

**FOR IMMEDIATE RELEASE**

**Smart Grid Demonstration Project in Poland  
to improve power system protection in case of high penetration  
of renewable energy**

**Warsaw, Poland, March 17, 2017** --- The New Energy and Industrial Technology Development Organization (“NEDO”), Hitachi, Ltd. (TSE:6501/“Hitachi”), Hitachi Chemical Co., Ltd. (TSE:4217/“Hitachi Chemical”), Sumitomo Mitsui Banking Corporation (“SMBC”), Polskie Sieci Elektroenergetyczne S.A. (“PSE”), ENERGA-OPERATOR S.A. (“EOP”) and ENERGA Wytwarzanie S.A. (“EW”), supported by the Ministry of Energy of the Republic of Poland (“Poland”), announced today that they have agreed to jointly carry out a smart grid demonstration project.

On March 14, 2017, NEDO and the Ministry of Energy of Poland concluded a memorandum of understanding for the project to support the power system security in response to increasing share of renewables connected to the Polish power system. The project goal is to test on the assigned grid area functionalities of Special Protection Scheme (SPS) and hybrid Battery Energy Storage System (BESS) in order to increase power system security. The solution offered utilizes Japanese state-of-art network stabilization and battery storage technologies.

In order to carry out the project, Hitachi, Hitachi Chemical and SMBC each will sign an entrustment agreement with NEDO. Alongside this, Hitachi and Hitachi Chemical today signed an implementation document to realize the project in cooperation with PSE, EOP and EW.

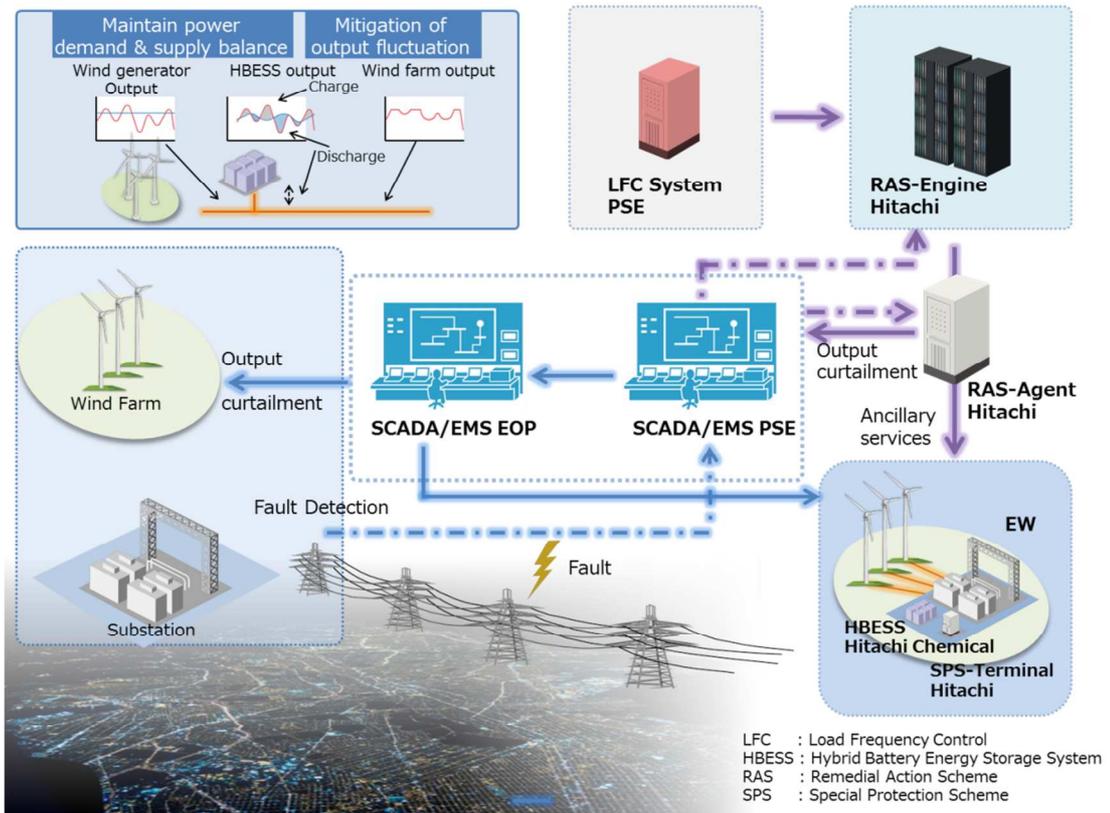
As an EU member state, Poland plans to increase renewables energy ratio in its power system. In order to handle the additional burden on the electricity networks, essential work is required to upgrade and enhance the grid. This can be supported by utilization of advanced grid automatics such as SPS preventing the grid overloading and allowing for optimal management of renewables generation, especially wind generation.

Decision on project execution in the next three and a half year is based on the results of a feasibility study conducted from February 2015 to November 2016 by

**-more-**

Hitachi, Hitachi Chemical, SMBC and other entrusted companies. More specifically, Hitachi working with PSE, EOP and EW will build SPS solution while Hitachi Chemical will be responsible for provision of hybrid BESS equipped with lithium-ion and lead-acid batteries. In addition, Hitachi, Hitachi Chemical and SMBC will explore business models for network protection systems and battery energy storage systems.

### Illustrative image of technologies used in the project



## **Demonstration project overview**

### **1. Special Protection Scheme (SPS) grid overloading prevention functions**

[Entrusted company: Hitachi]

An SPS system plans countermeasures actions for specific accidents on the power network based on online information extracted from SCADA. If an accident actually occurs, the SPS system carries out controls automatically in order to prevent overloads in the power system.

### **2. Hybrid Battery Energy Storage System (BESS) equipped with lithium-ion and lead-acid batteries for wind power generation** [Entrusted company: Hitachi and Hitachi Chemical]

The project aims to reduce the total costs of energy storage systems by introducing a hybrid energy storage system. The hybrid energy storage system is intended to achieve both high-performance thanks to the utilization of lithium-ion batteries and also cost-effectiveness through applying lead-acid technology.

Objective of BESS installation is to demonstrate usage of lithium-ion and lead-acid batteries and evaluate possibilities of its wider adoption in the following scope:

1. power system protection against overload on transmission and distribution lines,
2. energy storage in high wind generation conditions and provision of required reserves.

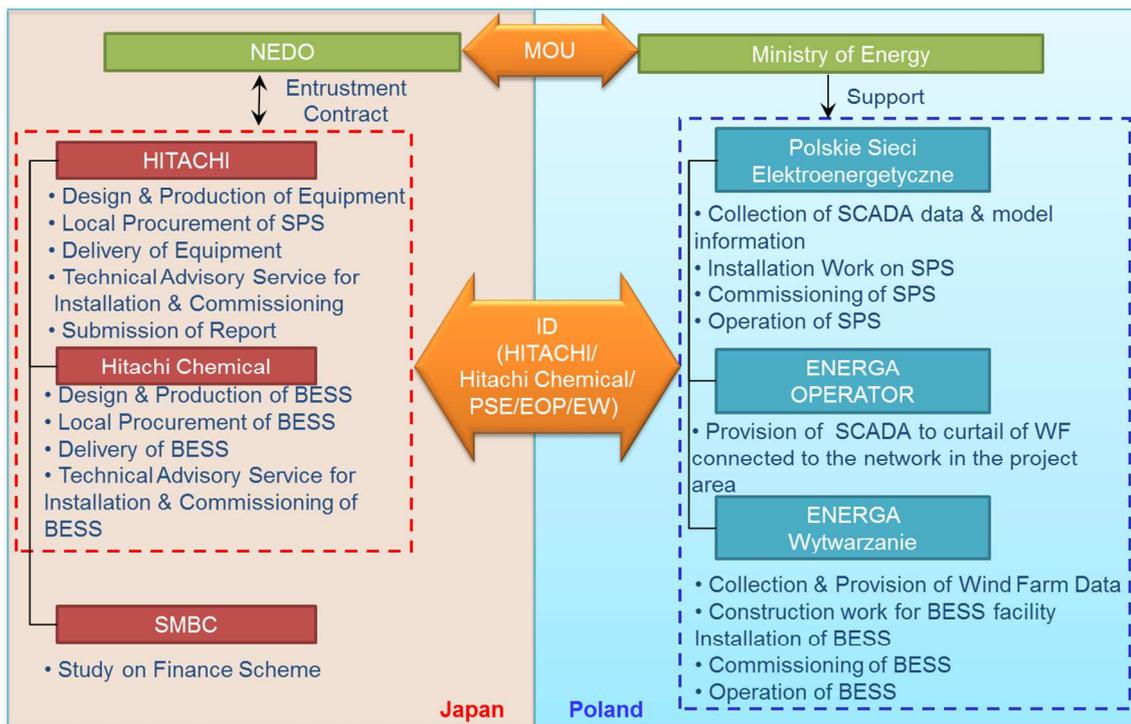
Objectives mentioned above include also functionalities such as:

1. curtailment of short-term fluctuations in wind farm output,
2. provision of ancillary services in the scope of frequency regulation for Transmission System Operator,
3. ancillary services similar to those provided by the pumped storage hydropower plants,
4. provision of reserve capacity services,
5. price arbitrage (electric energy time shift).

### **3. Exploring business models for SPS and BESS** [Entrusted companies: Hitachi, Hitachi Chemical and SMBC]

Hitachi, Hitachi Chemical and SMBC will verify the advantages of SPS and BESS, and will present business models aimed at their wider adoption.

## Illustration of the implementation structure of the project



- SCADA : Supervisory Control And Data Acquisition  
 MOU : Memorandum of Understanding  
 ID : Implementation Document

### About NEDO

The New Energy and Industrial Development Organization (NEDO) is a national research and development agency under the Ministry of Economy, Trade and Industry, the Government of Japan. Following the two oil crises of the 1970s, NEDO was established in 1980 to promote the development of oil-alternative energy technologies. NEDO is active in a wide variety of areas as one of the largest public research and development management organizations in Japan.

### About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges. The company's consolidated revenues for fiscal 2015 (ended March 31, 2016) totaled 10,034.3 billion yen (\$88.8 billion). The Hitachi Group is a global leader in the Social Innovation Business, and it has approximately 335,000 employees worldwide. Through collaborative creation, Hitachi is providing solutions to customers in a broad range of sectors, including Power / Energy, Industry / Distribution / Water, Urban Development, and Finance / Government & Public / Healthcare. For more information on Hitachi, please visit the company's website at <http://www.hitachi.com>.

### **About Hitachi Chemical Co., Ltd.**

Hitachi Chemical Co., Ltd. (TSE: 4217), headquartered in Tokyo, Japan, delivers wide range of innovative products, such as electronic materials, automobile parts, and devices and battery energy storage systems. The company's consolidated revenues for fiscal 2015 (ended March 31, 2016) totaled 547 billion yen (\$4.8 billion). For more information on Hitachi Chemical, please visit the company's website at <http://www.hitachi-chem.co.jp/english/>

### **About Sumitomo Mitsui Banking Corporation**

Sumitomo Mitsui Banking Corporation, headquartered in Tokyo, Japan, with 440 domestic branches and 17 overseas branches, is a Japanese mega bank with the total assets of ¥148,396.6 billion and the deposits of ¥98,956.9 billion, engaging in deposit taking, lending, securities brokering and trading, securities investment, money transfer, foreign currency exchange, corporate bond trustee services and custody services, financial futures underwriting, investment trust sales and other commercial banking activities. For more information, please visit the company's website at <http://www.smbc.co.jp>.

### **About Polskie Sieci Elektroenergetyczne S.A.**

PSE operates as the transmission system operator within the territory of the Republic of Poland, providing electricity transmission services in compliance with the required Polish Power System operation security criteria.

PSE is a company wholly-owned by the State Treasury, appointed as transmission system operator.

The subject of the PSE S.A. activity as polish transmission system operator is to provide the services of electricity transmission in compliance with the required criteria of the security of the Polish Power System operation.

The main objectives of the PSE S.A. activity are:

- providing electricity transmission services and ensuring secure and cost-effective operation of the Polish Power System whilst meeting the conditions of synchronous operation with other European systems,
- ensuring the necessary development of the domestic transmission grid and cross-border interconnections, making transmission capacity available on market based methods for cross-border exchange purposes,
- creating the technical infrastructure for the operation of the domestic wholesale electricity market.

### **About ENERGA Wytwarzanie S.A.**

Energa Wytwarzanie SA is a member company of Capital Group ENERGA SA. As a business unit, Energa Wytwarzanie is a leader of the Generation Segment that consolidates operations in the key areas as: electricity production from renewable energy sources, must-run power plants, cogeneration of heat and electricity, electricity production from conventional sources, heat production in heat plants and ancillary services. The total installed generation capacity in Group's power plants in 2016 was 1.3 GW.

Energa Wytwarzanie SA owns and manages Poland's largest run-of-river hydropower plant, the pumped-storage power plant and 44 small-scale hydropower plants located mainly in the northern Poland. The rated capacity of all hydro power plants reaches 365 MW. It is also the owner and manager of the generation potential of 5 wind farms in the northern Poland with rated capacity 202 MW. As the segment leader, it manages 2 solar parks. The rated capacity of both solar plants is 5,4 MW.

### **About ENERGA-OPERATOR S.A.**

ENERGA Operator SA is distribution network operator (DSO) responsible for the development and maintenance of distribution grid located in northern and central part of Poland. Energa Operator SA is also a member company of Capital Group ENERGA SA. Energa runs grid with a total length of 184 thousand km and geographical coverage of 75 thousand km<sup>2</sup> (which equals to 24% of country territory). Energa Operator supplies electrical energy to 2.9 mln customers ( including 0.29 mln business customers). The energy delivered to customers (sold) in Q2 2016 was equal to 5,5 TWh.

### **About the Ministry of Energy of Poland**

Ministry of Energy (Polish: *Ministerstwo Energii*) is the office of government in Poland responsible for energy policy and the management of mineral deposits. Krzysztof Tchórzewski is the current Minister of Energy. The Ministry of Energy of Poland was created in late 2015.