

Circulating and Ecological Economy

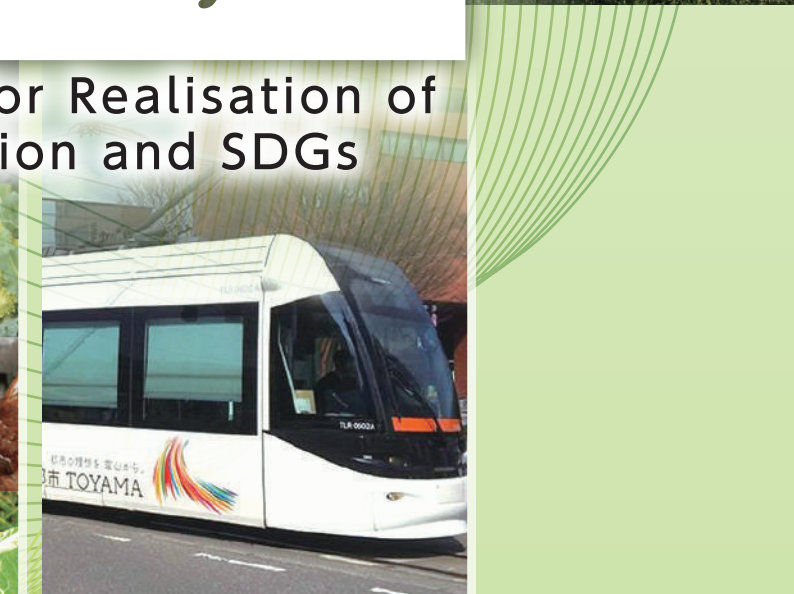
Japan's Vision for Realisation of Decarbonisation and SDGs

Edited and published by Ministry of the Environment, Japan
International Strategy Division, Global Environment Bureau /
Environmental Strategy Division, Minister's Secretariat

Published in July 2019

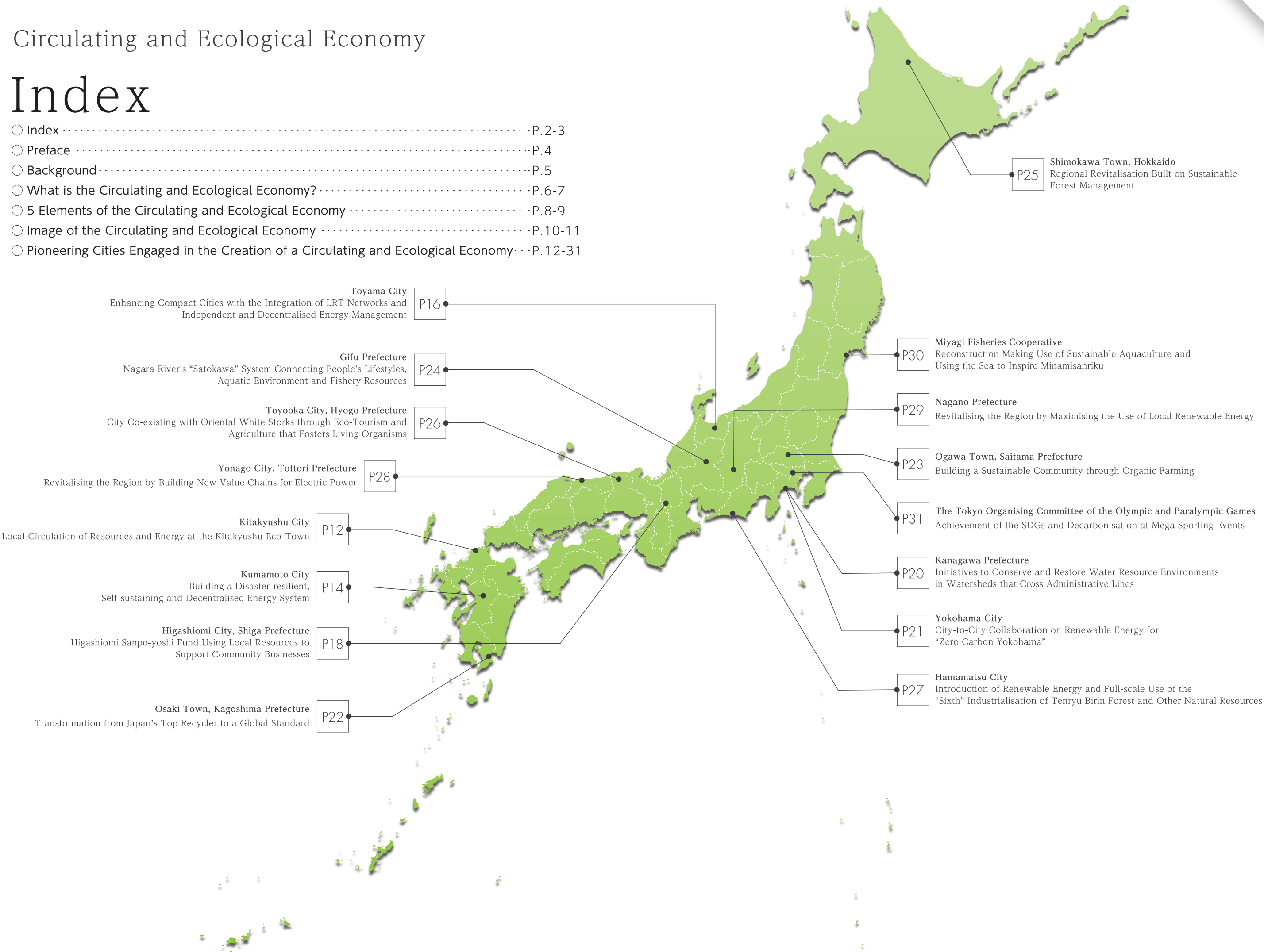
1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, Japan 100-8975
Editorial assistance from the Institute
for Global Environmental Strategies (IGES)

© Ministry of the Environment 2019



Index

- IndexP.2-3
- PrefaceP.4
- BackgroundP.5
- What is the Circulating and Ecological Economy?P.6-7
- 5 Elements of the Circulating and Ecological EconomyP.8-9
- Image of the Circulating and Ecological EconomyP.10-11
- Pioneering Cities Engaged in the Creation of a Circulating and Ecological Economy···P.12-31



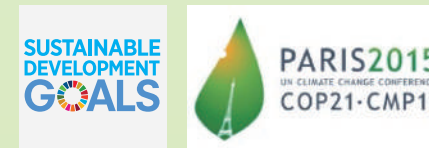
The Japanese government has proposed a vision called “Circulating and Ecological Economy” in the Fifth Basic Environment Plan approved by the Cabinet in April 2018. The Circulating and Ecological Economy is an idea that aims to develop self-reliant and decentralized societies by leveraging regional resources, including natural environments and resources, and maximizing the regional vitality by taking advantage of these various resources while complementing and supporting other areas taking into account the unique characteristics of each region.

The Circulating 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 Japan’s vision for the future towards creating a decarbonized society and achieving the Sustainable Development Goals (SDGs), by unlocking the potential of mountainous, agricultural and fishing villages, and cities.

This concept can be applied globally, based on the circumstances of natural and human capital in each region. This booklet aims to support actions for creating a Circulating and Ecological Economy in many parts of the world by showcasing 16 advanced initiatives in Japan related to the Circulating and Ecological Economy that can be references for other countries and the international community.

Planetary Boundaries and population

The world’s population today has broken through the 7 billion mark and is projected to reach 9.8 billion by 2050. The impact of human activities on the global environment has exceeded the Earth's carrying capacity, plunging into a serious crisis. It is this global environment, the very foundation for the survival of the human race that is now facing a serious crisis. The Paris Agreement and the 2030 Agenda for Sustainable Development, including the SDGs, were adopted to fight this crisis. It is time to implement these agreements in an effective manner.



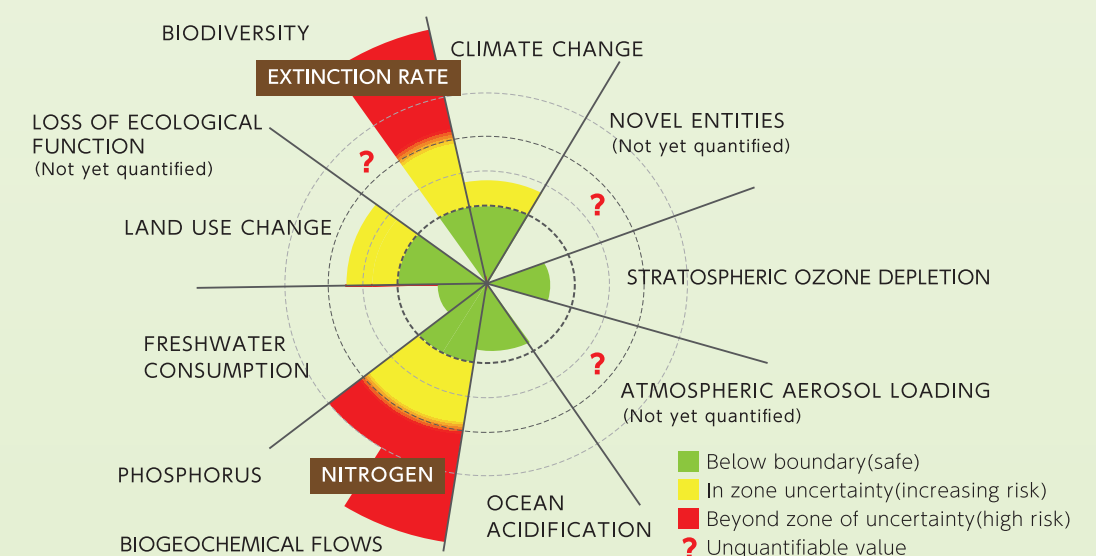
Decline of local economies and communities

It is an issue that can be found in many different places all around the world—the decline of rural areas due to the progress of urbanisation. In Japan, in particular, the excess inflow of people, mainly among the younger generation, from rural areas to cities continues unabated as the country faces the realities of a society with a declining birth rate, an aging population and a decreasing population. Uneven regional disparities with respect to population are growing, in contrast to falling numbers of younger and working-age people in local areas. These phenomena are having a serious impact on environmental protection efforts. For example, there has been an increase in abandoned cultivated land and poorly managed forests due to a declining number of agricultural and forestry workers, which has also led to the decline of biodiversity and eco-system services.



Planetary boundaries

This study on the limitations of the earth (planetary boundaries) is an example of a method to objectively assess the effects of human activity on the global system. According to this study, if the thresholds of each of the boundaries that are related to changes on the earth are crossed and move beyond a range where humanity can continue to thrive, there will be irreversible changes to the natural resources that we depend on. Out of the nine environmental elements that this study targets, the rate of loss of species and the cycling of nitrogen and phosphorus have moved beyond the boundaries of uncertainty into high risk areas. Climate change and land system changes have also been assessed as having crossed over into an increasingly uncertain zone.



Planetary Boundaries

Source: Will Steffen et al. "Guiding human development on a changing planet"

What is the Circulating and Ecological Economy?

○ Features of the Circulating and Ecological Economy (CEE)

- ▶ The CEE offers integrated solutions for the effective use of regional resources in a more 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 (connections among forests, the countryside, rivers and the sea) and economic connections (composed of human resources, financial resources and other elements), the CEE makes extensive use of mountainous, agricultural and fishing villages and cities.

- ▶ The concept of the Circulating and Ecological Economy can be applied to smaller areas, such as at the village and municipal level, but is also applicable to broader areas, such as basins, prefectural level, countries and the Asian region.

○ Benefits of the Circulating and Ecological Economy

- ▶ Continued benefits can be expected with the implementation of environmental measures as a business.
- ▶ The effective use of regional resources and the active involvement of local people 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 each local climate and natural environment. However, in recent years, these cultures and traditional industries have been neglected, resulting in the homogenization of some regions and causing their appeal to fade.

By rediscovering resources that are unique to each region and utilising them in a sustainable manner, an area's attractiveness can be recaptured and economic cycles within the region can be revitalised.

○ What is the key to continuous action?

Traditionally, environmental protection 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 administrations. To this end, broad-based partnerships that include administrations, companies, academia and NPOs, are becoming increasingly important.

○ Why build wide-area networks?

A self-reliant and decentralized society does not aim to isolate local areas. More robust local societies can be formed with each region utilising these resources to refine its strengths and connecting with other regions to support each other while taking advantage of these strengths.



Co-existence with nature: Outlook on nature as seen in the SATOCHI, SATOYAMA and SATOUMI

A traditional way of thinking exists in Japan where nature is respected as a living thing and people are a part of the natural environment. This view of nature has engendered a culture and system in which people and nature co-exist. Farmland and secondary natural environments that people have developed and maintained sustainably are widely known in Japan as "SATOCHI, SATOYAMA and SATOUMI", or "Socio-Ecological Production Landscapes and Seascapes (SEPLS)". SEPLS often serve as "green infrastructure" that reduces disaster risk, while also contributing to the prevention of land degradation, maintenance and improvement of biodiversity, resource circulation and measures to counter climate change.



5 Elements of the Circulating and Ecological Economy

P.10-11 shows the figure of the Circulating and Ecological Economy as an image of the Environmental and Life Centered Civilized Society that Japan should aim for. The five elements—energy, resilience, transportation and mobility, lifestyles and business—are emphasised in the Circulating and Ecological Economy, which depicts a practical model for a “virtuous cycle of the environment and growth”.

ONE

1 Self-reliant and decentralised energy systems

Keywords

- Local production of energy for local consumption and inter-regional exchange
- System supporting regional renewable energy business

- ▶ The use of locally produced renewable energy in the region can result in new business opportunities, including the construction and maintenance of power generation facilities and the production and supply of fuel (when using biomass).
- ▶ Systems where locally-produced renewable energy is used in a region will make it possible to supply a certain amount of energy in the region, even if a large-scale power source which supplies energy to a broader area is damaged in a disaster.
- ▶ In the case of a large city where it is difficult to meet energy demand within the region simply with renewable energy alone, an effective option would be to establish regional collaboration with areas that have a rich source of renewable energy.

TWO

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 resilient against heavy rainfall and the introduction of crops that are resistant to high temperatures.
- ▶ It is possible to use nature itself in preparation for increasingly frequent disasters, which can be effective when properly combined with conventional infrastructure.

THREE

3 User-friendly and attractive transportation and mobility systems

Keywords

- Safe and convenient transportation friendly to 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 servicizing and sharing, have started to emerge.

FOUR

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 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.
- ▶ Healthy and spiritually-rich lifestyles can be created 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.

FIVE

5 Creation of diverse businesses

Keywords

- “Regional energy businesses based on regional management style 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 Circulating and Ecological Economy is one of 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) is to support these new businesses. Not only major financial institutions but also local financial institutions will play an important role in expanding the application of ESG financing.
- ▶ Solution-oriented businesses responding to local needs can be applicable to areas overseas that are facing similar challenges.

On p. 12 and onward, pioneering cases of CEE in Japan are presented. Each case addresses multiple Sustainable Development Goals. Although each case has particular focus on highlighted SDGs, they also cover other Goals.



Circulating and Ecological Economy (Decarbonization originating from Japan · Concept of SDGs)

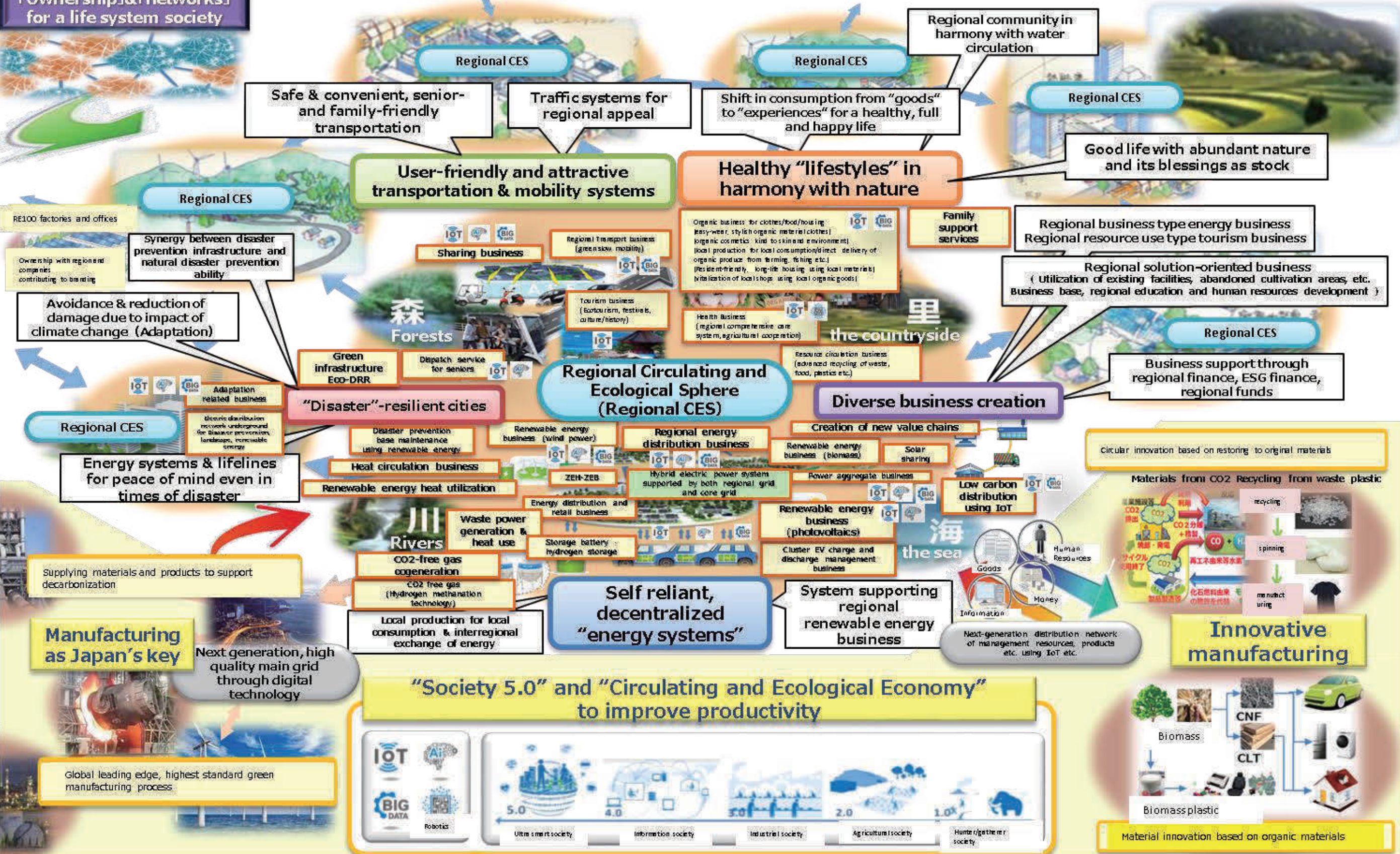
– Integrating cyberspace and physical space, for a life system drawing potential for people and nature from regions –

「Self-reliance & decentralization」×「Mutual cooperation」×「Circulation & symbiosis」 = **vitalization**
 「Ownership」 「Networks」 「Sustainability」 = 「**Circulating and Ecological Economy**」 ⇒ 「**decarbonization · SDGs implementation, to the world**」
 「human security, youth · women's empowerment as a base」

➡ **Basis for region leading to growth with new values and business**

（ People living a healthy, lively, happy life, with pride in a self-reliant region, and by organically linking with other regions, **abundance can extend nationwide** ）

「Ownership」&「networks」
for a life system society



CASE 1 Kitakyushu City

Local Circulation of Resources and Energy at the Kitakyushu Eco-Town

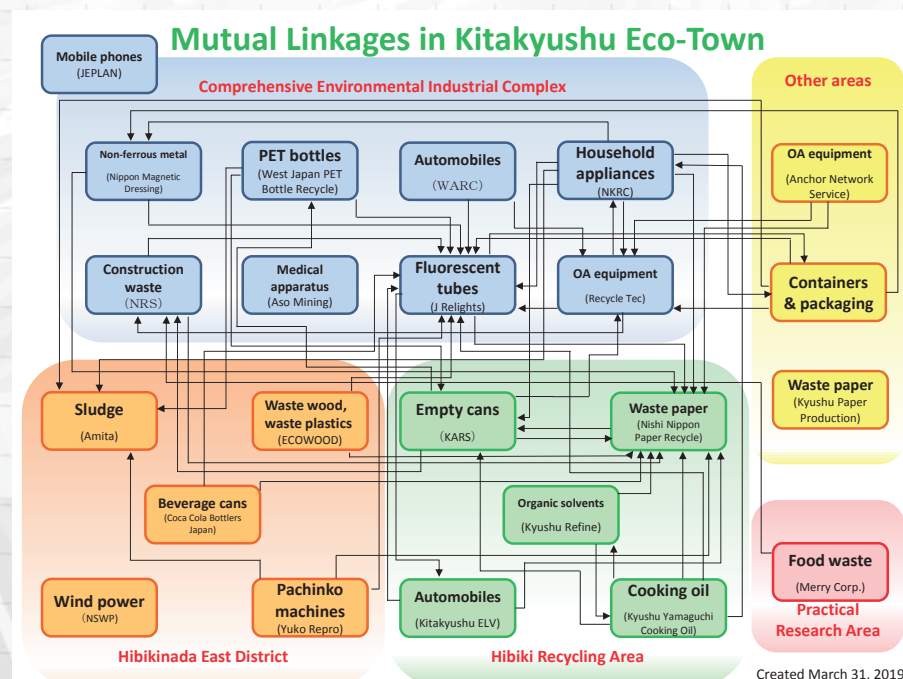


① Background and issues

- On the other side of the coin of Kitakyushu's development as a leading industrial city in Japan was the rise of a profound level of pollution. These acute pollution problems were overcome through the collective efforts of the city's residents, businesses and local administration. The accumulated technologies and know-how are now being used in the international environmental cooperation and business opportunities.
- Japan's first and largest-scale recycling base, Kitakyushu Eco-Town, was established in 1997 as a regional policy to integrate industry and the environment, with the aim of creating a resource recycling society.
- Kitakyushu City is promoting the local production and consumption of energy through the introduction of renewable energy and establishment of a local energy company.

② Overview of activities

- As of the end of March 2018, Kitakyushu Eco-Town includes an area in which 26 recycling companies are concentrated, a practical research area, and an Eco-Town Center and biotope that form a base for environmental learning.
- Under the concept of using all waste as raw materials in other industries and ultimately achieving zero waste, Kitakyushu City has formed a system to recycle a wide variety of waste, such as plastic PET bottles, home appliances, medical devices, vegetable oil, automobiles, metals, and sludge, that can be circulated to those industries that need them.
- Adjacent to Eco-Town, Kitakyushu City is developing a "Next-Generation Energy Park" where a variety of renewable energy facilities, including solar power, wind power and biomass power generation, are concentrated.



Aim at the final goal of zero waste with the mutual circulation of different types of resources

③ Results of activities and future developments

- Sales at Kitakyushu Eco-Town (total sales of all companies in 2017) accounted for over JPY 60 billion (about USD 550 million) and has created more than 1,000 jobs. Recycling also contributes to the reduction of approximately 430,000 tonnes of CO₂ emissions annually. About 100,000 people visit Eco-Town each year and many trainees from overseas come to tour the facilities.
- A new offshore wind farm in the port area that has a total capacity of 220,000 kW is now under construction.
- Kitakyushu City as a SDGs Future City, is promoting projects that integrate the economy, society and the environment with the aim to promote sustainable industries, create a lifelong active society, identify responses to climate change by reducing CO₂ emissions and improve resource efficiency.

Kitakyushu City has also been selected by the Organisation for Economic Co-operation and Development (OECD) as a model city for the localization programme of the SDGs, which includes the development of indicators that will enable international comparisons at city and regional levels.

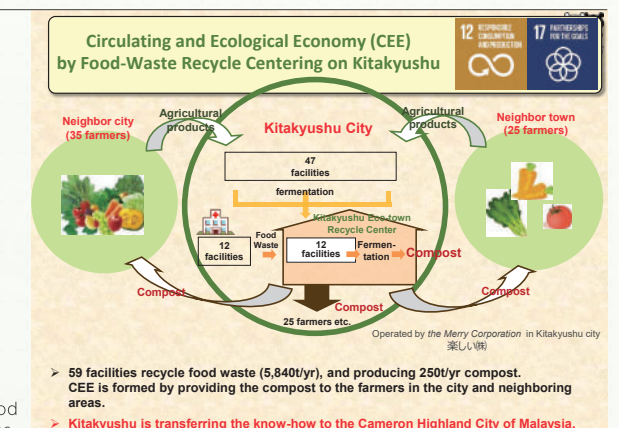


Eco-Town includes 26 recycling companies, a practical research area and other sites

COLUMN

Circulating and Ecological Economy for Recycling Food Waste

A Circulating and Ecological Economy for recycling food waste is being formed around Kitakyushu City in cooperation with farmers in nearby municipalities. Compost is produced from food waste, and agricultural products grown with this compost is recirculated within the city.



Establishment of a Local Energy Company

Kitakyushu City and eight local companies and financial institutions invested together to establish Kitakyushu Power Co., Ltd. in 2015 in order to achieve the low-carbon and stable supply of energy, as well as local energy management. The company aims to use waste-to-energy as a power source in the first step and expand to biomass, solar and wind power.



Establishment of Kitakyushu Power Co., Ltd

CASE 2 Kumamoto City

Building a Disaster-resilient, Self-sustaining and Decentralised Energy System



① Background and issues

- ▶ Kumamoto City gained insights into the importance of lifelines after experiencing massive disruptions in water supply and power outages as a result of a magnitude 7 earthquake that struck the Kumamoto area in Kumamoto Prefecture on April 14 and 16, 2016.
- ▶ The Kumamoto City Earthquake Disaster Reconstruction Plan, formulated in October 2016, included the development of a disaster-resilient, self-sustaining, and decentralised energy system as a key effort in creating a city able to prevent and reduce disaster risk.



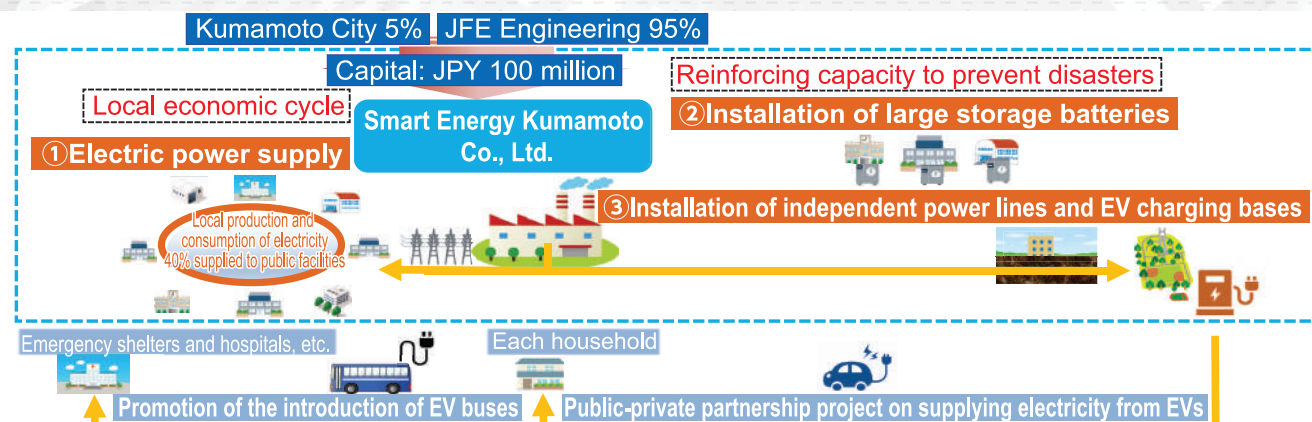
Damage from the Kumamoto earthquake

② Overview of activities

- ▶ The city jointly established “Smart Energy Kumamoto”, a local energy company, in November 2018 together with JFE Engineering. Smart Energy Kumamoto supplies power generated by the city’s two waste incineration plants to municipal facilities. The amount of power supplied makes up 40% of the amount of power consumed by public facilities and is contributing to the local production and consumption of electricity. Reduction in electricity bills as a result of this initiative counts approximately JPY 160-million-yen, which is being used to subsidise the Net Zero Energy House (ZEH), electric vehicles (EV) and energy-saving measures by small and medium-sized enterprises as part of the city’s energy-saving promotion fund.

Smart Energy Kumamoto plans to install large storage batteries at shelters. The batteries can continue to operate over a two-day period even during a power outage and adjust power shortages at normal times (peak shift, peak cut).

Kumamoto City will establish an independent power supply line and EV charging base at nearby disaster prevention bases in order to build a power supply system using EVs for shelters etc., without relying on grid power.

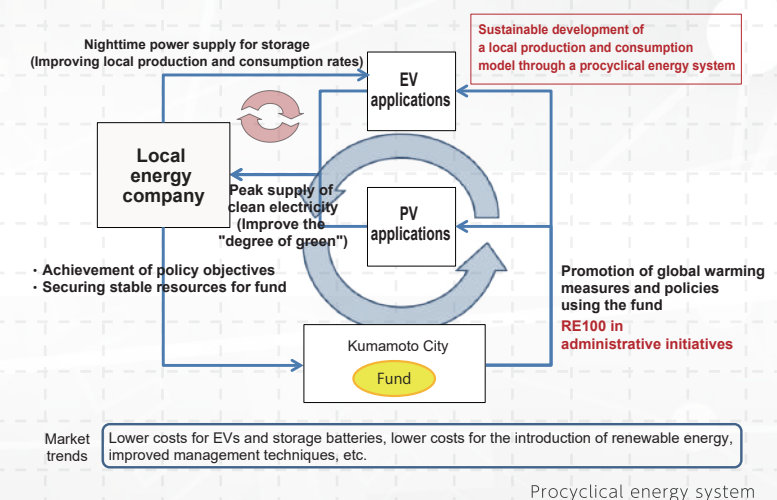


③ Results of activities and future developments

- ▶ Through these activities, Kumamoto City will create a positive cycle for the entire energy system to contribute to the development of a model for the local production and consumption of energy and enhance functions to reduce disaster risks.
- ▶ In addition to reinforcing global warming countermeasures in the Kumamoto cooperative centre urban area (total of 18 municipalities, population of 1.17 million), Kumamoto City will first jointly formulate local government action plans and regional energy visions in 13 municipalities based on the Act on Promotion of

Global Warming Countermeasures, with a view to exchanging energy between regions and reinforcing responses to disasters.

- ▶ Together with nearby municipalities and by developing functions that are more compact and connected, the city also aims to create a base to maintain vibrant socio-economic conditions with a constant population in the area amid declining populations and aged society with a low birth rate.



COLUMN

Grassland Revival in the Aso Area

In areas that stretch between Kumamoto and Oita prefectures, artificial “burn-off” of open fields has been carried out annually over hundreds of years to ensure the growth of grass to feed new livestock. This grassland area is not only a place to raise livestock, it is also home to rich biodiversity. Its stunning landscape has resulted in designation as a national park. However, because of changes in agricultural styles and an aging population of leaders who can carry on this tradition, the management of the grasslands has reached a critical stage. In the Aso area in Kumamoto Prefecture, the Aso Grassland Regeneration Committee was established in 2005 to preserve the restoration of the grasslands. Its activities include increase the number of volunteers involved in the burn-off of open fields, train local leaders

who will continue to carry on this tradition and provide support in restarting open field burn-off activities in partnership with various actors. In 2010, the Aso Grasslands Revitalization Millennium Committee, mainly consisting of economic community, was established to support the regeneration of the grasslands, and the Aso Grasslands Revitalization Fund was launched.



Nishiyunoura fire lighting in 2014

CASE
3

Toyama City

Enhancing Compact Cities with the Integration of LRT Networks and Independent and Decentralised Energy Management

① Background and issues

- ▶ Nestled in a rich natural environment with Toyama Bay and the Tateyama Mountain Range in the northern Alps, Toyama City has developed as a prominent major urban area along the Sea of Japan and is home to various industries, including pharmaceuticals and electronic devices, and cultures.
- ▶ The relocation of public and welfare facilities and the siting of large-scale commercial facilities to the suburbs has generated vacant lots and stores in the city centre and resulted in a decline in the number of visitors. The urban area is rapidly expanding out towards the suburbs along with the anticipated decline in the population and super-aging of society throughout the entire city. This decrease in the density of the urban area is a major cause of rising administrative costs related to urban management. The creation of a safe, healthy and comfortable living environment for the elderly and parents/guardians raising children and the ability to carry out sustainable urban management in both financial and economic terms are major issues facing the city.
- ▶ The city aims at creating technological and social innovation by integrating independent and decentralised energy management systems that can achieve the goal of the local production and consumption of local resources, such as renewable energy, while also bringing back the vitality of the central city area through measures to revive public transportation.

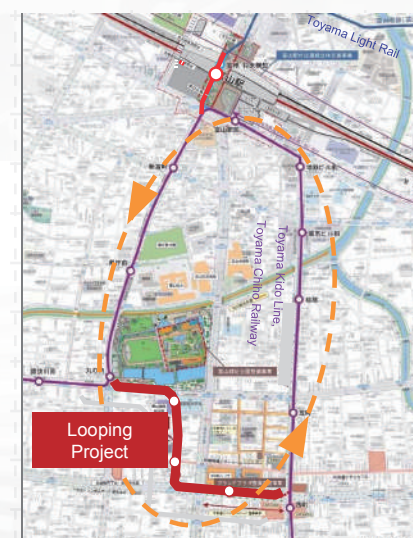
② Overview of activities

- ▶ Toyama City strived to improve the ease of navigating around the city by developing the Toyama Light Rail in the city centre's commercial area around the station and make access easier by connecting local trains in the city and creating loop lines.
- ▶ The Toyama Light Rail encourages use by the elderly with the application of barrier free cars and commuter passes (discounted fares for senior citizens). The residents' willingness to move around the city on foot has increased and the city promoted the health of the residents by improving the bicycle sharing system and other services.
- ▶ The city promotes urban development where residents can enjoy high-quality lifestyles and workstyles by redeveloping and creating an enhanced area with various urban services, such as commercial, business, art and culture, entertainment and exchange, and full of vitality (for example: closing the proximity of the large-scale commercial facility, Grand Plaza, and base facilities for community-based care).
- ▶ Toyama City is gently guiding the population to increase housing in the city itself by providing subsidies to high-quality housing construction companies and residents who purchase houses in the city central area, as well as by listing information on vacant houses on the city's website.
- ▶ In addition to examining the potential of using renewable energy for EVs and FCV route buses using EMS (Energy Management System), Toyama City also aims to build a "Toyama's model for Circulating and Ecological Economy" that creates an autonomous virtuous circle of energy in the region.



③ Results of activities and future developments

- ▶ On the economic front, land prices rose by 2% to 5% at multiple locations around Toyama Station and the city rail loop line. Revenue from property taxes and city planning taxes increased by approximately 10% in fiscal 2018 (compared to fiscal 2012), which is a source of financing for infrastructure development in the suburbs.
- ▶ On the environmental front, the city expects greenhouse gas emissions to decrease by 26,518 t-CO₂ in a single fiscal year by developing and promoting the use of public transportation networks, such as LRT, and by 7,020 t-CO₂ in the residential sector by promoting the development of residences in the city.
- ▶ On the social front, the number of steps taken per resident rose and medical expenses fell by about JPY 79 million, which helped the city achieve their goal of promoting healthy lifestyles centred on walking.
- ▶ Selected as an SDGs Future City in Japan, Toyama City aims to become a sustainable value-added city that allows to integrate resilience and decarbonisation and create technological and social innovation.



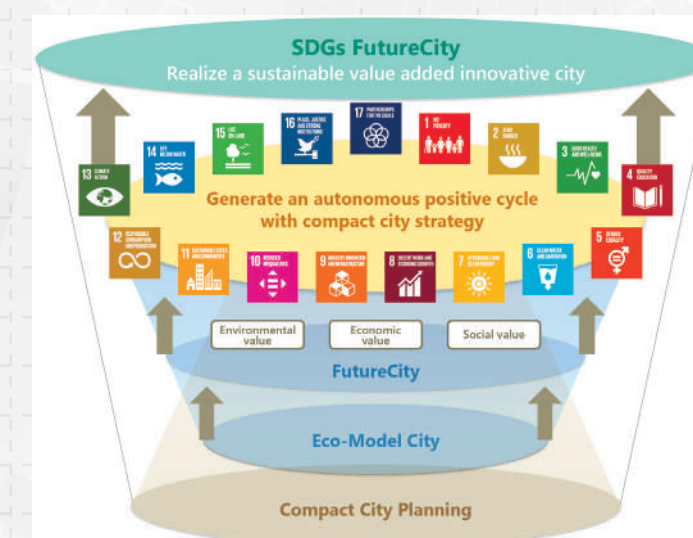
Development of city rail loop line



Toyama Light Rail



Grand Plaza



The Structure of Toyama City's SDGs Future City

CASE 4 Higashiomi City Shiga Prefecture



Higashiomi Sanpo-yoshi Fund Using Local Resources to Support Community Businesses

① Background and issues

- ▶ As of 2013, approximately JPY 29.4 billion yen (approx. 267 million USD) in energy costs have flowed to areas outside of Higashiomi City. That is on a scale of about 6.6% of the city's total production.
- ▶ The breakdown of energy charges show the outflow of oil and coal products at the head of the list, followed by electricity.
- ▶ Private consumption is also flowing out to regions outside the city at a scale upwards of 20% of the amount of consumption by the city's residents. As of 2010, investment is also draining out to other areas.

Reaching 1,000 accounts that will become basic asset!



Ambitious Fortunes, Higashiomi Sanpo-yoshi Fund

② Overview of activities

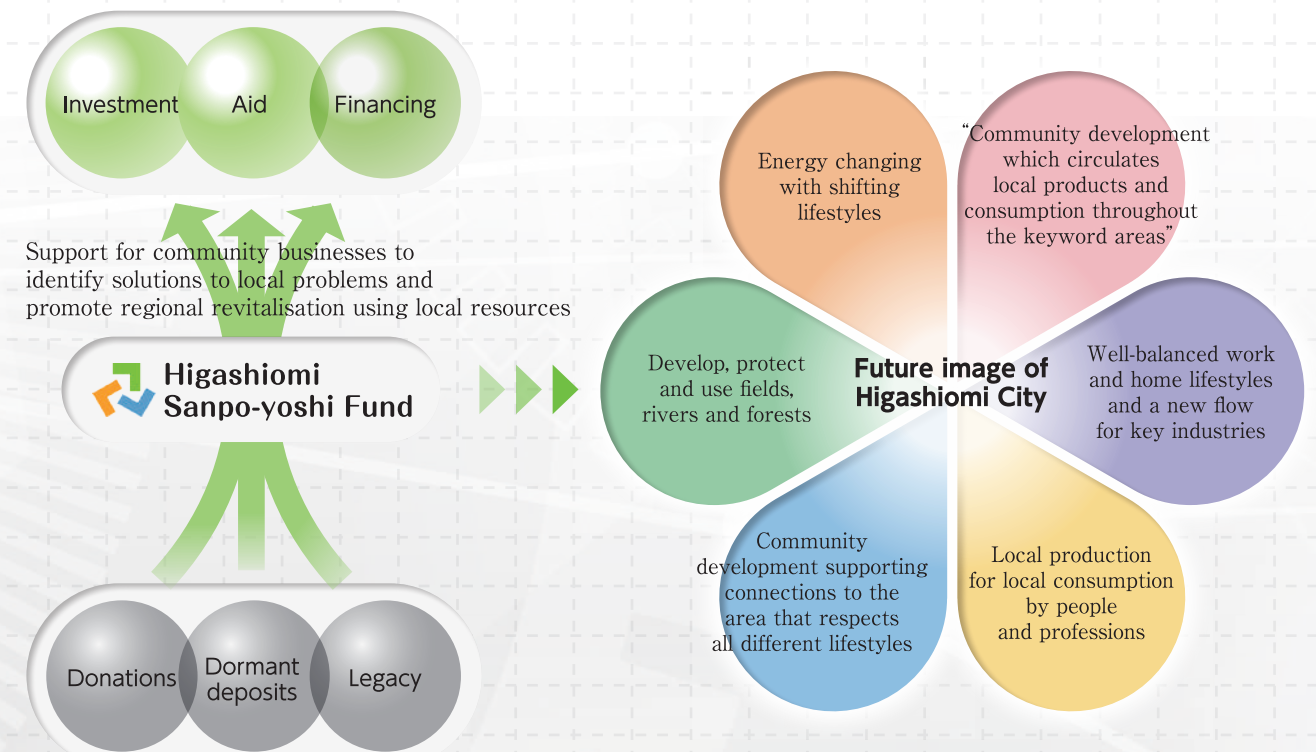
- ▶ Based on an analysis of these figures, Higashiomi City has included the "utilisation of local resources", "review, preservation and revival of regional resources", and the "development of mechanisms to connect local resources" as part of its basic policies and is working on projects connected to symbiotic relationships both in and outside the city by utilising local resources, as it aims to create a "circulating and ecological society where residents can feel well-being" (2nd Higashiomi City Basic Environmental Plan).
- ▶ Specifically, the Higashiomi Sanpo-yoshi Fund was established with donations from residents and includes the participation of local financial institutions, businesses, NPOs, and local governments. The fund helps raise money for various activities based on the city's basic policies.
- ▶ In addition, the "Higashiomi Environmental Roundtable" was established to oversee the progress of the city's Basic Environmental Plan and carry out awareness activities to realise the future image of common table where residents, companies, local governments and experts could all participate on an equal level. The roundtable aims to strengthen collaboration with various actors and support actual projects, aiming to promote the spread of renewable energy utilising the blessings of nature and mechanisms for energy savings to create a low-carbon society, encourage the local production and consumption of food and timber, and develop ecosystem networks and connections between local communities and the natural environment.

③ Results of activities and future developments

- ▶ Higashiomi City is turning the image of the area into reality where residents can feel well-being through the integrated improvement of the environment, economy and society, making use of connections between people, as well as between communities and nature, built upon the base of natural assets found in the basin area that stretches from the Suzuka Mountain Range to Lake Biwa.

- ▶ The city is engaged in a demonstration project on creating a "Circulating and Ecological Economy" connecting the symbiotic relationships that exist both in and outside the city by utilising local resources.

Fund's Role



CASE
5

Kanagawa Prefecture

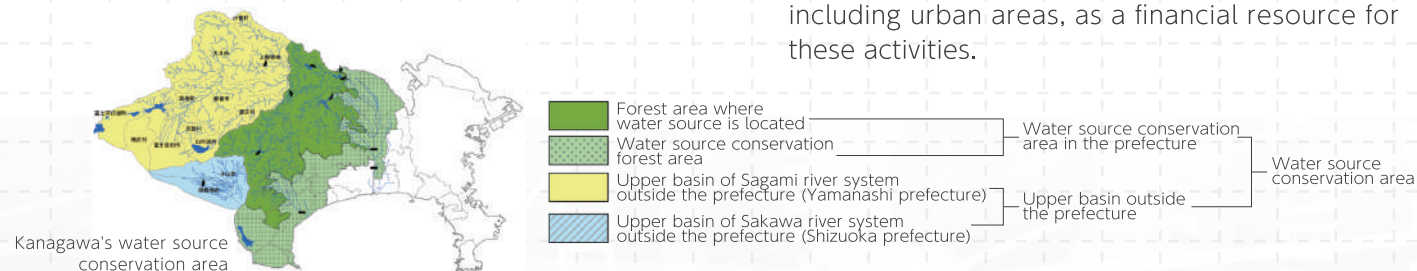
Initiatives to Conserve and Restore Water Resource Environments in Watersheds that Cross Administrative Lines

① Background and issues

- ▶ Neighbouring Yamanashi and Shizuoka prefectures are located upstream of the rivers that form Kanagawa Prefecture's primary source of water resources. Prior to the start of the following activities, the conservation and restoration of the water source environment had become an issue as a result of deforestation and an influx of domestic wastewater in water source areas, which led to various problems, including declining watershed conservation functions and deteriorating water quality.

② Overview of activities

- ▶ Kanagawa Prefecture implements activities such as maintaining the water source environment, increasing awareness with municipalities in the prefecture, and maintaining forests with Yamanashi Prefecture in the upstream regions outside of Kanagawa, to secure a quality and stable water resources for the future.
- ▶ An increased tax rates for the prefectural inhabitants tax on individuals (Water Source Conservation Tax) is imposed on all residents, including urban areas, as a financial resource for these activities.



③ Results of activities and future developments

- ▶ The effects of measures can be seen with the restoration of undergrowth in forests and improved soil conservation. In the future, Kanagawa Prefecture expects to promote activities, such as the maintenance of forests in

the entire prefecture, using both the newly created Forest Environment Tax and Forest Environment Transfer Tax, as well as Water Source Conservation Tax.

COLUMN

Dissemination of the SDGs Model

Kanagawa Prefecture hosted the "SDGs All Japan Meeting 2019" (January 2019) with the aim of disseminating "SDGs initiatives led by local governments". Under the leadership of Kanagawa Prefecture and with the approval of 93 local governments nationwide, the Declaration on "SDGs Japan Model" was adopted at this forum. This declaration included three pillars—"promotion of cooperation among local entities and spearheading partnerships linking public and

private sectors in the region", "expansion of social investment and innovation working with the private sector and financing", and "promoting the SDGs with residents playing a leading role through partnerships with the next generation and realisation of gender equality"—and was supported by 136 local governments which consists of 34 prefectures and 102 municipalities, including all of the municipalities in Kanagawa Prefecture (as of 5 July, 2019).



CASE
6

Yokohama city

City-to-City Collaboration on Renewable Energy for "Zero Carbon Yokohama"

① Background and issues

- ▶ Yokohama City revised its Yokohama City Action Plan for Global Warming Countermeasures in October 2018, which aims to bring greenhouse gas emissions to net zero aiming at 2050. To achieve "Zero Carbon Yokohama," the city must promote a shift to renewable energy as well as thorough energy savings. However, the amount of renewable energy producible in the city area is limited. Therefore, wide-area cooperation will also be needed to achieve the goals.

② Overview of activities

- ▶ In February 2019, Yokohama entered into a partnership agreement on renewable energy with 12 municipalities in the Tohoku region* that have an abundance of renewable energy resources.
- ▶ The potential power generation capacity of renewable energy, such as solar power, wind power, and biomass, by the 12 partner municipalities in the Tohoku region is estimated to be about 75 billion kWh, which is about four times the amount of power consumed in Yokohama City annually.
- ▶ Under the agreement, Yokohama City is looking into activities that will lead to the creation, introduction and expanded use of renewable energy, as well as the mutual revitalisation of regions by developing active exchange with residents and companies between different municipalities. The agreement also includes clauses on providing policy recommendations to the national government on developing renewable energy and creating a Circulating and Ecological Economy.



Zero Carbon Yokohama logo



Signed agreement

③ Results of activities and future developments

- ▶ Yokohama City will promote the development of specific mechanisms for supply and demand of renewable energy in each area. The city also plans to carry out concrete investigations and demonstrations in Environmental Model Zones mainly around the Shin Yokohama city centre and the Hiyoshi/Tsunashima area.

- ▶ This cooperative relationship between local governments for decarbonisation and the scale of energy interchange is the largest of its kind in Japan and are expected to have a ripple effect on other local municipalities in the future.

* Yokohama Town (Aomori Prefecture), municipalities under the jurisdiction of the Northern Iwate Regional Development Bureau in Iwate Prefecture (Kuji City, Ninohe City, Kuzumaki Town, Fudai Village, Karumai Town, Noda Village, Kunohe Village, Hirono Town, Ichinohe Town), Aizuwakamatsu City (Fukushima Prefecture), Koriyama City (Fukushima Prefecture)

CASE 7 Osaki Town Kagoshima Prefecture



Transformation from Japan's Top Recycler to a Global Standard

① Background and issues

- ▶ Although it is common for waste to be incinerated in Japan, Osaki Town does not have an incineration plant for municipal waste and has faced pressure on the remaining capacity of the landfill site.
- ▶ For this reason, the town decided to extend the capacity of the existing landfill site by separating, collecting and recycling waste through the development of separation rules and explanations to residents.

② Overview of activities

- ▶ Osaki Town has achieved the highest recycling rates in Japan (82.0%) for 12 consecutive years by instilling the idea that "waste is garbage when mixed and a resource when separated" in its residents.
- ▶ In addition to the sustainable recycling management through the complete separation of waste into 27 different categories with a focus on public participation, the town is also creating multicultural symbiotic communities that embrace life with the elderly and foreign nationals who have settled in the area through communication on separating garbage and is implementing training programmes for environmental and global human resources based on the concept of recycling.

③ Results of activities and future developments

- ▶ By promoting cooperation among three different actors, namely residents, companies and the local government, the town developed the "Osaki System", a low-cost waste disposal method implemented by thoroughly separating garbage without relying on incineration.
- ▶ The town carries out international cooperation activities that provide the Osaki System, such as by sharing these techniques to reduce and recycling waste in Indonesia.



Reduction and recycling of waste in Indonesia with the "Osaki System"



Impacts of the Osaka Recycling System (increase in jobs)

CASE 8 Ogawa Town Saitama Prefecture



Building a Sustainable Community through Organic Farming

① Background and issues

- ▶ Located about 60km from central Tokyo and surrounded by mountain ranges, Ogawa Town pioneered in Japan the practice of organic farming to produce safe food and protect the environment in the early 1970s. This is when various types of pollution that emerged with the development of industries started to become a social problem in Japan.



Organic farming in Ogawa Town

② Overview of activities

- ▶ Ogawa aims to create a livable town with beautiful satoyama landscapes, using local resources, such as fallen leaves from mountain forests, wheat and rice straw and weeds, in organic farming.
- ▶ Organic farming practices are supported by local communities and private companies, as well as consumers. For example, with local NPOs acting as mediators, companies in urban areas purchase all the organic rice grown in one area of Ogawa at a potentially reproducible price. This rice can be built into a worker's salary, should the employee wish to take this option. By securing sales channels, an entire community became involved in organic farming and the experience of growing rice became an opportunity for people in urban areas to get out into nature, such as in corporate staff trainings and the participation of company employees and their families in activities to improve satoyama areas.

③ Results of activities and future developments

- ▶ As of December 2017, the proportion of farmers involved in the sales of organic produce was among the highest in the country.

- ▶ The town certifies organic farming practices that make use of local resources and is currently implementing a project to brand vegetables from Ogawa.

- ▶ A former school is being used as a model cafe that uses agricultural products grown by organic farmers in the area. Through the model cafe, the city is examining the added value of using locally-grown agricultural products in local restaurants and the feasibility of a local circular society.

- ▶ Ogawa Town holds a festival every year where residents and visitors can enjoy food and music, with the aim of promoting interaction with urban areas and further expanding the idea of organic farming.



CASE
9

Gifu Prefecture

Nagara River's "Satokawa" System Connecting People's Lifestyles, Aquatic Environment and Fishery Resources

① Background and issues

- ▶ About 80% of the area in Gifu Prefecture is mountainous, and three large rivers, including the Nagara River, flow through the southern plains. Despite flowing through urban and residential areas, the Nagara River boasts an abundance of clear, high quality water.
- ▶ In this region, the inland fishery industry, which is centred on *ayu* (sweetfish), is thriving. Water quality conservation activities by the communities in the basin areas help maintain a clear flow of water. These clear flowing waters help the *ayu* grow and allow the local people to then enjoy the benefits offered by these fish. In this way, both the clear waters and *ayu* have a deep connection to people's lives, the local economy and traditions. This "satokawa" system in the upper and middle basin areas of the Nagara River, where human life, the aquatic environment and fishery resources are linked, is referred to as the "Nagara River System."
- ▶ However, the symbol of this system, the *ayu*, has seen a decrease in catch nationwide.

② Overview of activities

- ▶ In order to secure *ayu* resources by promoting natural reproduction, Gifu is promoting various initiatives, such as protection and development of spawning grounds and the release of fish larvae or juvenile fish.
- ▶ In addition, the public and private sectors are promoting the preservation and restoration of the natural environment, including the clear waters of the Nagara River. A new prefectural tax was introduced in 2012 and the tax revenue is expended on the preservation and maintenance of forests and rivers, promotion of the use of materials from the prefecture in public facilities,

and implementation of environmental education activities.

- ▶ Basin areas, which range from the upstream area to the downstream basin area outside the prefecture, collaborate in the organisation of river clean-up activities and family tours to enhance people's understanding of environmental protection.

③ Results of activities and future developments

- ▶ Today, Gifu is working on branding and developing the river system as a tourist attraction by using local agricultural, forestry and fishery products, processed products, traditional handicrafts and tourism resources.
- ▶ In addition to disseminating information to the international community about the Nagara River System, which was designated as a Globally Important Agricultural Heritage System in 2015, Gifu Prefecture also accepts trainees and dispatches researchers to contribute to the development of inland fishery industries in developing countries.



The Nagara River System

CASE
10

Shimokawa Town
Hokkaido

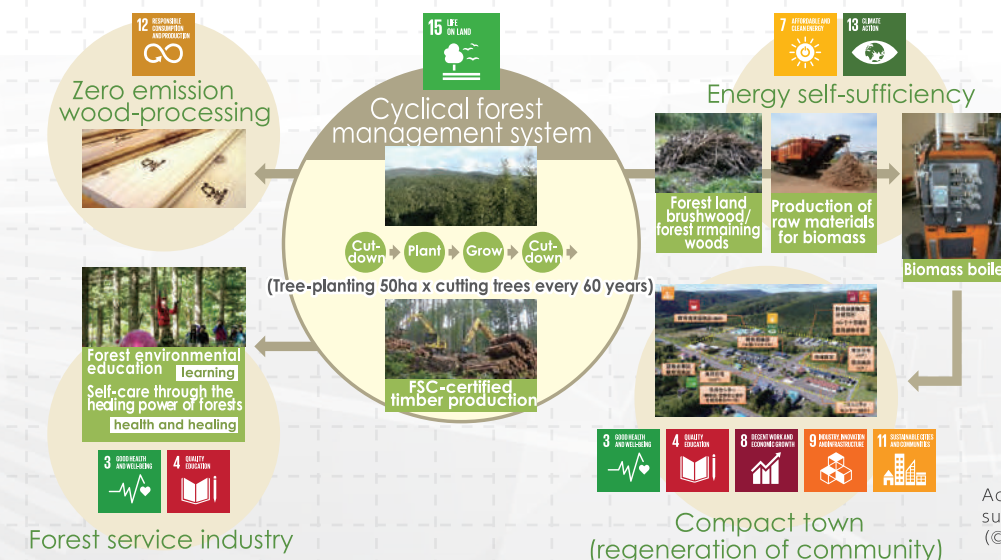
Regional Revitalisation Built on Sustainable Forest Management

① Background and issues

- ▶ Shimokawa Town is promoting actions to integrate three dimensions of sustainable development, i.e., society, economy and the environment to address the issues of falling birth rates, the aging society and population decline, building upon the sustainable management of forests, which account for nearly 90% of the area of the town.
- ▶ Energy supply in the region using local resources is an important initiative for revitalisation of the local economy and stable energy supply.

② Overview of activities

- ▶ Shimokawa Town manages its forest with 50 ha-tree planting per year and a 60-year growth and logging cycle, which aims to secure stable timber supply and the employment of forest sector. The town also promotes biomass energy using forest cut offs.
- ▶ Shimokawa Town introduced the first forest biomass boilers in public hot spring facilities in fiscal year 2004. The town also is supplying thermoelectric power generated from forest biomass to public housing and facilities and utilises the income received for childcare support.



Actions to achieve the creation of a sustainable community in Shimokawa (©IGES)

③ Results of activities and future developments

- ▶ Shimokawa Town has achieved reductions in fuel costs of JPY 26.97 million (FY 2017) and CO₂ emissions of -3,077t (FY 2017) through the development of a renewable energy heat supply system.
- ▶ Sustainable urban development has started to become effective in attracting people from outside the town, as there are years when the population increases in social dynamics.
- ▶ In recognition of these efforts, Shimokawa Town received the Prime Minister's award at the first Japan SDGs Awards in 2017.
- ▶ Shimokawa Town formulated its 2030 vision with participation of town residents in 2018 and integrated it in the town's comprehensive plans. The two is going to further promote the use of local resources and partnerships both within and outside the town.

CASE 11 Toyooka City Hyogo Prefecture



City Co-existing with Oriental White Storks through Eco-Tourism and Agriculture that Fosters Living Organisms

① Background and issues

- ▶ Home to a thriving agricultural, forestry, fisheries and tourism industry, Toyooka City is endowed with beautiful nature where wetlands and rice paddies stretch around the Maruyama River that flows through the city.
- ▶ The city was the last habitat for wild oriental white storks (birds at the top of the ecosystem pyramid demonstrating the richness of biodiversity), but they disappeared from Japan's skies after its last sighting in Toyooka in 1971 with the deterioration of their habitat.
- ▶ Before the oriental white stork became extinct, Toyooka had been putting efforts into an artificial breeding project to reintroduce the oriental white stork into the wild, as it aimed to create a city where both the oriental white stork and people could co-exist.



Scene with oriental white storks returned once again

② Overview of activities

- ▶ The farmers all over the city have carried out the practice of environmentally-friendly rice cultivation in order to conserve desirable environment for living organisms as feed for oriental white storks.
- ▶ Rice grown using this farming method has been developed into a brand and is sold at a price that is 1.3 to 1.5 times higher than that of conventionally-farmed rice, which has led to an increase in farmers' income.
- ▶ This rice is also consumed locally, including by being served for lunch at local elementary and junior high schools.
- ▶ Some rice paddies that have been abandoned are also being restored as wetlands where natural ecosystem can be conserved in collaboration with various actors, such as universities, NPOs and companies.
- ▶ The city also uses activities on the reintroduction of the oriental white stork into the wild in ecotourism and environmental education activities for local children.

③ Results of activities and future developments

- ▶ By utilising the oriental white stork as a local resource in agriculture and tourism industries, Toyooka City has created a virtuous cycle of environmental conservation and economic vitalisation.
- ▶ The activities carried out in collaboration with various local stakeholders are also leading to community development and enrichment of culture.
- ▶ The lower Maruyama River and the surrounding rice paddies, including reclaimed wetlands, are designated as a Ramsar Site under the Ramsar Convention.
- ▶ Nowadays, over 100 oriental white storks fly grandly in the skies of Japan.



Wetlands registered with the Ramsar Convention

CASE 12 Hamamatsu City



Introduction of Renewable Energy and Full-scale Use of the "Sixth" Industrialisation of Tenryu Birin Forest and Other Natural Resources

① Background and issues

- ▶ Hamamatsu City, which stretches from the upper to the lower reaches of the Tenryu River, is facing issues in the supply of disaster-resilient energy, depopulation measures in hilly and mountainous areas, and the promotion of agriculture and forestry, in addition to the question of how to revitalise the city centre.



Largest FSC-certified area by municipality in the country

② Overview of activities

- ▶ The Tenryu Forest and Forest Products Industry Promotion Council, established by the national government, Shizuoka Prefecture and six forestry cooperatives within Hamamatsu City, acquired FSC/FM certification in 2010 and is engaged in strengthening proper forest management and the Tenryu materials brand. As of April 2018, 74 organisations acquired FSC/COC certification, and "a supply chain that stretches from mountains to manufacturing and sales" has been established in cooperation with the private sector.
- ▶ With the use of local resources, including an area with the longest number of hours of sunshine in Japan and a supply of woody biomass, Hamamatsu City is promoting the local production and consumption of stable and affordable renewable energy. In 2013, the city and nine companies from both inside and outside the region joined together to launch "Hamamatsu Energy Co., Ltd.", a new electric power company that was the first to count a local government among its stakeholders.

③ Results of activities and future developments

- ▶ The FSC/FM-certified area is 45,270ha (as of 1 April 2019, largest in Japan by municipality) and about 60% of the volume of materials produced is FSC-certified.
- ▶ The city is promoting the expanded use of Tenryu materials through the external trade of local products. To facilitate external trade, the city collaborates with actors toward the "sixth" industrialisation.* The city also partners with larger cities in metropolitan areas.
- ▶ Hamamatsu City ranked first among municipalities of the entire country in photovoltaic (PV) capacity. The city's self-sufficiency ratio in primary energy supply that was 4.3% in fiscal 2011 had ballooned to 10.0% by the end of fiscal 2015.
- ▶ Hamamatsu Energy Co., Ltd. will enter the low-voltage electricity supply market for households and companies from August 2019.

*The "sixth" industrialisation refers to integration of primary, secondary and tertiary industries (1x2x3=6) to increase the value added of the products and services offered by these industries.

CASE 13 Yonago City Tottori Prefecture

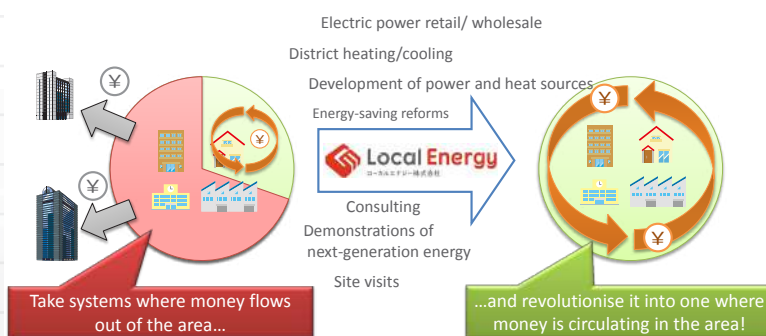


Revitalising the Region by Building New Value Chains for Electric Power

① Background and issues

- ▶ The outflow of money from electricity charges to areas outside of Tottori Prefecture is estimated at JPY 100 billion annually.
- ▶ Yonago City aimed to make its local economy self-sufficient and revitalise the region by promoting the local production of energy for local consumption and creating a regional economic infrastructure.

Local Energy's Goal in Circulating Funds in the Region



■ Prior to the establishment of a Local Energy Corporation, electricity consumption and investment in electric power companies flow to businesses outside of the area.

② Overview of activities

- ▶ In 2015, the city jointly established a local energy company called "Local Energy Corporation" with five companies in the region. In 2018, Sakaiminato City, a neighbouring city of Yonago, joined and started investing in the company.
- ▶ The power supply configuration of this company is mainly comprised of waste-to-energy, solar power, hydro power and geothermal power in the region.
- ▶ The company also adjusts supply and demand to reach the most optimal levels suited to the characteristics of the region, such as by supplying electricity according to local weather conditions, events and school activities.



Tottori Yonago Solar Park



Yonago City Clean Center

③ Results of activities and future developments

- ▶ The result of building new value chains for electric power in the region has brought about multiple effects, including savings in electricity costs for public facilities, creation of new jobs in the region through the independent management of supply and demand, reductions in greenhouse gas emissions due to increased renewable energy supply, environmental education, inspection visits and local PR.
- ▶ The company's smart meter data is expected to be used in community development. In the future, the company will engage in local heat

supply, power supply development, VPP, and energy efficiency reforms.



Local Energy's 6 business areas

CASE 14 Nagano Prefecture



Revitalising the Region by Maximising the Use of Local Renewable Energy

① Background and issues

- ▶ Despite having one of the nation's leading reserves of renewable energy, Nagano Prefecture used to mainly rely on fossil fuels brought in from other areas, which has resulted in an outflow of local assets outside the prefecture.

② Overview of activities

- ▶ Nagano Prefecture implemented Small Hydroelectric Generation Support-group ('Caravan'), which supports small hydropower projects in the region, with the cooperation of multiple departments within the Nagano Prefectural government in order to promote locally-led renewable energy projects. The prefecture also established a "revenue payment type subsidy" with which the prefecture provides the first infusion of aid for renewable energy projects with deep roots in areas where funding is difficult and some of the profit from Feed-in Tariffs will be used to pay back. The prefecture has also established "Shinshu Renewable Energy Network", a network of public-private partnerships at the prefectural level to boost the use of renewable energy.

- ▶ In Nagano, differences in temperature between the summer and winter months are extreme and houses must be better insulated. However, there has been little progress in this area.

interregional exchange, including the delivery of lectures by staff from the Public Enterprise Bureau to children in nursery schools in the ward.

- ▶ The Prefecture has achieved a diffusion rate for heat-insulated houses that is higher than that at the national average by requiring the owners of new houses to consider the construction of energy-efficient housing and the introduction of renewable energy equipment in housing by ordinances and conducting trainings for the construction companies involved.



Project "Ainori-kun" in which citizens jointly set up solar panels

③ Results of activities and future developments

- ▶ The Prefecture is decoupling economic growth and energy use by promoting the formulation and implementation of plans aligned with local situations, while also continuing to observe global trends.

- ▶ Nagano Prefecture and ICLEI Japan handed over "Nagano Declaration", approved by 119 municipalities in Japan and overseas that aims to create a Circulating and Ecological Economy, to the Minister of the Environment of Japan on the occasion of the G20 Ministerial Meeting in Karuizawa.

CASE
15

Miyagi Fisheries Cooperative

Reconstruction Making Use of Sustainable Aquaculture and Using the Sea to Inspire Minamisanriku

① Background and issues

- ▶ Even before the 2011 Great East Japan Earthquake, Minamisanriku Town in Motoyoshi-District, Miyagi Prefecture faced the issue of a lack of successors in the fisheries industry. In particular, it was necessary to take measures for workers who could not continue to work for economic reasons, such as reduced catch as a result of environmental impacts.
- ▶ Oyster farming requires creation of aquaculture farms in the sea. Before the earthquake, oysters were cultured in an overcrowded environment, which resulted in a lack of nutrients and environmental burden.
- ▶ Oyster farmers from Minamisanriku, who had been hard hit by the Great East Japan Earthquake, were forced to fold up their businesses as the tsunamis caused all of the rafts to be washed away.

② Overview of activities

- ▶ Local oyster farmers decided to try new environmentally-friendly farming practices. They put an aquaculture industry into practice that could be passed on to the next generation by reducing the number of rafts to one-third of that before the earthquake and creating a sustainable system that would minimize pollution of the ocean environment.



Aquaculture without harming the environment
(Photo taken by Masashi Asada)

③ Results of activities and future developments

- ▶ By reducing the number of rafts, there is now a sufficient amount of nutrition and oxygen circulating among oysters. Previously, it took three years to culture oysters for shipping, but now it takes only one year for oysters to grow to a size where they can be shipped out.
- ▶ Working hours for oyster farmers have also decreased, allowing them more time to enjoy with their families.
- ▶ Through this endeavor, the association has acquired Aquaculture Stewardship Council (ASC) certification, an international certification system for conservation of the marine environment.



ACS certification acquired

CASE
16

The Tokyo Organising Committee of the Olympic and Paralympic Games

Achievement of the SDGs and Decarbonisation at Mega Sporting Events

① Background and issues

- ▶ The International Olympic Committee (IOC) announced the "Olympic Agenda 2020" in 2014, which has identified sustainability as one of the overarching topics along with credibility and youth.

② Overview of activities

- ▶ Activities are being implemented under the following five themes on sustainability.
- ▶ Under the theme of "climate change", the Tokyo 2020 Games is promoting decarbonisation initiatives through energy savings, renewable energy and offsets for the approximate three million tonnes of CO₂ that are expected to be emitted during the Games.
- ▶ The theme of "resource management" features the promotion of various initiatives, including the creation of medal podiums from used plastic, as well as the production of gold, silver and bronze medals from recycled metals sourced from small household appliances and other articles.

③ Results of activities and future developments

- ▶ As mega sporting events that will take place in the same year that the Paris Agreement will come into effect, the Tokyo 2020 Games are expected to offer an integrated solution to make the SDGs and decarbonisation a reality.
- ▶ The Olympic and Paralympic Games Tokyo 2020 are expected to embody the Circulating and Ecological Economy through sports and serve as a model for the 2024 Paris Games and other major sporting events in the future.

