

**Osaka Gas to Start a Verification Project to Establish a Virtual Power Plant (VPP)
Using a residential Fuel Cell, ENE-FARM
—VPP Verification Project Connecting 1,500 Units—**

June 5, 2020
Osaka Gas Co., Ltd.

Osaka Gas Co., Ltd. (President: Takehiro Honjo) will start a verification project to build a virtual power plant*¹ (hereinafter referred to as “VPP”) by controlling approximately 1,500 units of residential fuel cells, ENE-FARM, installed at customers' homes (hereinafter referred to as “ENE-FARM”) (the total rated output reaches around 1 megawatt*² [hereinafter referred to as “MW”]) as if they are a single power plant, so as to utilize it for effective adjustment of grid supply and demand.

Recently, Osaka Gas has been selected to participate in the program “FY 2020 Subsidies for Verification Projects for Building Virtual Power Plant Using Customer-side Energy Resources” established by the Ministry of Economy, Trade and Industry*³ in the field of VPP aggregator business (hereinafter, this verification project). While the aggregation coordinator*⁴ in this verification project is Chubu Electric Power Miraiz Co., Inc. (President: Shinya Otani, hereinafter “Chubu Electric Power Miraiz”), Osaka Gas will participate in the project as a resource aggregator*⁵.

The output power of renewable energies, such as solar and wind power, fluctuates depending on the amount of solar radiation and the strength of winds. On the other hand, ENE-FARM characteristically enables free control of the output power, and is attracting attention as a resource that can contribute to adjustment of grid supply and demand in a society in which a large amount of renewable energy is introduced*⁶. We have installed the IoT function on our products starting at the ENE-FARM type S*⁷, which was released in 2016, and approximately 50,000 units are currently connected to the server of Osaka Gas. In this verification project, we will verify that the output power of ENE-FARM can be controlled in accordance with the grid supply and demand situation, including the output fluctuation of renewable energy, by utilizing the know-how of remote control technology cultivated through the efforts to realize IoT applications.

Through the spread of ENE-FARM, we will help reduce CO2 emissions with its high energy-saving performance. Furthermore, we aim to contribute to the stabilization of the power grid, which has been increasingly required in society, by creating a new value of ENE-FARM and offering novel values to customers.

*1: Virtual power plant. It is realized by business operators called “aggregators” using, in a bundle, the adjustment power supplied by distributed power sources

*2 If the rated power output of ENE-FARM is estimated to be 700W, the total rated power output of 1,500 units of ENE-FARM will be 1,050 kilowatts ≈ 1 MW.

*3 Program in which subsidy is granted by the Ministry of Economy, Trade and Industry, as a part of the cost for a verification project related to building a VPP

*4 A business operator who aggregates the electric power controlled by a resource aggregator, and trades electricity directly with general electricity transmission and distribution utilities and electricity retailers

*5 A business operator who controls resources by directly concluding VPP service contracts with customers

*6 Source: Document 7 “Efforts to promote the use of distributed energy resources” presented at the 11th Energy Resource Aggregation Business Review Meeting

(hereinafter "ERAB Workshop") held by the Agency for Natural Resources and Energy in the Ministry of Economy, Trade and Industry (https://www.meti.go.jp/shingikai/energy_environment/energy_resource/pdf/011_07_00.pdf)

*7 A device that directly generates electricity through the chemical reaction between hydrogen and oxygen. It generates electricity continuously for 24 hours according to the amount of electricity used at each house. Meanwhile, the heat generated during power generation can be used for hot water supply and storage in a tank.

1. Verification project outline

Project period	June 2020 to February 2021 (tentative)
Energy resource	Household fuel cell, ENE-FARM type S: approximately 1,500 units
Major contents of verification	Through the remote control of multiple ENE-FARM units, (1) Verification of technologies to ensure accurate supply of adjustment power for power grid stabilization (2) Verification of technologies to control output power in accordance with the grid supply and demand situation

2. Major contents of verification

(1) Verification of technologies to ensure accurate supply of adjustment power for power grid stabilization

We will perform verification tests in which adjustment power is supplied based on control by the aggregation coordinator. Through these tests, we will verify the technologies for remote control of multiple units of ENE-FARM (by checking how accurately the adjustment power was supplied against the amount specified by the aggregation coordinator).

(2) Verification of technologies to control output power in accordance with the grid supply and demand situation

We will verify the technologies for remote control of multiple units of ENE-FARM in accordance with the grid supply and demand situation (by checking how appropriately the adjustment power was supplied based on the supply and demand situation).