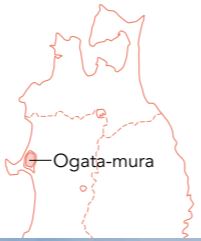


Joining Forces with the Community towards a Low-Carbon Society

— Tackling the Smart Grid —



TDK is participating in an extensive field trial of a "Local Smart Grid" (next-generation electric power transmission network) that was started in April 2010 at Ogata-mura in Akita Prefecture. By efficiently combining wind power, solar power, and fuel cell storage, the grid achieves self-sufficiency in local energy consumption. A new challenge for TDK's courageous spirit of craftsmanship!



Teruyoshi Ogawa, Manager Academic Research Department Akita University

Masashi Sato, Associate Professor Akita University Graduate School of Engineering and Resources Science

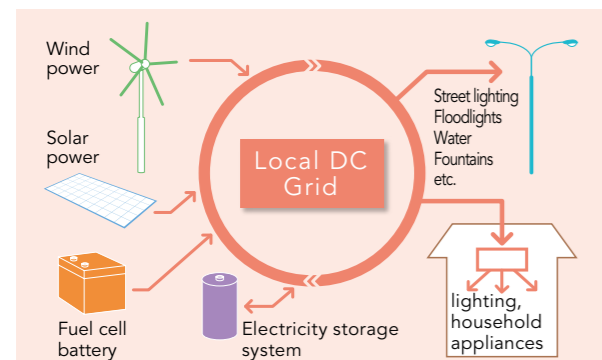
Hiroto Takahashi Mayor of Ogata-mura

Masahiko Hirokawa, Manager Energy Systems Development Grp Devices Development Center, Technology Grp TDK Corporation

Kazutaka Yamagami, Section Chief Department of Natural Resources and Energy Industrial Work Division, Akita Prefecture Government

Industrial, Governmental, and Academic Sectors Join Hands in Smart Grid Field Trial

In April of 2010, at Ogata-mura, a rural community located in the center of Akita Prefecture, a "Local Smart Grid" field trial was launched by TDK with the cooperation of Akita University and five local business enterprises. The site of the trial is "Road Station Ogata," a large parking and rest area/recreation facility along a major highway. The "Local Smart Grid" aims at achieving self-sufficiency in electric power within a regionally defined area, through use of renewable energy sources such as wind power and solar power. This not only helps to promote the use of renewable energy but also reduces risks of power outages. Another beneficial effect is a revitalization of the local



community. This approach is therefore currently garnering a lot of attention in various areas of Japan.

So far, similar projects in Japan usually were limited to the use of one type of renewable energy, but the current project combines three different kinds, namely solar power, wind power, and fuel cell battery. During periods of low power generation such as at night and at times without wind, previously stored electrical energy can be utilized to partially meet power needs for vending machines, parking lot lighting, etc. The current field trial aims at further improving stability and efficiency, to pave the way for practical use on a wider scale.

The project which was selected by the Ministry of Economy, Trade and Industry as a model project, originally was proposed by the Akita Environment Study Group organized by the Tokyo Office of Akita Prefecture. In keeping with one of the declared aims of the prefecture, namely the "creation of a new industrial infrastructure focused on new energy sources," Akita University took on the role of legal entity for management of the project, and a consortium was formed with participants from the industrial, governmental, and academic sector. In selecting the site, meteorological characteristics such as long hours of sunshine and high number of windy days worked in favor of Ogata-mura, and the fact that the community had already previously shown a dedication towards using renewable energy sources also played a role. On the side of the industry, TDK's longstanding ties with the region, as well as an existing track record of projects conducted in cooperation with Akita University made the company the natural choice. We will endeavor to use our accumulated know-how in order to contribute to this project.

Venturing into New Territory to Bring Real Value to Society

The task assigned to TDK is the configuration of a more effective system designed to optimize the demand/supply balance. In order to effectively convert the voltage when charging and discharging the storage batteries, TDK has developed a so-called "bi-directional converter" and is testing its implementation, along with various other measures designed to match system operation to the respective power generation and power consumption patterns at various points. The aim is to create a system with minimal losses both during power generation and during power use. One of the staff members involved in the project, Masahiko Hirokawa of the Devices Development Center, comments that "the opportunity to actually implement and use products that we have developed ourselves is of great value. Getting direct feedback under real world conditions provides a strong incentive to work towards further improvements, and it also brings new development targets into focus."



If this project is successful, it will have implications also for other scenarios, such as outlying islands or locations in developing countries where obtaining power from an outside source may be difficult. The concept of the Local Smart Grid is bound to find a wider application scope in future. Mr. Kazutaka Yamagami of the Department of Natural Resources and Energy of Akita Prefecture points out that he has high expectations of TDK "as a leading enterprise that can utilize its store of advanced technology know-how, and apply it towards local revitalization and the realization of a low carbon economy in Akita."

The participation of various organizations and entities in this project in the form of a consortium is an important aspect. "Whether we can produce results that meet the high expectations of the respective stakeholders in this project is definitely something we worry about. But as researchers and engineers involved in technical development, venturing into new territory is part of our job description. We hope that we can make best use of this opportunity to create something of lasting value for society at large." As this comment by Hirokawa reveals, the opportunity to view something from various angles creates a synergy effect that can even lead to a kind of "domino effect" in innovation, whereby one discovery leads to another. When people with various viewpoints work together, it becomes easier to create technology that can enhance the functioning of the social framework by contributing to goals such as the realization of a low carbon economy. This is the ultimate goal that informs TDK's spirit of craftsmanship.



Cutting the ribbon at the system inauguration ceremony

Comments from consortium participants

Hiroto Takahashi
Mayor of Ogata-mura



Already since a number of years, our community has been engaged in concepts for regenerated sustainable agriculture and the adoption of natural energy sources. Our aim for the future is to cover all our energy needs from renewable sources. Therefore this project has considerable significance for us.

TDK is a company with strong local ties, yet renowned the world over. Our citizens therefore have great interest in this field trial, and the expression "Smart Grid" is on everybody's lips. It would of course make us proud and happy if technology developed in our community were to be adopted on a worldwide scale.

Comments from consortium participants

Masashi Sato
Associate Professor Akita University Graduate School of Engineering and Resources Science



Teruyoshi Ogawa
Manager Academic Research Department Akita University



Such a large-scale experiment would be difficult to carry out by a university alone, due to budget restraints and various other reasons. Therefore it is of great significance that we can cooperate with a company like TDK that is actively engaged in advanced research. We look towards continuing the collection of data year round, and will also be exploring new avenues and topics for research, making the best use of the university's store of knowledge. We have high expectations that Smart Grids along the lines of the current trial system may become widespread in future.

Consortium Organizational Chart

