

CREATION OF A REGIONAL CIRCULAR AND ECOLOGICAL SPHERE (REGIONAL CES) TO ADDRESS LOCAL CHALLENGES

For the country as a whole to build a sustainable society, it is important to create a Regional CES that complements and supports regional resources. Each region will demonstrate its strengths by utilizing its unique characteristics, thereby building a self-reliant and decentralized society where different resources are circulated within each region, leading to symbiosis and exchange with neighboring regions according to the unique characteristics of each region.

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REGIONAL CIRCULAR AND ECOLOGICAL SPHERES

Management and quality improvement of local resources

Local socio-economic activities depend on local resources. Local resources are not just limited to locally available energies, natural resources, infrastructure, and industrial conglomerations but also include the indigenous culture, climate, groups, and communities. For a region to be sustainable, its local resources must not be impaired by its socio-economic activities.

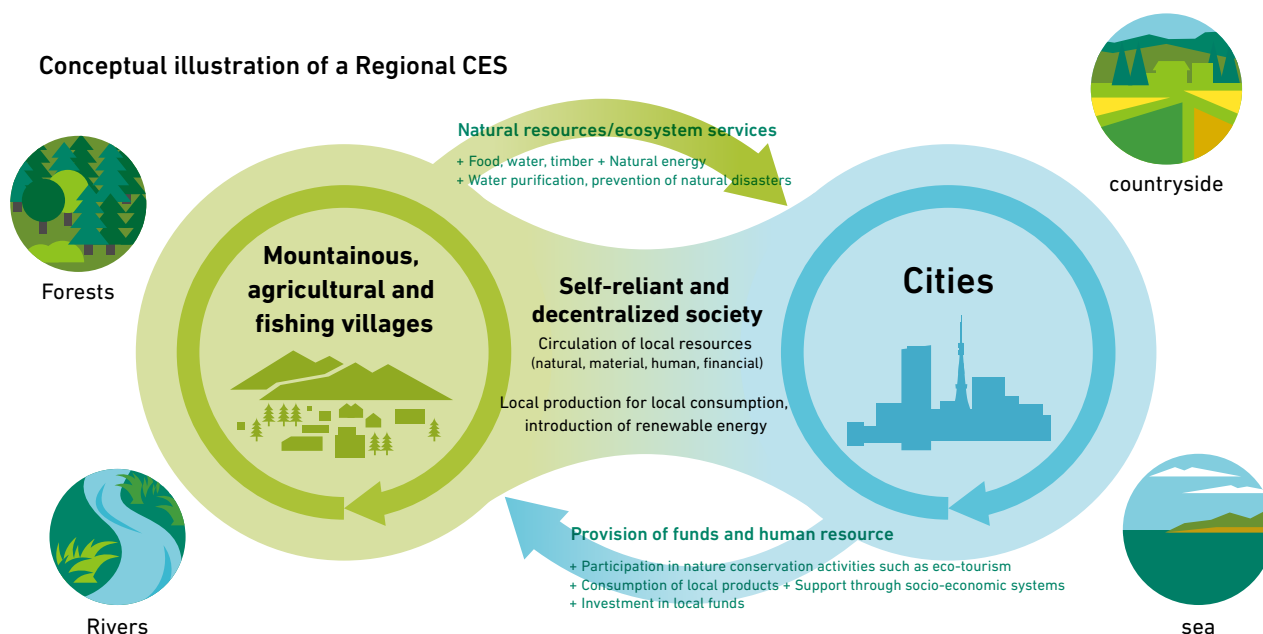
Conversely, improvement of the quality of the resources can lead to enhancement of the socioeconomic activities. Keeping in mind that the distinctive cultures and the additional value arisen from the diversity, uniqueness, and collaboration of regions can be the engine for national growth, we can say that sound management of local resources, which are the source of local diversity, and the improvement of their quality are quite important.

The importance of a Regional CES

While each region is required to pursue efforts toward II2ES, while taking advantage of its own characteristics, it is impossible for any local socio-economic activities to be entirely self-contained in this modern age of extensive socioeconomics. In this context, the creation of a Regional CES that complements and supports regional resources by building broader networks, which is composed of natural connections (connections among forests, the countryside, rivers and the sea) and, economic connections (composed of human resources, funds, and others), thus complementing each other and generating synergy.

Each region demonstrates its strengths by utilizing its unique characteristics, thereby building a self-reliant and decentralized society where different resources are circulated within each region, leading to symbiosis and exchange with neighboring regions according to the unique characteristics of each region is important for a region to achieve II2ES and remain sustainable. The key to creating a regional CES is to re-discover regional resources and make optimum use of them in a sustainable manner. Finding new values in overlooked resources of each region will be the first step moving towards II2ES.

Conceptual illustration of a Regional CES



MAKING A LOW-CARBON COMMUNITY TO CREATE A REGIONAL CES

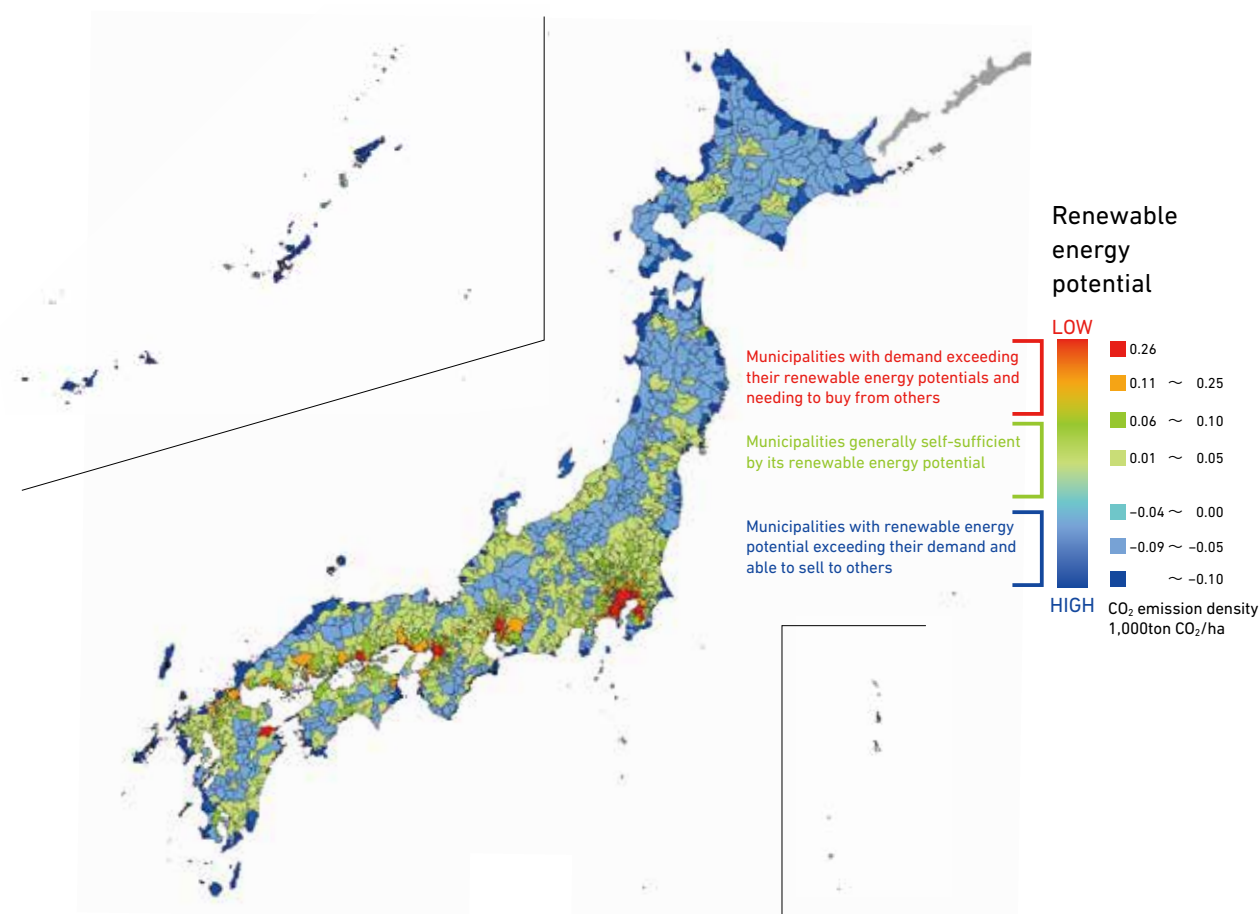
Community revitalization through introduction of renewable energies

Potential renewable energy resources of some kind are found in all communities in Japan.

The potential supply capacity nationwide is estimated to be about 1.8 times as large as the total energy demand. At present, however, about 90% of municipalities have an energy deficit, causing capital to flow out of the community. Redirecting funds to the

introduction of, or investment in, renewable energy will return the energy balance to equilibrium and help build a resilient local economy. One estimate suggests that investments in renewable energies and energy efficiency projects required to meet Japan's 2030 greenhouse gas emission reduction target will generate some 3.4 trillion yen worth of impact on the Japanese economy.

Renewable energy introduction potential (by municipalities)



Local production of energy for local consumption

Efforts are already underway through the collaboration among local firms, citizens, and financial institutions to develop and use local renewable energy to satisfy the local energy

demand as much as possible, and thus achieve decarbonization and self-sufficiency in energy (also in the sense of disaster risk reduction), and create new opportunities for employment and income.

Local energy potential fully utilized by direct supply management

The city of Yonago, Tottori Prefecture promotes the concept of “local production for local consumption” to generate new flows of funds within the region by setting up a power and heat distribution company named Local Energy Corporation in 2015 in a joint venture with five local private firms.

Waste-to-energy, solar energy and geothermal energy sources account for about 60% of the electric power that Local Energy distributes. The company has the capacity to manage its power supply to match the fluctuating local demand and can adjust optimum energy balance according to the local demand characteristics. It has also created new employment opportunities in the area.



SoftBank Tottori Yonago Solar Park
(solar power generation)

Source: Sharp Corporation



Yonago City Clean Center
(waste-to-energy power generation)

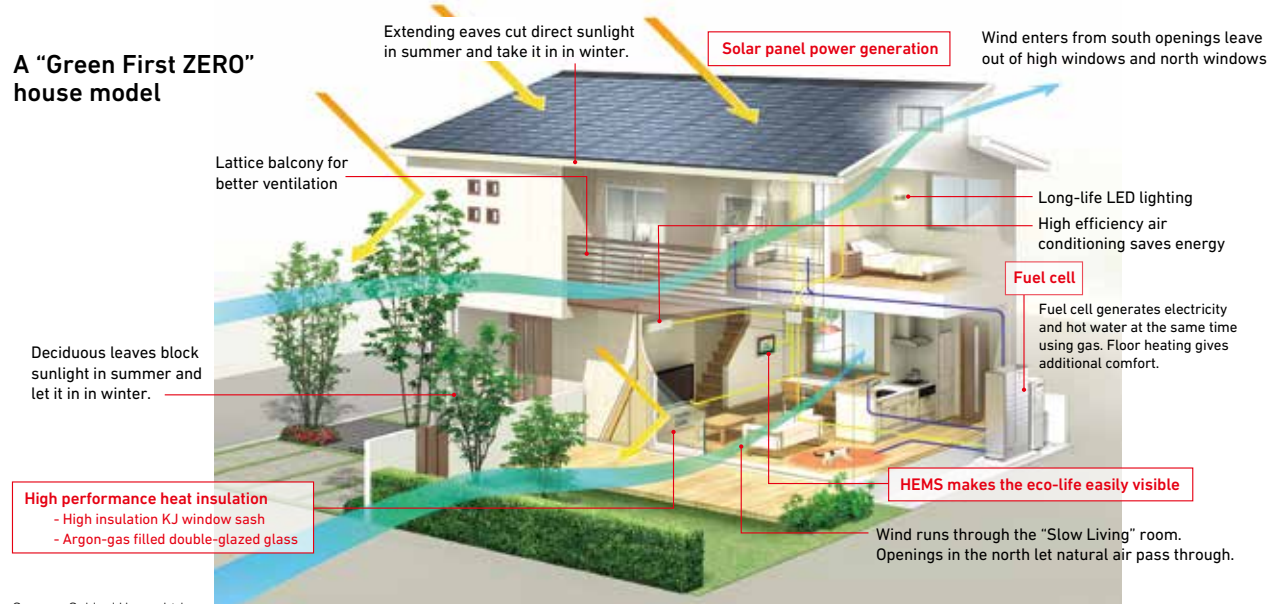
Source: The city of Yonago, Tottori Prefecture

Making houses and office buildings low-carbon

Net Zero Energy Buildings (ZEB) and Net Zero Energy Houses (ZEH) are being built to make office buildings and family houses energy neutral. The final energy consumption by civilian sector is about 30% and is increasing faster than other sectors. Energy conservation in this sector is an urgent challenge for Japan. In this context, ZEB is a focus of attention. The Plan for Global Warming Countermeasures calls for net zero energy in all

new public facilities by 2020 and the average of all new construction by 2030. In addition, the plan calls for ZEH in a majority of custom-built single-family houses that home-building companies construct by 2020 and provides for measures to encourage such construction. Sekisui House Ltd. reports that over 70% of the new single-family houses they build by order are already ZEH.

A “Green First ZERO” house model



Source : Sekisui House Ltd.

USE OF NATURAL RESOURCES TO CREATE A REGIONAL CES

Revitalization of local industries by the use of natural resources

Utilization of blessings from nature, a kind of local resources, has the potential to enrich the locality in its own way consistent with its distinctive culture and climate. In agriculture, forestry and fisheries as

well as in tourism, local industries and the locality itself can be turned into brands and can enjoy economic benefits.

Project to Fully Enjoy National Parks

Japan has put up the targets of increasing the inbound visitors to 40 million a year by 2020 and 60 million by 2030. In line with this and in pursuit of bringing Japan's national parks to a world-class level, a target has been set to increase national park visitors from outside Japan to 10

million by 2020, more than double the numbers in 2015. The Ministry of the Environment has selected eight national parks as pilot projects for focused efforts to provide high quality and value-added tourism in accordance with “National Park Step-up Program 2020.”

Overview of the Step-Up Programs of the eight selected national parks

1 Akan-Mashu National Park



Rebirth as an attractive recreational location offering novel nature conservation activities, comfortable, high quality accommodation, participatory Ainu culture workshops and other activities

2 Towada-Hachimantai National Park



Enjoyment of native wilderness on a variety of mountain paths, along with the traditional hot spring culture. Improvement of scenery based on removal of abandoned buildings and other eyesores to create attractive facilities

3 Nikko National Park



Opening up of public facilities to attract quality hotels and enable visitors to enjoy examples of Japan's culture and history such as the World Heritage site of Shrines and Temples of Nikko, former embassy villas, and Royal Resort Nasukogen

4 Ise-Shima National Park



Installation of a private-sector café in the lookout offering panoramic views of the ria coastline dotted with fishing and farming villages

5 Daisen-Oki National Park



Opening public facilities to and otherwise working with private sector initiatives to develop integrated facilities for the enjoyment of various ready-made recreational activities including hiking and hands-on nature/cultural experiences



6 Aso-Kuju National Park



Implementation of a field museum concept with the historical man-made grasslands at its core, offering activities focused on enjoyment of the majestic grassland and volcano scenery, and also possibly entrance fee-funded grassland egeneration

7 Kirishima-Kinkowan National Park



Promoting multi-day tourism of park destinations through attracting quality hotels, together with development of a diversified tour program enabling visitors to experience a volcanic landscape steeped in history and mythology, and possible refurbishment of the wide variety of hot springs for enjoyment by foreign visitors

8 Keramashoto National Park



Enhancing value through offering opportunities to participate in conservation activities and utilizing environmental cooperation tax levied on park entry



Common initiatives

- ◆ Cooperating with private enterprise and relevant agencies to promote the attractions of Japan's national parks both in Japan and overseas
- ◆ Integration of park use in visitor centers
- ◆ Clear communication of park boundaries through establishing conspicuous entrances as standard fixtures
- ◆ Implementation of universal design, including installation of Western-style toilets

Cafe Terrace in the Sky in collaboration with private sector

Ise-Shima National Park is working to increase the number of foreign visitors to the area under the concept of "Ise Jingu, a site where a long, splendid, multifaceted history unfolds. Satoyama and Satoumi, a land of enrichment interweaved with the workings of people and nature." A part of such efforts is the opening of a cafe and the renovation of Yokoyama Observatory located in the hill north of Ago Bay with a commanding view. In parallel, English and other foreign languages are added to the signs and exhibits of Yokoyama Visitor Center to pursue synergy. The renovation of observation deck was completed in March 2018 and the cafe terrace in the sky (Mirador Shima) opened in August of the same year. The visitors can enjoy the local delicacies of Ise-Shima while being marveled by the panoramic views of Ago Bay.



Panoramic view of Yokoyama Tenku Café Terrace

Source : Ministry of the Environment



Conceptual drawing of rest area in Yokoyama Tenku Café Terrace

Source : Ministry of the Environment

Eco-tourism

In addition to natural resources, local culture, custom and traditional lifestyle, which are closely linked to the natural environment, can be understood as resources. An effort to make use of such resources in a sustainable manner is eco-tourism, which

serves to protect the natural environment, promote tourism business, stimulate the local economy, and offer environmental education.

Hida Satoyama Cycling to journey through the life of Hida

Chura-boshi Company of the town of Furukawa, the city of Hida, Gifu Prefecture, capitalizes on the rich local resources to offer eco-tours for visitors to journey through the good old traditions and culture of the area. The most popular eco-tour is the Hida Satoyama Cycling to enjoy satoyama landscape on a mountain bike with a guide. The tour offers the opportunities to feel and touch the ecosystem of satoyama and the people there, an experience an ordinary tourist would never be able to have. This cycling tour garners high praise since its start in 2010 and continues to receive new visitors and repeaters.



Picture of Satoyama Cycling

Source : Chura-boshi Company

Hot springs (Onsen)

Recent technological advancement has made it possible to make use of the thermal energy of hot springs (onsen) as long as the water is above a certain temperature, making multistage utilization of onsen heat feasible. The Ministry of the Environment is advocating a new style of spa bathing coined “ONSEN Stay,” which encourages

the visitors to enjoy a variety of programs making full use of the surrounding nature, history, culture, food in addition to bathing in hot springs and interacting with local people and other visitors so that they are rejuvenated both physically and mentally.

Joint use of onsen heat

Yunohama Onsen in the city of Tsuruoka, Yamagata Prefecture, has joined hands to utilize the untapped thermal energy of the onsen and has reduced CO₂ emissions. In April 2017, the association installed a central hot water distribution system with heat exchanger to adjust the high temperature of the raw onsen stream and distribute hot water to 12 facilities for use for warm shower and other purposes. By replacing the fossil fuels previously used for privately owned boilers, some 15% reduction (879 tons) in CO₂ emission is expected annually. In addition to the CO₂ reduction, the project will have a branding effect on Yunohama Onsen as an environment-friendly resort and thus revitalize the area.



Panoramic view of Yunohama Onsen



Heat recovery type heat pump



Exterior of central hot water distribution system

Source : Yunohama Gensen Facility Co., Ltd.

Utilization of wood biomass resources

Following the 2012 start of the Feed-in Tariff (FIT) system, wood biomass power generation has surged. Use of timber from forest thinning and other unutilized wood materials for energy purposes increased to 4.33 million m³ in 2016, more than five times as large as in 2012. Use of such unutilized wood materials helps achieve

low-carbon and resource saving and at the same time contributes to better management and maintenance of forests. In this way, it helps preserve and enhance ecosystem services and also contributes to increased economic benefits and job opportunities in the area.

Sustainable community development based on the forest of 100 years

The village of Nishiawakura, Okayama Prefecture, launched the "Initiative with a 100-year Vision of Forests" in 2008 and has been working to achieve 100% renewable energy self-sufficiency by the use of forest biomass and other sources. More specifically, wood-fired boilers were installed at the village's three hot spring facilities to heat up the raw spa water. The expected benefits include 20% saving in fuel cost, 13 million yen in annual retained earnings, and 379 tons in CO₂ emission reduction. Through this initiative, 30 local venture businesses mostly in forest-related fields were established, creating over 140 new employment.



Central facilities for forest progressed by the "Initiative with a 100-year Vision of Forests"



Wood-fired boiler for hot spring facilities

Source : The village of Nishiawakura, Okayama Prefecture