



Initiative for the realization of a decarbonized society, to which we contribute with our proprietary power electronics technologies

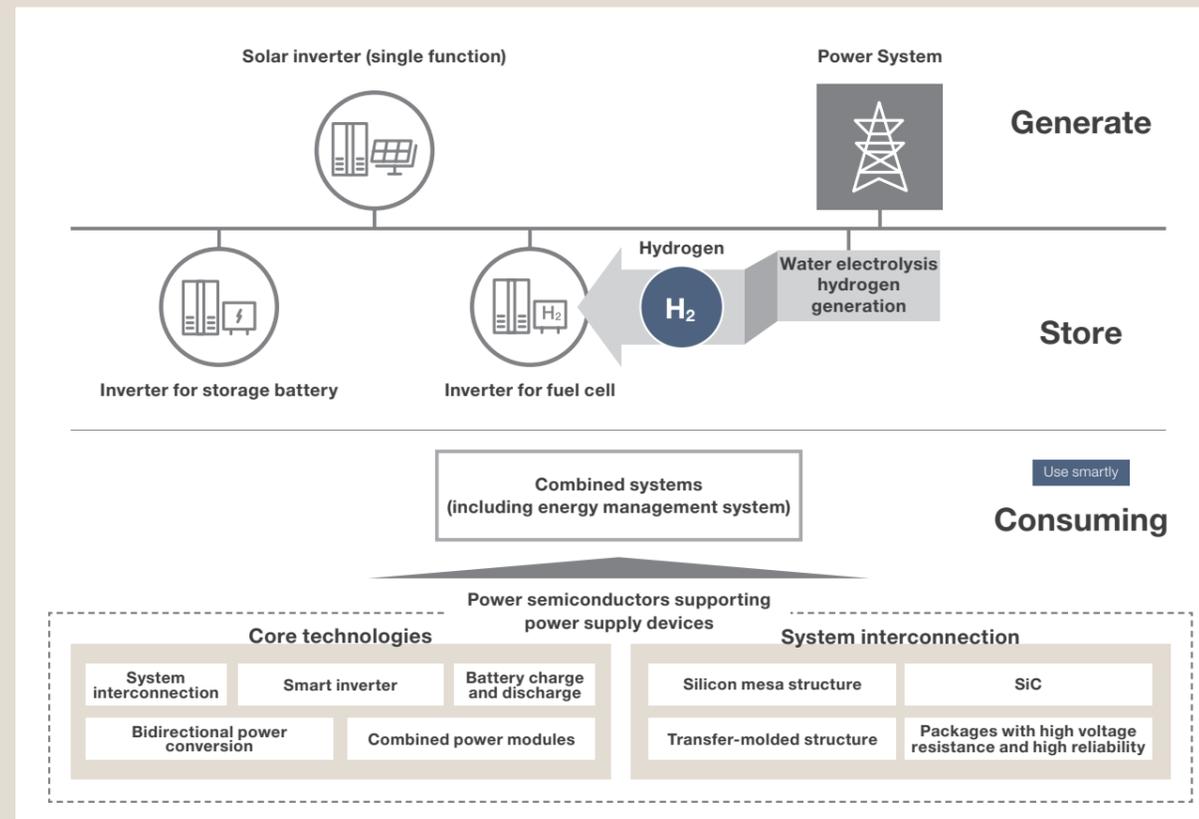
The Government of Japan has set the FY2030 greenhouse gas emissions reduction target at 46% (from the FY2013 level) and expressed its determination to keep working to achieve the lofty goal of 50%. The significance of the efforts in the energy conversion sector is increasing, as it is responsible for more than 40% of greenhouse gas emissions. It is particularly necessary to increase the use of sunlight, wind power, biomass and other renewable sources of energy. Announced in April 2021, the Green Growth Strategy set specific goals not only in the area of next-generation renewable energy but also in the storage battery, semiconductor and many other related sectors.

Since our foundation, we have nurtured power source technologies to limit the loss involved in power storage or

consumption to a low level. Based on these technologies, we develop solar inverters for power storage systems and fuel cells and other power supply devices. They play significant roles in the creation of a carbon-free society. We also internally produce high-voltage and large-current power semiconductors and high efficiency next-generation compound semiconductor modules. They are core devices supporting the power supply devices above. We are always able to deliver leading-edge technologies to society.

At the Sansha Electric Manufacturing Group, we will continue to provide new technologies and products further by applying technologies that we have continued to cultivate since our foundation to contribute to realizing carbon neutrality by 2050.

Energy solution provided by fully leveraging power electronics technologies



Specific initiatives

Development of a system combining storage batteries, fuel cells and a water electrolysis system

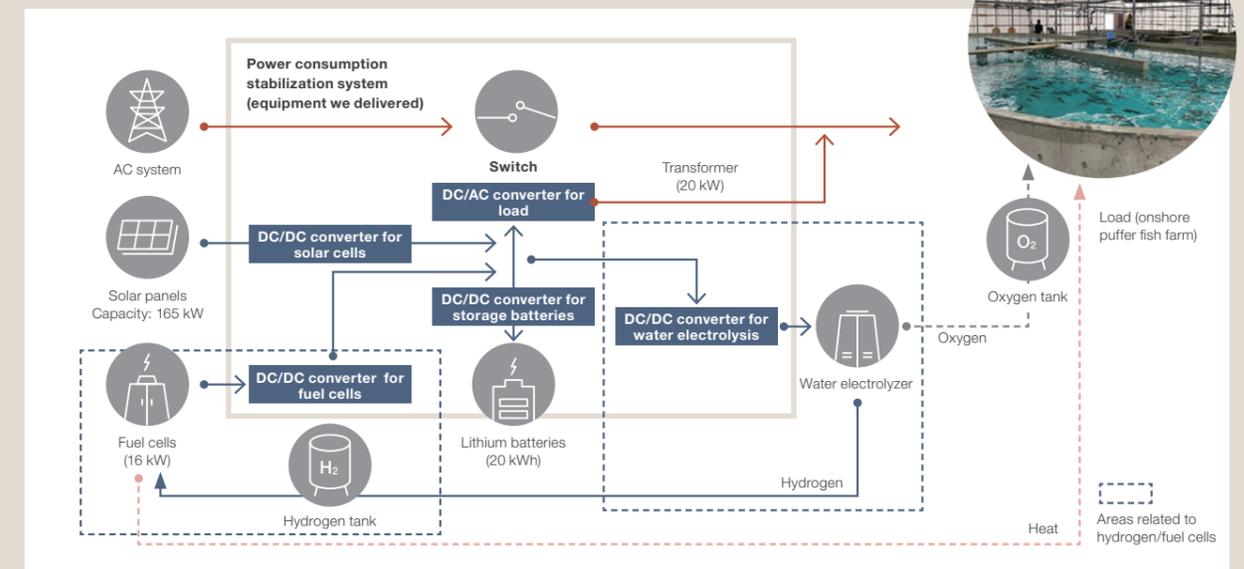
The power consumed in Iki City, Nagasaki (Iki Island) is generated by diesel power generators on the island. Due to the soaring cost of fuel (light oil), transportation and other expenses, it was urgently necessary to replace this method of generating power. Against this background, in FY2021 the Iki City Government began a demonstration experiment of a system using solar power and power from fuel cells with hydrogen generated from sunlight. This project has been implemented at an onshore puffer fish farm.

In this demonstration experiment, we delivered products

including solar inverters, DC/DC converters for fuel cells, DC/DC converters for storage batteries, and DC power supplies for the water electrolysis system.

The solar power and the power generated by converting the power from storage batteries and fuel cells is used to drive the water circulation pump used in puffer fish farming. Oxygen that is electrolytically generated by the water electrolysis system is used to maintain the oxygen level in the aquarium, and the heat generated as a by-product is used to maintain the water temperature.

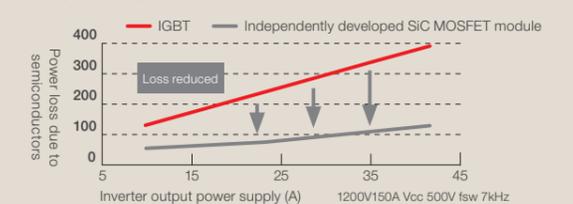
Configuration of our products



Contributing to saving energy with SiC MOSFET modules

We are working to develop a solar inverter that use hydrogen and build a fuel cell system leveraging the technologies for solar inverters that we have cultivated. This fuel cell inverter has a silicon carbide (SiC) MOSFET power module that we developed and contributes to improving energy efficiency in high-current, high-voltage applications.

Comparison of power loss of semiconductors



Virtual power plant* construction demonstration project

We are involved in a virtual power plant construction demonstration project with the goal of achieving unprecedented new energy management to build a foundation for energy infrastructure that will contribute to efficient energy use by society as a whole.

We are considering ideas which will lead to solutions to various

issues in the popularization, expansion and commercialization of renewable energy. Expected achievements have been seen in the demonstration experiments using household storage batteries, industrial storage batteries and electric vehicles as energy sources. We will continue working to optimize energy management for future commercialization.

*A virtual power plant is a system in which small power generation and storage facilities in many households, office and commercial buildings, factories and others are operated together like a single power plant, instead of constructing a large power plant, by integrating and remotely controlling them using IoT and other information technologies.

Initiatives for building a decarbonized society advanced together with our partner companies

On November 8, 2022, we signed capital and business alliances with Mitsubishi Heavy Industries, Ltd. and Nitto Kogyo Corporation. We collaborate with the companies to implement decarbonization initiatives, with the goal of enhancing our corporate value.

Comments from Mitsubishi Heavy Industries, Ltd.

At Mitsubishi Heavy Industries, Ltd. ("MHI"), we set our growth strategy as "Energy Transition" on the energy supply side and "Smart Infrastructure" on the demand side. Our aim is to strongly promote energy conservation, automation, and decarbonization initiatives in these areas contributing to the establishment of a carbon-neutral society.

We have been actively looking for an alliance partner, believing that collaboration with a partner will accelerate such initiative with an eye to the medium-term growth of the business, rather than pushing forward with it on our own. Sansha Electric Manufacturing has world-leading power supply and power semiconductor technologies and has proactively contributed to the establishment of a decarbonized society through highly efficient electric power transformation. This is an important element in the medium-term growth strategy that we have established at MHI, and we believe that Sansha Electric Manufacturing is an essential partner in our efforts to execute this strategy.

We are certain that the power electronics technologies

provided by Sansha Electric Manufacturing will make a substantial contribution to solving social issues as we move toward decarbonization. By leveraging each other's strengths, we can achieve a sustainable, carbon-neutral society globally providing new solutions. With Sansha Electric Manufacturing our mentor in the realm of power electronics, we hope for further strategic collaboration.

Shinichiro Gomi
General Manager
Business Development Department
Growth Strategy Office
Mitsubishi Heavy Industries, Ltd.



Comments from Nitto Kogyo Corporation



Safa Link-One

At Nitto Kogyo, we have set the expansion of our business in the energy management market as an initiative to be pursued in anticipation of decarbonization and the changes in the environment surrounding energy, to achieve continued growth under our long-term vision:

Trust, Technology, and Contribution — A company that creates values and connects electrics and information to tomorrow. We were looking for an alliance partner believing that, to achieve the above, we need to have a partner that shares our orientation, instead of working on our own. At Nitto Kogyo, we believe that the power electronics technologies possessed by Sansha Electric Manufacturing are essential for executing the above initiative. We are certain that the capital and business alliance will enable the two companies, both of which are oriented toward decarbonization, to leverage each other's strengths.

We believe that the power electronics technologies possessed by Sansha Electric Manufacturing are playing a very important role in the realization of a decarbonized society. The Safa Link-ONE- industrial solar self-consumption storage

battery system that Nitto Kogyo has productized is the first product that leverages the strengths of the two companies. It is highly acclaimed by many people. We expect that the two companies will continue to create new products and new solutions leveraging their technologies and strengths and thereby contribute to a decarbonized society.

We hope that the two companies can open up the way to a new era as strategic partners, aiming to achieve sustainable growth and the medium- to long-term improvement of their corporate value.

Mr. Takashi Mizukoshi
EMS Business Department,
Business Planning Department,
Nitto Kogyo Corporation



Helping solve regional issues with wireless technologies

Chino City, Nagano, where Suwa Sansha Electric Co., Ltd. is located, boasts the rich natural environment at the base of Yatsugatake. This has created social issues unique to Chino City, including the need to watch over mountain climbers and school commuters, the prevention of damage caused by harmful fauna, disaster control, and the introduction of agricultural IoT. To help solve these issues using unique technologies, Suwa Sansha Electric participated in the industry-academia-government collaborative project for the creation of the SUWARIKA Brand during the three years from FY2018 to FY2020.

Among these issues, in mountainous areas, flood damage is becoming more frequent every year with the rising risk of the flooding of small rivers. In Japan, a flood-prone country, there is strong demand for the measurement of river and lake water levels. Water gauges have already been installed in government-managed rivers and the data from them is transmitted wirelessly. However, these gauges have yet to be installed in small rivers.

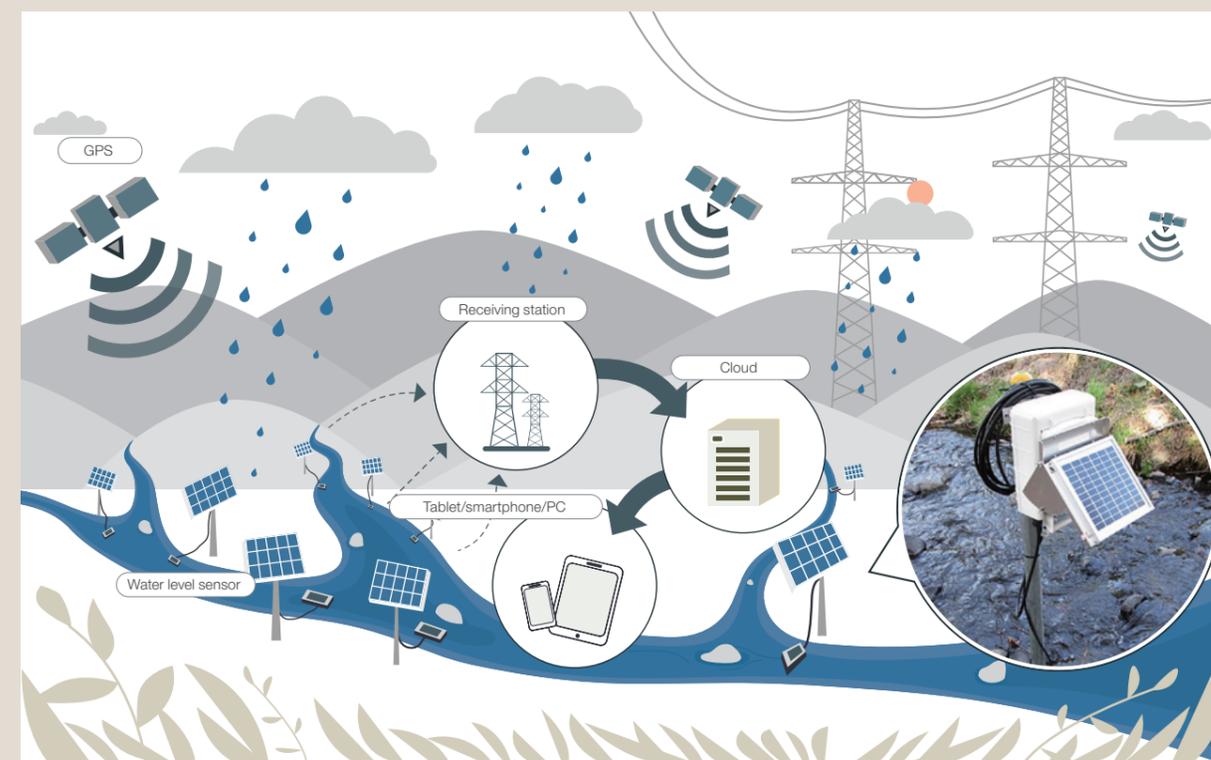
A compact, lightweight, high-precision, low-cost water gauge was developed as a SUWARIKA Brand product. In this project, Suwa Sansha Electric developed a wireless transmission board for the IoT device. The transmission board is equipped with a GPS. It is capable of transmitting location information

and information from the sensors connected to it. It is used to accurately predict river water levels and to monitor water levels, such as the detection of abnormal phenomenon caused by mudslides. At present, the water gauges are operating in the Chino and Suwa areas.

A demonstration experiment is under way for using these technologies for weather observation and crime prevention in the future.



Yatsugatake



What is the industry-academia-government collaborative project for the creation of the SUWARIKA Brand?

The project was created by the government of Chino City, Nagano to address the population decline, the low birthrate and the aging of the population. With Suwa University of Science playing a central role, the goal of this initiative is to solve various administrative and regional issues by integrating advanced manufacturing technologies with the Low Power Wide Area (LPWA) wireless transmission technology for leading-edge IoT devices.