

News Release

FOR IMMEDIATE RELEASE

New Energy and Industrial Technology Development Organization
Ministry for Economics, Labour and Transport of Niedersachsen,
Federal Republic of Germany
EWE-Verband
EEW Holding
Hitachi Chemical Co., Ltd.
Hitachi Power Solutions Co., Ltd.
NGK Insulators, Ltd.
EWE AG

March 21, 2017

Large-Scale Hybrid Battery System Demonstration Project to Launch in Germany —Aiming to Build a System and Establish a New Business Model—

Japan's New Energy and Industrial Technology Development Organization (NEDO); the Ministry for Economics, Labour and Transport of Niedersachsen of the Federal Republic of Germany; EWE-Verband, an association managing the electric power supply to 17 districts and four cities in Niedersachsen, and EEW Holding have agreed to jointly implement a demonstration project on a large-scale hybrid battery system.

On March 19th 2017, Mr. Furukawa, Chairman of NEDO, Mr. Lies, Minister for Economics, Labor and Transport of Niedersachsen, Mr. Schönecke, Association Director of EWE-Verband, Mr. Bramlage, Deputy Association Director of EWE-Verband, and Mr. Röhler, Managing Director of EEW Holding signed a memorandum of understanding.

At the same time, Hitachi Chemical Co., Ltd.; Hitachi Power Solutions Co., Ltd.; and NGK Insulators, Ltd., Japanese companies commissioned by NEDO to implement the project, and EWE AG, an energy provider in Germany, have agreed to collaborate in the project and concluded an implementation document.

The demonstration project will be launched in Niedersachsen, which has been actively introducing renewable energy, particularly large-scale wind power, in recent years. The project aims to build a large-scale hybrid battery system using lithium-ion batteries and NAS® batteries that can stabilize the distribution grid, and thereby control the electric power supply and demand balance, by charging and discharging storage batteries. Another aim is to establish a new business model for electricity trading using the battery system.

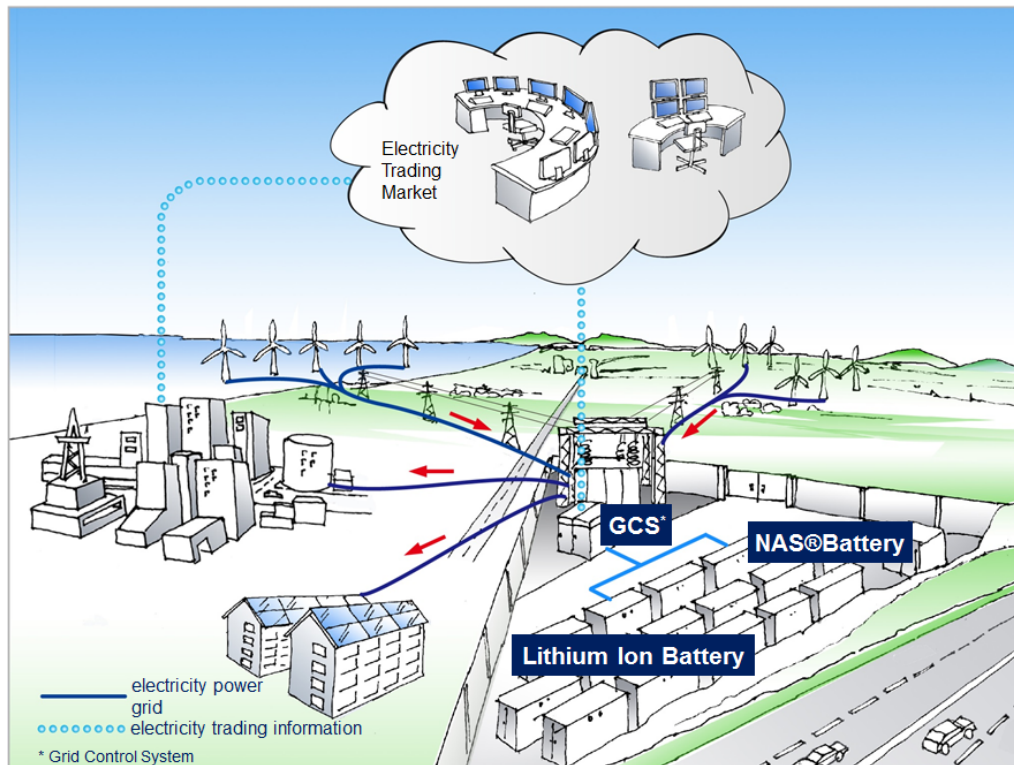


Figure 1: Illustration of the demonstration project

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. Niedersachsen, a state in northwestern Germany, is the country's largest wind energy provider as of 2015.

Because of the recent expansion of renewable energy use in Germany, conventional power plants for maintaining electric power supply quality are falling into disuse. Consequently, there is a rapidly growing need for technology to replace the role of such power plants. Meanwhile, Niedersachsen and other states in Germany are facing imbalances^{*1} within balancing groups^{*2} and grid voltage instability in local regions. To address these problems, NEDO has been working with Niedersachsen's Ministry for Economics, Labour and Transport to undertake a demonstration project on a large-scale hybrid battery system.

To implement the project, NEDO and the Ministry for Economics, Labour and Transport will work together with EWE-Verband,^{*3} an association managing the electric power supply to 17 districts and four cities in Niedersachsen, and EEW Holding.^{*4} The four parties signed a memorandum of understanding (MOU) for the project on March 19. 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, have teamed up and concluded an implementation document (ID) to officially launch the project.

The demonstration project will be carried out over a three-year period from April 2017 to March 2020 in Varel, Niedersachsen, to build a large-scale hybrid battery system that can stabilize the distribution grid, and thereby control the electric power supply and demand balance, by charging and discharging storage batteries. Another aim is to establish a new business model

for electricity trading using the system. Moreover, the project plans to collaborate with Germany's *enera* project.*⁵

2. Description of the Demonstration Project

A description of the demonstration project follows below.

(1) Building a large-scale hybrid battery system

A large-scale hybrid battery system will be built using lithium-ion batteries from Hitachi Chemical, NAS[®] batteries from NGK Insulators, and a power grid information and battery control system*⁶ from Hitachi Power Solutions. A large-scale system will be designed by taking advantage of the features of lithium-ion batteries with a high power charge/discharge output and durable, large capacity NAS batteries, combined with a power grid information and battery control system that communicates information in and outside of balancing groups in cooperation with EWE AG's electricity trading system. Through this system, the four functions of primary control reserve*⁷ supply, secondary control reserve*⁸ supply, balancing*⁹ within a balancing group, and reactive power supply*¹⁰ that stabilize local power 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.

(2) Establishing a new business model for electricity trading using a large-scale hybrid battery system

The demonstration project aims to establish business models so as to make the system attractive to power generation and electricity trading companies in and outside of Germany, thereby expanding the hybrid battery system in the future.

Project duration, implementation system, and total budget

Period: Three (3) years from April 2017 to March 2020

Implementation system: As shown in Figure 2

Total budget: Approximately 2.88 billion yen

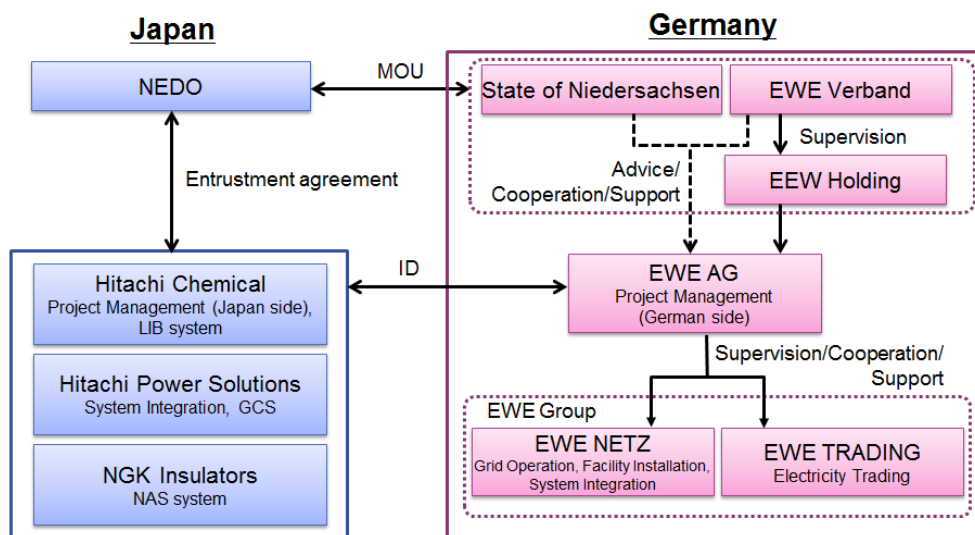


Figure 2: Implementation system of demonstration project

3. Signing Ceremony for the MOU and ID

The signing ceremony for the MOU and ID was held at the Hannover Fairground in Hannover, Niedersachsen, on March 19. The MOU was signed by Mr. Kazuo Furukawa, Chairman of NEDO; Mr. Olaf Lies, Minister for Economics, Labour and Transport of Niedersachsen ; Mr.

Heiner Schönecke, Association Director of EWE-Verband; Mr. Bernhard Bramlage, Deputy Association Director of EWE-Verband; and Mr. Thiemo Röhler, Managing Director of EEW Holding. Mr. Misao Nakagawa, Vice President and Executive Officer of Hitachi Chemical Co., Ltd.; Mr. Kazuo Suzuki, Executive Managing Director of Hitachi Power Solutions Co., Ltd.; Mr. Hideaki Saito, Director and Senior Vice President of NGK Insulators, Ltd.; Mr. Michael Heidkamp, CSO of EWE AG; and Mr. Wolfgang Mücher, CFO of EWE AG, signed the ID.

Glossary

*1 Imbalance

The difference between power demand and supply. A penalty is imposed on imbalances.

*2 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.

*3 EWE-Verband

A special-purpose power supply association wholly owned by 17 districts and four cities in Niedersachsen.

*4 EEW Holding

A private limited company wholly owned by EWE-Verband.

*5 *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).

*6 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.

*7 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.

*8 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.

*9 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.

*10 Reactive power supply

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

4. Contact

(For inquiries concerning this news release)

NEDO

Smart Community Department

Contact persons: Terakado, Asano, Kurosawa

Tel: +81-44-520-5274

Hitachi Chemical Co., Ltd.

Corporate Communication Center, Public and Investor Relations Group

Contact person: Koizumi

Tel: +81-3-5533-7146

Hitachi Power Solutions Co., Ltd.
Corporate Planning Dept. Promotion & Communication Sec.
Contact persons: Sato, Fujita
Tel: +81-294-55-7185

NGK Insulators, Ltd.
Public Relations Office
Contact persons: Sawafuji, Sato
Tel: +81-52-872-7181

(For general inquiries concerning NEDO projects)
NEDO
Public Relations Department
Contact persons: Kotsusa, Fujimoto, Sakamoto
Tel: +81-44-520-5151
E-mail: nedo_press@ml.nedo.go.jp

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.
