August 26, 2025
Meidensha Corporation

To members of the media

Demonstration to supply 100% renewable power begins on Hahajima Island

Project adopts a power conditioner system with a Virtual Synchronous Generator function for energy storage battery system

Meidensha Corporation has delivered a power conditioner system with a Virtual Synchronous Generator function (VSG-PCS)[*1] for an energy storage battery system to be used in a demonstration project to transition Hahajima Island to 100% renewable electricity. The VSG-PCS was jointly developed with TEPCO Power Grid, Incorporated (TEPCO PG).

The demonstration will be carried out by Meidensha, the Tokyo Metropolitan Government, and TEPCO PG. It is scheduled to begin on August 29, 2025, on Hahajima in the village of Ogasawara, Tokyo.

According to Meidensha studies, this will be the first use of a VSG-PCS in Japan's commercial power grid. The project involves installing solar panels and energy storage batteries with the aim of using only renewable power to supply the island's energy needs for about six months per year.

Solar power generation equipment installed on Hahajima Island

The VSG-PCS delivered by Meidensha

■ Background

Hahajima Power Plant on Hahajima Island, which is one of the Ogasawara Islands, currently uses four 960 kW diesel generators to meet the island's power needs. This arrangement faces challenges including high CO_2 emissions, rising fuel procurement costs, and significant maintenance and repair expenses for the generators. In December 2018, the Tokyo Metropolitan Government, the village of Ogasawara, and TEPCO PG signed an agreement to pursue the respective goals of Tokyo and Ogasawara of achieving zero CO2 emissions on Tokyo's islands and creating sustainable islands in harmony with nature.

Aiming to meet the island's annual energy demand of roughly 3 million kilowatt-hours (3 million kWh) with renewable sources, the three parties agreed to a three-year demonstration project. However, increasing the share of renewable generation can reduce the grid's inertia by displacing conventional synchronous generators (such as those at thermal power plants), which can compromise stability during supply disturbances. For this demonstration, the project will thus use Meidensha's power conditioner system with a Virtual Synchronous Generator function (VSG-PCS) for energy storage battery system, which can provide inertial response[*2] and synchronizing power[*3] equivalent to conventional synchronous generators.

■ Features of the power conditioner system with Virtual Synchronous Generator

function (VSG-PCS) for energy storage batteries

1. Provides inertial response and synchronizing power equivalent to conventional synchronous generators directly from the power conditioner system.
2. Can operate as the main power source by forming a grid composed solely of VSG-PCS units, thanks to the Grid Forming Method (GFM). It can also operate in parallel with other voltage sources, including conventional generators.
3. Continuously supplies fault current while managing overcurrent during grid incidents using its overcurrent management function (patents jointly held by Meidensha and TEPCO PG).
   Power conditioner systems have limited tolerance for overcurrent, so they must restrict output current during grid faults to avoid damage. However, reduced fault current can impair the sensitivity of protective relays in conventional grids. The VSG-PCS overcurrent management enables it to supply the maximum permissible fault current within its tolerance limits, minimizing impact on protective relay sensitivity.

(Specifications of the device)

Items		Specifications
Capacity of the device		600kVA
Built-in commercial frequency isolation transformer with grid connection		Yes
Direct current input	Maximum supply voltage	750V
	Working voltage range	432V-745V
Alternating current output	Rated output voltage	6,600V (3,300V is also possible)
	Rated output current	52.5A
	Rated frequency	50Hz/60Hz
	Number of phases	Three-phase, three-wire system

Looking ahead, Meidensha will extend the application of virtual synchronous generator (VSG) functions to equipment beyond that described above to resolve inertia-related issues in non-island locations.

Meidensha remains committed to realizing a more affluent society by delivering products and systems that reduce environmental impacts and accelerate the shift to a

low carbon/decarbonized society.

- Press release for reference
  TEPCO PG press release dated August 8, 2025
  Regarding the start of demonstration to supply 100% renewable power on Hahajima (Japanese only)

https://www.tepco.co.jp/pg/company/press-information/press/2025/pdf/250808j0101.pdf

*1: Patent No. 7182009 and three other patents
*2: Inertial response is the immediate power that helps maintain a power grid's frequency. The greater the inertial response, the smaller the magnitude and the slower the rate of frequency deviations when the grid's supply–demand balance is disturbed.
*3: Synchronizing power: When a disturbance disrupts the synchronized operation of parallel-connected generators, synchronizing power acts to restore them to their original synchronized condition.