

TEPCO Power Grid (referred to as “PG” below)

TEPCO aims to install and manage 27 million smart meters in the wake of electricity retail market deregulation

TEPCO Group, whose mission is to provide a stable supply of electricity and energy to the Greater Tokyo Area, is installing smart meters to improve efficiency and to further enhance customer service. The group, which became a holding company structure on April 1, 2016 at the time of Japan's electricity retail market deregulation, has already installed more than 13 million smart meters. The number is expected to reach approximately 27 million upon completion by 2020. In a project of such a globally remarkable scale, NTT DATA was selected as a partner for development of the Meter Data Management System (MDMS) to process the huge volume of essential data and to interface with other systems. TEPCO is already seeing results such as improved efficiency of meter reading work and burden reduction for users by remotely performing tasks; the next steps being considered are the offering of finely tuned services corresponding to each user's requirement, and further utilizing the data to find other ways to contribute to society in the future.

Problems for customers

- Increased burden due to the manual monthly meter reading work
- Customer's physical presence required at the time of moving-in/out and change of contract capacity
- Due to monthly meter reading, rate plans by electricity retailers become inflexible and limited

Benefits of introduction

- Meter reading work became drastically efficient by automatic, remote reading
- Open/close at the time of moving-in/out and change of contract capacity can be remotely performed, meaning customer presence is no longer required
- Meter readings at 30-minute intervals, allowing flexible service plans corresponding to actual electricity usage

Background of introduction and problems

27 million smart meters to be installed while maintaining a stable supply of electricity

By optimizing an indispensable aspect of everyday life –electricity– TEPCO contributes to the realization of a sustainable society that is not just convenient and easy to live in, but also in harmony with nature. Within TEPCO's group of companies, PG handles electricity transmission and distribution.

Yusuke Kuze, head of the company's Smart Meter Promotion Office, emphasizes “The vital mission of our company is to realize a stable supply of electricity more efficiently, while securely maintaining our enormous infrastructure”.

Meter reading work has been a challenge to date. Until now, meter readers needed to visit every household on a monthly basis to check electricity usage. And, in addition to being a labor-intensive task by nature, factors such as an increase in the number of apartments and detached residences with self-locking entrances and enhanced security further complicate the matter. From the perspective of customer satisfaction, there were inconveniences such as the requirement of residents' physical presence when moving, or changing a residence's capacity.

To address these needs, TEPCO launched a massive project to replace as many as approxi-

mately 27 million meters installed in its service area with smart meters by FY 2020, to reduce the labor involved and improve customer service.

Selection criteria

Acknowledgment of achievements in developing large scale systems and project management

At the launch of the project, NTT Data was selected as a partner to develop the MDMS (Meter Data Management System), the key to the entire system. Kobun Nakajima, Head of PG's Smart Meter Operations Center, Smart Meter Promotion Office, said of choosing NTT Data, “The distinctive feature of MDMS is that it is an incomparably large-scale system which will eventually process a massive volume of data sent by 27 million smart meters. The system is closely related to billing based on customer meter readings. For this reason, we were impressed by NTT Data's achievements in developing such a large-scale enterprise system, which is unique, as well as their ability to manage the system by leveraging their experience and knowledge.”

MDMS is positioned between the communication system, which collects smart meter data, and the sales billing system, which calculates customer electricity charges, linking with both to configure the smart meter system. MDMS itself has three main functions. First, MDM (Meter Data Management) to accumulate

meter readings and make them available at any time. The second is MAM (Meter Asset Management) to manage facility information, and the third is NM (Network Management) to do just that. In addition, a system collaboration platform to link these two systems and three functions is provided.

PG's Kuze noted “Since multiple systems and reliable cooperation between them were required, we had high expectations for the ability of NTT Data's project management involving multiple systems.”

Process of introduction

A detailed project plan to address an additional new requirement

Following the launch of the MDMS project in May 2013, development of the communication and sales billing systems were started in parallel.

Hideyuki Sato, then-system group manager, Smart Meter Promotion Office, observed “As developments were proceeding right and left of the MDMS at the same time, the point was how to adjust specifications while maintaining communication with the persons in charge of both systems and the development vendors. NTT Data offered various realistic and optimal proposals contributing greatly to rapid development in a short period of time.”

In autumn of the same year, a new requirement imposed by the state in relation to the

full deregulation of electricity retail market called for meter readings at 30-minute intervals, to be sent to electricity retailers within 60 minutes, resulting in the deregulation project's hasty launch.

"Just after naming NTT Data as a partner, we drafted the project plan in a month or so. Any and all problems that might arise, and the frameworks to resolve them were integrated into it, making it possible to cope with any situation quickly," recalls Sato.

The installation of smart meters was initiated in April 2014, and the switch-over to MDMS began in February 2015 with some services utilizing the smart meter system in the then-Tama branch service area. Adaptation for deregulation was completed on time by April 2016.

Effect of introduction and future prospects

Installed meters exceed 13 million; efficiency improved by automatic reading

PG's smart meter system, with MDMS at its core, continues operating successfully, with smart meters spread throughout the entire served area and exceeding 13 million as of September 2017.

Munehito Mori, the System Group Verification and Construction Team Leader, Smart Meter Promotion Office explains "A smart meter is an IoT instrument. We are already integrating data from 13 million IoT instruments every 30 minutes. The data is processed adequately and sent to a separate system within 60 minutes. We are confident that the system scale and speed of deployment are unparalleled in the

world."

After the introduction of the MDMS, and with an increase in the number of installed smart meters, automatic meter reading is spreading, while the number of locations requiring a visit by a meter reader is steadily decreasing. In addition, when changing the contract ampere, burdens such as being physically present and power cut by changing a circuit breaker were reduced by setting the ampere to the smart meter remotely. Better work efficiency and enhanced customer service are also achieved. In addition, by changing meter reading frequency from monthly to every 30 minutes, it is possible to visualize electricity use conditions and offer various rate plans according to actual use.

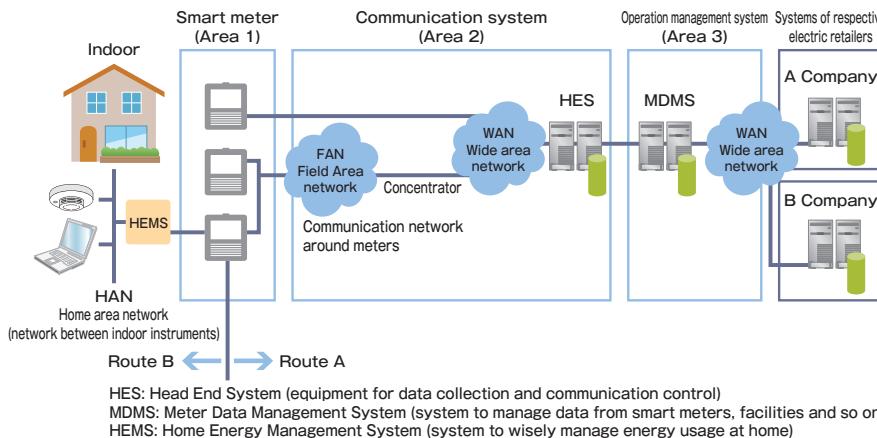
Looking forward, TEPCO PG plans to complete the installation of 27 million smart meters by 2020 and is aiming for further data utilization. "Since valuable data is being integrated, we intend to consider ways of data utilization that benefit society. On the other hand, we expect that the smart meter system will be in high demand globally, therefore we are considering expanding abroad, such as in Southeast Asia. In expanding business while benefitting society, we have high expectations for NTT Data, their abundant achievements in the field of social infrastructure and overseas network, as well as their international experience," says PG's Kuze.

From improved work efficiency and customer service enhancement to societal contribution – the role of MDMS by TEPCO Power Grid appears to be expanding.

Services presented in this report

Smart Meter System

By installing a smart meter in every household within the served area, electricity usage (integrated value) for the previous 30 minutes is transmitted and processed every 30 minutes. This system was separately developed in three areas, namely area 1: meter development, area 2: communication system construction and area 3: MDMS system construction.



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Company Profile



TEPCO Power Grid, Incorporated

Location: 1-1-3 Uchisaiwai-cho, Chiyoda-ku, Tokyo

Business commencement: April 1, 2015

Business overview:
TEPCO Power Grid, who is responsible for about one-third of electricity supply in Japan and sustains electricity distribution in Japan which is the third largest energy consumption country in the world (first: USA, second: China). By its highly reliable facilities and advanced technology, it maintains the world's top-class stability with both annual number of interruption of 0.06 times/year (in FY 2015) and interruption duration of six minutes/year.

URL: <http://www.tepco.co.jp/pg/>

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