

# IQGeo<sup>o</sup>

## Case study

TEPCO is the largest electric utility in Japan and the 4th largest electric utility in the world. It provides services for Japan's Kantō region, Yamanashi Prefecture, and the eastern portion of Shizuoka Prefecture, includes Tokyo.



Photo courtesy TEPCO Power Grid

## TEPCO

Japan currently ranks as the third largest energy consumer in the world, after the US and China. TEPCO Power Grid, part of the Tokyo Electric Power Company Holdings (TEPCO) group, is responsible for nearly one-third of all the power supplied in Japan.

The utility provides energy to the Tokyo Metropolitan Area, which has a population of about 44 million, and accounts for around one-third of Japan's total power consumption rate.



# Challenge

On 9th September 2019, Typhoon Faxai hit Japan. In the Tokyo Metropolitan area, it caused electricity outages for 934,000 households, taking down 1,996 poles and two transmission towers.

Damages from Typhoon Faxai were heavier than had been anticipated and while supporting units were transferred to assist from other regional electric companies, they were not familiar with the area. The utility also needed to communicate with Japan Self-Defense Force, and other infrastructure providers such as telecoms, gas, road management, and local government. TEPCO Power Grid was required to have daily press meetings to keep everyone informed of progress, but the lack of accurate and current information made it almost hard to forecast recovery timing.

Being responsible for transmission and distribution, TEPCO Power Grid was able to monitor the status of power distribution of high voltage line but they couldn't monitor the low voltage line status. So TEPCO asked citizens in the Tokyo Metropolitan area to notify their houses' outage status to TEPCO. However, the requests were made through Twitter and via television, but without power neither of these communication channels were effective. The media called this the 'hidden outage'. Customers were getting increasingly frustrated by the perceived lack of information, prolonging the disaster recovery and impacting the company's key success factors like Credibility and Customer Satisfaction.

They quickly needed a new solution that would enable TEPCO to respond efficiently and effectively to this situation, and future severe weather conditions that are increasingly common in the Tokyo area. In the immediate term it needed to provide:

- The Disaster Response Headquarters (DRH) with an accurate picture of the situation in the field in order to speed up recovery
- Accurate forecast reports and improve communications between relevant organizations

# Solution

About a month before Typhoon Faxai, TEPCO Power Grid started working with IQGeo and NESIC (a partner of IQGeo) on a Proof of Concept (PoC) to trial functionality across a number of use cases. As part of this work, the IQGeo team added the location and attributes of six million poles plus other asset information such as substations and high-voltage wires. They had checked the performance and tested an easy-to-use interface for the field engineers.

While the initial focus of the PoC was not disaster recovery, the IQGeo – NESIC team had designed the platform to aid in these cases and had conducted several exercises. For example, they involved adding extracted data from TEPCO's Field Situation Sharing System into the IQGeo Platform to provide an accurate view of current status and exact location of critical asset damages. However, the number of users was still limited.

Then the typhoon hit Tokyo Greater Area and the requirements changed, there was now an urgent need to monitor the status of recovery progress. The IQGeo PoC had demonstrated the platform's benefits and most of stakeholders started understanding its value. The IQGeo Platform was installed at Disaster Recovery Headquarters (DRH) and started operating temporarily.

Via the IQGeo Platform, field engineers and DRH shared exact location of damaged part of the problem assets, which helped DRH to understand the damage and make informed estimates about the required materials and repair work, as well as restoration forecasts.

TEPCO discovered a solution to find the "hidden outage" areas, which were still losing energy due to low voltage line damage. They first displayed energized status of high voltage line with overlaying failure information from Smart Meters to flag areas where something may be wrong with a low voltage line. This enabled TEPCO Power Grid to transfer field engineers to problem areas rapidly, helping smooth restoration without waiting for notice from customers.

# Results

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IQGeo's geospatial Platform made it easy for TEPCO to visualize accurate damaged location and accelerate collaboration with key decision-makers, while sharing vital information to citizen and governments.

The supervisory ministry asked for a detailed report in just a month and the IQGeo Platform enabled the team to do this quickly and efficiently. A Group Manager at TEPCO said that without IQGeo, it would take double the time to grasp the total damage for extreme weather events.

The IQGeo Platform is currently being used in distribution division at TEPCO, but there are plans in place to expand the deployment to broader Power Grid business processes including the construction division, communication division and contractors.



Photo courtesy TEPCO Power Grid