

## **Nissin Electric Develops Japan's first Energy Management System for Automatic Self-consignment Operation of Photovoltaic Power Generation — Sales launched as a new solution for self-consumption photovoltaic systems —**

Nissin Electric Co., Ltd. has developed Japan's first\* energy management system for automatic self-consignment operation of photovoltaic power generation (\* in terms of self-consignment demonstration projects, etc. in Japan, based on our survey conducted in July 2020). The company started sales of the system as a new solution in July 2020.

This is a new solution for self-consumption photovoltaic systems that increases their environmental value by using excess electricity from photovoltaic power generation and that reduces the operation workload by automating the various operations and controls related to the self-consignment operation.

Self-consignment refers to a system for consigning electricity derived from private power generation to remote in-house facilities via the power grid operated by a power company.

Recently, there have been an increasing number of customers who are studying the possibility of introducing a self-consumption photovoltaic system to reduce their CO<sub>2</sub> emissions. However, there was an issue about the use of excess electricity when the load was low, such as on holidays. Excess electricity can be subjected to self-consignment for use at remote in-house facilities, but this requires various operations and controls. Manual operations and controls would involve an enormous workload. This is difficult to achieve by photovoltaic power generation alone. In general, regulating power, such as through storage batteries, is required.

Nissin Electric offers a solution for these issues. Eliminating the waste of excess electricity by means of self-consignment further improves the ratio of renewable energy, reduces CO<sub>2</sub> emissions, and cuts electricity costs, making it possible to improve the environmental value of a company. The system can also be used for consignment using a remote location (satellite facility) on a large piece of land, including unused land, even if power generation equipment cannot be installed on the premises due to limited space.

This new energy management system that supports PV (photovoltaic power generation) self-consignment is offered as a new function of ENERGYMATE-Factory. Nissin Electric will propose systems in combination with a self-consumption photovoltaic system and offer the system as a solution for issues faced by customers. The key features of this energy management system that supports PV self-consignment are as follows.

### **[Main features of energy management system that supports PV self-consignment]**

#### **1. <First in Japan> Automating the self-consignment operation of complicated photovoltaic power generation and significantly reducing the operation workload**

To perform self-consignment of photovoltaic power generation, it is necessary to forecast the excess electricity amount and formulate a consignment plan in advance and to submit and update the planned values to the Organization for Cross-regional Coordination of Transmission Operators, JAPAN (OCCTO) on a daily basis. It is also necessary to ensure control to achieve balancing with the planned values. Thus, operation involves an enormous workload. This energy management system that supports PV self-consignment has automated all of these tasks. This is the first system developed in Japan that automates the self-consignment operation for photovoltaic power generation.

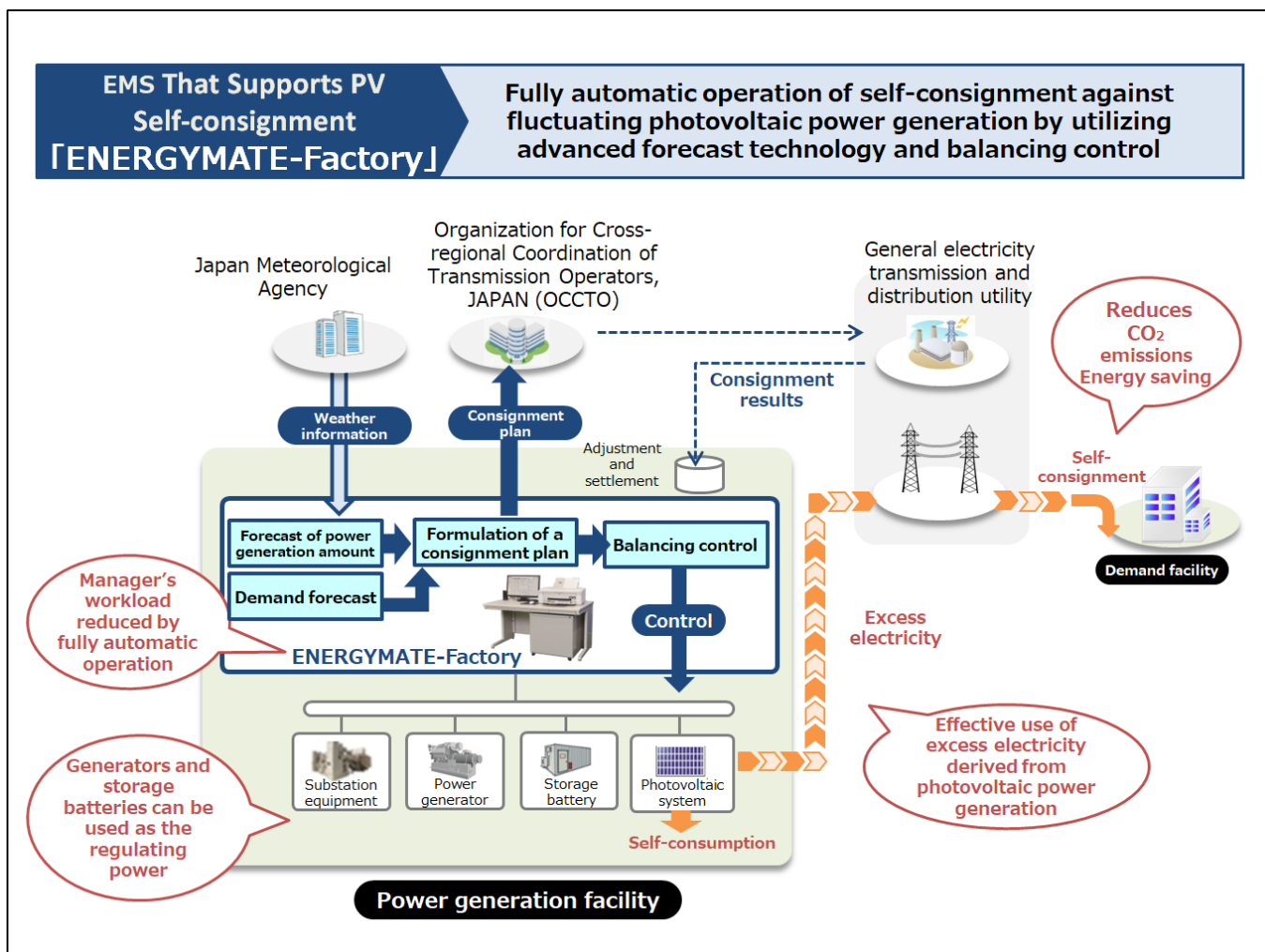
#### **2. Achieving self-consignment with unstable photovoltaic power generation only**

In general, it is difficult to formulate a consignment plan for photovoltaic power generation because the power generation amount is variable. This energy management system that supports PV self-consignment can forecast excess electricity of photovoltaic power generation and formulate a consignment plan based on the forecast data. If excess electricity is likely to exceed the planned value due to variation, the output of photovoltaic power

generation is reduced by real-time control, even in an environment without regulating power, such as storage batteries, to attain balancing with the planned value. Storage batteries and generators, if any, can be used as the regulating power.

To achieve a sustainable society, an increasing number of companies are working to reduce their CO<sub>2</sub> emissions. In the international community, self-consumption of renewable energy of in-house sources is highly evaluated. Self-consignment of photovoltaic power generation is an effective solution to improve the environmental value of a company. PV self-consignment, which is a new function of ENERGMATE-Factory, helps achieve this goal.

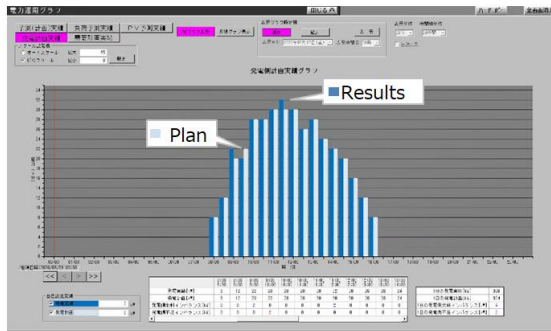
Nissin Electric has been committed to developing the ENERGMATE-Factory energy management systems, which feature the optimal control function for various distributed energy resources and the VPP function. Having added a new product, which supports self-consignment, to its lineup, the company will continue to offer various solutions, focusing mainly on energy management systems.



Mechanism of ENERGMATE-Factory that supports self-consignment

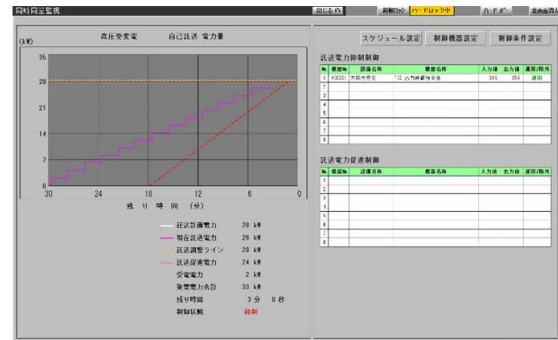
Excess electricity at a power generation facility is subjected to consignment to a demand facility. The role of the energy management system is to formulate a consignment plan based on the forecast of power generation amount and demand, submit the plan to OCCTO, and conduct power balancing control so that consignment is performed based on the submitted plan.

## Power generation plan and results



Graph display of self-consignment plan and results

## Balancing control



Monitoring of balancing control of consigned electricity

Screenshots