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New Energy and Industrial Technology Development Organization (NEDO)
Hitachi Chemical Co., Ltd.
Hitachi Power Solutions Co., Ltd.
NGK Insulators, Ltd.

Demonstration Project in Germany; Large-Scale Hybrid power storage system starting to operate in November

- Utilizing two types of storage batteries in pursuit of stable distribution grids –

Having completed a large-scale hybrid power storage system in the City of Varel in Niedersachsen, NEDO, Hitachi Chemical Co., Ltd., Hitachi Power Solutions Co., Ltd. and NGK Insulators, Ltd. are starting to operate the system from November 1, 2018.

The system consists of two types of storage batteries, lithium-ion and NaS batteries (total capacity: 11.5MW/22.5MWh) to take advantage of their different features. Utilizing lithium-ion batteries with a high power charge and discharge output, and the long duration capacity of NaS batteries, the system maintains the electric power supply and demand balance and aims to establish a business model for power trading through the system in the region where wind power adoption is accelerating.

Picture: The large-scale hybrid power storage system

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1- Overview

Germany aims to shift more than 80% of its domestic electric power demand to renewable energy by 2050 under its “Energiewende“ energy transition policy by actively introducing renewable energy resources such as wind and solar power. Because of the recent expansion of renewable energy use in Germany, conventional power plants for maintaining electric power supply stability are falling into disuse. Consequently, there is a rapidly growing need for technology to replace the role of such power plants.

To address the arising challenge, NEDO and the Ministry for Economics, Labor and Transport in the state are working together with EWE-Verband, an association managing the electric power supply to 17 districts and four cities in Niedersachsen, and EEW Holding. The four parties signed a memorandum of understanding (MOU) for the project on March 19, 2017. At the same time, Hitachi Chemical Co., Ltd.; Hitachi Power Solutions Co., Ltd.; and NGK Insulators, Ltd., Japanese companies commissioned by NEDO, and EWE AG, Niedersachsen's energy provider cooperating with the German parties, teamed up and concluded an implementation document (ID) to officially launch the project. The project started in April 2017. Following the City of Varel granting permission to establish a large-scale hybrid power storage system, the facility foundation construction and machine assembly were completed, and thereafter, a commissioning has been finished and hence operation will commence from November 1, 2018.

A ceremony will be held to mark the operation of the large-scale hybrid power storage system at 10:00 a.m. (Central European Time - CET) on November 1, 2018. Takeshi Yagi Ambassador Extraordinary and Plenipotentiary of Japan to the Federal Republic of Germany, Enak Ferlemann Parliamentary State Secretary to the Federal Minister for Transport and Digital Infrastructure and many distinguished attendees will take part in the ceremony. The demonstration project will be carried out over a three-year period up to February 2020.

2- Description of the Demonstration Project

The project aims to demonstrate the effectiveness of the large-scale hybrid power storage system designed by taking advantage of the features of lithium-ion batteries (capacity: 7.5MW/2.5MWh) with a high power charge/discharge output and durable, large capacity NAS® batteries (capacity: 4MW/20MWh), in combination with Hitachi Power Solutions’ power grid information and battery control system*1 that controls the both batteries and enables the following four functions by communicating information for the electricity trading.

Through this system, the four functions of primary control reserve*2 supply, secondary control reserve*3 supply, balancing*4 within a balancing group*5, and reactive power supply*6 that stabilize local grid voltage will be realized to replace the functions of conventional power plants. Electricity trading will be executed in line with the EWE Group's electricity trading system. Creating a virtual power plant (VPP) *7 in collaboration with Germany's “enera” project*8, various types of energy sources in the country will also be combined and managed for the electricity trading.

The aims of this project are to contribute to maintaining an economical supply and demand balance and to ensure a non-variable supply from renewable energy sources.

【Glossary】

*1 Power grid information and battery control system

A system to analyze information about the supply and demand balance in the power grid and control the charge/discharge of the battery storage energy.

*2 Primary control reserve

The primary control reserve is automatically activated within 30 seconds according to power supply and demand fluctuations and secures power in a systematic manner to balance the supply and demand.

*3 Secondary control reserve

The secondary control reserve is activated within 5 minutes after receiving instructions from power distributors according to power supply and demand fluctuations and secures power in a systematic manner to balance the supply and demand.

*4 Balancing

Balancing is performed to correct imbalances within balancing groups by reducing deviations between planned power supply/demand and the actual power supply/demand balance.

*5 Balancing Group

Groups in Germany comprised of power generators and consumers that undertake power supply and demand balancing. The in-charge of each group balances the power supply and demand to ensure their match. Such groups are known as balancing groups.

*6 Reactive power supply

Among the major grid frequency and voltage stabilization services, the reactive power supply functions to stabilize local voltage.

*7 Virtual power plant (VPP)

A cloud-based single power plant (virtual power generator) that remotely controls and integrates several types of distributed energy sources

*8 enera project

A large-scale project led by EWE AG to introduce renewable energy in Niedersachsen under Germany’s energy policy (project assisted by the Federal Ministry for Economic Affairs and Energy).

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.
