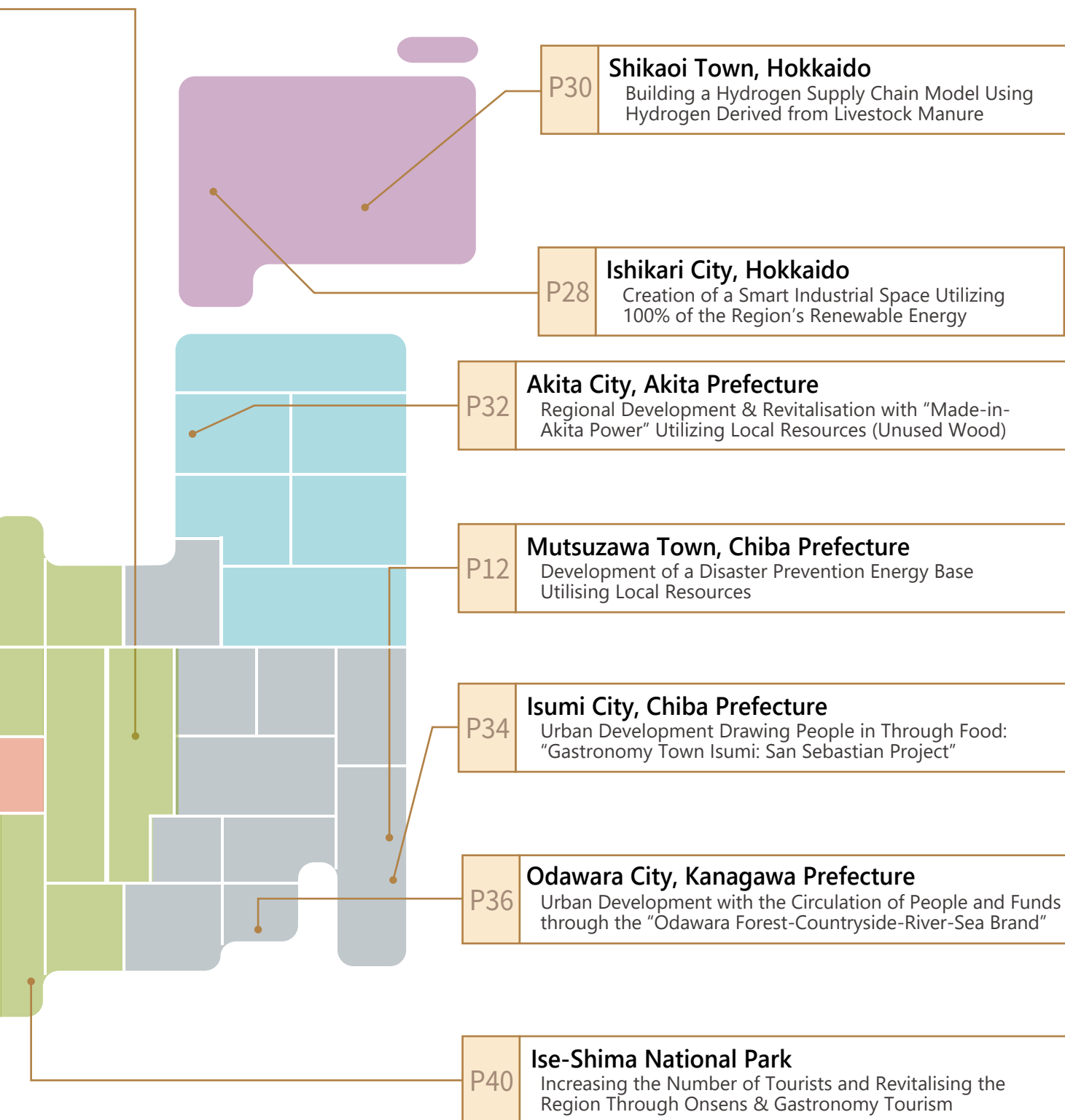
Japan's Vision for Realization of Decarbonization and SDGs

Circular and Ecological Economy vol.2



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►► What is the Circular and Ecological Economy?

Features of the Circular and Ecological Economy (CEE)

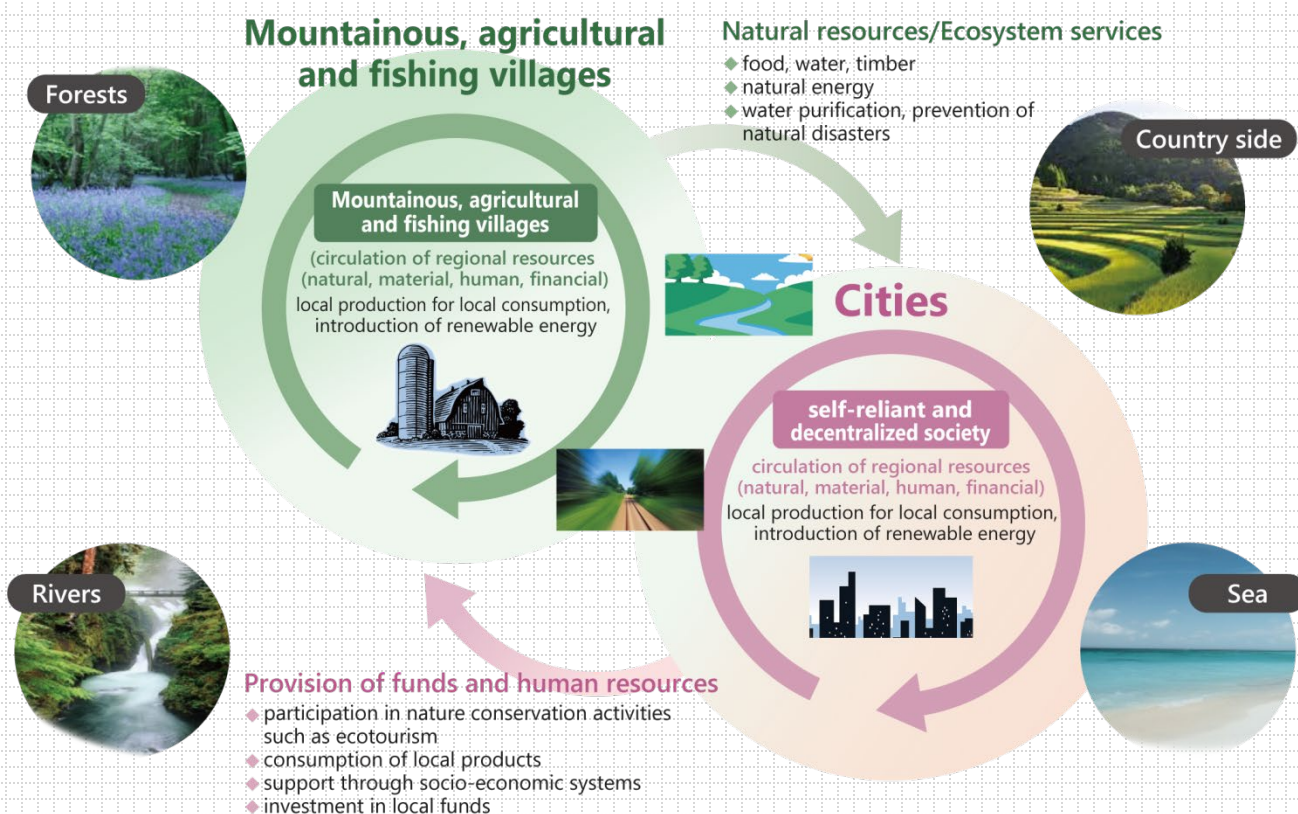
- The CEE offers integrated environmental, economic and social solutions for the effective use of regional resources in a sustainable manner with a focus on regional and local issues.
- With the development of a wide-area network, the CEE aims to create a new value chain that complements regional resources.
- Composed of natural connections (linkages with forests, the countryside, rivers and the sea) and economic connections (composed of human, financial and other resources), the CEE makes extensive use of mountainous, agricultural and fishing villages and cities.
- The concept of the Circular and Ecological Economy can be applied to smaller areas, such as at the village and municipal level, but it is also applicable to broader areas, such as basins, prefectural or national levels, and the Asian region.

Benefits of the Circular and Ecological Economy

- When environmental measures are implemented like a business, they are expected to be sustainable.
- The effective use of regional resources and the active involvement of the local community will in turn create dynamic regions.

What is the significance behind the formation of a self-reliant and decentralised society?

- Japan has developed diverse cultures and industries against the backdrop of the climate and natural environment of each region. However, in recent years, these cultures and traditional industries have been neglected, causing the appeal of some regions to fade as they become increasingly homogenous.
- By rediscovering the unique resources of each region and utilising them in a sustainable manner, the attractiveness of an area can be recaptured and economic cycles within the region can be revitalised.



Why build wide-area networks?

- A self-reliant and decentralised society does not aim to isolate local areas. More robust communities can be formed when each region utilises these resources to refine its strengths and connects with other regions to support one another while taking advantage of these strengths.

What is the key to continuous action?

- Traditionally, environmental conservation efforts had a tendency to be dependent on subsidies from the government. However, it is time for these efforts to become viable as community-based businesses, with companies and NPOs that have deep roots in the community shifting into position as major players and engaging local financial institutions and the government. To this end, broad-based partnerships that include the government, companies, academia and NPOs are becoming increasingly important.

Sustainable Development Goals (SDGs)

Today's global population has broken through the seven billion mark and is expected to reach 9.8 billion by 2050. Impacts on the environment from human activity is on the rise, placing the global environment, the very foundation of human existence, at serious risk.

The 2030 Agenda for Sustainable Development was adopted at the United Nations General Assembly in September 2015 in recognition that the problems arising from human activity are urgent issues and that the international community must work together to resolve them. The 2030 Agenda, which includes 17 Sustainable Development Goals (SDGs) and 169 targets, was adopted as a universal goal involving the entire world to be addressed by both developed and developing countries.

The 17 SDGs and 169 targets are integrated and characterised by their objectives to resolve multiple problems in an integrated way and to achieve multiple benefits, where a single action generates benefits on multiple dimensions.



►► 5 Elements of the Circular and Ecological Economy

P.10-11 shows an illustration of the Circular and Ecological Economy as the ideal Environmental and Life Centred Civilized Society. The five elements--energy, resilience, transportation and mobility, lifestyles, and business--are emphasised in the Circular and Ecological Economy, which represents a practical model of a "virtuous cycle of the environment and growth."

1 Self-reliant and decentralised energy systems

Keywords

"Local production of energy for local consumption and inter-regional exchange"
"Systems supporting local renewable energy businesses"

- The use of locally-produced renewable energy can bring new business opportunities to the region, including the construction and maintenance of power generation facilities and the production and supply of fuel (when using biomass).
- If a system can be established to use locally-produced energy, it is more likely that a certain amount of energy can continue to be supplied even if a large-scale power source is damaged in the event of a disaster.
- In the case of a large city where it is difficult to meet the energy demand of the region with locally-available renewable energy alone, an effective option would be to form wide-area partnerships with areas that have an abundant supply of renewable energy.

2 Disaster-resilient cities

Keywords

"Energy systems and lifelines that offer a sense of security in a disaster"
"Avoiding/mitigating (adapting to) damage from impacts of climate change"
"Synergistic effects of disaster prevention infrastructure and the capacity of nature to prevent natural disasters"

- New businesses can be developed from the perspective of adapting to climate change, such as the creation of cities that are resilient against heavy rainfall and the introduction of crops that can tolerate high temperatures.
- Nature itself can be used to prepare for increasingly frequent disasters, which can be effective when properly combined with conventional infrastructure.

3 User-friendly and attractive transportation and mobility systems

Keywords

"Friendly, safe and convenient transportation for the elderly and families with children"
"Transportation systems that highlight the appeal of the region"

- Simple and safe methods of travel for the elderly are needed as a response to the aging population.
- New technologies and infrastructure, such as Low Floor LRT (Light Rail Transit) and electric-motored mobility, as well as new forms of business, such as servicing and sharing, have started to emerge.

4 Healthy lifestyles in harmony with nature

Keywords

"Enjoyment of a healthy, full and happy life with a shift from the 'consumption of goods' to 'experiences'"
"Regional community in harmony with the circulation of water"
"Good life with abundant nature and its blessings as a stock"
"Creating empathy and inspiration (culture, art, history, sports)"

- It is crucial to change the practices of mass consumption and disposable cultures both from the perspective of resource constraints, as well as the protection of our ecosystems. Reforming working styles is also an important perspective.
- We can create healthy and fulfilling lifestyles as we gain a new recognition of the value of the natural environment and cultural resources inherent in forests, villages, rivers and the sea in each region and rebuild connections between people and nature, as well as between people themselves.

5 Creation of diverse businesses

Keywords

"Regional energy businesses based on regional management styles and tourism businesses that utilise local resources"

"Regional solution-oriented businesses (development of business bases and tourism resources through the use of existing facilities and abandoned cultivated land, local education and human resources development)"

"Business support through local and ESG financing and regional funds"

- The process of creating a Circular and Ecological Economy is a positive social change that expands various business opportunities. Solution-oriented businesses according to the needs of each region will play a leading role in the CEE.
- ESG financing (financing that takes environmental, social and governance into account) will be a key driver for these new businesses. Both major and local financial institutions will play an important role in expanding the applications of ESG finance.
- Solution-oriented businesses that respond to local needs can be applied to areas overseas that are facing the same challenges.

Approaches to the creation of a Circular and Ecological Economy

A Circular and Ecological Economy aims at the integrated improvement of the environment, economy and society and simultaneously resolving local issues, and therefore requires a more inclusive approach than traditionally seen with environmental conservation. Future environmental policies must work to incorporate both conventional approaches as well as the following approaches when creating a Circular and Ecological Economy.

	Conventional approaches	Approaches for the creation of a CEE
Vision	Solution-oriented approaches in response to emerging issues in each sector Forecasting where targets are set by building on the current situation and aiming to achieve these targets	Value-creation approach aiming at integrated improvements and an awareness of connections between the environment, economy and society Backcasting, which offers a vision of an ideal state and works to address gaps with the current situation to achieve that ideal vision
Structure	Consensus building through councils and study groups composed of experts in the environmental field and residents	Collaboration (partnerships) among players in diverse fields in the environment, economy and society
Actions	Direct responses to environmental issues through regulations, volunteers, subsidies, etc.	Responses to not only environmental issues, but also economic and social problems through the creation of businesses
Performance indicators	Indicators for the environmental field	Indicators for each of the environmental, economic and social sectors, integrated indicators

►► Ministry of the Environment Local SDGs: Platform for the Creation of a Circular and Ecological Economy

The Ministry of the Environment, Japan launched the “Local SDGs Platform for the Creation of a Circular and Ecological Economy” in order to promote the concept of CEEs and support community-based practices. This platform will revitalize local areas in Japan and use the environment to re-energise them, providing support for the creation of a sustainable circular symbiotic society.

P roject overview

- The Platform for the Creation of a Circular Economy has started operations featuring five functions to help resolve issues as each region takes action to create CEEs: “Know,” which familiarises people with the concept of a CEE and publicises events; “Learn,” which helps users prepare a roadmap for the creation of a CEE and develop models for local environmental businesses that can be rolled out to other areas; “Connect,” which features a registration system for practical application areas and sends out digital newsletters; “Encounter,” which creates spaces for companies, related ministries and communities to meet; and “Challenge” to innovate new systems and rules.

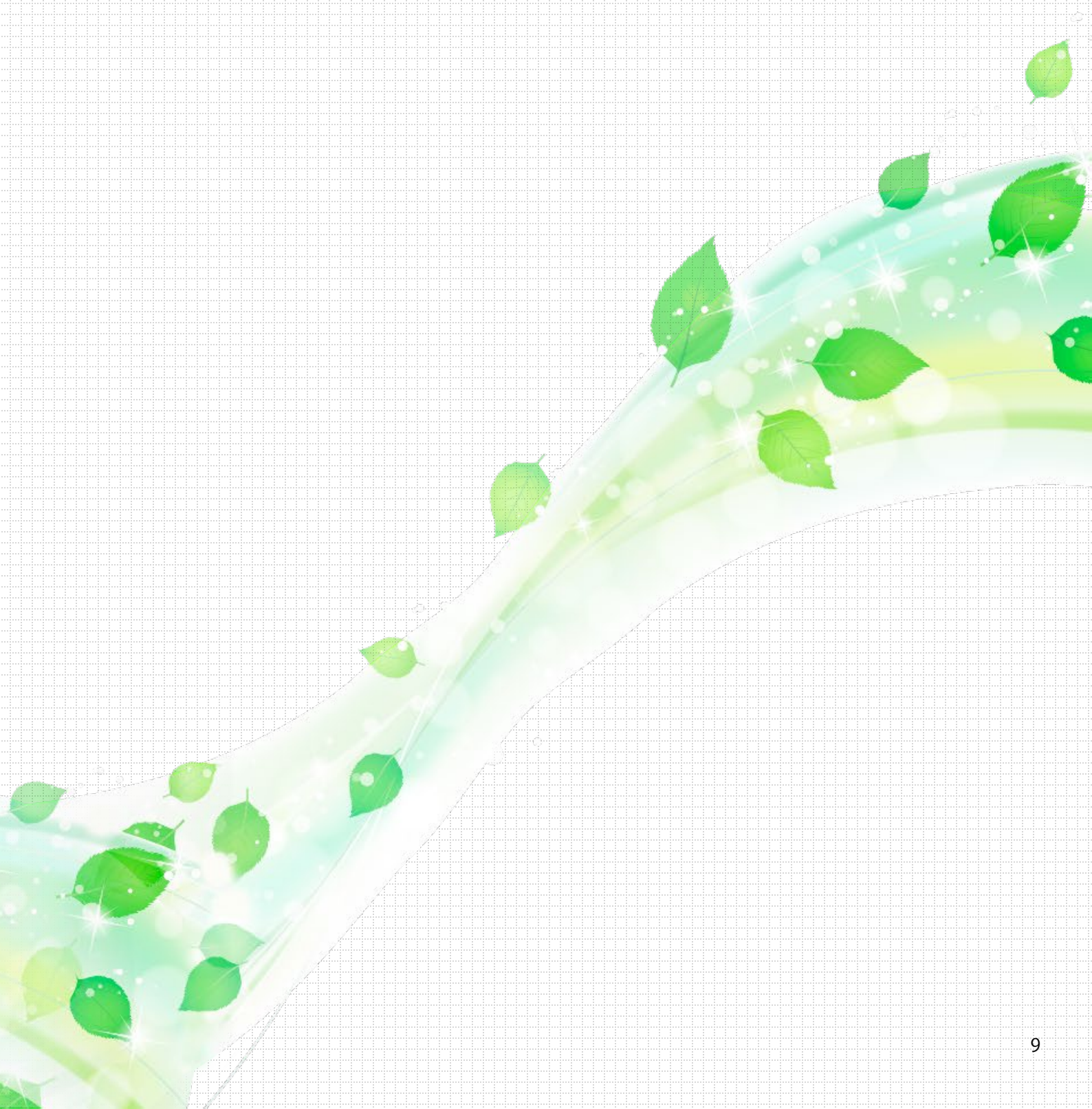
**Ministry of the Environment Local SDGs
Platform for the Creation of a Circular
and Ecological Economy**

<http://chiikijunkan.env.go.jp>

C ircular and Ecological Economy in practice

- The Ministry of the Environment, Japan has launched a “Registration System for Areas with Circular and Ecological Economies,” a registration system for regions and organisations that have developed, are in the process of developing, or are planning to develop a CEE.
- The overview and status of activities of registered regions and organisations will be open to the public on the Ministry of the Environment’s website to encourage companies to support them and secure human resources.
- The secretariat also provides information on related events, symposiums and other topics to registered regions and organisations by email. They plan to start providing support on promoting exchanges and networking for regions and organisations, as well as opportunities to consult on developing platforms.

On page 12 and onward, pioneering cases of the CEE in Japan are presented. Each case addresses multiple Sustainable Development Goals and lists the logos of key SDGs.



CIRCULAR and ECOLOGICAL ECONOMY

– The life-based ecosystem draws potential of people and nature in

[Self-reliance & decentralization] × [Mutual cooperation] × [Circulation & symbiosis]

Ownership

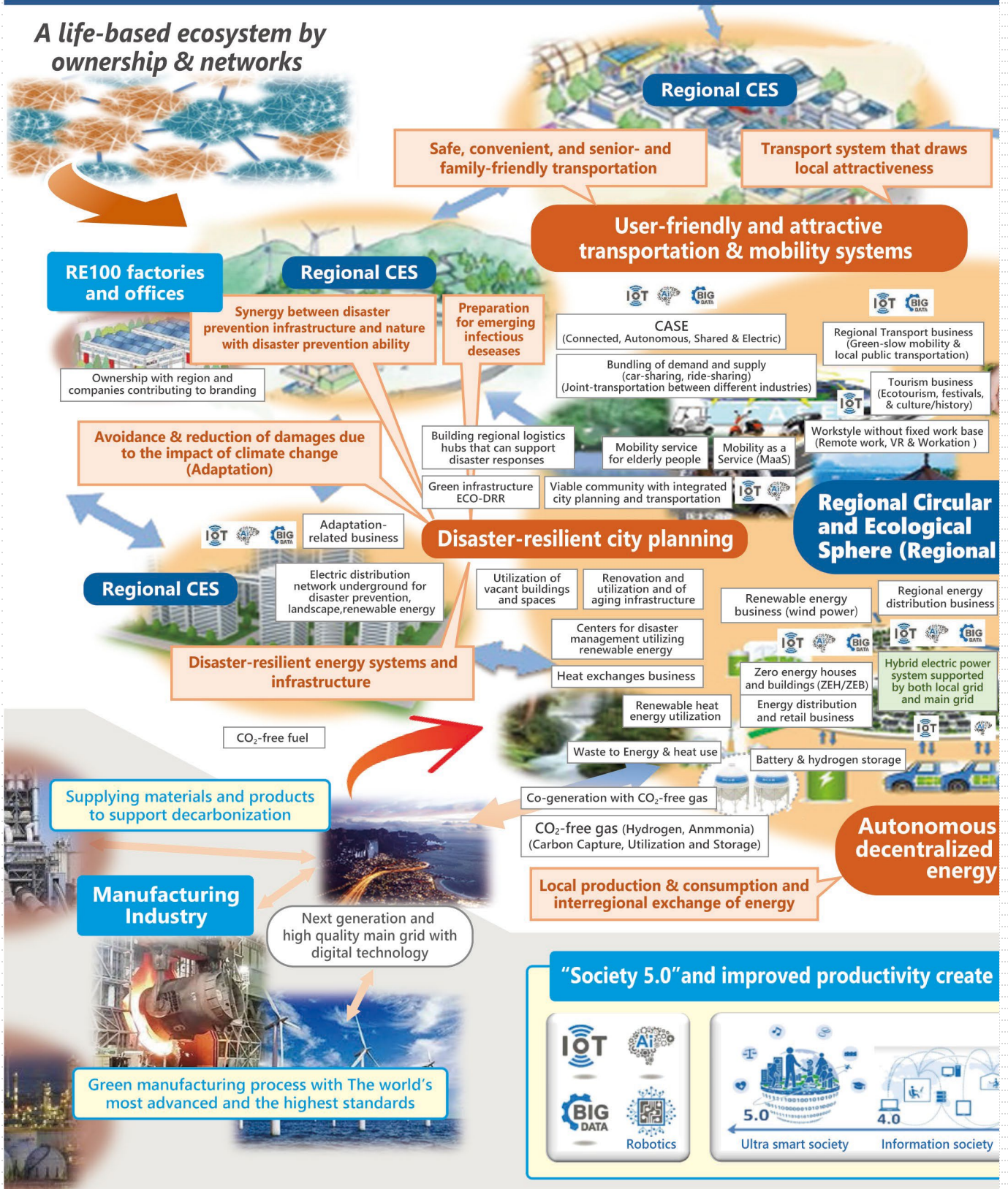
Networks

Sustainability

= Vital **Circular and**

➔ The basis for local communities that leads growth by creating new values and

A life-based ecosystem by ownership & networks



(Japan's vision to realize decarbonization and SDGs)

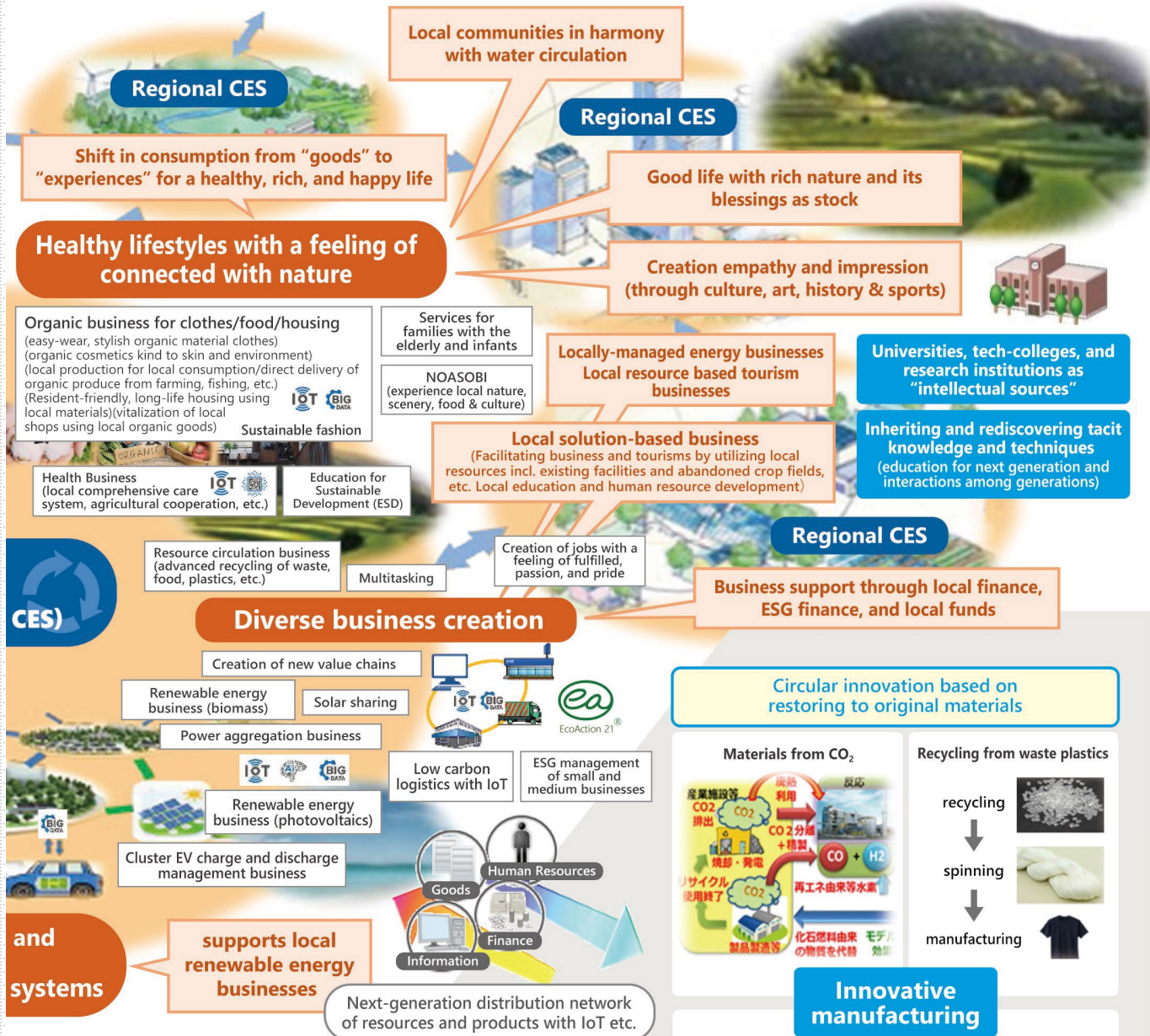
local communities by integrating the cyber and physical space –

Ecological Economy

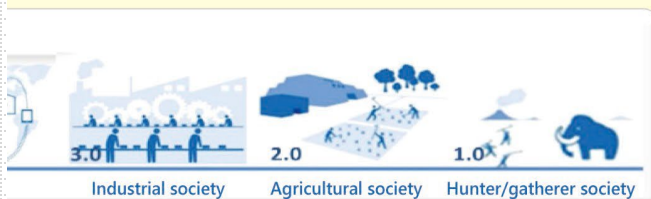
Achieving decarbonization & SDGs, and to the world human security and youth & women's empowerment as a basis

businesses

Richness can be spread out nationwide as a self-reliant region having organic linkages with other regions enables people to live a healthy and lively life with happiness and pride



"Circular and Ecological Economy"



Material innovation based on organic materials

Case 1 Mutsuzawa Town, Chiba Prefecture

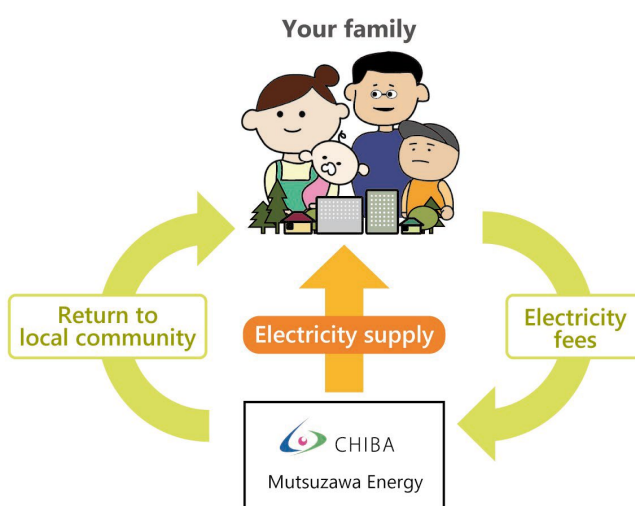
Development of a Disaster Prevention Energy Base Utilising Local Resources

① Background and issues

- Mutsuzawa Town has been able to curb the drastic decline in its population to a certain extent with projects encouraging people to settle in the area and initiatives to support raising children. However, in order to outpace the shrinking population, there was an urgent need to create a vibrant region by shaping society and the environment into one where residents could feel secure in their daily lives, give birth and raise children.
- In December 2014, the town formulated the "Basic Plan for the Mutsuzawa Smart Wellness Town," which set out a roadmap for the integrated development of a "michi-no-eki" (roadside station) and quality local rental housing as a "base for all to live healthy and active lives."
- Mutsuzawa Town is located in the extraction area for the Minami Kanto gas fields (water-soluble natural gas deposits) that extend throughout the Kanto region. This is also the supply area for public city gas managed by the gas division in neighbouring Chonan Town.
- For this reason, the Mutsuzawa Smart Wellness Town was planned as a facility in which locally produced and locally consumed energy services could be possible by effectively utilizing the town's local source of natural gas.
- The town also intended to use the area's natural gas for the local production and consumption of electricity. However, since there are no open power lines in the area, it was not possible to connect surplus power to the grid even when the generators were running, which resulted in the development of a plan for a microgrid that could operate separately from the grid.
- Mutsuzawa Tsudoi-no-Sato was selected as a priority roadside station by the national government. As a disaster base, it also serves as an autonomous, decentralised energy system that can supply electricity in the event of a disaster.

② Overview of activities

- CHIBA Mutsuzawa Energy Co., Ltd., a power producer and supplier (PPS), was established in June 2016 through joint investment by Mutsuzawa Town, companies, the Chamber of Commerce and Industry, and financial institutions.
- CHIBA Mutsuzawa Energy started electricity retail operations in October 2016 (start of supply to low-voltage customers, including ordinary households, in February 2017). Since then, the company has mainly supplied naturally-derived electricity produced in Chiba Prefecture to public facilities and private companies in the town, achieving the local production of energy for local consumption, and is returning the profits made to health promotion projects in the town.



Corresponding SDGs

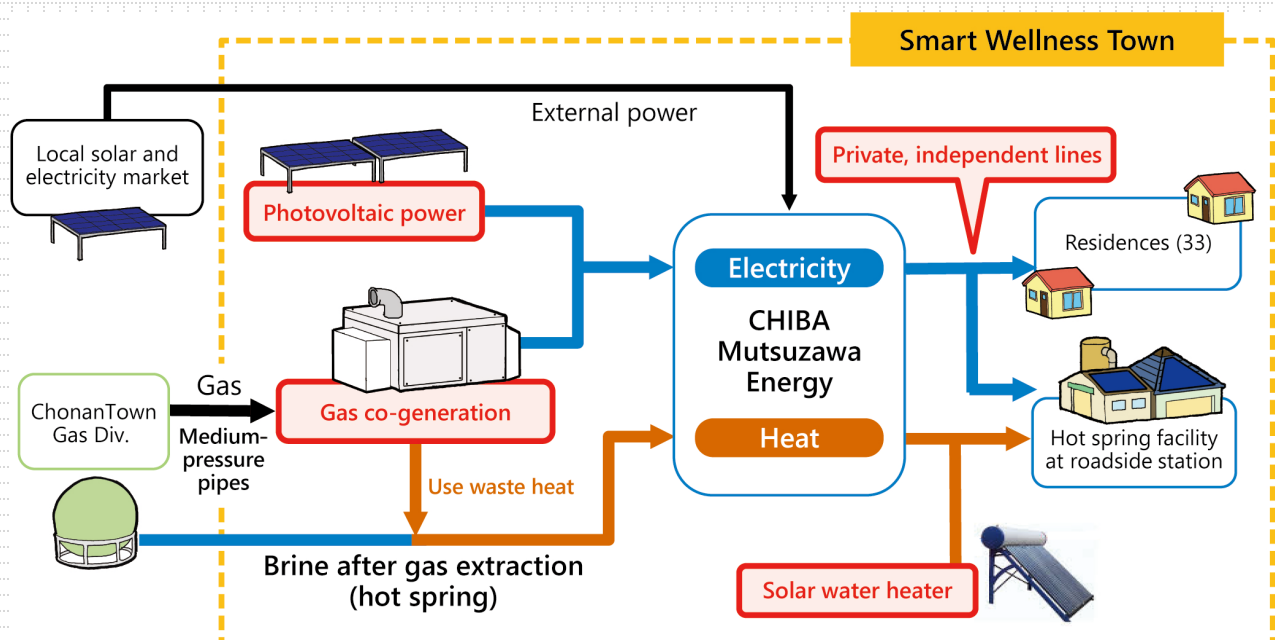


- ▶ CHIBA Mutsuzawa Energy started to supply energy to Mutsuzawa Tsudoi-no-Sato and residences in the Mutsuzawa Smart Wellness Town on September 1, 2019.
- ▶ This was the first case of its kind in Japan where a PPS financed with local capital is supplying both electricity and heat.
- ▶ Electricity is generated through gas co-generation (80 kW x 2 units) using the supply of natural gas produced in Mutsuzawa Town. The electricity generated is then consumed in the Smart Wellness Town.
- ▶ In addition, waste heat from generators is used to heat brine water after natural gas is extracted, which is then supplied to a hot spring facility located adjacent to the roadside station. In this way, the water-soluble natural gas, which is a local resource, is completely and effectively used, a rare initiative even in Japan.

- ▶ The town is also home to a photovoltaic power generation system (20 kW) and a solar water heater (37kW), which also help reduce greenhouse gas emissions through the use of renewable energy.
- ▶ CHIBA Mutsuzawa Energy supplies electricity to residences using its own power lines. All power lines have been laid underground from the vantage point of the landscape and disaster management.



▲ Residential zone with no visible utility poles



▲ Overview of microgrid system (sections encircled in red indicate facilities owned by CHIBA Mutsuzawa Energy)

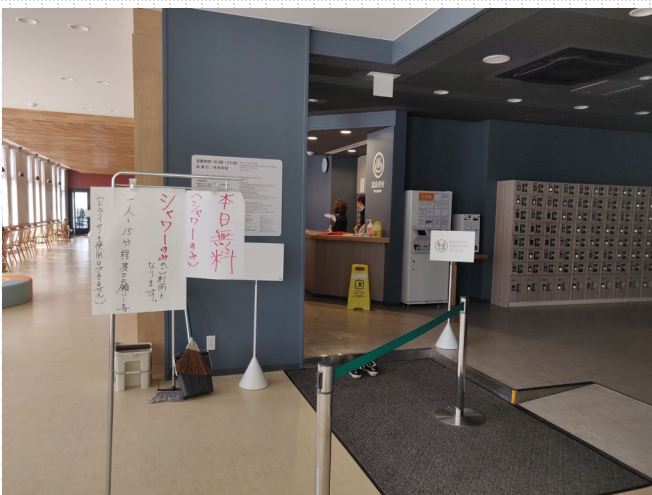
▶▶ Pioneering Cities Engaged in the Creation of a Circular and Ecological Economy

③ Results of activities and future developments

- ▶ Since the company was set up with local capital, profits from operations will be returned to the local community instead of flowing outside. This project is also expected to be appealing to customers at the roadside station.
- ▶ The microgrid will also be connected to the existing grid at a single point with the general power transmission and distribution utility. After connecting to the grid, power will be supplied using private, independent lines, which will enable independent operation even in the event of a grid blackout.
- ▶ Shortly after the soft opening of the Mutsuzawa Smart Wellness Town on September 1, 2019, strong winds at around 3AM on September 9, 2019 caused by Typhoon Hagibis damaged TEPCO's transmission and distribution lines and resulted in a large-scale power outage over a wide area in Chiba Prefecture, which also included Mutsuzawa Town.
- ▶ Power was also cut temporarily to Mutsuzawa Smart Wellness Town. However, after checking and determining that there was hardly any damage because the power lines (private, independent lines) were located underground, the gas co-generation system was restarted around 9AM on September 9 and began transmitting electricity to important facilities at the roadside station and residences.
- ▶ Furthermore, at around 10 AM on September 10, tap water could be heated using waste heat from the gas co-generation system to provide free hot showers to residents in the area. Water continued to be supplied until September 11 when the power was restored.
- ▶ In this way, electricity can be supplied to the roadside station and residences even when there are power outages in adjacent facilities, allowing it to function as a disaster prevention energy base.



▲Roadside station (left) and residences (right) shine brightly in the middle of local stores and houses experiencing power outages



▲More than 800 local residents used the free hot showers and toilets

Voice

Q What motivated Mutsuzawa Town to become involved in the PPS?

A Pacific Consultants Co., Ltd., the parent company of Pacific Power Co., Ltd., had been conducting a variety of business operations in Mutsuzawa Town for a number of years.

Pacific Consultants had been building momentum to establish a company to support the establishment and operation of a PPS since around 2014; this led to the establishment of Pacific Power in April 2015.

Our proposal for a PPS to Mutsuzawa Town was the impetus that led to the start of this initiative.

Q How are profits being returned to the town?

A Mutsuzawa Town, which is committed to building a healthy town, requested that a portion of the profits be returned to the town through the organisation of health-related events and the provision of health exercise equipment (fitness machines) for use in facilities owned by the town.

Q What plans are in place to develop operations in the future?

A We believe that the damage caused by Typhoon Hagibis has made people aware of the importance of systems for the local production and local consumption of energy. However, the area covered by this system is limited at this time, so there were a number of places outside the area that experienced power outages.

In the future, we would like to examine the possibility of using electric vehicles to supply electricity



Takeshi Matsuda
Pacific Power Co., Ltd.



Mutsuzawa Smart Wellness Town
(Mutsuzawa Tsudoi-no-Sato roadside station is in the foreground, with the residential area in the background.)

outside the area so that it can be used as a backup source of power in the event of a power outage.

We would also like to contribute to the development of an attractive community and region by promoting initiatives that will contribute to the creation of the healthy town of Mutsuzawa.

Case 2 Ikoma City, Nara Prefecture

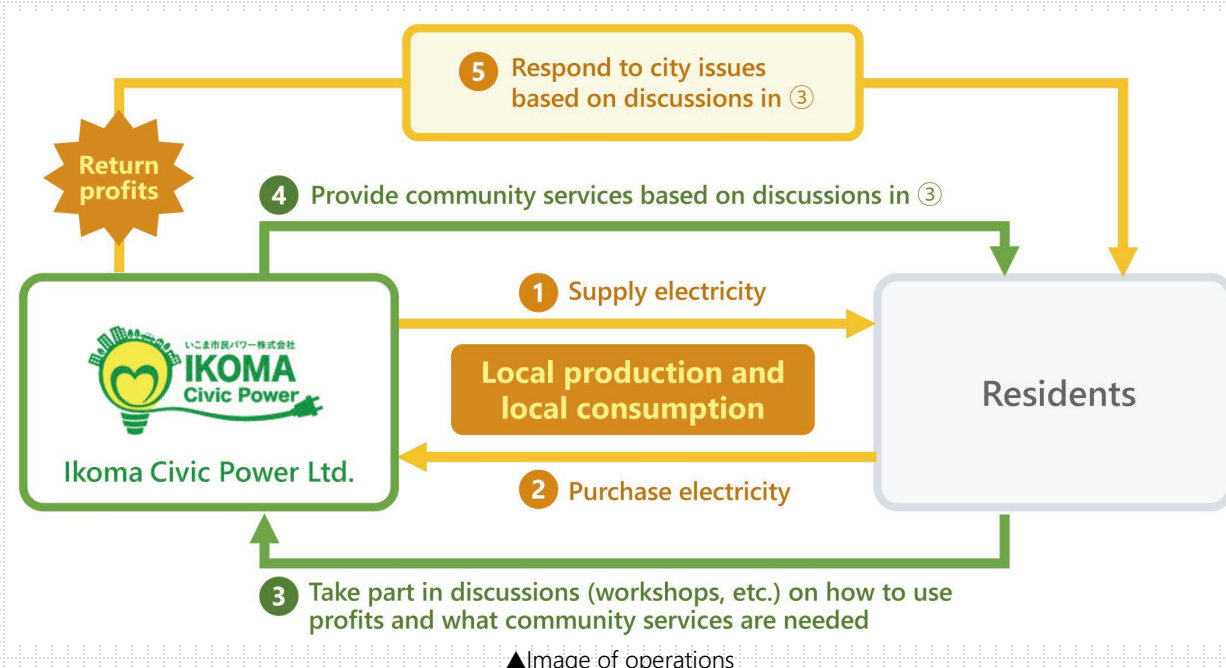
Creating a Japanese-style Stadt Werke Model with “Ikoma Civic Power” (New Power & Regional Energy Company)

① Background and issues

- ▶ A residential city convenient for commuters and with an excellent living environment, Ikoma faces issues like those of other residential cities in revitalising industries, regenerating residential areas with aging populations, and effectively utilising local resources.
- ▶ Ikoma was selected as an Eco-Model City in March 2014, the first residential city located near a major metropolitan area, in recognition of the city's proposal for redesigning its urban structure and energy circulation activities in residential areas.
- ▶ In January 2015, the city formulated the “Ikoma City Eco-Model City Action Plan,” which included the establishment of a new power and regional energy company.
- ▶ Ikoma conducted studies on the operations of Power Producers and Suppliers (PPS) * with the aim of achieving the city's objective of becoming an Eco-Model City where people want to continue to live and relocate to by developing a diverse set of projects to solve environmental, economic and social issues using its distinctive characteristics.

② Overview of activities

- ▶ Ikoma Civic Power Ltd., a PPS, was established in July 2017 through joint investment by Ikoma City, Civic Energy Ikoma and other stakeholders.
- ▶ This is the first case of its kind in Japan where a civic group has invested in a PPS. Civic Energy Ikoma operates “joint citizen solar power plants” at four locations in the city, and the electricity generated is supplied to Ikoma Civic Power.



▲Image of operations

*PPS

Electric retail utility that supplies electricity to public facilities, private companies and households in the region by maximising the use of locally generated electricity

Corresponding SDGs



- ▶ In addition to Civic Energy Ikoma, Ikoma Civic Power procures electricity from solar power, small-scale hydroelectric power at city-owned facilities, such as the main government building, and woody private biomass power. This has resulted in a renewable energy ratio of 10.2% as of fiscal year 2019.
- ▶ Initially, electricity was supplied to 53 facilities (public only), but a gradual expansion in the number of suppliers has increased this number to 83 facilities (public: 61, private: 22) in fiscal year 2019.
- ▶ Ikoma Civic Power aims to revitalize the city from three perspectives: economic (regional circulation of energy costs and job creation), social (creating space to allow residents to take part in community development), and environmental (expanding the application of renewable energy and promoting the local production of energy for local consumption).
- ▶ One of the features of this system is that it allows residents (service contractors, etc.) to directly participate in discussions on how profits will be used and what community services are needed through workshops.
- ▶ In February 2018, the city organised a self-care health class for residents in the work force using profits from Ikoma Civic Power.
- ▶ In July 2018, Ikoma Civic Power, Ikoma City, and NTT DOCOMO Kansai Branch (hereinafter referred to as "Docomo") signed an agreement to develop operations based on the use of ICT to promote the concept of an Eco-Model City. This is the first case of its kind in Japan with civic services provided using Docomo's ICT technology and utilising the profit from a PPS.
- ▶ In November 2018, Ikoma Civic Power supported the introduction of an ICT-based community monitoring service for children walking to and from elementary school and completed the introduction of this system in all elementary schools in Ikoma City by January 2019. With this service, when a child passes through the school gate carrying an IC tag, it is detected by a sensor, which automatically sends notification to a pre-registered email address of the child's guardian.
- ▶ In order to increase its use, Ikoma Civic Power has expanded the service so that it is free of charge in the first semester for new first graders in fiscal year 2019. Plans are in place to extend the free period in order to continue to offer the service in fiscal year 2020.
- ▶ As a new initiative in fiscal year 2020, Ikoma Civic Power is planning to raise awareness of the SDGs and to support Ikoma City's "multifunctional community space" project to enhance actions. The space has a variety of functions, including the collection of recyclable waste, recycling, promoting health, mobile sales of agricultural products and the exchange of unused goods.
- ▶ Ikoma City plans to implement a variety of community services in the future with public participation.



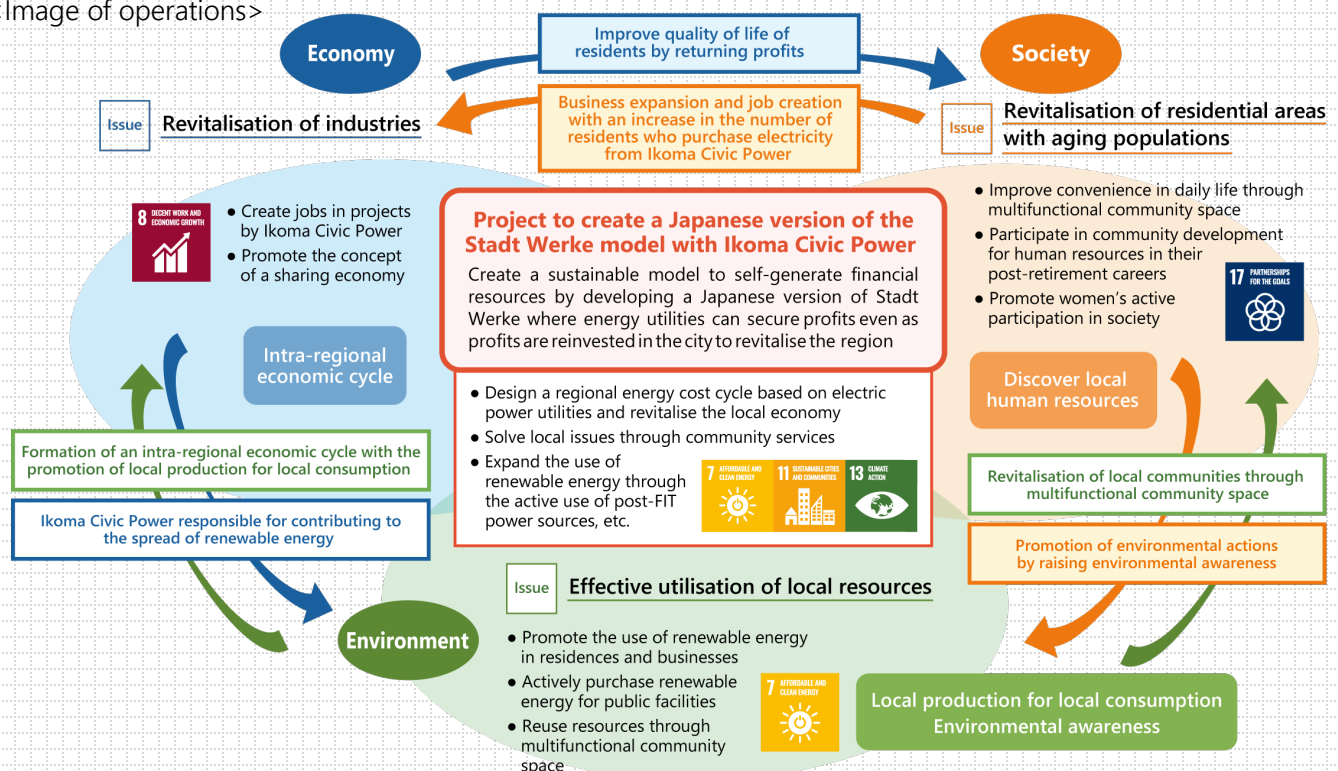
▲Health class

►► Pioneering Cities Engaged in the Creation of a Circular and Ecological Economy

③ Results of activities and future developments

- Ikoma City is expected to promote the introduction of photovoltaic power generation systems for households in the city with the development of measures to actively utilise non-FIT power sources from Ikoma Civic Power. The city will be able to prevent electricity bills from flowing out of the city and create a financial cycle by requiring Ikoma Civic Power to purchase electricity generated by these photovoltaic power generation systems.
- Prioritising the procurement of electricity derived from renewable energy sources in the city and supplying that to ordinary households will promote the local production of energy for local consumption and expand the use of renewable energy.
- In addition, with regard to community services implemented by returning profits, the increase in profits from the supply of electricity to households will increase financial resources and enhance the content of services.
- Residents will be able to participate in workshops to determine the content of community services and will have opportunities to think about solutions to the city's challenges.
- This is expected to lead to the formulation of more detailed community services that have been developed from the residents' perspectives and to the identification of solutions to social issues that are in line with community needs.
- In July 2019, Ikoma City was selected as an SDGs Future City in recognition of its contribution to achieving the SDGs through the promotion of initiatives centring on Ikoma Civic Power.
- In November 2019, Ikoma City declared itself a "Zero Carbon City" aiming at net zero CO₂ emissions by 2050 in response to a call by the Ministry of the Environment, Japan.
- In the future, Ikoma City will create a financing cycle in the region through the electric power industry based around Ikoma Civic Power and also simultaneously address regional issues and implement environmental initiatives, such as the local production of energy for local consumption, by reinvesting profits in the city. Ikoma City aims to create a Japanese version of the "Stadt Werke"* model through these initiatives.

<Image of operations>



*Stadt Werke

Public corporation that develops and manages public infrastructure, such as electricity, gas, water and transportation in Germany, with an aim to provide community-based public services by integrating multiple services into a single entity.

Voice

Q What motivated Ikoma City to become involved in the PPS ?

A The high level of environmental awareness of the residents in Ikoma City (=civic power), as evidenced by the city's utilisation rate of solar power systems in households that exceeds the national average, is considered to be a local asset.

Since 2009 when the Second Ikoma City Environmental Basic Plan was formulated, the city has emphasised collaboration with residents, organisations and businesses who responded to a public call from the city and has been striving to encourage them to participate in a wide range of activities ranging from the formulation of plans to implementation and follow-up.

In fiscal year 2013, the city compiled a list of measures that should be taken to further leverage the city's "civic power" and applied for and was selected as an Eco-Model City. One of these measures was the development of a PPS.

Q Going forward, how will electricity be procured?

A In addition to solar power generated by city-owned facilities and Civic Energy Ikoma, Ikoma Civic Power has acquired power from woody biomass power generation since fiscal year 2019, which has improved its renewable energy ratio to 10.2%.

However, this ratio is still inadequate, so in the future, the city would like to supply electricity with high environmental value while also improving Ikoma Civic Power's business potential by acquiring post-FIT electricity from households and solar power generation for which costs are decreasing, without needing to rely on FIT.



Masayuki Kiguchi
Manager, SDGs Promotion Division
Ikoma City Hall

Q What plans are in place to develop operations in the future?

A Since Ikoma is a residential city, we believe that we can achieve better results by working together with residents to take environmental action as part of our overall urban development strategy.

One example of such an initiative is the electric power business which is centred on Ikoma Civic Power. We would like to promote the local production of energy for local consumption by expanding renewable energy sources and suppliers.

Another example is an initiative for the development of a "multifunctional community space" that plays a variety of roles in the community, such as promoting health, mobile catering and the exchange of unused articles. We believe that an increase in the number of convenient bases located close by will lead to a reduction in CO₂ emissions.

Ikoma declared itself a "Zero-Carbon City" in November 2019 and will continue to take the lead in actions to achieve our ambitious goals.

Case 3 Yoshino River Basin, Tokushima Prefecture

Creating a System to Preserve Sustainable Agriculture and Environmental Conservation Activities with the Establishment of an Oriental White Stork Brand

① Background and issues

- The Yoshino River basin is a thriving agricultural area. Naruto City in particular is a vast area of farmland primarily focused on growing lotus root.
- A rich natural environment for aquatic life and insects is preserved as shallow water covers the lotus paddy fields all year round and the environmentally-friendly farming of the past continues to be practiced.
- However, although agriculture is the primary industry in this region, the lack of future leaders and regional revitalisation have become issues due to a decrease in farmlands and the rising age of producers.
- In the spring of 2015, two Oriental white storks from the Tajima region in the northern part of Hyogo Prefecture flew to Naruto City and began to build a nest on a utility pole.
- In 2017, the pair succeeded in breeding in the wild for the first time around the Tajima area, which continued for three consecutive years until 2019. However, there was only one pair of storks that were breeding and the feeding environment required further improvements.
- The arrival of the Oriental white storks marked the start of efforts to revitalise agriculture and local industries, using the storks as a symbol.

② Overview of activities

- In May 2015, the "Liaison Council for Promoting the Settlement of the Oriental White Stork" (hereinafter referred to as the "council") was established with the participation of 10 (and later 12) groups, including Tokushima Prefecture, Naruto City, Tokushima University, Shikoku University, local JA, producer groups, and the Tokushima Prefectural Branch of the Wild Bird Society of Japan, with the aim of promoting the settlement of storks and revitalising the local region.
- In order to secure feeding sites and set up measures on how visitors should behave, the council set up five expert subcommittees: nesting, biological surveys, feeding sites, awareness raising, and brand promotion. Mr. Ezaki from the Hyogo Park of the Oriental White Stork was invited to take part in the council as an advisor.
- The council's activities were financed through a fund from the Ministry of the Environment for projects related to the Circular and Ecological Economy, as well as a budget from the prefecture, grants from the Nichia Furusato Foundation, and donations from residents and others. Decision making for activities was delegated to each entity and individual subcommittees and activities were promoted on an individual basis.
- In August 2017, Naruto City began the operation of the "Naruto City Oriental White Stork Brand Certification System." The city certifies lotus root grown by farmers who meet two requirements ("eco-farmer certification" and "efforts to secure feeding grounds for the Oriental white stork") as "Stork Hospitality Lotus Root," which is sold through the local JA.
- These initiatives will help promote eco-friendly agricultural practices, as well as promote the development of the regional economy.



◀ Logo mark of the Oriental White Stork Brand certification system

Corresponding SDGs



- In order to further build up the number of living creatures in the area that the storks feed on, a biotope is being created using fallow land and surveys are being conducted on local creatures with the participation of local junior high school students and others. Awareness raising activities are also being carried out through a variety of events, such as cooking classes using lotus root and events related to both living creatures and the environment, as well as agriculture and agricultural products.



▲Survey and observation of aquatic creatures in the biotope



▲Cooking class using lotus root

- Efforts are being made to protect the storks by installing signs requesting visitors to watch their behaviour and securing space for parking, since photography and monitoring may interfere with the storks' ability to settle in the area and breed or obstruct agricultural work and passage on farm roads.



▲Signboard (left) and parking lot (right)

- To identify an individual stork, the "Leg Band Attachment Project Team," consisting of members from the prefectural government, the council, YONDEN Shikoku Electric Power, and the Tokushima Zoo, among others, is attaching bands to the legs of chicks, identifying the sex using DNA, and surveying their habitats.



▲Securing a leg band attachment

- In 2018, the prefectural government and council installed an artificial nest tower to ensure that the storks could nest safely. The artificial nest tower is 12 meters high and is paid for by the prefecture.



▲Nesting on a utility pole (left) and an artificial nest tower (right)

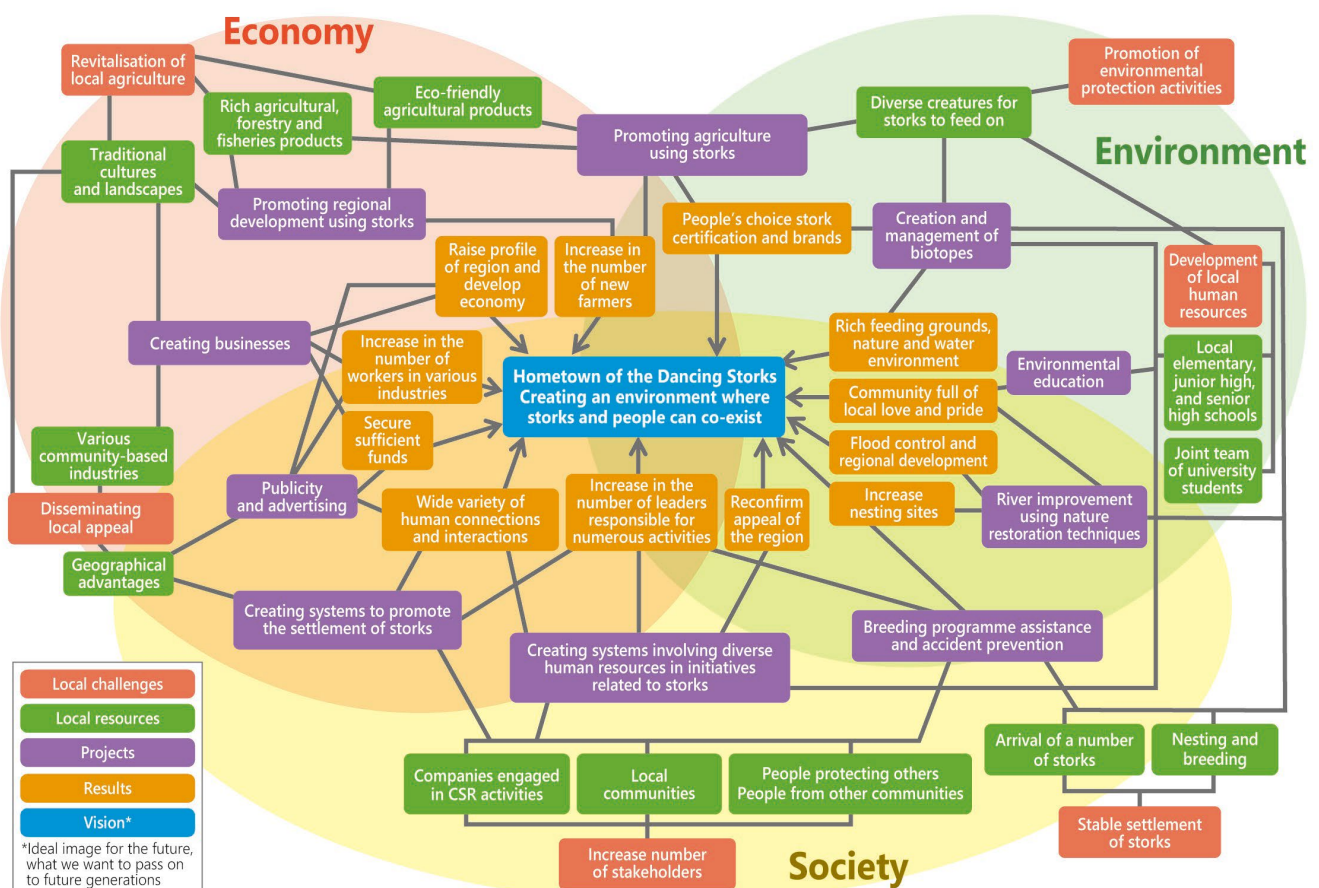
►► Pioneering Cities Engaged in the Creation of a Circular and Ecological Economy

③ Results of activities and future developments

- Promoting eco-friendly agricultural practices to help storks settle in the area has resulted in an increase in the total area of farmland taken care of by eco-farmers or involving special organic farming practices from 50 ha to 104 ha. As a result of this initiative, up to 31 storks were sighted in the Naruto City area in October 2019.
- Due to an increase in the number of shipments to new markets and growing momentum for local eco-friendly farming practices, 23 brands were certified (number of farms) in 2020. The effects of the project are also visible, including the arrival of about 10 prospective farmers from outside the city.
- Branding for lotus root produced using eco-friendly agricultural practices is being promoted with a focus on the lotus root vegetable itself. In the future, more products will continue to be developed under the stork brand, sales channels will expand, and local agriculture will be revitalised.
- Currently, the council is facing challenges in terms of securing funds and human resources in order to expand initiatives further in the future. Therefore, the non-profit Tokushima Stork Fund was established

in August 2019 with the core members of the council. The members visited hundreds of organisations, including companies, to establish the foundation and were able to encourage almost 90 groups to join as supporting members.

- With the establishment of the non-profit, the council has been able to involve corporations as stakeholders, which had been difficult. By becoming a certified non-profit, they have been able to set up a stronger funding system and activity structure.
- In addition, the council is planning to add on to the biotope using a direct payment system sponsored by the Ministry of Agriculture, Forestry and Fisheries, take part in the development plan for the Tokushima Prefecture Stork Foster Parent Centre (tentative name), and collaborate with the Yoshino River Basin Dancing Stork and Crane Ecosystem Network Council, an organisation under the Ministry of Land, Infrastructure, Transport and Tourism, to strengthen cooperation with local organisations and businesses by participating in community-wide nature restoration projects associated with river development.



▲Vision of the local community

Voice

Q What was your motivation in setting up the council and becoming involved in activities?

A In the spring of 2015, a farmer discovered that storks were flying into a lotus paddy field. This became a topic of conversation and was reported in the media, which attracted a number of visitors to the site. As a result, we found it necessary to immediately begin to consider measures to protect the storks, such as by restricting the entry of visitors and stopping power transmission to protect nests that had been built on utility poles.

At that time, I was an employee at the Tokushima Prefecture's Department of Agriculture, Forestry and Fisheries, where I coordinated with the government, producers organisations and research groups. In May 2015, we were able to launch the Liaison Council for Promoting the Settlement of the Oriental White Stork.

After I retired from the prefectural government in March 2017, I continued to be involved in these activities and am currently serving as the secretary-general of the non-profit organisation established in August 2019.

Q What is the status of the newly established non-profit?

A In order to promote agricultural and regional development through the settlement of storks, the non-profit is responsible for some of the council's projects and administrative work, as well as securing funds for activities. Now that the non-profit has been established, we have been able to secure the participation of a number of companies and individuals.

Q What types of activities are currently being implemented?

A In addition to organising surveys on living creatures and observation tours



Mr. Fumiaki Shibaori (left), Director and Secretary General, Tokushima Stork Fund (non-profit) ((Centre) Mr. Yosuke Inubuse, Chief, Tokushima Prefecture's Management Promotion Division, (Right) Ms. Nayumi Kawada, Director, Tokushima Stork Fund)



This mark is displayed on the packaging of the "Stork Hospitality Lotus Root" and other agricultural materials, and a portion of the proceeds from sales are donated to projects.

for parents/guardians and their children, as well as cooking classes using lotus root, we created a logo mark for products using donations we received in November 2019.

Q What are your plans for the future?

A We would like to increase the number of stork branded products, such as branded sake made from rice grown in rice paddies that are managed as biotopes for storks to use as feeding grounds.

The local economy can be revitalised with the strong promotion of agriculture and industries developed by regions that support storks as stork-certified agricultural products and brands. We believe that revitalising the local economy will attract new leaders to the region, which will help solve local challenges.

Case 4 Shibushi City, Kagoshima Prefecture

Creating a Resource-Circulation Society by Recycling Used Disposable Diapers

① Background and issues

- Since there are no incineration facilities in the local area, Shibushi City has formed a special district authority together with the neighbouring town of Osaki to landfill waste in a final disposal site for general waste.
- In order to reduce the amount of landfilled waste at the final disposal site, Shibushi City started the full-scale separation and collection of waste for 27 items in 2000 under the slogan of “Garbage if mixed, a resource if separated.”
- As a result, although Shibushi has achieved the highest recycling rates in Japan for 13 consecutive years (as an individual city unit) and the volume of landfilled waste has declined, the city is being faced with the challenge of recycling used disposable diapers, which account for about 20% of all landfilled waste.
- In 2007, Shibushi aimed to construct a treatment facility as a subsidised project under its Biomass Town plan, but it was not profitable. In 2010, the city started to consider converting disposable diapers into RPF (refuse paper and plastic fuel), methane fermentation, and high-speed composting facilities, but the study was suspended due to the lack of an established polymer processing method.
- Later, since the So Recycle Center was involved in developing basic technologies for polymer processing, Shibushi put out a call for collaboration to the Unicharm Corporation. Unicharm completed the world’s first basic technology for recycling used disposable diapers in 2015 and had been considering candidate sites for social demonstration tests, which led to this collaboration.

② Overview of activities

- In May 2016, Shibushi City launched the Shibushi City Used Disposable Diaper Recycling Promotion Council, consisting of 17 organizations and individuals, including Unicharm.
- In November of the same year, Shibushi City, the So Recycle Center (Osaki Town), and Unicharm signed a three-party agreement and launched a demonstration project on recycling technologies for used disposable diapers.
- On November 1, a model collection programme for households started in three neighbourhood associations in Shibushi City (Shibushi-cho, Ariake-cho, and Matsuyama-cho) and one neighbourhood association in Osaki Town, and a programme for businesses was launched at one special nursing home for the elderly and one senior citizen nursing home (The program for businesses ended in March 2018).
- Prior to the start of the model collection programme, Shibushi organized briefing sessions for residents in each neighbourhood association to call for their understanding about recycling disposable diapers and cooperation in sorting and disposal.



▲ Briefing session for residents before the demonstration project

Corresponding SDGs



- ▶ Two types of diaper collection bags (large: 45L, small: 20L) were distributed free of charge. Initially, these bags were collected once a week using a special packer truck for the model area (Since April 2018, bags have been loaded onto trucks used to collect raw garbage.)
- ▶ A box with the two large and small special bags for diapers are installed at each garbage station. Those who need them can remove the special bags from the box and place used diapers in them for disposal.
- ▶ In November 2017, a study group on recycling disposable diapers in the Osumi region was set up with the participation of four cities and five towns



▲Collection sites and special bags distributed free



▲Diapers disposed at a garbage station

in the Osumi region (cities of Kanoya, Tarumizu, So and Shibushi, and the towns of Osaki, Higashikushira, Kinko, Minamiosumi and Kimotsuki), businesses, and academic institutions to study the feasibility of this project. However, the project was cancelled because all the towns and cities other than Shibushi and Osaki have incineration facilities and it would not have been profitable.

- ▶ In April 2018, a new agreement was signed for a demonstration project by four groups, including Shibushi City, So Recycle Center, Unicharm and Osaki Town.
- ▶ In August 2019, these four parties signed a memorandum of understanding on a demonstration project for recycling used disposable diapers. The demonstration project is ongoing; the model area has expanded to 71 neighbourhood associations with collection carried out three times a week.
- ▶ The project is financed by the Furusato Kokorozashi Fund (hometown tax payment programme). Most expenditures are marked as outsourcing fees for the recycling and treatment of used disposal diapers, as well as commissioned fees for the model collection of diapers. Income is generated from a subsidy for accelerating regional development, subsidy for regional creation, and the Ministry of the Environment's subsidised project supporting low-carbon waste treatment.

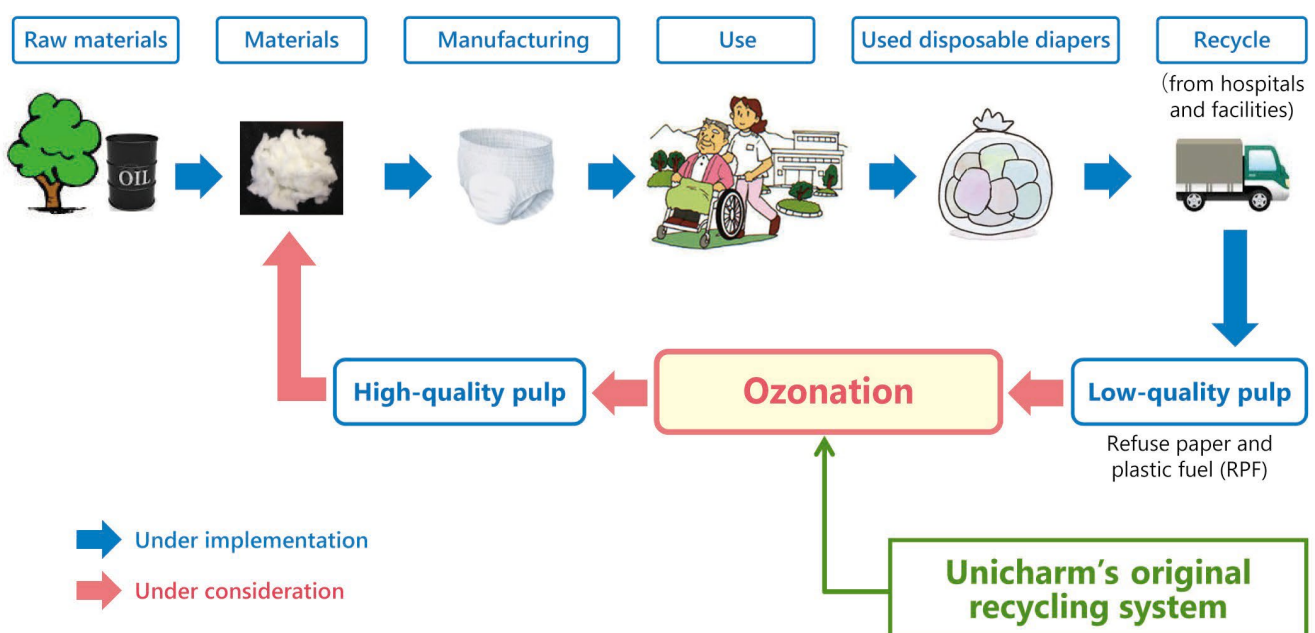


▲Collection

▶▶ Pioneering Cities Engaged in the Creation of a Circular and Ecological Economy

③ Results of activities and future developments

- ▶ One of the benefits of recycling disposable diapers is the effect it has on extending the service life of the final disposal site. According to the results of the abovementioned study, recycling is expected to extend the remaining service life of the final disposal site by 13 years in the case of Shibushi City and Osaki Town where waste is directly landfilled.
- ▶ Extending the service life of the final disposal site will reduce the cost of constructing a new landfill site and earth dams. Reducing the volume of waste directly landfilled by 50 tonnes per year will also have an effect on reducing the generation of methane gas.
- ▶ In addition, since used disposable diapers can be recycled and removed from landfilled waste, this waste can be separated again to produce RPF. This will further reduce the volume of landfilled waste, although there will be issues in terms of quality and stability.
- ▶ The first case of its kind in the world, the material recycling of disposable diapers is also expected to have an economic effect on the region as a result of an increase in the number of inspection visits and by improving the image of the area.
- ▶ Shibushi City is currently distributing bags for the disposal of diapers free of charge, but is considering charging for them in the future. The city is examining setting the cost of these bags at a price lower than that of general garbage bags, which are currently 120 yen for a pack of 10 small bags and 200 yen for a pack of 10 large bags. Charging for these bags will help the city support childcare and reduce the burden on households providing nursing care.
- ▶ In October 2019, Unicharm unveiled prototypes for disposable diapers, toilet paper, memo pads and paper files produced using raw materials that had been recycled from used disposable diapers as the company had completed the technology needed to recycle disposable diapers to a level where they could be used for hygienic products. Unicharm aims to commercialize these products after April 2021.
- ▶ However, there are concerns that people may be resistant to the idea of using disposable diapers produced from recycled pulp. Therefore, it will be necessary to make an effort to raise and spread awareness through the local production of recycled pulp for local consumption (for business cards and city newsletters) and requests to nursing care facilities (active use of recycled diapers), while also helping nursing care facilities in the city understand that the use of recycled diapers poses no hygienic issues and that they are environmentally friendly.



▲Example of Unicharm's vision of a recycling model for disposable diapers

Voice

Q What was Shibushi City's motivation for becoming involved in recycling disposable diapers?

A Shibushi City has been able to reduce landfilled waste by about 80% through thorough separation in cooperation with residents. However, since Shibushi does not have an incineration facility and is not planning to build one due to the cost of construction, maintenance and management, we needed to reduce the amount of waste landfilled even more to extend the service life of the final disposal site and our global warming countermeasures. This is why we focused on recycling disposable diapers, which account for about 20% of landfilled waste.

In addition, if we could remove diapers from landfilled waste, we would be able to make further improvements in terms of sanitation.

Q What was the catalyst for working with Unicharm?

A Unicharm, one of the companies in Japan that manufactures diaper products, was engaged in recycling. Since Unicharm's CSR for the environment aligned with our city's approach to promoting this recycling project, we wanted to conduct demonstration projects and research together with them and invited them to collaborate with us in launching the council.

Q How did you overcome difficulties with collection?

A In order to solve problems when disposing of diapers and challenges in the collection process, city staff personally visited model collection areas and organized briefing sessions for residents. We faced a few difficulties with the initial arrangements for these



Mr. Kiyomi Yamashita

Manager, Environmental Policy Department,
Office of Environmental Policy Resident &
Environment Section, Shibushi City Hall

briefing sessions. However, by gaining the understanding of residents on the background of the disposable diaper recycling project and the disposal process, we have received no complaints about odours and have been able to properly collect diapers in cooperation with residents.

Some residents dispose of diapers with newspapers, so we will continue to brief the residents about the process.

Q How do you plan to move forward with the disposable diaper recycling project in the future?

A In the future, we want to expand this initiative to the entire city. In order to do this, we expect to collect two tonnes of disposable diapers per day and dispose of 500 tonnes a year together with the neighbouring town of Osaki. Since annual recycling and collection costs are estimated at approximately 20 million yen, we will also consider such issues as improving the efficiency of collection and transportation methods, as well as how to increase profitability.

Case 5 Ishikari City, Hokkaido

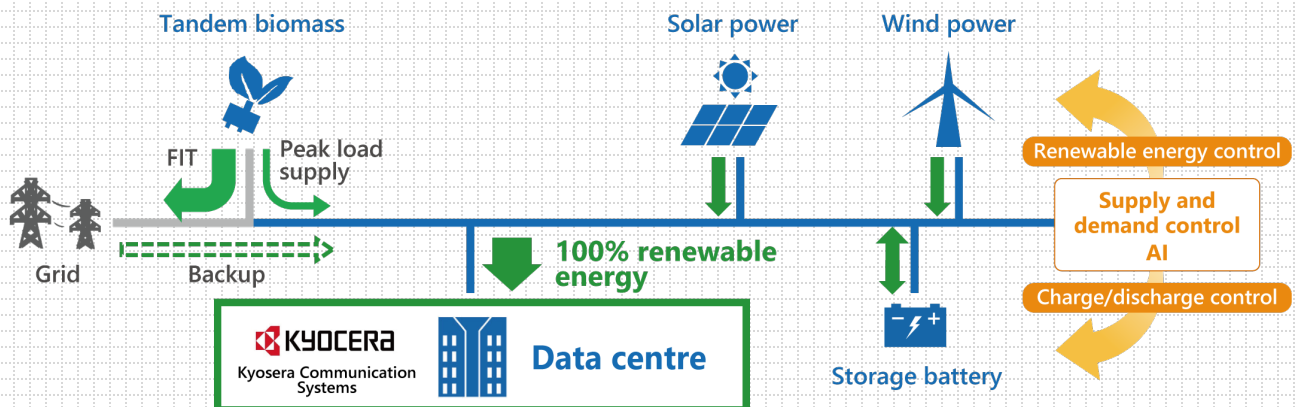
Creation of a Smart Industrial Space Utilizing 100% of the Region's Renewable Energy

① Background and issues

- Adjacent to the north of Sapporo City and overlooking Ishikari Bay, Ishikari is a city with urban functions that are in balance with nature. In recent years, the development of the Ishikari Bay New Port Area, an industrial space with the port at its core, has generated a sense of vitality in the region.
- However, with an increasing concentration of industries in the area, there was a need to take action to create a sustainable region, such as by reducing greenhouse gas emissions over the medium to long term and forming a resilient area in view of the Hokkaido Eastern Iburi earthquake.
- It is for these reasons that Ishikari City is considering plans to use electricity derived from 100% renewable energy in parts of the Ishikari Bay New Port Area by taking hold of renewable energy sources, such as wind, solar and biomass power, that are being developed in the city as local resources.
- By building a system to supply renewable energy for various business activities, Ishikari City is working on revitalising the local economy to attract companies using renewable energy as a starting point for the creation of additional industrial clusters.

② Overview of activities

- Kyocera Communication Systems Co., Ltd. (KCCS) is aiming to realize a "zero-emissions data centre" that operates on 100% renewable energy as a model project that embodies the efforts of Ishikari City (scheduled to be operational in 2021).
- Electricity generated from wind and photovoltaic power facilities installed by KCCS will be supplied directly via private, independently lines, and electricity generated from biomass power will also be introduced.
- In addition to the data centre, Ishikari is also considering supplying electricity to other facilities with the aim of realising a comprehensive supply of renewable energy.
- This project aims to achieve Ishikari City's objective to locally produce renewable energy for local consumption and revitalise the area. As well, the lessons learned from the power outages caused by the Hokkaido Eastern Iburi earthquake have resulted in the construction of a micro-grid system using private, independent lines to realise an autonomous supply of power.



▲System flow diagram

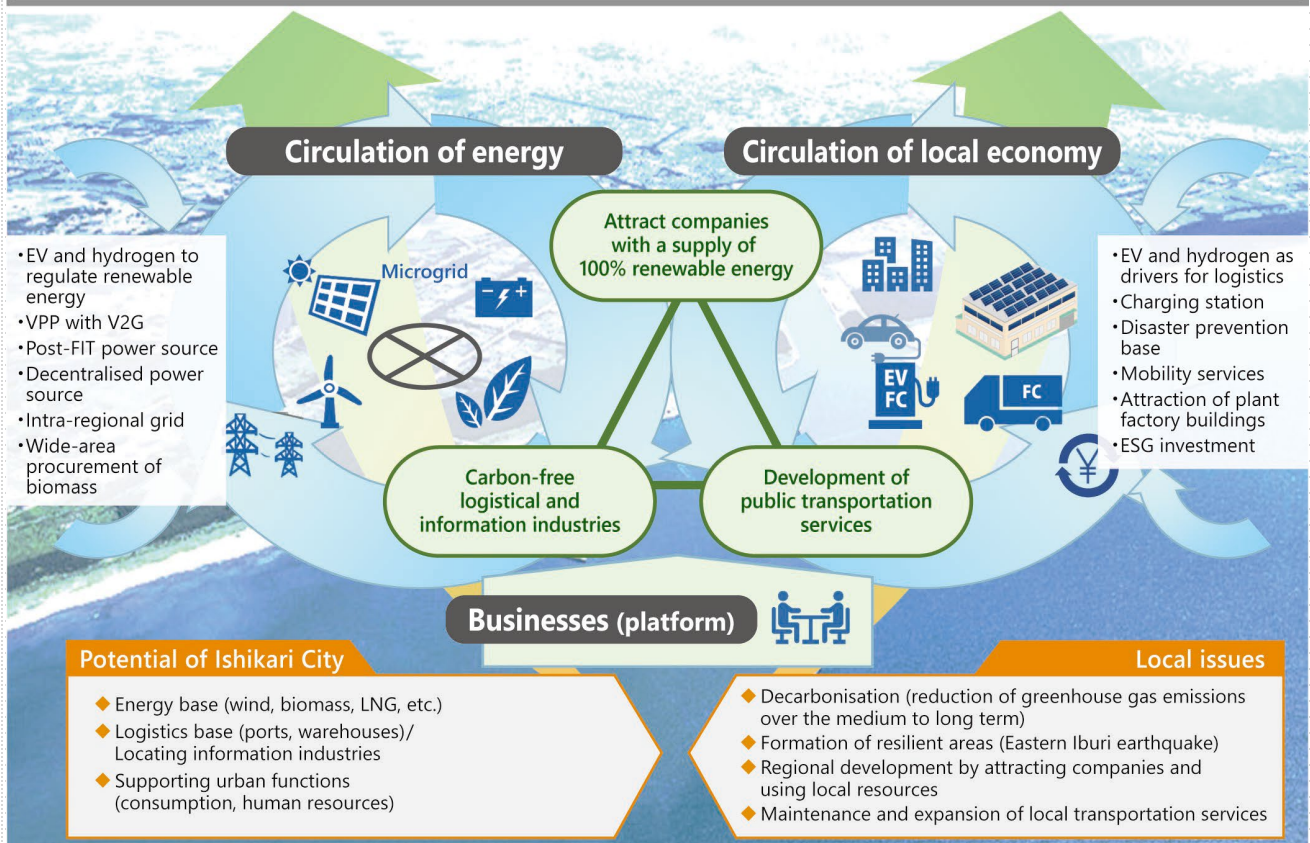
Corresponding SDGs



③ Results of activities and future developments

- ▶ This project will contribute to the development of the local economy by promoting the local production of renewable energy for local consumption through the creation of a data centre for power-intensive industries that Ishikari City is seeking to attract as part of its local economic cycle.
- ▶ In addition, the establishment of a system to utilize renewable energy from the region, which Ishikari City is taking the lead to promote, has the potential to not only turn industrial areas that consume a significant amount of energy into carbon-free areas, but to also create new industries.
- ▶ In addition, in order to utilise unstable renewable energy in a smart way, Ishikari City is considering the introduction of hydrogen, electric vehicles, and closed growing systems for the year-round production of vegetables to regulate the supply and demand of electricity.
- ▶ Ishikari City aims to further develop the Ishikari Bay New Port Area, the largest industrial cluster in Hokkaido, into a next-generation industrial space through the introduction of renewable energy and coupling of sectors in various industries.

Decarbonization, industrial development and expansion of public services = Realisation of Ishikari's version of a Circular and Ecological Economy



▲Ideal image of a Circular and Ecological Economy

Case 6 Shikaoi Town, Hokkaido

Building a Hydrogen Supply Chain Model Using Hydrogen Derived from Livestock Manure

① Background and issues

- Shikaoi Town in Hokkaido is an agricultural area centred on dairy farming and field crops and where the disposal of large amounts of livestock manure has become an issue.
- Around 2001, Shikaoi Town began a study on the use of a centralised biogas plant to treat livestock manure, which had been treated individually on farms, and formulated the “Biomass Town Plan” in March 2006.
- The Environmental Conservation Center, which contains a biogas plant, composting plant and other facilities, started operation in October 2007.
- In addition to utilising refined biogas as energy, the digestive liquid that is generated can be returned to farms as high-quality organic fertiliser at lower costs than commercial compost, which can lead to initiatives that have less of an environmental impact, ease the burden on livestock farmers and reduce odours caused by the dispersion of manure.
- Shikaoi Town has also helped promote local industries by using the surplus heat generated by the facility in PVC greenhouses used to grow mangos, breeding sturgeon, and the long-term storage of sweet potatoes.

② Overview of activities

- Since 2015, Shikaoi Town has carried out the first demonstration of its kind in Japan on the construction of an integrated hydrogen energy supply chain model that produces, stores, transports, supplies and uses hydrogen derived from livestock manure. This is one of the “Hydrogen Society Creation Projects,” which are entrusted to several project implementation organizations by the Ministry of the Environment.
- In January 2017, Shikaoi Hydrogen Farm®, a hydrogen production and supply facility, was installed on the premises of the Environmental Conservation Center, as a demonstration project entrusted by the Ministry of the Environment.
- The Shikaoi Hydrogen Farm® produces hydrogen from biogas supplied by the Environmental Conservation Center.
- The produced hydrogen is used in the Environmental Conservation Center as energy for pure hydrogen fuel cells. Hydrogen is stored and transported to dairy farms and neighbouring facilities in bundles of cylinders in order to supply them with electricity and hot water.
- Electricity generated by fuel cells is used in facilities at the Environmental Conservation Center, and hot water is used to heat the water tanks in the sturgeon breeding facility.
- Shikaoi Town has also installed Hokkaido’s first stationary hydrogen station in the Environmental Conservation Center, which is used as a hydrogen supply station for fuel cell vehicles (FCV) and FC forklifts.



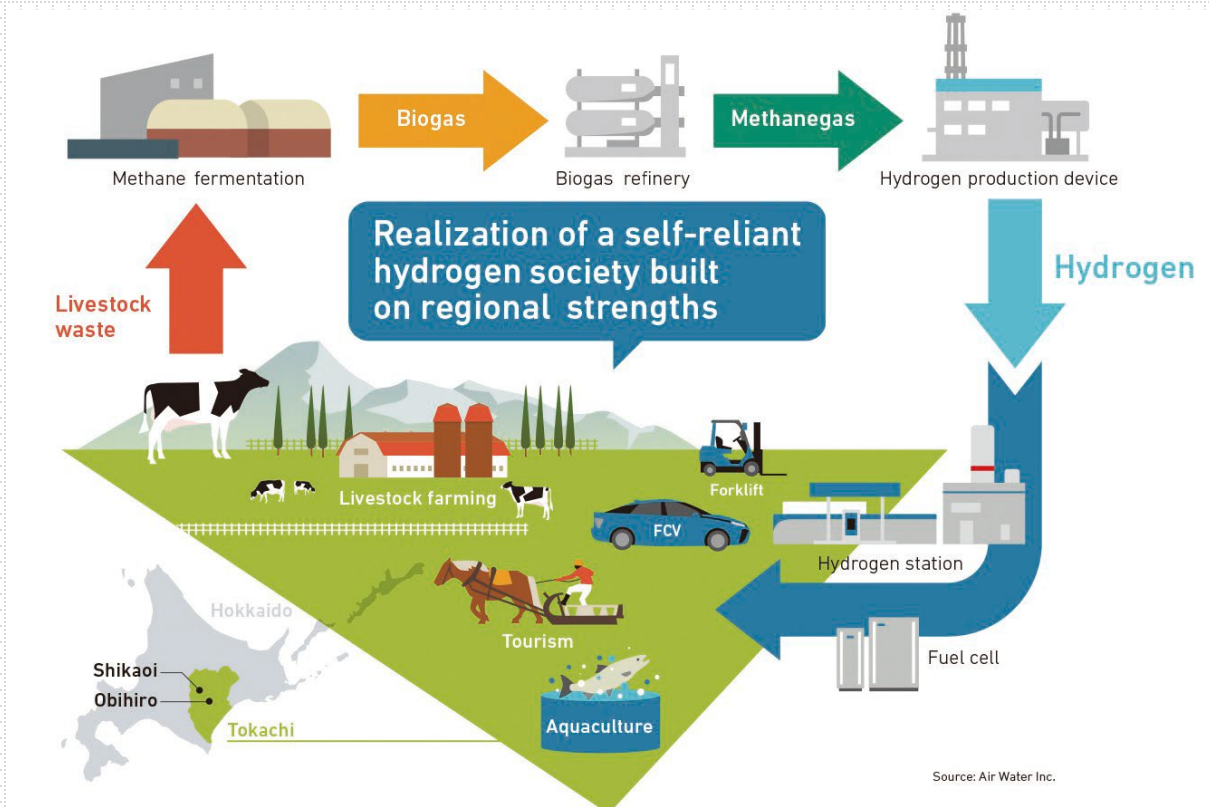
▲Opening ceremony for Shikaoi Hydrogen Farm®

Corresponding SDGs



③ Results of activities and future developments

- ▶ With hydrogen as the new application for biogas, methane fermentation facilities for livestock manure is expected to become more widespread.
- ▶ In addition, the production of hydrogen from biogas will expand its applications as energy and is expected to help in promoting the spread of hydrogen stations, fuel cells and FCVs.
- ▶ By expanding the use of hydrogen to FC forklifts and FC tractors and FC trucks in the future, there will be a significant reduction in the use of fossil fuels.
- ▶ If farming vehicles can be powered by hydrogen instead of fossil fuels, they can also be used to ship products as zero-carbon agricultural products, which will help differentiate local agriculture and revitalise the local economy.
- ▶ The independent, decentralised energy systems of FCVs and fuel cells will also provide a sense of security to local communities as emergency power sources in farming areas in the event of a disaster or power outage.
- ▶ After the demonstration project is completed, Shikaoi Town plans to increase demand for hydrogen in the region, including the commercial application of fuel cells for dairy farms, vegetable storage houses, greenhouses and public facilities.
- ▶ The town will also conduct studies on the introduction of off-site hydrogen stations in urban areas, as well as the feasibility of introducing FCVs, FC forklifts, FC trucks, and FC buses.
- ▶ Shikaoi Town will also continue its efforts to develop similar hydrogen supply chain model projects in the Tokachi district.



▲Image of a society that locally produces and locally consumes hydrogen

Case 7 Akita City, Akita Prefecture

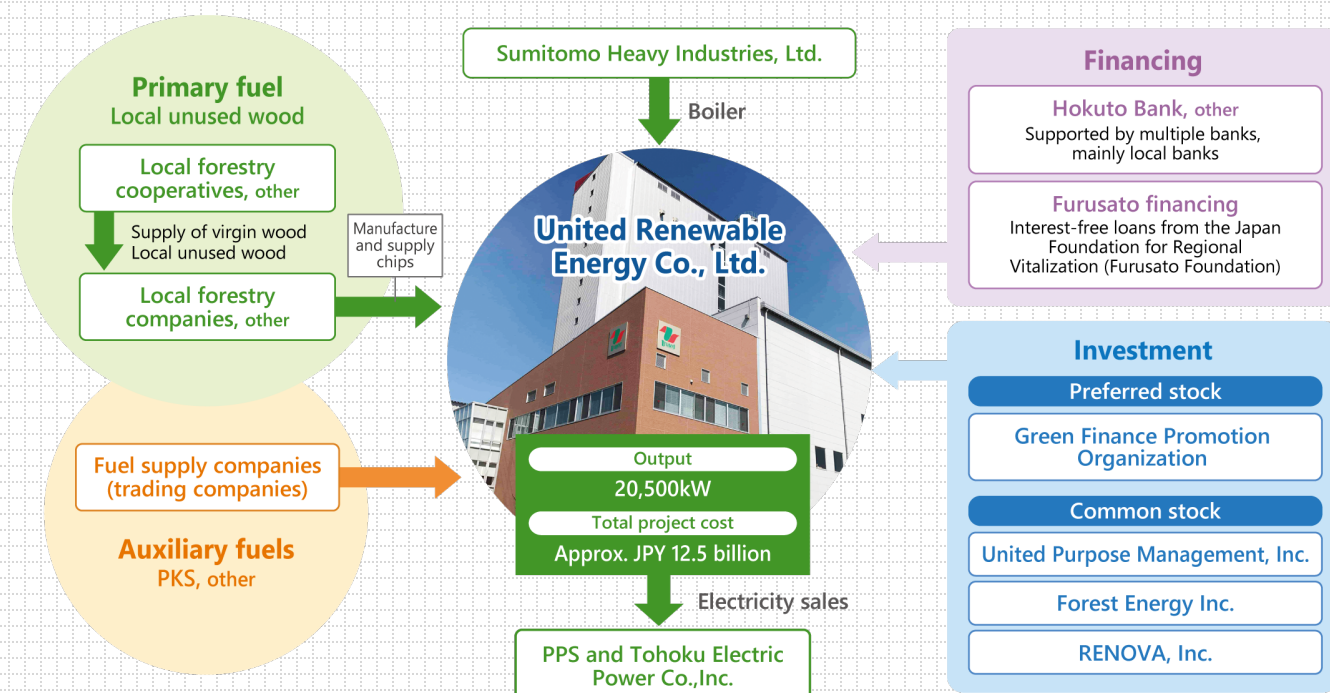
Regional Development & Revitalisation with “Made-in-Akita Power” Utilizing Local Resources (Unused Wood)

① Background and issues

- Forests cover about 70% of the land in Akita Prefecture, which has an abundance of forest resources, including the largest amount of artificial cedar forest resources in Japan.
- However, forest resources are not being used effectively, as there are a number of timber materials that become curved due to the accumulation of snow, especially in the southern part of the prefecture, and components that cannot be used for building materials are left unused in the forest after being cut down.

② Overview of activities

- United Renewable Energy Co., Ltd. was established in October 2013 under the leadership of United Purpose Management, Inc. after the start of the Feed-in Tariff (FIT) system in July 2012, in order to raise the vitality of Akita Prefecture, which has seen an ongoing decline in population and a slowdown in the forest industry. The company is engaged in the generation of wood biomass power, mainly using unused wood in the prefecture as fuel.
- In order to secure unused wood in the prefecture for this project, Akita City visited forestry companies throughout the prefecture to request their understanding and build up a chip supply network.
- Palm Kernel Shells (PKS) are procured from Southeast Asia. Traceability surveys are conducted, including those on the status of acquisition of international RSPO certification.



▲Overview of scheme

Corresponding SDGs



- ▶ In July 2016, a wood biomass power plant started operations with a maximum output of 20,500 kW, one of the largest in the Tohoku region at that time.



▲ Wood biomass power plant

- ▶ About 70% of fuel is produced from unused wood in the prefecture (PKS make up the remaining 30%).
- ▶ In cooperation with the prefectural government, Akita City has developed a system to enable the stable procurement of about 150,000 tonnes of wood chips, which is the primary fuel, each year by concluding long-term chip supply contracts with major material producers and eight forestry cooperatives located throughout the prefecture.
- ▶ With the conclusion of long-term contracts on supplying chips, stable profits for foresters and forestry cooperatives are leading to stable operations, which in turn is leading to investment in new forestry equipment and machinery and increased employment.

③ Results of activities and future developments

- ▶ The application of unused wood in the prefecture plays a role in maintaining the multi-faceted functions of forests, such as flood and landslide control, through the proper management of deteriorated forests and contributes to the revitalisation of local forestry and related industries.
- ▶ The effects on the local economy are expected to be wide-ranging, including new employment opportunities at the power plant, as well as at related chip factories and transportation companies. The employment effect over the 20-year period of this business operation is estimated at 4,710 people with an economic ripple effect of JPY 50.1 billion.
- ▶ The project will also contribute to the control and reduction of CO₂ emissions and is expected to result in an annual reduction of approximately 80,000 tons of CO₂ emissions annually.
- ▶ Observers connected with the Next Generation Energy Park that Akita City is involved in are welcome to visit (for a fee). Souvenirs produced in cooperation with welfare facilities in the city are distributed to visitors.
- ▶ The total amount of the tour fees collected is donated to a fund that aims to regenerate cherry trees in the city with the hope of contributing to forest maintenance in some way.
- ▶ In the future, Akita City will continue to increase the percentage of unused wood in the prefecture, which is currently about 70%, and carry out activities that contribute to regional development and revitalisation in a variety of ways through the provision of "Made-in-Akita Power."

Case 8 Isumi City, Chiba Prefecture

Urban Development Drawing People in Through Food: “Gastronomy Town Isumi: San Sebastian Project”

① Background and issues

- ▶ The primary industry in Isumi City is thriving, blessed with the gifts of nature from the abundant sea, mountains and rivers. The city's mild climate, fertile land and one of the top rocky coastlines in Japan where the Kuroshio and Oyashio currents meet allow for the production and landing of extremely high-quality agricultural and marine products.
- ▶ There are a considerable number of commuters traveling to the metropolitan centre because of Isumi's proximity to Tokyo, and more people move to the city each year in search of a rich natural environment.
- ▶ However, with a declining population, falling birth rates and an aging society, the local economy has shrunk, resulting in stagnant prices for agricultural and marine products, aging workers in agricultural and marine industries, a shortage of successors, an increase in abandoned cultivated land and damage from harmful birds and animals.
- ▶ Thus, there was a need to promote local industries and revitalise the region by consuming high value-added agricultural and marine products locally and making them available for sale nationwide.

② Overview of activities

- ▶ Isumi City is promoting a local development project based on the theme of food called “Gastronomy Town Isumi: San Sebastian Project.”
- ▶ With exquisite food, beautiful scenery and easy access from Tokyo, the numbers of tourists and visitors, population related industries of Isumi City is expected to increase in the future. The city aims to transform itself into a “Gastronomic Tourism City” like San Sebastian in Spain by carefully cultivating and perfecting its food and food culture.
- ▶ Isumi City is engaged in creating high value-added food by communicating and sharing information about the appeal of producers who are working with food and the natural environment through experience tour at the workplaces of producers.
- ▶ Isumi City also organises special one-day only restaurants where local producers and chefs offer full-course meals using local ingredients, in addition to seminars where the value of food is reaffirmed, which helps disseminate its appeal to residents.



▲Agricultural/Fishery experience tour

Corresponding SDGs



- ▶ In 2012, Isumi City established a Liaison Council for the Development of Rural Communities Coexisting with Nature, which is comprised of agricultural groups and organisations engaged in conserving the natural environment and biodiversity. The council is working to revitalise the region through the promotion of environmental-friendly agriculture and the conservation and restoration of the natural environment.
- ▶ Isumi City uses local-grown organic rice that is 100% sustainably produced for school lunches. The brand-name rice, called "Isumikko," is sold in the Tokyo metropolitan area with the empathy of sustainable agriculture and local food production for local consumption.
- ▶ In addition, Isumi City took part in the first "SDGs leader training program for creating the future of a

sustainable region" organised by the Ministry of the Environment to develop young leaders able to both continuously and proactively work on resolving local issues with a focus on the environment in order to realise a sustainable society. The city also helped organize a three-day on-site training programme with lectures and observation tours from October 4 to 6, 2019.

- ▶ During the training, participants visited persons engaging in agriculture and fishery and entrepreneurs who have moved to the area in order to learn about initiatives in building relationships and creating sustainable communities under the theme of learning about new agricultural, fishing and lifestyle practices in Isumi City in Chiba Prefecture, a treasury of local resources, and imagined ways to develop businesses that leverage local resources.



▲The brand-name rice "Isumikko"



▲SDGs leader training

③ Results of activities and future developments

- ▶ By revitalising the agricultural and fisheries industries and promoting the "Gastronomic Town of Isumi: San Sebastian Project," Isumi City hopes to create a community where visitors can enjoy themselves through food, which in turn is expected to increase income, generate employment, and revitalise the local economy.

- ▶ The municipality and private sector will work together to shape the appeal of the region through food, which will enable people living in Isumi City to take pride in their hometown and communicate the allure of the region to visitors. The city will continue to develop the area as a brand so that it will be recognised as a "Gastronomy Town" that exists in harmony with nature together with a diverse group of living creatures.

Case 9 Odawara City, Kanagawa Prefecture

Urban Development with the Circulation of People and Funds through the “Odawara Forest-Countryside-River-Sea Brand”

① Background and issues

- Although it is located in the suburbs of Tokyo, Odawara City's all-in-one natural environment of forests, the countryside, rivers and the sea can all be found within the city limits.



- However, due to a shrinking population, aging society with falling birth rates and a transformation in lifestyles, there has been an increase in abandoned cultivated land, damage by birds and animals, devastation of forests and satoyama (secondary forests), and less interaction by residents with the natural environment.

- The Odawara Environmental Citizen's Network was established in March 2016 to revitalise environmental conservation and restoration activities in the region. Formed with the network at its core, a collaborative system with diverse actors, including Odawara City, universities, local businesses and financial institutions, and the Chamber of Commerce and Industry, was established to resolve issues.

- In addition, as part of the Odawara Forest-Countryside-River-Sea incubation project called “Yosegi,” the city has been conducting studies and research on how the network can operate in a sustainable way by leveraging the specialized knowledge of universities and the innovative ideas, dynamism and expertise of university students in collaboration between the city, the Odawara Environmental Citizens Network and universities.

② Overview of activities

- Based on these activities, since 2019, Odawara City has been engaged in the development of a system that will add economic and social value to solution-oriented activities through diverse partnerships with the aim of “maximising what Odawara has to offer by refining local resources and passing them down to the next generation in a richer state.”
- In order to develop such systems, Odawara City organised a regional consortium of core stakeholders in the region, including Odawara City, the Odawara Environmental Citizen Network, companies, universities, organisations and financial institutions, under the name, “Yosegi Innovation.” The city also launched a study group on new businesses to energise the region and connect researchers recruited through an open call with

regional resources and stakeholders, and provided support to each researcher in formulating plans for projects that help resolve problems.

- Diverse partnership have emerged as a result of collaborations involving stakeholders from various fields and generations, such as Yosegi Innovation and the new project study group.
- Since 2019, Odawara City has been conducting a car-share project in collaboration with REXEV Inc., a car sharing company using electric vehicles in the city, and Shonan Electric Power Company, a PPS specialising in the region. The project also aims to develop a decarbonized regional transportation system by implementing a regional energy management project where electric vehicles are viewed as “mobile storage batteries” and energy is used efficiently in the region.

Corresponding SDGs

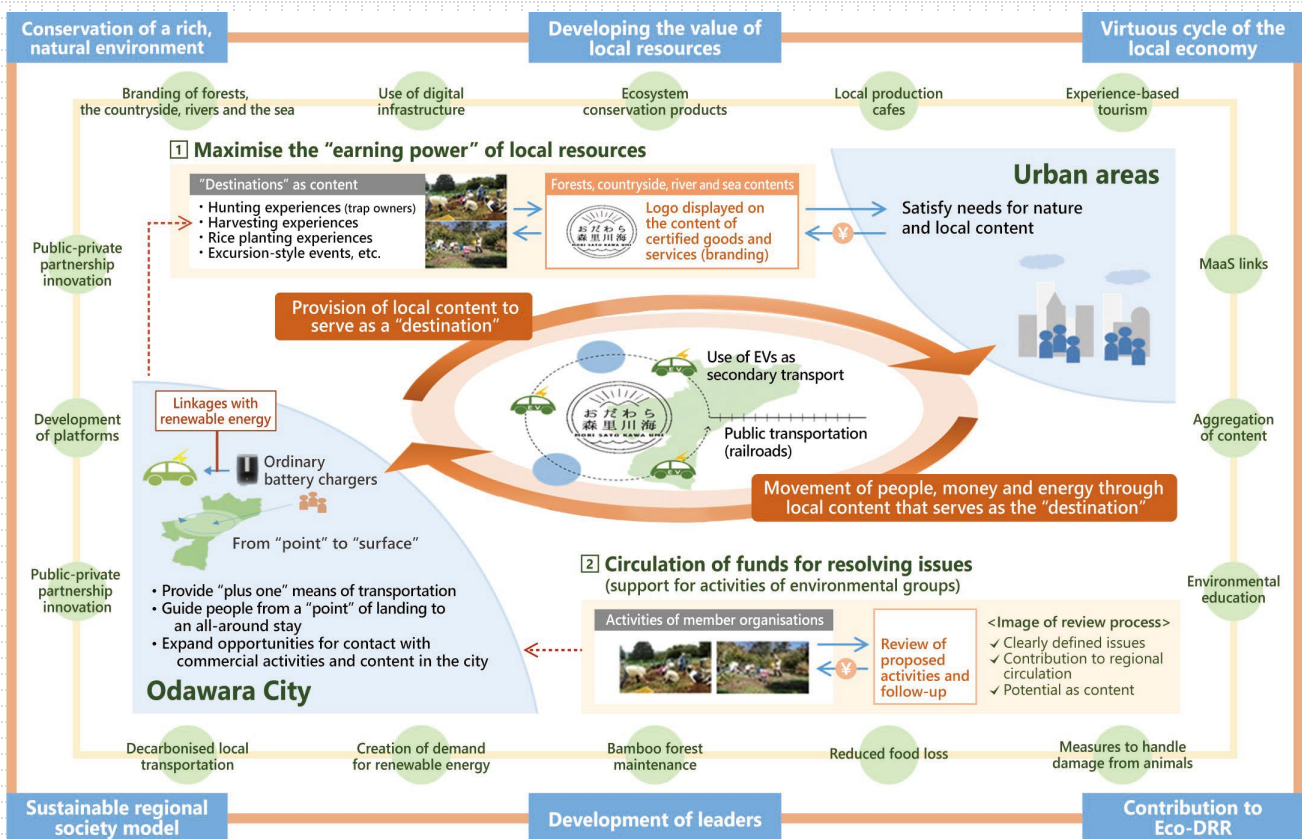


③ Results of activities and future developments

- ▶ In local energy management projects, electric vehicles are expected to revitalise the local economy by connecting local resources throughout the community to create a flow of people. In the event of a power outage caused by a disaster, the electricity stored in electric vehicles can also be used to strengthen disaster prevention functions.
- ▶ In the future, Odawara City aims to create a space for open innovation where human resources from different industries and fields can come together to develop initiatives by connecting individuals and resources to help resolve local challenges.
- ▶ In addition, Odawara City will promote the local production of goods and services for local consumption by bringing together a variety of local products (goods and services) under the integrated

concept of the 'Odawara Forest-Countryside-River-Sea' project, branding them to increase their value and the appeal of the region.

- ▶ Odawara City is also aiming to collaborate with local energy management projects and use it as a secondary transportation system to deliver the 'Odawara Forest-Countryside-River-Sea' products in an all-in-one package.
- ▶ These projects are expected to help reduce the number of abandoned cultivated land and bamboo forests, alleviate damage caused by birds and animals, diminish outflow from the region through the local production of energy for local consumption, and increase the consumption of local products.



▲Ideal community

Case 10 Asahi Village, Nagano Prefecture

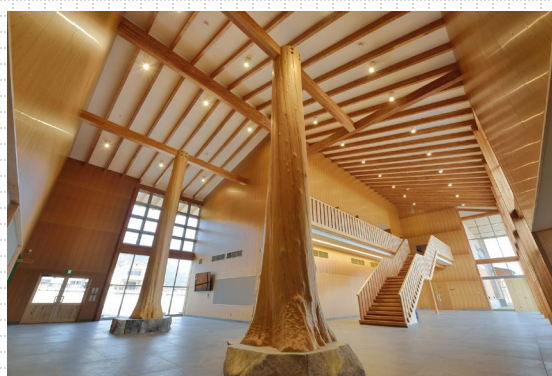
Circle of People and Resources Created Through the Use of Locally-produced Materials

① Background and issues

- Forests cover about 87% of the area in Asahi Village. Sixty years have passed since larch trees had been planted after the end of WWII and they were ready to be cut down.
- For this reason, there was a need to work together with local forestry-related organisations in promoting the application of local lumber by removing, drying and sawing up larch wood to be used in constructing public facilities and converting furnishings into wood.

② Overview of activities

- Since fiscal year 2009, Asahi Village has utilised the prefectural government's afforestation support fund to manufacture desks and chairs for elementary school children, library bookshelves, and benches for public facilities using the larch wood grown locally.
- In fiscal year 2012, the village established a policy for the use of local materials in public buildings and civil engineering works and has actively used larch trees and other materials grown in the village to construct the village hall building, nursery schools and campground cottages.
- The village planned to make use of its local lumber resources and incorporate building materials grown and produced in the prefecture, as well as leading wooden structure technologies and techniques for the construction of the village hall building, which opened in May 2018.



▲Villagers' exchange hall



▲Offices and lobby



▲Large conference room and assembly hall

Corresponding SDGs



- ▶ The village hall building has also been designed on an environmentally-friendly concept with the installation of a photovoltaic power generation system and geothermal heat used for air-conditioning in the offices and lobby.



▲ Photovoltaic power generation system for the village hall building

- ▶ Asahi Village is also installing quick chargers and promoting the expanded use of electric vehicles and plug-in hybrid vehicles as next-generation initiatives.



▲ Air-conditioning system using geothermal heat (Radiant panels)

③ Results of activities and future developments

- ▶ These initiatives are expected to become a model for the application of larch wood with the bold use of the larch trees grown in the village that are ready to be harvested in the form of adhesive built-up beams, laminated wood and thick panels.
- ▶ In addition, the use of building materials developed by the prefecture and local companies, as well as the involvement of local companies in the majority of logging, lumber processing, construction work and production of furniture has resulted in a concentration of skills and experiences and led to the development of human resources and identification of future leaders.
- ▶ In recognition of these initiatives, Asahi Village received the Minister of Agriculture, Forestry and Fisheries Award and the Nagano Prefecture Governor's Award for Hometown Afforestation (Shinshu wood use category) at the Excellent Wood Use Facility Competition in fiscal year 2018.
- ▶ The use of geothermal heating and cooling in offices is expected to reduce energy consumption by about 60% and CO₂ emissions by about 70% in contrast with the conventional use of kerosene boilers for heating and air-conditioners for cooling.
- ▶ Photovoltaic power generation is also expected to help reduce CO₂ emissions by approximately 22 tonnes per year and ensure energy supply in the event of a disaster or other emergency.
- ▶ Asahi Village will continue to promote the use of locally grown and produced lumber in public facilities in the future and will communicate the appeal of lumber both inside and outside the village with the aim of revitalising the region through the use of local resources.

Case 11 Ise-Shima National Park

Increasing the Number of Tourists and Revitalising the Region Through Onsens & Gastronomy Tourism

① Background and issues

- With breath-taking scenery that allows people to experience the relationship between individuals and nature, Ise-Shima National Park has a significantly higher percentage of privately-owned land and a much larger residential population within the borders of the park itself in comparison to other national parks in Japan. This distinctive feature allows visitors to experience the lives, history, culture and customs of the local people.
- The national government formulated the “Tourism Vision to Support the Future of Japan” in March 2016, setting a goal to brand Japan’s national parks on a world-class level and increase the number of foreign visitors to parks in Japan to 10 million annually by 2020.
- In order to achieve this goal, the government developed a “Project to Fully Enjoy National Parks,” selecting Ise-Shima National Park as one of the leading models for the project in July 2016.
- While the potential of the natural environment, culture, history and food of Ise-Shima National Park is considerable, it has not been fully utilised as the environment for welcoming overseas visitors to Japan has not been adequately developed in terms of both tangible and intangible aspects.
- Therefore, the challenge facing the park was how to create an environment that could provide appealing, high-quality and stress-free experiences in nature that overseas visitors to Japan could access.
- The Ise-Shima National Park Step-up Program 2020 was formulated in December 2016, and both the public and private sectors have been working together as a local entity to encourage the use of the park by visitors from overseas.

② Overview of activities

- A “ONSEN and Gastronomy Walking Tour in Shima City and the Ise-ebi (Japanese Lobster) Area of Hamajima” is currently being planned in Hamajima-cho in Shima City, which is located inside Ise-Shima National Park.
- Shima City’s Hamajima-cho area features an exquisite rias coastline with a rich bounty from mountains and sea. The area is also known as a hot spring town.
- Popular mainly in Europe and the United States, “gastronomy tourism” is a form of tourism that aims to provide visitors with the experience of enjoying food cultures shaped by local ingredients, customs, traditions and history.
- “ONSEN Gastronomy Tourism” is a novel experience that combines the concepts of “gastronomy tourism” with a source of pride in Japan, the country’s “onsens,” or hot springs.
- The reasons for using the word “ONSEN” instead of the term “hot springs” in Japanese kanji is to communicate the appeal of onsens not only to tourists from Japan but also those from overseas.

Corresponding SDGs



- ▶ This initiative aims to revitalise the region by framing hot spring areas not only as places where visitors can enjoy the onsens, but also as a base for stay- and interactive-type tourism that draws out and allows many people to experience and enjoy the charms of hot spring areas.
- ▶ The “ONSEN Gastronomy Walking” tour in Shima City is a 9-km course that takes visitors through the stunning views of the Shima Peninsula and the Kumano Sea, as well as the nostalgic atmosphere of a fishermen’s town lined with fishing boats.
- ▶ This is an event where visitors can walk around and get in touch with the nature and history of the area, taste local delicacies and soak in the hot springs after the walk.
- ▶ Organised with Shima City, a special group tour train, the “Kagirohi,” runs from Kintetsu Osaka-Namba Station and Kintetsu Nagoya Station to Kashikojima in Shima City.



▲Kagirohi group tour train



▲Walking course



▲Local delicacies



▲Hot spring

③ Results of activities and future developments

- ▶ A high-quality scenic environment will continue to be developed in the future to increase the number of visitors, including those from overseas, and to create a comfortable user environment that includes access to major bases.
- ▶ Further efforts will also be made to improve and refine tourism resources so they can be offered as high-quality interactive programmes in nature, complete with a storyline.

Case 12 Maniwa City, Okayama Prefecture

Creating a Model for the Conservation of Satochi, Satoyama and Satoumi through Energy and Food

① Background and issues

- ▶ Located in a mountainous region where forests cover about 80% of the area, Maniwa City has been known as a lumber production area from ancient times.
- ▶ The city has been engaged in the use and recycling of local resources, including woody biomass power generation, new industries such as CLT (Cross Laminated Timber), and the agricultural use of liquid fertiliser produced from food waste.
- ▶ However, despite the city's regional development efforts, the population has continued to shrink and has become unevenly distributed, and measures to address population decline and revitalise the region have become issues for the city.
- ▶ Maniwa City is also located in a wide area, making it difficult to connect people and goods and for the mutual use of resources.
- ▶ Maniwa City was selected as an SDGs FutureCity and Local Government SDGs Model Project in June 2018 in recognition of the diverse initiatives it has implemented over the years.
- ▶ The city aims to form an autonomous virtuous cycle and create a model for the sustainable development of mountainous regions by promoting initiatives for a Circular and Ecological Economy, a regional version of the SDGs.

② Overview of activities

- ▶ From 2019, the city has been engaged in creating the Maniwa-version of a Circular and Ecological Economy by organically linking various activities and resources in the region over the years.
- ▶ In order to create the city's version of a Circular and Ecological Economy, Maniwa exchanged ideas and opinions and shared awareness on their ideal vision at the Maniwa SDGs Roundtable and informal exchange meetings that included representatives from the private sector.
- ▶ The city was also able to share their ideal vision as its overall roadmap through dialogues with the Maniwa City General Planning Council, which is the city's top advisory body.
- ▶ Maniwa City is also collaborating with local companies, organisations, financial institutions and other stakeholders that are central to the implementation of projects.
- ▶ Today, rice produced using oyster shells from the Seto Inland Sea as soil fertilizers in paddy fields has been branded as "Maniwa Satoumi Rice" with the aim of revitalising agriculture and creating a circulation-oriented society.
- ▶ Maniwa Satoumi Rice is used in school lunches at all elementary and junior high schools in the city. It is also listed in study materials to peak the interest of local children on the environment both inside and outside the city.



▲ School lunches with Maniwa Satoumi Rice

Corresponding SDGs

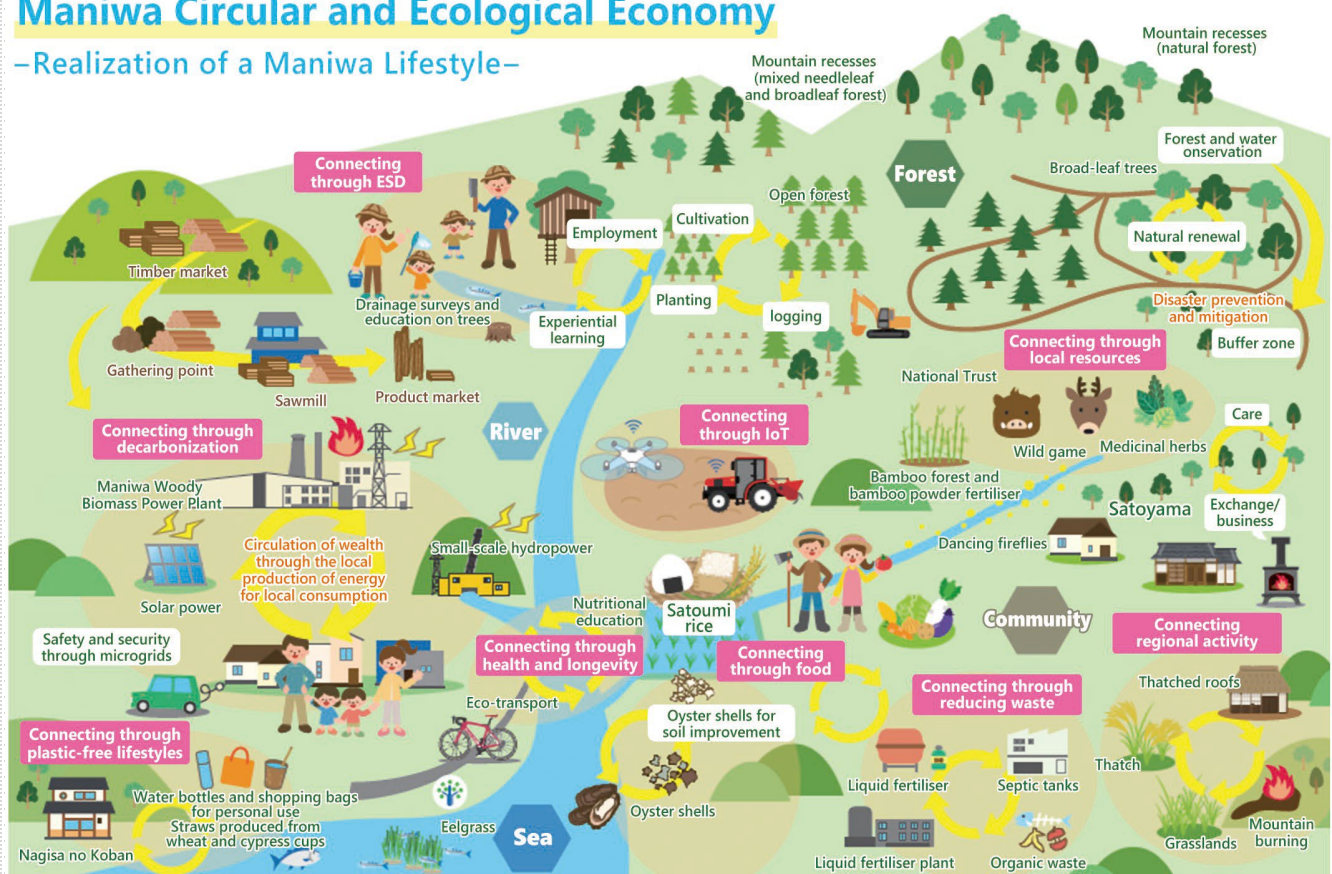


③ Results of activities and future developments

- ▶ The different projects and products that the city is involved in have all been developed individually over the years. However, Maniwa City can communicate a stronger message of its Circular and Ecological Economy by combining them into a unified effort.
- ▶ The city's tax revenue will rise as a result of an increase in the number of corporate versions of the hometown tax system with a better understanding of companies outside the city. Expenditures related to incineration plants will also decrease with a reduction in the amount of waste generated by residents, and new investments are also expected to emerge.
- ▶ Currently, Maniwa City is considering the introduction of a "local microgrid" that can supply electricity to the region even in the event of a disaster in cooperation with the Maniwa Biomass Power Plant and electric utilities. The city plans to continue examining ways to achieve this in the future, and will also investigate methods for effectively utilising the abundant reserves of broadleaf trees that exist in the city together with forestry cooperatives and lumber-related businesses.
- ▶ In this way, Maniwa City aims to become a city with a self-sufficiency rate of 100% in renewable energy, making full use of its forest resources.

Maniwa Circular and Ecological Economy

–Realization of a Maniwa Lifestyle–



Aiming to become a model for the conservation of satochi, satoyama and satoumi through energy and food

▲Regional vision

Case 13 Matsue City, Shimane Prefecture

Creating an Environmentally- and Welfare-Friendly City Using the Green Slow Mobility System, Re×hope

① Background and issues

- ▶ City buses operate in Matsue's city centre around JR Matsue Station and nearby suburbs, while community buses run in outlying suburbs and provide an indispensable means of transport for commuting to work and school, daily shopping and hospital visits for the elderly.
- ▶ However, public transportation is expected to close down or downsize since it is becoming difficult to maintain as the population shrinks. On the other hand, the importance of public transportation is rising as a means of mobility for the elderly and to replace private vehicles, meaning that the decline of public transportation is expected to have a major impact on local lifestyles.

② Overview of activities

- ▶ Matsue City conducted a demonstration project on green slow mobility from September to December 2018 with the aim of establishing a regional public transportation system that will cover "last one mile" movement in areas with inconvenient options for public transport.
- ▶ "Green slow mobility" is defined as a means of "public mobility for four or more people that runs on electricity and operates on public roads at speeds of less than 20 km/h." This type of mobility is environmentally-friendly, can be operated by the elderly and is small enough to travel on narrow roads.
- ▶ Vehicles are operated by the "Association for Eco-friendly × Universal City Planning in Matsue," which was created by the social welfare corporation, Mizuumi, and other groups.
- ▶ The green slow mobility used in the demonstration project was nicknamed "Re×hope" in answer to the desire that people in the area would be able to live with hope once again.
- ▶ The demonstration project was carried out in the following steps: a pre-trial run on a simple route, circulation-type operation in apartment blocks to gradually expand the test run area, and demand-type operation for community-based mutual assistance.
- ▶ To operate this service, it is necessary to be able to respond quickly to bookings made over the phone, so Matsue City made it possible to conduct a quick search of data containing a list of users' names and to aggregate past data to gain an understanding and analyse the number of times the service was used.
- ▶ Vehicles were also equipped with portable batteries and routers so that smart speakers, network cameras and GPS loggers could be used, which improved the network environment inside the vehicles.
- ▶ GPS loggers allow the base station to keep track of the vehicle's location. Any user who knows the URL can access the information on the vehicle's location from a cell phone or computer.



▲ Demonstration project

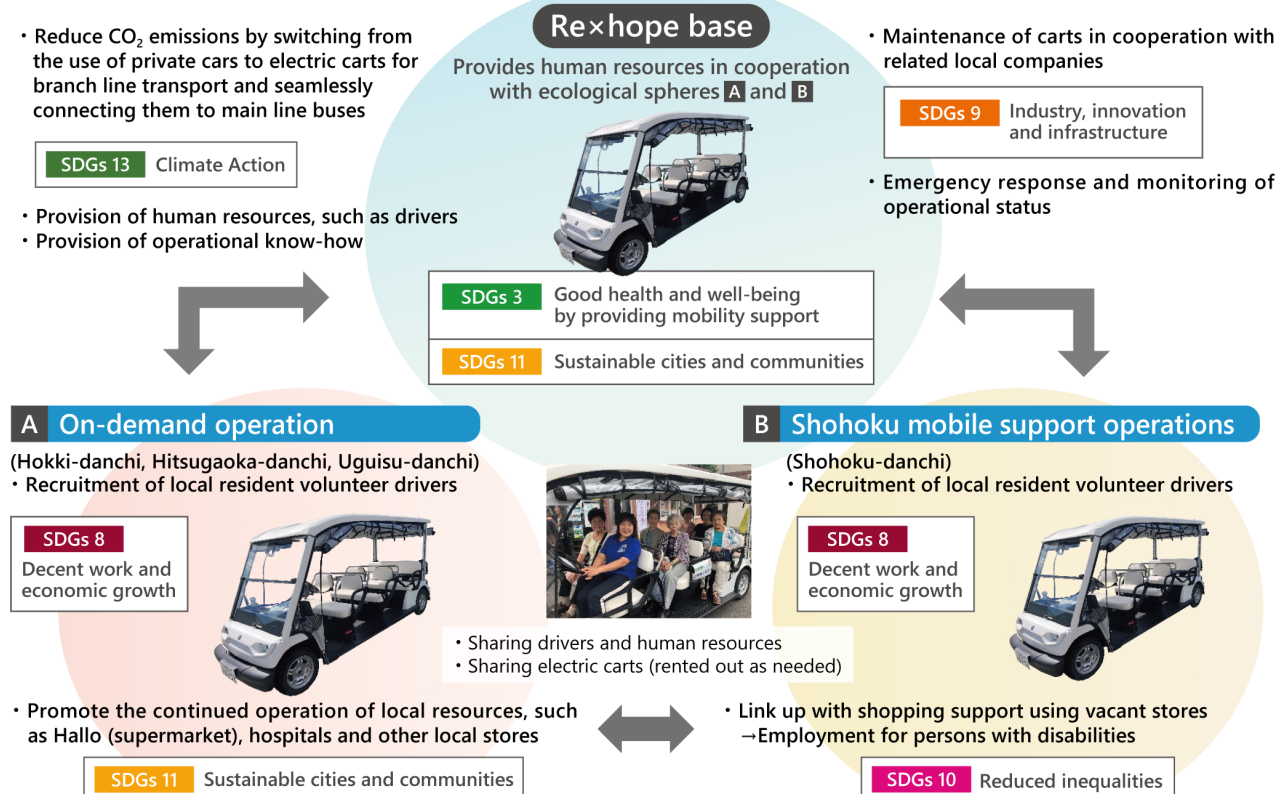
Corresponding SDGs



③ Results of activities and future developments

- ▶ The service was used by a total number of 2,558 users over the approximately 3 1/2-month period. The service was so well received that the city commercialised it for operation from May 2019.
- ▶ In societies with falling populations, the use of green slow mobility is expected to not only provide a sustainable means of transportation, but also improve the health of the elderly by increasing opportunities for them to go out and create job satisfaction by recruiting volunteer drivers from the local community, which will lead to the creation of liveable communities.
- ▶ From April 2020, a paid service was launched for private use (On-demand service is free on weekday mornings and 100 yen per day in the afternoon only).
- ▶ In the future, Matsue City plans to work with local residents to open shops in apartment complexes where stores have closed and escort users using green slow mobility.

Operated by Mizuumi and the "Association for Eco-friendly × Universal City Planning in Matsue"



* In the future, Matsue plans to increase the number of CEE in the city, such as the areas shown in A and B.

▲ Ideal image of a Circular and Ecological Economy

Case 14 Minami-Chikugo Region, Fukuoka Prefecture

Development of Resource Circulation Cities Through the Creation of a Wide-Area Recycling System for Plastics

① Background and issues

- Located in the Minami-Chikugo region of Fukuoka Prefecture, Oki Town has been actively engaged in reducing incinerated waste by treating raw garbage, manure and septic tanks sludge through methane fermentation and utilising them as biomass resources.
- Oki Town and the cities of Miyama and Yanagawa started to sort and collect plastics in fiscal 2010; Chikugo City started sorting and collecting plastics in fiscal 2012.

② Overview of activities

- The “Minami-Chikugo Region Study Group on Comprehensive Plastic Recycling” was established in March 2013 with the participation of seven towns and cities. With Oki Town, Miyama City and Yanagawa City taking the lead and the cities of Chikugo, Yame and Okawa, as well as Hirokawa Town participating as observers, the group launched a study on a wide-area recycling system for plastics in the Minami-Chikugo region.
- Constructed in Oki Town by a private operator that had taken part in the study group, the primary sorting facility for waste plastic and oil conversion facility started operations in April 2018.
- In this project, collected plastics are separated and oil is produced in an oil conversion facility from plastics other than container and packaging plastics.
- Several issues needed to be addressed in order to commercialise the project, including securing a stable supply of separated plastics, guaranteeing recycling rates through advanced separation, securing demand for recycled products, cooperation and division of roles between the public and private sector, and public awareness and consensus building for residents.
- However, the project was successfully commercialised due to (1) the existence of municipalities that led, planned and drove activities and promoted consensus building by demonstrating their pioneering achievements to other local governments, (2) the existence of companies in the region that were in charge of the project and able to collaborate, (3) the ability to conduct required studies and demonstration projects through the use of subsidised projects, and (4) the participation of the prefectural government, knowledgeable third parties, and local residents, who, even on a volunteer basis, helped promote the project, share information and build consensus.



▲Primary sorting facility for waste plastic



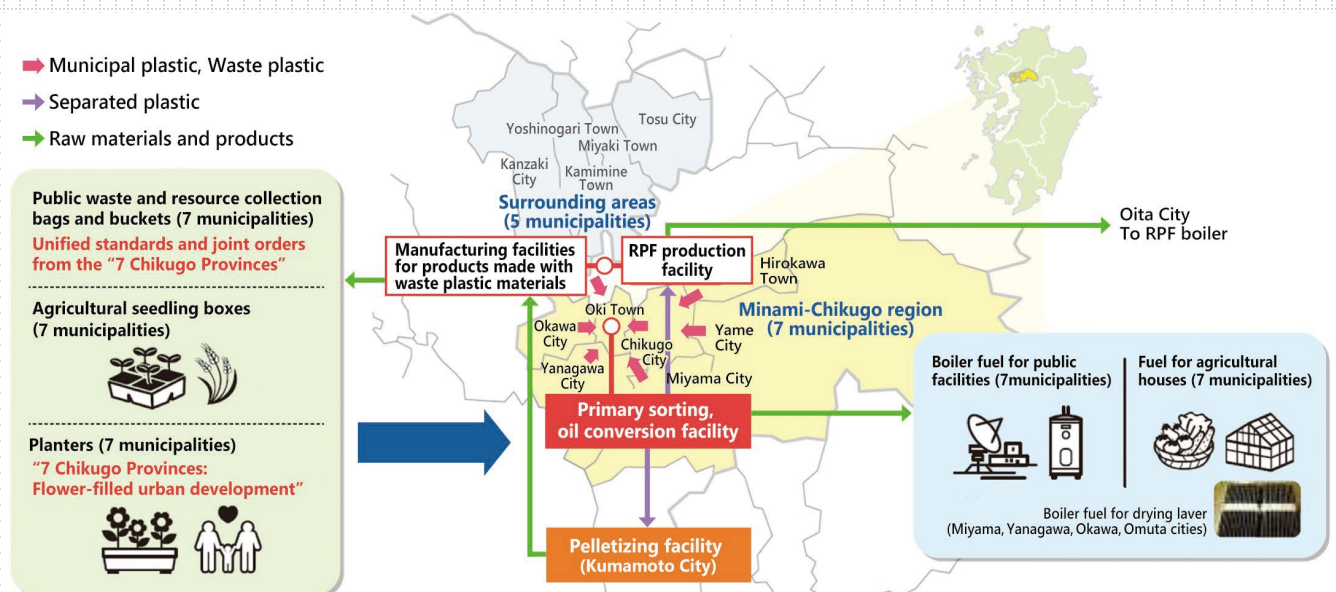
▲Oil conversion equipment

Corresponding SDGs



③ Results of activities and future developments

- ▶ Currently, waste plastic is only collected in Oki Town and the cities of Yanagawa and Miyama. However, in the future, the project aims to establish a comprehensive plastic recycling system in all seven cities and towns in the Minami-Chikugo region.
- ▶ In fiscal 2019, the three municipalities expected to collect 660 tonnes of waste plastic. The cities of Chikugo and Okawa are expected to join the project from fiscal 2020. The five cities are expected to collect 1,000 tonnes of plastic waste per year.
- ▶ The location of the primary sorting and recycling facilities close to residents has served as educational material and lead to an increase in the amount of waste plastic collected.
- ▶ Other benefits may include extending the service life of final disposal sites, reducing waste treatment costs, creating new businesses and employment with the construction of the new primary sorting and resource recovery facility, forming networks with neighbouring municipalities, and contributing to the development of a low-carbon society through recycling. This initiative is also connected to the SDGs.
- ▶ In addition, in recent years, marine litter caused by plastics has become a global problem, and the reduction of plastics and the creation of efficient recycling systems have become issues for the entire international community.
- ▶ This initiative is also attracting attention as one way to utilise plastic waste as waste plastic imports are being restricted by a number of Asian countries and importance is being placed on resource circulation in Japan.
- ▶ The produced oil is used as boiler fuel for public facilities. In the future, the oil will be used as boiler fuel for drying laver and for agricultural greenhouses in the region, which will make it more visible to residents.
- ▶ The municipalities involved also aim to expand this initiative to other types of resource circulation of incinerated waste based on the wide-area circulation of plastics, in addition to developing regional measures to promote public awareness, environmental learning and environmental values.



▲ Ideal image of comprehensive plastic recycling system

Case 15 Sasebo City, Nagasaki Prefecture

Solar Sharing for Collective Self-Consumption in Huis Ten Bosch

① Background and issues

- Huis Ten Bosch was certified as a Next Generation Energy Park in 2007 and has been engaged in promoting a variety of initiatives by considering future energy approaches that are in balance with the global environment.
- A large-scale photovoltaic power generation system has been installed in the “Closed System of Local Production and Local Consumption” where energy supply and consumption are completed within the park. A co-generation system has also been adopted which effectively uses the heat generated through the production of electricity from natural gas for heating and cooling.
- The Phase 2 building of the “Henn-na Hotel Huis Ten Bosch,” which opened in March 2016, is the first hotel in Japan to adopt a self-sustaining hydrogen energy supply system using renewable energy and hydrogen. Produced using energy generated by solar power, hydrogen is stored for use as fuel cells. This is also the first hotel in Japan to use CLT (Cross Laminated Timber).
- A demonstration test is being conducted at the hotel’s Phase 3 building, which opened in December 2018, using the latest film-type solar cells in order to improve energy self-sufficiency rates.



▲Film-type solar cells

② Overview of activities

- In the spring of 2019, construction started on a blueberry farm for visitors using solar sharing as a new project to simultaneously generate renewable energy and improve food self-sufficiency on site.
- Solar sharing (farming photovoltaics) is an initiative in which electricity is generated through solar power on farmland while the farm continues to operate. This is the first solar sharing initiative in Japan for collective self-consumption.
- Solar panels have been installed on approximately 2,300m² of land in Bastion Square inside the park’s Art Garden. Potted blueberries will be grown in 1,681m² of flat land in the centre of the area using an automated sprinkling system.
- The shielding rate of the solar panels is 37.13%. The pillars are designed to be 3-meters high with 4.1 meter spaces in between so that there is no interference with farming. The electricity generated will be consumed by facilities in Huis Ten Bosch.

Corresponding SDGs



- Blueberries were chosen because they grow well in the shade and are easy to care for in pots. The area is scheduled to be opened as a tourist farm.



▲ Solar sharing for collective self-consumption

- Blueberry picking will be open to visitors for the first time in the early summer of 2020.



▲ Installation location



▲ Cultivated blueberries



▲ Cooking with blueberries

③ Results of activities and future developments

- The amount of electricity generated through solar sharing is expected to be 142,157 kWh per year. The increased usage ratio of renewable energy is expected to reduce CO₂ emissions by 74.08 tonnes per year.
- This initiative is also expected to encourage the local production of electricity and primary products for local consumption, as well as promote visitors' understanding of the environment and renewable energy.
- With the efficient production of electricity and crops to be used in Huis Ten Bosch, the park will continue to improve productivity and customer satisfaction, while ultimately contributing to measures to counter global warming.

Case 16 Aso-Kuju National Park

“Nature × Culture × Experience”: Initiatives for Creating New Value

① Background and issues

- ▶ Aso-Kuju National Park is distinguished by its volcanoes, including Mt. Aso, which towers above one of the world's largest calderas, and the Kuju mountain range to the north, as well as the majestic rolling grasslands that surround them. The park, known as the “Reservoir of Kyushu,” is also blessed with hot springs and spring water produced by the volcanoes and grasslands.
- ▶ Aso's majestic grasslands have been maintained for a millennium with the involvement human activities, such as the controlled burning of grasslands, grass harvesting and grazing. In recent years, maintaining the grasslands has become a significant challenge due to a slowdown in the agricultural and livestock industry, as well as a shortage of leaders.
- ▶ The Kumamoto Earthquake in April 2016 resulted in a drastic fall in the number of visitors to the Aso area. Today, the community has rallied together and is

working on creative revival measures that are aimed not only at recovery, but also at further developing the region.

- ▶ Parallel initiatives are also underway to create a Circular and Ecological Economy that will promote regional revitalisation through the sustainable use of natural resources in the Aso region, such as grasslands, water, and renewable energy, as well as through mutual cooperation with urban areas.



▲Majestic Aso grasslands

② Overview of activities

- ▶ Consisting of local residents and grassland associations, the Aso Grassland Restoration Committee was established in 2005 to protect the grasslands of Aso. The committee is involved in activities to preserve and restore the grasslands, with management carried out by volunteers who provide support for the controlled burning of grasslands and building firebreaks (to prevent flames from controlled burning from spreading to nearby forests and buildings).



▲Controlled burning of grasslands

- ▶ The Aso-Kuju National Park was also selected as one of the leading model areas for the Project to Fully Enjoy National Parks in July 2016, and various initiatives are being promoted to encourage inbound tourism to the park. The use of grasslands, an important resource for this region, in particular, is being promoted.



▲Open air yoga

Corresponding SDGs



- New content is being developed that takes advantage of the grasslands, such as open air yoga on the grasslands overlooking the great caldera, biking and trekking on the grasslands when not in use for farming or raising livestock, and tours speeding around the grasslands in ATVs with less tread pressure.



▲Biking on the grasslands



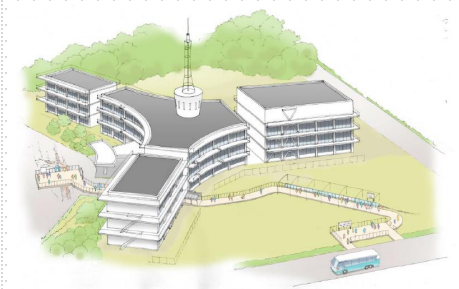
▲ATV racing around the grasslands

- Activities are being promoted to utilise the area's rich water resources. The water-retaining properties of the Suizenji-nori algae, which grows in clean water, is being used in cosmetics, and new businesses are being developed to revitalise the region and protect the environment, such as the introduction of small-scale hydropower that takes advantage of the volume of water in the region.



▲Cultivated Suizenji-nori

- An earthquake museum has been newly constructed as a way to convey the memories and experiences of the Kumamoto Earthquake. A space for storytellers (earthquake guides) to talk about their experiences in the earthquake has also been established.



▲Core facility of the earthquake museum (image)

③ Results of activities and future developments

- As a result of these efforts and the recovery of the transportation network after the earthquake disaster, the number of visitors to the Aso region is expected to increase significantly, prompting concerns about the impacts of traffic congestion and other problems on local lifestyles. For this reason, it will be necessary to consider the promotion of park & ride services and ways to enhance public transportation.
- In the past, initiatives have mainly been focused within the region itself. However, it is now necessary to consider how to move forward by cooperating with urban areas in order to efficiently circulate the local resources of the Aso-Kuju National Park. The Circular and Ecological Economy is expected to expand to even further heights by promoting the utilisation of local resources over a wider area.



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