

Osaka Gas to Start a Virtual Power Plant Demonstration Project Using Household Use Fuel Cells, ENE-FARM Type S
—Joining the Demonstration Project to Establish Next-generation Technologies Using Distributed Energy Resources—

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Osaka Gas Co., Ltd.

Osaka Gas Co., Ltd. (President and Representative Director: Masataka Fujiwara) will take part in a demonstration project that places focus on the further utilization of distributed energy resources*¹ (“DERs”)*² under the program “FY2022 Subsidies for Demonstration Projects to Establish Next-Generation Technologies Using DERs Such as Storage Batteries”*³ publicly offered by the Ministry of Economy, Trade and Industry. This project will be implemented by a consortium led by ENERES Co., Ltd. (President and Representative Director: Sanehiro Tsuzuki) to verify the performance of virtual power plants*⁴ (“VPPs”) as a means to adjust supply and demand in the grid. Osaka Gas takes part in the consortium as a resource aggregator,*⁵ who will build VPPs that will use “ENE-FARM Type S” (“ENE-FARM”), household fuel cells installed at customers’ homes, as energy resources.

The output power of renewable energies, such as solar and wind power, fluctuates depending on the amount of solar radiation and wind strength. ENE-FARM has high energy efficiency, which can realize reduced CO₂ emissions, as well as the free adjustability of output power, thereby attracting attention as a resource that can contribute to the adjustment of grid supply and demand in a society in which renewable energy plays a major role.*⁶

Last fiscal year, Osaka Gas participated in a DER demonstration project,*⁷ where the company used over 3,600 ENE-FARM units, achieving favorable results, including a successful supply of over 1 MW of balancing capacity. This fiscal year, with a different control method, Osaka Gas will carry out the technical verification, aiming for even more accurate remote control of ENE-FARM and an even faster supply of balancing capacity in accordance with supply and demand in the grid.

The Daigas Group will utilize low-voltage resources such as ENE-FARM to promote the spread and expansion of energy networks combined with DERs, contribute to the realization of a low-carbon society and a decarbonized society, and become a corporate group useful in the “further evolution” of life and business.

*1: A general term for generation facilities and power storage facilities that are directly interconnected with network, in addition to other energy resources on the consumer side

*2: Abbreviation for the demonstration project that places focus on the further utilization of DERs and that will be implemented as part of the Renewable Energy Generation Aggregation Technology Demonstration Project

*3: Program for demonstration projects that are intended to improve the environment for expanded use of DERs and effective use of renewable energy and to contribute to the achievement of carbon neutrality through the development of aggregation-related business. For these purposes, these projects focus on the further utilization of DERs and demonstrate DER control technologies, which are required to be further sophisticated, in electricity markets, including the balancing market and the capacity market.

*4: A virtual power plant is implemented by a business operator known as an “aggregator” who, using information and communication technologies, systematically controls distributed power supply so that they seem to function as a single generation facility.

*5: A business operator that controls resources by directly concluding VPP service contracts with consumers

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

*7: “FY2021 Subsidies for Demonstration Projects to Establish Next-Generation Technologies Using DERs Such as Storage Batteries” offered by the Ministry of Economy, Trade and Industry

(Appendix)

1. Outline of the demonstration project

Project period	June 2022 to February 2023 (planned)
Energy resource	Household fuel cell, ENE-FARM Type S: approximately 500 units
Major objectives of demonstration	To conduct the following technical verification by remotely controlling a large number of ENE-FARM units: (1) Technical verification to ensure an accurate supply of balancing capacity to keep the grid stable (2) Technical verification to control power output in accordance with supply and demand in the grid

2. Major objectives of demonstration

(1) Technical verification to ensure an accurate supply of balancing capacity to keep the grid stable

Osaka Gas will verify the performance of technologies to control the output of ENE-FARM units in accordance with commands from the aggregation coordinator^{*8} and supply balancing capacity (verification of accuracy in supplying balancing capacity in accordance with commands).

This time, instead of a method that controls both forward power flow^{*9} and reverse power flow,^{*10} which the company adopted last fiscal year,^{*11} Osaka Gas will use a method that does not control the forward power flow but the reverse power flow only.^{*12} Moreover, when controlling the reverse power flow from ENE-FARM units, Osaka Gas will use a method that ensures that the power generated will exceed the power consumed by a certain margin. This control method automatically regulates the power generation amount in response to fluctuations in customers' power consumption by controlling ENE-FARM units. In this way, Osaka Gas will aim to further improve accuracy in supplying balancing capacity in accordance with commands.

In addition to power-receiving-point control,^{*13} which the company implemented last fiscal year, Osaka Gas will newly adopt unit-point control,^{*14} which is not affected by fluctuations in power consumption, to conduct technical verification.

The company will also make a new ambitious effort to achieve a faster supply of balancing capacity, thereby identifying issues to solve to achieve an even faster supply of balancing capacity.

*8: A business operator who aggregates the electric power controlled by resource aggregators and trades electricity directly with general transmission and distribution companies and retail companies

*9: Power flow from the side of an electric power company's power line to the consumer side (power flow for purchase of electricity from a retail company)

*10: Power flow from a self-generating business operator to the side of an electric power company's power line. When more power is generated than consumed, the surplus is sent in this reverse power flow. (Power flow for sale of electricity to a generation company)

*11: Called "negawatt and posi watt aggregation," this method supplies Δ kW by both restraining demand (reducing forward power flow) and causing reverse power flow at the same demand location.

*12: Called "posi watt aggregation," this method supplies Δ kW only by reverse power flow.

*13: This method supplies balancing capacity by controlling the power generated by ENE-FARM based on the power measurements made at the power-receiving point (where an electricity meter is located). This control method is accepted in the current balancing market.

*14: This method supplies balancing capacity by controlling the power generated by ENE-FARM based on the power measurements made at the points of individual units. This control method is currently under review by the government.

(2) Technical verification to control power output in accordance with supply and demand in the grid

Osaka Gas will verify the performance of technologies to remotely control a large number of ENE-FARM units in accordance with supply and demand in the grid (verification of how appropriately supply capacity can be supplied in terms of its contribution to balancing supply and demand).

This time, the company will aim for further optimal control, including simultaneous pursuit of control that restrains electricity purchase and high-accuracy control.