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NGK INSULATORS, LTD.
Ricoh Company, Ltd.

NGK and Ricoh to Start Renewable Energy Tracking Trial Project

Aiming to secure the environmental value of renewable energy stored in and discharged from storage batteries and build a structure that enable trading

NGK INSULATORS, LTD. (“NGK”) and Ricoh Company, Ltd. (“Ricoh”) will start a trial project in fiscal 2022 for tracking all processes from renewable energy generation to consumption, including charging and discharging of surplus generated electricity in NAS® batteries for storing electricity. Aiming to build a system that enables environmentally valuable renewable energy to be more easily and securely shared and traded, the two companies will conduct a demonstration test at the regional power producer and supplier, Ena Electric Power Co., Ltd. (Gifu Prefecture, “Ena Electric Power”)

Ena Electric Power is currently proceeding with the installation of photovoltaic equipment (hereinafter “PV”) on the roofs of public facilities and NAS® batteries in unused plots of land in Ena City with a view to commencing operations in the next fiscal year. The demonstration test will seek to enable maximum usage of generated renewable electricity in a form that displays its environmental value by using these facilities of Ena Electric Power and a renewable energy distribution record platform that uses blockchain (Distributed Ledger Technology) developed by Ricoh to verify the tracking of the generation, storage, and consumption of renewable electricity. Furthermore, NGK and Ricoh will also examine the possibility of remotely connecting the electricity storage, PV, and other facilities that they install with those of Ena Electric Power to conduct tracking.

<Background>

To realize the 2050 carbon neutral target set out by the Japanese government, it is important to expand the amount of renewable energy introduced in regional autonomous distributed energy systems and to maximize local consumption of locally generated renewable energy. However, the amount of electricity generated by renewable energy, such as PVs, can fluctuate depending on the weather, and therefore when expanding the amount of renewable energy installed, there is a risk that when the supply of renewable energy exceeds the consumption volume, surplus electric power will flow into the main grid (reverse power flow), threatening to impair the stability of the grid. Therefore, large capacity storage batteries that can store surplus energy and supply it when needed are useful for the stable use of renewable energy. On the other hand, there are issues to be addressed, including establishing renewable energy tracking mechanisms and systems, such as handling of environmental value when charging and discharging storage batteries and real-time adjustment of the amount of charge and discharge.

<Envisaged scenario for the trial>

NGK and Ricoh consider it necessary to conduct a demonstration test of technologies in an actual situation that will form the basis for their examination, aiming to institutionalize and standardize renewable energy tracking using NAS batteries. The two companies will conduct trial testing for the following two scenarios.

1) Expanding the amount of renewable energy introduced in the distribution network and maximizing its usage

This trial aims to prevent backflow into the main grid and increase the usage rate of renewable energy in the distribution network.

By tracking in real-time the generation of renewable energy in the distribution network at the level of a transformer substation and below as well as consumption by consumers and storing the surplus renewable energy in a NAS battery securely in a form that has environmental value, the backflow of surplus renewable energy will be prevented from entering into the main grid. With its environmental value secured, the renewable energy can be stored in the NAS battery, so that even when there are restrictions on the transmission capacity of the upper-level grid, the renewable energy

can be additionally introduced to the distribution network without disturbing the stability of the main grid. In this way, the rate of local renewable energy and local production for local consumption can be maximized.

2) Sharing of renewable energy between different distribution networks

This is a trial of certifying that surplus renewable energy electricity generated on distribution networks at the transformer substation level or below is actually renewable energy and sharing it to another distribution grid while retaining its environmental value.

Since there are restrictions on the amount of electricity transmission on the upper-level main grid, in some cases real-time sharing and using surplus renewable energy electricity between different distribution networks may be difficult. In such cases, by tracking, renewable energy is stored in a NAS battery while securing its environmental value. During time periods when there is not restriction on the grid, by sharing renewable energy between NAS batteries on different distribution networks, the rate of local production for local consumption can be increased without losing the environmental value of renewable energy.

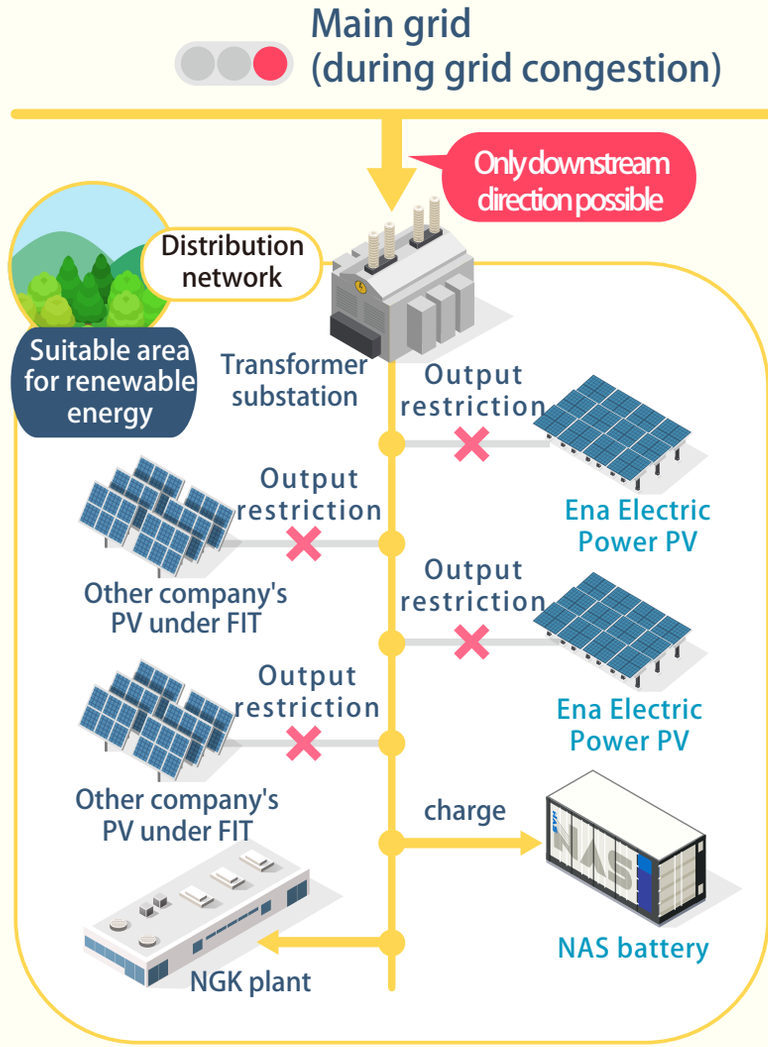
With this trial, the companies believe that widespread use of the trial results will enable them to contribute to increase the renewable energy rate and minimize output restrictions at regional power producer and suppliers nationwide and in advanced decarbonization communities promoted by the government.

Through this trial test, NGK and Ricoh aim to build mechanisms to easily share and trade renewable energy with environmental value and to contribute to expanded introduction of renewable energy and maximization of its use, as well as to realizing carbon neutrality by 2050.

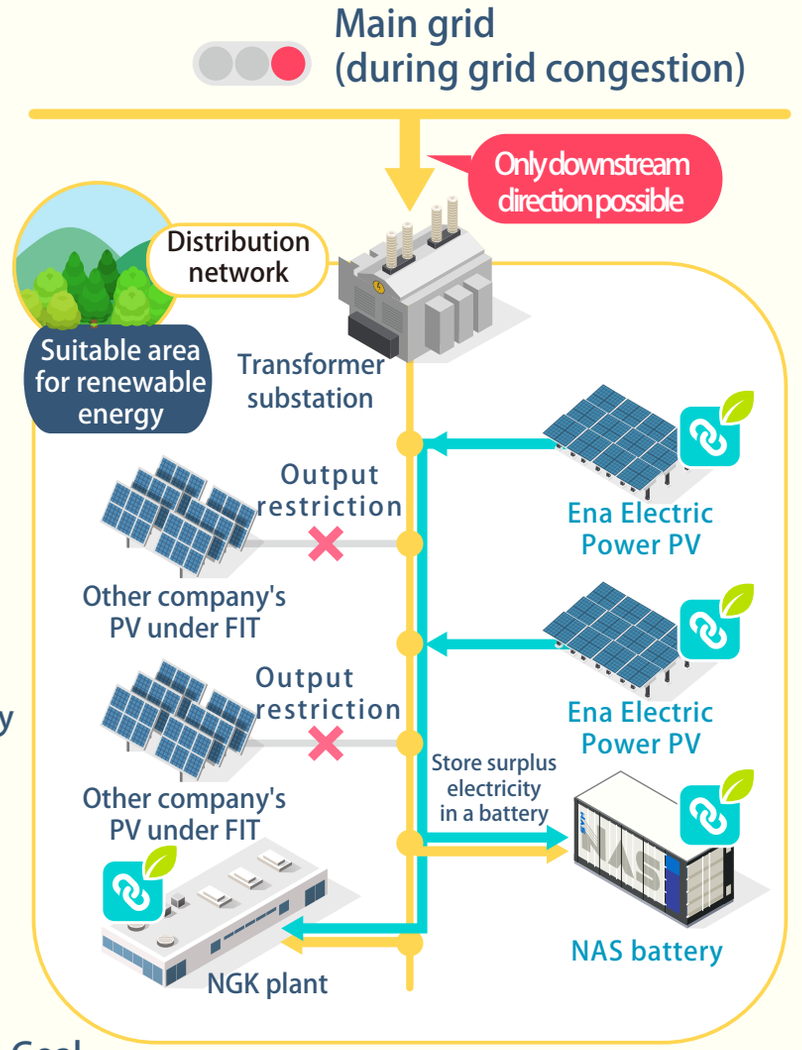
*About Ena Electric Power Co., Ltd.

Ena Electric Power is a regional power producer and supplier established in April 2021 by NGK, Ena City, and Chubu Electric Power Miraiz Co., Inc. (operations are scheduled to start in April 2022). Ena Electric Power will independently own photovoltaic equipment and NAS batteries for energy storage and aim to realize a zero-carbon city through local production and local consumption of energy using the Ena Model. This model is characterized by independent renewable energy use without relying on the Feed-in Tariff system (FIT system), stable corporate management, and a strengthened capability to respond to natural disasters.

Scenario 1 Expanding amount of renewable energy introduced in the distribution network and maximizing its use



Install real–time renewable energy distribution record platform using blockchain technology



Issue

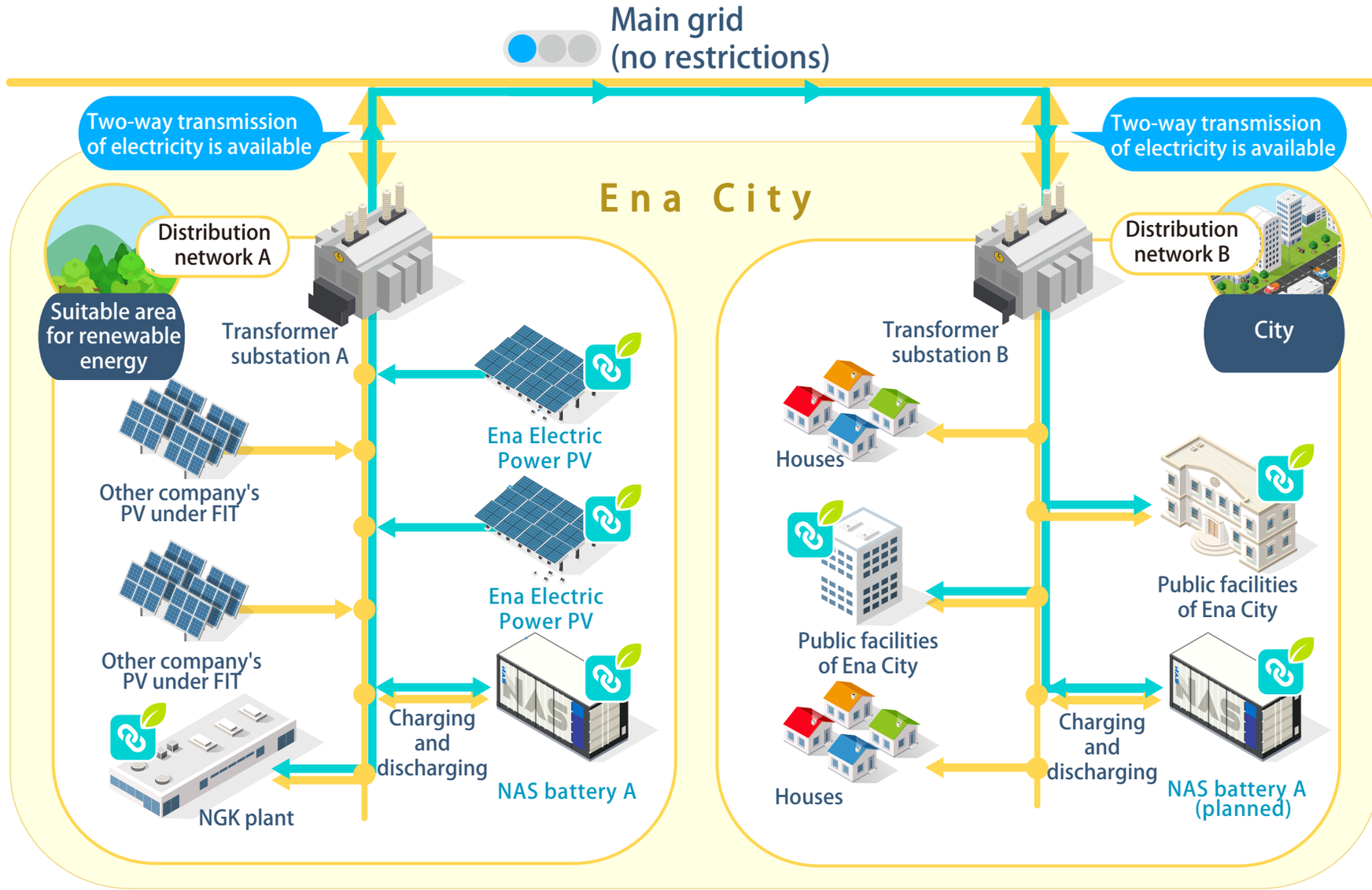
Supply of renewable energy on the distribution network exceeds consumption, causing reverse power flow of surplus electric power into the main grid, which can threaten the stability of the electricity grid. In such cases, stoppage of specific power generations (output control) is carried out to reduce the generation volume from renewable energy.

The output control means that generated electricity can no longer be used, which prevents progress on introduction of renewable energy.

Goal

By securely storing surplus renewable energy in a NAS battery, reverse power flow into the main grid is prevented. Since renewable energy can be stored in the NAS battery while securing its environmental value, even when there are restrictions on transmission capacity in the upper–level grid, additional renewable energy can be introduced to the distribution network without disturbing the stability of the main grid, enabling maximization of the ratio of renewable energy locally and local production for local consumption.

Scenario 2 Sharing renewable energy between different distribution networks



Issue

There are cases where it is difficult to deliver renewable energy generated in the suburbs to the urban center, even in the same city, due to restrictions on the main grid. Since space is limited in urban centers, there are limits to increasing the rate of renewable energy in them.

Using tracking, the renewable energy is stored in NAS battery A, while securing its environmental value.

Goal

During periods when the main grid is not restricted, renewable energy can be shared between NAS batteries A and B on different distribution networks. In this way, the rate of local production for local consumption can be increased without losing the environmental value of renewable energy.