

**Commenced Demonstration Operation of
Cloud-Based Advanced Energy Management System in Slovenia
—Project aims to realize energy service business for large-scale
power consumers and electric power retailers —**

Translation of Japanese NEDO news release posted on November 5, 2021
New Energy and Industrial Technology Development Organization (NEDO)
Hitachi, Ltd.

New Energy and Industrial Technology Development Organization (NEDO) and Hitachi, Ltd., in cooperation with ELES, d.o.o., Slovenian national power transmission company, have completed "a cloud-based Advanced Energy Management System (AEMS)" which has been under construction since 2018 as the second phase of the smart community demonstration project and commenced its demonstration operation.

In this demonstration operation, we are aiming to establish an energy service business for large-scale power consumers and electric power retailers by building a cloud-based AEMS in the data center which has several functions such as, islanding (autonomous operation in the event of a power grid accident), voltage dips mitigation measures, and ancillary services (provision of flexibility to electricity transmission system operator).

Based on the analysis and evaluation results of the demonstration project, we will consider the development of the business model in the form of a service, primarily in Europe, that provides cloud-based AEMS along with cloud-based DMS (completed in 2019). Along with the start of this demonstration operation, an online ceremony to celebrate the start of operation was held connecting Slovenia with Tokyo, which involved parties attended from both countries.



The storage batteries which were installed in the power distribution grid in the Idrija district

1. Overview

In Slovenia, a massive power outage caused by natural phenomena such as a severe cold wave occurred in 2014 and measures to protect hospitals and other critical facilities from long blackouts have become increasingly important.

Also, countermeasures are needed especially for large-scale power consumers, such as factories, because voltage dips caused by lightning strikes etc. have a significant impact to own equipment.

In addition, the increasing demand for renewable energy and electric power has raised concerns about the need to secure flexibility of voltage and current to stabilize frequency, and there is a need for more advanced and economical power distribution grid systems and energy management technologies to solve these problems.

Under these circumstances, NEDO, Slovenia's Ministry of Economic Development and Technology, Ministry of Infrastructure, and ELES, d.o.o., have agreed to expand the scope of the demonstration project^{*1} for large-scale power consumers and electric power retailers and to start a demonstration project for a cloud-based Advanced Energy Management System (AEMS^{*2}). The parties signed a revised version of Memorandum of Cooperation (MOC), Minutes of Meeting (MOM) and Memorandum of Understanding (MOU) respectively on September 24, 2018. At the same occasion, Hitachi, Ltd. and ELES, d.o.o. agreed to jointly implement this new demonstration scope and signed a revised version of the Implementation Document (ID). This demonstration project is the second phase following the first phase^{*3} of the demonstration project to construct a cloud-based integrated power distribution management system (DMS^{*4}) for small- and medium-sized distribution companies.

Now, NEDO and Hitachi, Ltd. in cooperation with ELES, d.o.o. completed an AEMS which has been under construction since MOU as the second phase of the project and commenced its demonstration operation. Hitachi, Ltd. has completed the construction of a cloud-based AEMS which enables the linkages between the storage batteries which were procured and installed by ELES, d.o.o. on the consumer's premises in the BTC district of Ljubljana and the storage batteries which were and installed procured by Hitachi, Ltd. in the power distribution grid in the Idrija district and to the xEMS^{*5} of the consumers.

2. Contents of the demonstration project

In this demonstration operation, we are aiming to establish an energy service business for large-scale power consumers and electric power retailers by building a cloud-based AEMS in the data center which has several functions such as, (1) islanding (autonomous operation in the event of a power grid accident), (2) measures to prevent voltage dips, and (3) ancillary services (provision of flexibility to electricity transmission system operator).

(1) Islanding (autonomous operation during grid failure)

In the event of power outages, the system will link up with the DMS to isolate the targeted areas including important facilities such as hospitals from the power grid and to supply power from the

storage batteries to avoid a prolonged power outage. No islanding test has been conducted in an actual power distribution system in Japan, and this will also be the first demonstration case in Slovenia.

(2) Voltage dips mitigation measures

The storage batteries installed in the targeted areas will be used to protect customers' important load facilities from voltage dips caused by natural phenomena such as snowfalls and lightning strikes at factories that require high-quality power supplies.

(3) Ancillary services (provision of flexibility to electricity transmission system operator)

In cooperation with the storage batteries and xEMS such as BEMS and HEMS installed on the consumer's premises in the areas, the system provides electricity transmission system operator with the ability to adjust the frequency that contributes to grid stability.

Based on the analysis and evaluation results of the demonstration, Hitachi, Ltd. and ELES, d.o.o. will consider the development of the business model in the form of a service, primarily in Europe, that provides cloud-based AEMS along with cloud-based DMS which was developed in the first phase demonstration project.

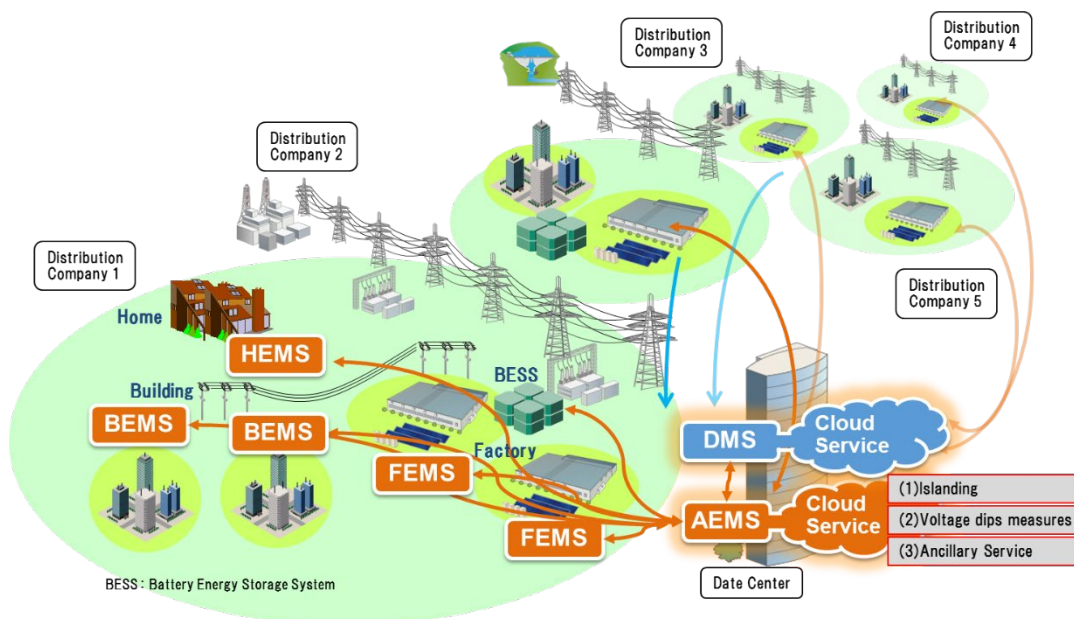


Image of Phase 2 of the demonstration project

3. Ceremony to celebrate the start of operation

On November 4 (local time), an online ceremony to celebrate the start of operation was held connecting the Tokyo site with the BTC site in Ljubljana, the capital of Slovenia, where the storage batteries had been installed.

From Slovenia, Mr. Počivalšek, Minister of Economic Development and Technology, Mr. Matsushima, Ambassador Extraordinary and Plenipotentiary of Japan to the Republic of Slovenia,

Mr. Ishizuka, NEDO Chairman, and representatives of other involved parties attended the ceremony. During the ceremony, Minister Počivalšek and other representatives made speeches, video messages from the project members from Slovenia and Japan were screened, and Hitachi, Ltd. and ELES, d.o.o. introduced the outline of the demonstration project.



The online ceremony to celebrate the start of operation

[Notes]

*1 demonstration project

The second phase of the smart community demonstration project in Slovenia to be conducted from October 2018 to March 2022 (with possibility of extension).

*2 AEMS

Energy management system for large-scale power consumers and electric power retailers.

*3 first phase

The first phase of the demonstration project was aimed to establish a business model for small to mid-sized distribution system operators solving problems such as maintaining appropriate voltage and shortening power outage time by developing cloud-based DMS for 2 Slovenian distribution system operators. On November 25, 2016, NEDO and Ministry of Development and Technology and Ministry of Infrastructure of Slovenia as well as ELES, d.o.o., Slovenia's state-owned electricity transmission operator agreed to carry out a smart community demonstration project. In addition, NEDO, Hitachi, Ltd. and ELES, d.o.o. have agreed to undertake a joint project. Hitachi, Ltd. and ELES, d.o.o. conducted demonstration operation after building the distribution management system (DMS) for electricity distribution companies and the first phase of the project was completed in December 2019.

*4 DMS

Management system for distribution systems.

*5 xEMS

General term to describe energy management system for factories, buildings and homes. Factory Energy Management Systems (FEMS), Building Energy Management Systems (BEMS) and Home Energy Management Systems (HEMS).

4. For more information, please contact:

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