

Reconstruction and development solutions in Higashimatsushima, an area that was greatly damaged by the earthquake.

Miyagi, Japan



Ten years since the Great East Japan Earthquake.

Town reconstruction development solutions in Higashi-Matsushima, Miyagi Prefecture, an area that was greatly damaged by the earthquake.

The Great East Japan Earthquake occurred on March 11, 2011. March 2021 will mark the 10th anniversary of the earthquake. During those ten years, the disaster areas have steadily recovered. As a Group, Panasonic is also working to help reconstruct the Tohoku region, and we offer our solutions in the belief that it is our mission to fulfill the social responsibilities through our support.

As an example of that, we would like to introduce Panasonic's earthquake disaster prevention solution initiatives in Higashi-Matsushima, Miyagi Prefecture, an area that was greatly damaged and claimed many victims from the earthquake.

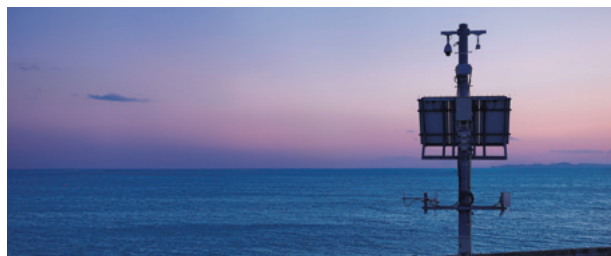


A monitoring system that is strong in emergencies to prevent tsunami disasters.

Higashi-Matsushima was heavily damaged by the tsunami during the Great East Japan Earthquake, and approximately 60% of the city was flooded. In the reconstruction plan, a guideline to formulate a disaster prevention independent city was raised, and various efforts have been made for that purpose. As part of that, the Higashi-Matsushima coastal tsunami monitoring system advance model project was implemented. This equipment operates a wireless network with a solar power generation system and storage batteries even during emergencies when commercial power or wired information networks are not available.

One of the reasons of the heavy damage suffered by Higashi-Matsushima due to the tsunami was the breakdown of the disaster prevention radio and warning systems due to power outages.

When a major tsunami warning is announced, personnel cannot be dispatched to the dangerous coastline, so a disaster-resistant monitoring system that can function for three days even if there is a power outage was required.



A camera network with an independent power system installed on the Omagari coast

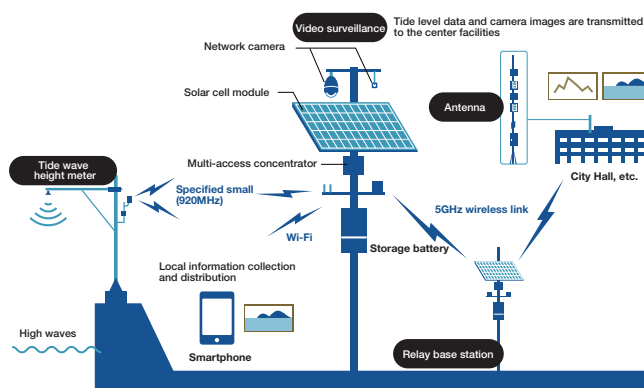
Operates the wireless monitoring system even during a power outage with the power self-sustaining system.

In this advance model project, network cameras for coastal tsunami monitoring were installed at the Omagari Coast, Hamaichi Coast and Nobiru Coast. The plan is to wirelessly transmit the wave height meter data provided at the Hamaichi Coast and real-time video to the Disaster Countermeasures Headquarters at City Hall.

The core of this wireless system is the multi-access concentrator, which supports the transmission and reception of three wireless networks, a 5G wireless link sends video, with 920MHz transmission which suitable for transferring extra small data such as wave height data and Wi-Fi. This power is supplied by an autonomous power system consisting of a solar panel and a lithium-ion storage battery.

In addition to when a disaster occurs, a wide range of uses is being considered for this system, including monitoring dangerous behavior of people fishing or swimming, providing weather information via Wi-Fi and providing tourist information to tourists, etc.

Coastal tsunami monitoring system diagram



— For further development —

Enhance the functionality of the coastal tsunami monitoring system and use it for ICT infrastructure for town reconstruction development.

In Higashi-Matsushima, many residents moved after the earthquake, and formation of a community was an issue. Therefore, the development of infrastructure was required to make the community center a base where local residents can gather more easily and promote mutual cooperation between each of the community centers.

In each of the community centers, in addition to installing indoor Wi-Fi access points and establishing a wireless communication environment, the wireless network (5G wireless link) established by the coastal tsunami monitoring between each center and city hall was used to add base stations. As a result, ICT infrastructure that enabled video conferencing was established.

Using this infrastructure, Internet access from smartphones and tablets has become possible at the community centers, making them a base where local residents can gather even more easily. We provide communication services that connect multiple bases such as City Hall and each community center with video and audio and enable them to be used for activities that connect the communities or for live viewing.

Furthermore, monitoring services for the elderly are also implemented using a Wi-Fi environment.



The Omagari Community Center with its base station antenna



The video conference system terminal at the Nobiru Community Center

An evacuation guidance system that notifies users with light and sound and provides information in the event of an emergency disaster.

The JR Senseki Line in the Nobiru area of Higashi-Matsushima was damaged by the Great East Japan Earthquake, and the former JR Nobiru Station was flooded up to 3.7m by the tsunami. In 2015, the JR Senseki Line was relocated to a route that goes through the higher ground relocation site, and the original station building was renovated as the Higashi-Matsushima 3.11 Disaster Recovery Memorial Museum.

The evacuation information transmission pole installed next to the Higashi-Matsushima 3.11 Disaster Recovery Memorial Museum normally functions as a street light and provides a Wi-Fi environment and tourist information a digital signage.

During an emergency, it will appeal to visual and auditory senses with the flash light and evacuation guidance display and guide residents to a safe location.

Furthermore, the damage situation can be grasped remotely with the surveillance cameras, so it is expected that it will be possible to collect information and take appropriate measures without going to dangerous sites.



The evacuation information transmission pole installed next to the Higashi-Matsushima 3.11 Disaster Recovery Memorial Museum. During an emergency, it will provide an evacuation guidance to the Nobiru Community Center located on the hill in the back.

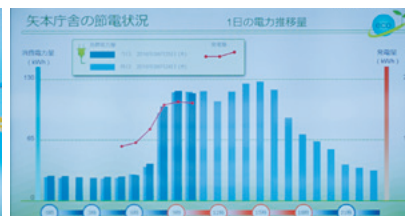
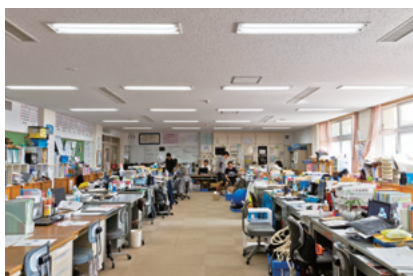
The attempt at a smart community that aims to become a net-zero energy city.

The grand design towards the realization of a net-zero energy city is being drawn up in Higashi-Matsushima under the formulated town reconstruction development plan and energy vision.

The objective of this project is to reduce normal power measurement and power consumption in public facilities. Therefore, power measuring devices were installed in a total of 13 facilities including City Hall and elementary and junior high schools. The energy in all 13 facilities is managed by the EMS server of the main government building in City Hall which is connected by an existing intranet, and the power consumption of each facility is measured.

Also, in order to optimize the visualization of power usage and energy, a lighting control system was introduced in four facilities. By converting the lighting of each facility to LED, a significant reduction in power consumption has been achieved.

Furthermore, the lighting is controlled using motion sensors and illuminance sensors and energy saving activities are promoted by sending emergency emails when electricity usage is pressing, and detailed energy saving measures are also implemented.



(Pictures above) Visual presentation of facility power saving statuses and hourly power consumption
 (Picture on the left) Converting the lighting of the staff room to LED at elementary and junior high schools

We will continue to contribute to the further development of the city.

Panasonic's goal of development during disaster reconstruction is to create a sustainable and smart city by utilizing renewable energy and good energy management.

At the same time, Panasonic aims to create a safe and secure city by proposing facilities and equipment that consider disaster functions, such as securing a power source and communication which can be used to maintain a lifeline at every facility in the city. Panasonic will continue to contribute to the reconstruction of the disaster areas with technology.



Installed Products



Coastal tsunami monitoring system diagram

- Multi-access concentrator
- Antennas (5G, 920MHz, Wi-Fi)
- Network camera
- Solar power generation system
- Power storage system
- Wavemeter



Smart community for "Net Zero Energy City"

- EMS server
- Switching hub
- Power measuring instruments
- Demand controller
- Energy visualization system
- LED lighting fixtures
- Lighting control panel
- Motion sensor
- Human sensor controller (Separate Cell Con)



ICT platform for reconstruction and development

- Information communication terminal
- Two-way HD-COM terminal
- Base station equipment
- Relay station equipment
- Indoor access points



Evacuation information transmission pole

