Special Feature 1

Renewable Energies

— Contributing to society with solution products and systems —


Kegon Falls, Nikko

Furukawa Electric Group's efforts

Renewable energies such as hydropower, wind power and solar power have attracted more attention since the 2011 Great East Japan Earthquake as clean, non-depletable energies to replace fossil fuels.

The Japanese government is trying to increase the proportion of power generated by renewable energies from the present 10% or so to equal to or more than 20% by 2030. There have been previous attempts to increase this rate, such as by introducing the Act on Special Measures Concerning Procurement of Electricity from Renewable Energy Sources by Electricity Utilities (RPS Act) and the Feed-in Tariff system, but they have faced big problems such as unstable power output and high installation costs.

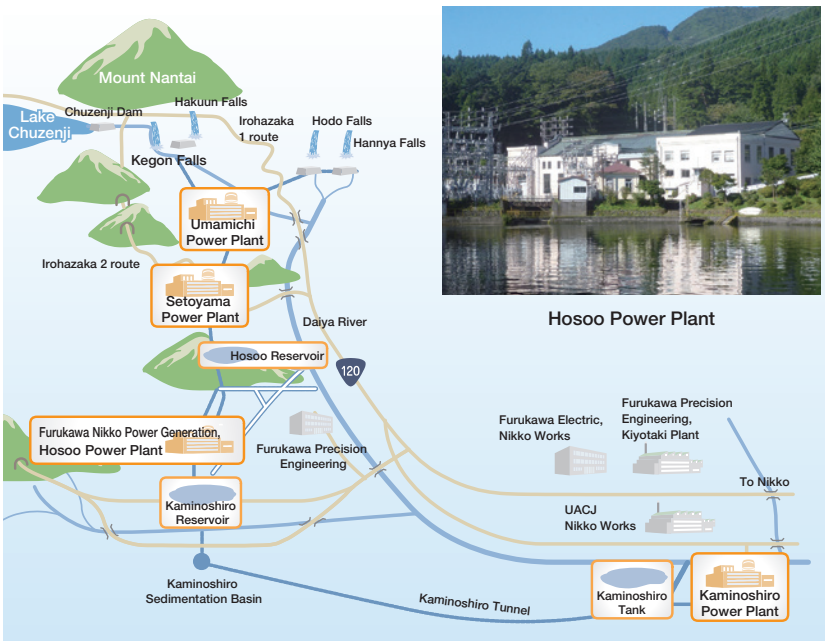
The history of Furukawa Electric Group's use of renewable energies can be traced all the way back to the hydropower plant constructed at Nikko in 1906, the electric power of which was used in the Nikko Copper Electrolyzing Refinery which conducted the electrorefining of copper, and others. Our group has also used its accumulated technology to create problem-solving products and systems. Examples include power storage systems to control fluctuations in power output, and power cables that resist even undersea tidal currents.

Recently, in collaboration with the Railway Technical Research Institute and others, Furukawa Electric is participating in the world's largest superconducting flywheel energy storage system project by supplying our superconducting wire rods. This system is showing promise as a lossless storage battery, rotating a huge flywheel to store electric power as kinetic energy and converting the torque back into electric power as required.

Furukawa Nikko Power Generation Inc. providing 100% of Nikko Works' energy

Ichibei Furukawa, founder of the Furukawa Group, began to develop the Ashio Copper Mine in 1877. As the copper mine expanded rapidly, he needed an abundant water supply to meet the electrical demands of the Nikko Copper Electrolyzing Refinery, and in 1906 constructed the Hosoo Power Plant No.1 (2,000 kW) in Hosoo-machi, Nikko, the origin of the present-day Furukawa Nikko Power Generation Inc. That company has four power plants downstream of Kegon Falls flowing from Lake Chuzenji, namely, Umamichi, Setoyama, Hosoo, and Kaminoshiro, generating a total output of 29,890 kW. Hydropower has long contributed to the regional community as a clean energy source that emits no carbon dioxide, and currently meets 100% of the power demand at our Nikko Works as well as supplying power to our affiliates, Furukawa Co., Ltd., Ashio Power Plant, and TEPCO.

Of all the renewable energies that show promise for the future, hydropower delivers the most stable power supply. Amid the various challenges facing Japan's energy policy, Furukawa Nikko Power Generation Inc. will continue to supply clean, stable power.



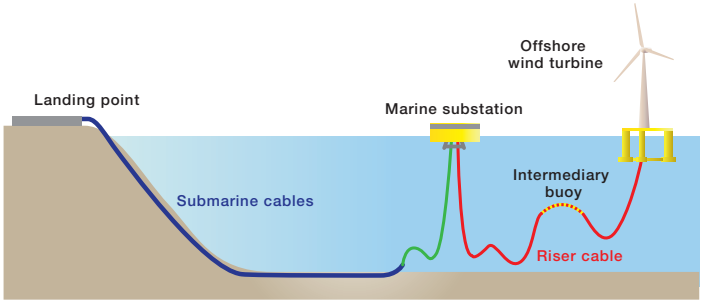
Hosoo Power Plant

Fukushima floating offshore wind power station, contributing to earthquake restoration

Furukawa Electric is participating in “Fukushima Experimental Offshore Floating Wind Farm Project”, one of the region’s restoration projects, having endorsed Fukushima Prefecture’s proposal to “be a pioneering place for renewal energies”. Utilizing offshore energy is vital for a country surrounded by water like Japan, and in this experimental study we have established a business model for a floating offshore wind power station, which we hope will help to make full-scale floating offshore wind farms a reality.

In this experimental study, we have built and verified a power transmission system that securely delivers control signals and power output from a floating offshore wind power station along submarine cables. The floating offshore wind power turbines oscillate due to the force of the waves and tide and, in this harsh environment, the submarine cables also need to be able to move dynamically in response. By bringing all Furukawa Electric’s accumulated cable technologies to bear, we have developed the world’s first 66kV ultra-high voltage riser cable system. As the experimental study project enters its second phase of construction, we have delivered the special high-voltage riser cable manufactured at our Chiba Works. Operation of the third generation facility is due to begin in fiscal 2015.

Floating wind tower



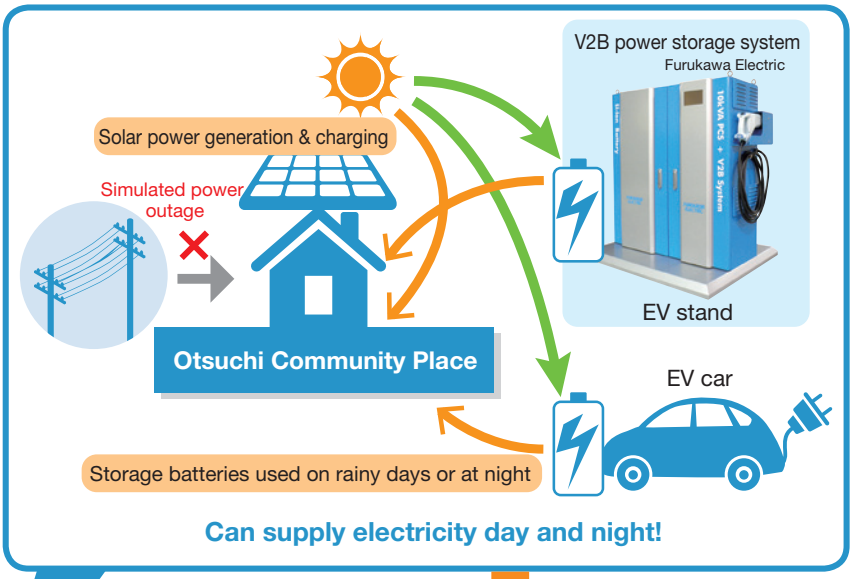
Cable laying diagram

V2B power storage system, resolving unstable power output

Ever since the 2011 Great East Japan Earthquake, electric power generation and transmission systems that remain strong and self-sustaining even during a large-scale disaster have been examined nationwide. In an industry-academic-government collaboration with the University of Tokyo and others, Furukawa Electric is part of an innovation model creation project to accelerate the sustainable development of disaster-affected under-populated areas, and in March 2015 conducted a demonstration test of our V2B (Vehicle to Building) power storage system in the devastated town of Otsuchi, Iwate Prefecture.

We installed a power storage system at Otsuchi Community Place and supplied it with electricity from solar panels and electric cars, and conducted a demonstration test assuming a 72-hour power outage. We simulated the experience of using a TV, smartphone, etc. to be able to get accurate up-to-date information, using LED lights and oil heaters to ensure safety and security, and using monitors and computers at town meetings to help people in the community.

Features of V2B power storage system – Self-sustained operation mode



Otsuchi Community Place and V2B power storage system