

Green reconstruction—disaster reconstruction with environmental preservation

Sanriku Fukko National Park and Michinoku Coastal Trail

The Pacific coastal area of Japan's Tohoku (north-eastern) region was devastated by the Great East Japan Earthquake. As a contribution to the area's reconstruction, the national government compiled the "Vision for Green Reconstruction Centered around the Establishment of a Sanriku Fukko (Reconstruction) National Park" in May 2012. National parks promote preservation and appropriate use of the natural environment, and also contribute to boosting local tourism. Tohoku's Pacific coast has a large proportion of natural coastline with no man-made structures. It is one of the best areas in Japan for finding pristine nature, and several parts of it have been designated as natural parks, including Rikuchu Kaigan National Park.

The vision involved reorganizing these existing natural parks to create Sanriku Fukko (Reconstruction) National Park in order to make use of the natural environment as part of reconstruction and to pass the area on to future generations as a venue for learning about both the blessings and threats that stem from nature. In doing so, the park will become a foundation for collaboration that extends throughout the area directly impacted by the earthquake.

Tanesashi Kaigan Hashikamidake Prefectural Natural Park in Aomori Prefecture was incorporated into Rikuchu Kaigan National Park, and in May 2013 the area was designated as Sanriku Fukko (Reconstruction) National Park. There is also Minami Sanriku Kinkasan Quasi-National Park, which is located to the south of Sanriku Fukko (Reconstruction) National Park. Authorities are considering incorporating it into the national park.

In addition, by the end of FY 2015 Japan aims to establish a long-distance natural hiking trail, to be called Michinoku Coastal Trail (about 700 km from Hachinohe, Aomori Prefecture to Soma, Fukushima Prefecture), to serve as a symbol of reconstruction and to link the local natural environment with people's lives, vestiges from the earthquake, people who use the trail, and people who live in the area. The trail offers the opportunity to experience both natural and human landscapes that cannot be seen from an automobile, as well as to gain a deeper insight into such aspects of the region as its history

and culture (manners and food) by traveling on foot along the Pacific coast in the Tohoku region.

Hikers on the route of the Michinoku Coastal Trail



Source: Ministry of the Environment

Fund encouraging residents to invest in their own prefecture

In areas recovering from the Great East Japan Earthquake in 2011, it is important to accelerate initiatives that contribute to rapid reconstruction while minimizing negative impact on the environment. Toward that end, it is necessary to invest not only public funding but also private sector funding in these types of initiatives, and to construct a funding cycle that supports autonomous local reconstruction. Moreover, adoption of independent and distributed energy systems that make use of local resources helps stimulate local economies at the same time that it minimizes negative effects on the environment.

Based on the revised version of Fukushima Prefecture's vision for promoting renewable energy, which was drawn up in March 2012, the prefecture established the Fukushima Airport Solar Fund, in which prefectural residents participate as investors. In order to promote the introduction of renewable energy through local funding, the fund was designed to circulate money within the region by investing in a solar power generation company established by Fukushima Prefecture. The company set up a mega (large-scale) solar power plant with capacity to generate 1.2 MW of electricity on the grounds of Fukushima Airport. Profits from the business are to be returned to its investors, including local residents and companies. The prefecture aims to become a pioneer in renewable energy and make this project a symbol of prefectural reconstruction.

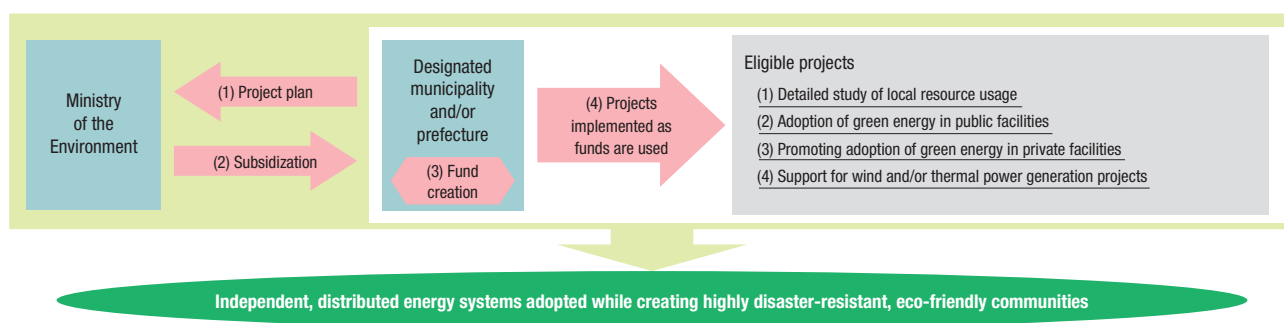
Funding for local public entities that adopt renewable or clean energy (Green New Deal Funds)

Japan is introducing independent, distributed energy systems that make use of renewable energy and other local resources in order to rebuild areas damaged by the Great East Japan Earthquake. The challenge is how to create communities that are highly disaster-resistant, while minimizing negative impact on the environment.

In the Tohoku region and other areas damaged by the earthquake, Japan established Green New Deal

Funds (businesses that help fund local public entities adopting renewable or other clean energy sources) to support the adoption of renewable energy, storage batteries and/or other end-user power sources for emergency shelters and disaster prevention centers. In FY 2011, the government issued subsidies to eight local public entities, including municipalities in the Tohoku region. The local public entities that received the subsidies are implementing one or more of four types of project including research or adoption of renewable energy, as they use the subsidies over a period of five years from the time of issue.

How Green New Deal funding works



Source: Ministry of the Environment

Next-generation energies for Tohoku recovery—microalgae R&D project

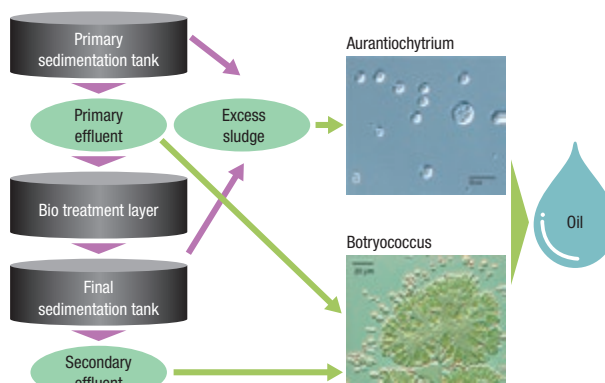
Because the largest sewage treatment plant in Sendai, Miyagi Prefecture, was located near the coast and sustained devastating damage from the Great East Japan Earthquake, since FY 2012 the Japanese government has been promoting reconstruction by linking University of Tsukuba and Tohoku University in joint research and development of biomass fuel production and sewage treatment using oil-producing algae.

The project is using a plant that treats roughly 70% of Sendai's sewage as a venue for verification testing. Using *Aurantiochytrium* and *Botryococcus*—two species of microalgae discovered and cultivated by University of Tsukuba—researchers from both universities are applying jointly developed algal biomass production technologies and techniques for optimizing concentration, harvesting, extraction and refinement processes to treat a portion of the wastewater handled by the plant.

Aurantiochytrium and *Botryococcus* produce hydrocarbon oils with properties equivalent to those of crude petroleum. Assuming that it is possible to

cultivate these algae on a large scale, it appears theoretically possible to obtain enough oil to replace Japan's petroleum imports. Additionally, since the oil would be produced using organic components of wastewater, it could be used to treat sludge in sediment tanks. Going forward, the goal is to apply the results of this research project in sewage treatment facilities worldwide.

Cultivation of Algal Biomass



Source: Sendai City