

Community development with a core facility for ensuring peace of mind.

The challenge of providing long-term support for recovery, through the efforts of industry.

On March 11, 2011, the Tohoku region (the northeast part of Honshu, the main island of Japan) was struck by the Great East Japan Earthquake. Immediately afterwards, I found myself searching for missing family members in Rikuzentakata City, Iwate Prefecture—wandering in the pitch-black night, without any electric power supply.

With no accurate information available, and with no lights at all to see by, it was a really disheartening situation.

Eight years on, the new town being built at Rikuzentakata has yet to take shape.

In this report, we look at the challenge that has been taken up at Ohira Village in Miyagi Prefecture, where business enterprises, the local government and local people have combined their efforts with the aim of “building a factory-centered community where people can enjoy real peace of mind.”

The F-grid Concept

Text and photographs by photojournalist Kei Sato.



Business enterprises take hand to hand to realize a new concept.

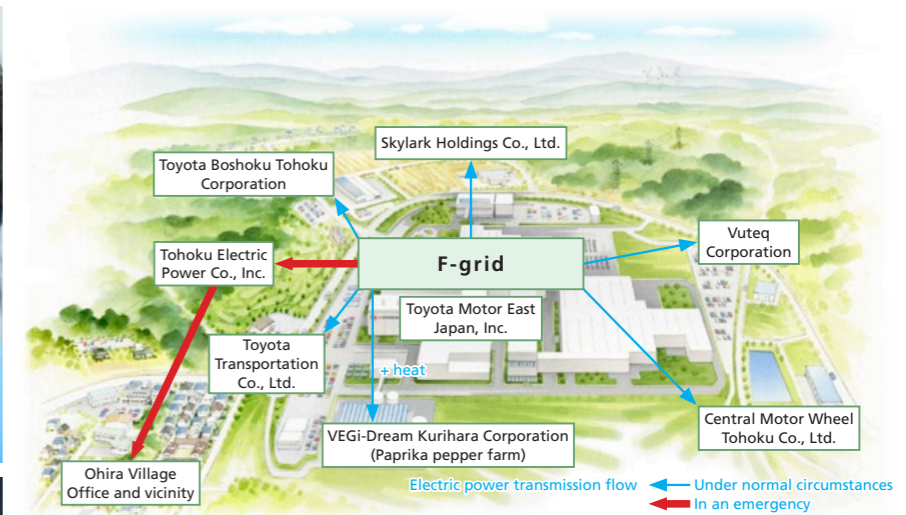
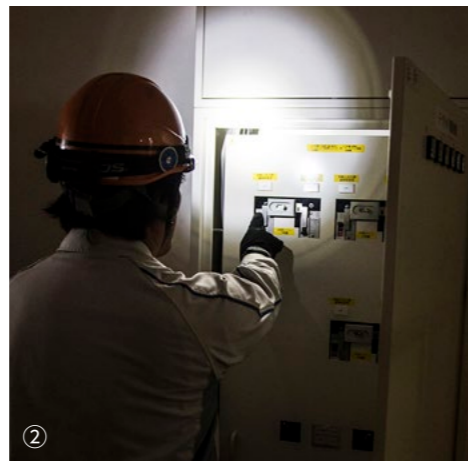
Located around 40 minutes' drive from one of the biggest city in northeast Japan Sendai, Ohira Village is the only local administrative district in Miyagi Prefecture that is designated as a Village (as opposed to a City or Town). Before visiting Ohira, I had a preconception that it would just be a collection of steel-blue factory buildings. But what I actually saw there was a park where a group of senior citizens and families were relaxing, and a roadside rest area where locally-grown vegetables were on sale. If I hadn't been looking for it, I probably wouldn't have noticed that there was also an industrial park directly opposite me.

The industrial park, which is centered round the Toyota Motor East Japan (TMEJ) factory, has been developed using the revolutionary new F-grid (“Factory grid”) concept. The environmentally-friendly electric power and heat energy that are generated by Toyota's large-scale generator unit are allocated flexibly to the factories of seven companies that are located within the industrial park. For example, the facility belonging to restaurant chain Skylark needs to keep ingredients and food products chilled continuously, 24 hours a day, and so is able to make effective use of the power generated by Toyota's generator unit during periods when other factories aren't using much power—night time for example. VEGi-Dream Kurihara

Corporation uses the waste heat generated by the nearby factories to cultivate high-quality paprika peppers. In this way, F-grid provides a framework for efficient production which involves collaboration between the manufacturing and agricultural sectors, and which creates jobs for the local community.

What is truly revolutionary about F-grid is the electricity transmission arrangement that has been established through collaboration with Tohoku Electric Power Co., Inc. In the event of a natural disaster or other emergency, the electric power generated at the Toyota factory can be transmitted to the Village Office, which serves as the Disaster Management Center for Ohira Village. “There were some significant psychological barriers to overcome. Linking up the systems so that we could transmit electric power generated by another company's generator unit was an almost unimaginably difficult task. However, we strongly identified with Toyota's vision of ‘Growing together with the local community,’ and so our attitude gradually changed from ‘There's no way this can be done,’ to ‘This is something we really need to do,’” explains Mr. Kobari, the head of the transmission department at Tohoku Electric Power's Miyagi branch.

Rikuzentakata City in the aftermath of the Great East Japan Earthquake of 2011, with all the lights having gone out.



[The F-grid Concept]
 F-grid is a system that aims to realize the efficient supply of energy within an industrial park by combining energy (both electric power and heat) from electricity generation equipment that utilizes the municipal gas supply with effective control and optimization of electricity purchased from the electric power company. In an emergency, electric power can be transmitted from F-grid to the local Disaster Management Center.

- ① Personnel from Tohoku Electric Power, the City of Sendai Gas Bureau and Toyota standing in front of the building that houses Toyota's huge generator unit. Effective collaboration has supported the development of F-grid.
- ② Training is conducted every year to verify the procedures for ensuring the supply of electric power in an emergency when there has been a power outage.
- ③ Skylark's huge cold storage and refrigerated warehouse facility. "If the power supply was cut off, the food ingredients stored would become unusable very quickly. Thanks to F-grid, we can be sure of having a backup power supply in the event of a power outage, which is very comforting." (Mr. Hirasawa, a manager at Skylark)
- ④ The staff of VEGi-Dream Kurihara Corporation's Ohira Farm. The Farm produces around 280 tons of paprika peppers per year. By making effective use of the heat generated by the F-grid generator unit, the Ohira Farm is able to maintain cultivation year-round with fuel expenditure that is roughly half that of VEGi-Dream Kurihara Corporation's other farms. In the future, the Ohira Farm also plans to begin utilizing the carbon dioxide emitted by the F-grid production facilities.
- ⑤ "It may sound over-the-top, but we actually risk life and limb in order to ensure a stable supply of electric power." (Mr. Kobari, a manager at Tohoku Electric Power)
- ⑥ The delegation from Kanegasaki in Iwate Prefecture who were invited to attend the Ohira Man-yo festival put on a performance of the traditional "Rokuhara Onikenbai" dance, helping to strengthen cultural exchange between Kanegasaki and Ohira.

People can work with peace of mind with their families being safe.

"It's not enough just to think about our own company; we need to think in terms of the needs of people outside the Toyota Group and outside the automotive industry—the needs of people throughout Japan." The Great East Japan Earthquake of 2011 led Toyota to develop the F-grid concept based on the vision outlined above. While rushing to get the factory operating again, employees had no peace of mind because of the uncertainty affecting their families. When the earthquake occurred, the electric power supply was cut off, so there was no way of transmitting information; people living inland had no idea as to how badly affected the coastal areas had been. With no lighting in the village, people were enveloped in an atmosphere of fear and worry. Electric power means more than just the power needed to run a factory; it also represents the ability to transmit information, and the lights that give people a sense of security. This was why Toyota decided to put in place a system so that, while the electric power generated at the plant would normally be used for business operations, in an emergency it could be transmitted for use at the local Disaster Management Center. It was being clear that the priority order for recovering from a natural disaster was: first, focus on saving lives; next, concentrate on helping the local community to recover; finally, get the factory operating again.

The "YUI Gallery" forms part of the TMEJ factory at F-grid, and is normally used for displaying car engines, etc. In an emergency, the Second Floor area of the Gallery will be made available as an emergency evacuation center for the general public, with enough room to accommodate around 200 people. In the event of a power outage, this facility would still have backup power from the F-grid generator and from PHV (plug-in hybrid vehicle); it is also equipped with TV sets, mobile phone chargers, and satellite phones. To confirm that Ohira Village Office would be able to receive electric power from F-grid in the event of an emergency, every year the Village Office conducts joint disaster preparedness training in collaboration with the F-grid industrial park. When the Great East Japan Earthquake occurred, the Ohira Village Office was able to maintain a minimal level of electric power using a fuel oil powered generator but from now on the Village Office will be able to utilize electricity transmitted from F-grid. "It's a complex system and I don't really understand all the details of how it works, but even just keeping one light on can help to reassure people in an emergency," notes Mr. Sekiuchi, a chief of a residents' association who has been working actively to promote disaster preparedness at the local level.

Industry and daily life are two sides of the same coin. The approach to underpin future community development.

It takes time for an area that has been affected by a natural disaster to recover. The objective that underlies the F-grid project is to do more than just provide short-term support; instead, the aim is to help manufacturing industry put down firm roots in the area in a way that can underpin the continued economic development of the Tohoku region as a whole. With a conventional industrial park model, people commute from their homes to a workplace that is located some distance away, and this does little to revitalize the community. By contrast, F-grid is founded on an awareness of the need to focus not just on corporate profitability, but also on working together with local government authorities and local people on the challenge of community development. "Since 2011 there has actually been a slight increase in the Village's population," says Mr. Waizumi, who works at the Ohira Village Office, with a cheerful smile. The Ohira Man-yo festival, which was held in August 2018, was a great success, attracting around 8,000 visitors (exceeding Ohira Village's population of 6,000 people). As both communities host a Toyota factory, Ohira Village has established

a "twin town" relationship with the town of Kanegasaki in Iwate Prefecture, and in the event of an emergency the two communities are able to support one another; being able to receive help from people you know provides an enhanced feeling of confidence. In the past, Ohira Village didn't really do much in the way of disaster preparedness, but today the local government and local residents collaborate on the distribution of emergency survival kits, and on implementing disaster response training in each district within the Village, etc. Rather than being just a collection of rational actors focused on their own self-interest, the inhabitants of Ohira Village are pooling their respective skills and expertise to work together on building a whole new kind of community. It doesn't matter how good your infrastructure is; if you don't listen to the people who live there, then you can't really call it a "community." Toyota sincerely hopes that, for people living in areas affected by natural disasters where recovery is taking a long time, a warm light of hope is starting to appear, and daily life is gradually starting to return to happy normality.