News Release

June 19, 2025

New Energy and Industrial Technology Development Organization (NEDO)

Nissin Electric Co., Ltd.

Demonstration Operation of India's First Micro Substation With a Power Voltage Transformer Commences

—will establish technology to achieve stable power supply for areas off the grid—

The New Energy and Industrial Technology Development Organization (NEDO) is working with Nissin Electric Co., Ltd. on demonstration research into micro substations to realize a power supply with low environmental impact in areas of India with underdeveloped power grids. This is taking place as part of the subsidized International Demonstration Project on Japan's Technologies for Decarbonization and Energy Transition. Demonstration operations recently commenced with the installation of a micro substation with a power voltage transformer (PVT) developed by Nissin Electric.

The micro substation is located at a substation on the outskirts of Delhi owned by the local distribution company TATA Power-Delhi Distribution Limited (TATA Power-DDL). It will directly convert extra high voltage (EHV) power from transmission lines to low voltage power and supply it to the surrounding area. The aim is to verify the reliability of such a power supply and the effectiveness of power quality while establishing technology to supply stable power to areas where the grid is underdeveloped or non-existent.

On June 18, 2025, the parties held a ceremony celebrating the start of operation at the Smart Grid Lab of TATA Power-DDL in New Delhi.

Figure 1: Micro substation with a PVT

1. Overview

In India, “24x7 Power for All” has been adopted as the main power-related policy, with the aim of supplying power to all regions 24 hours a day, 365 days a year. However, in North and Northeast India there are many areas where transmission lines have been installed but a power grid has not yet been developed or is vulnerable. Mini grids that utilize diesel generators are used in such areas, but air pollution caused by fossil fuel consumption has become a social problem.

Against this background, in January 2024 NEDO signed a letter of intent with Power Finance Corporation Limited, which is a leading Non-Banking Financial Corporation under administrative control of India’s Ministry of Power, regarding a demonstration project*1 to supply power through a micro substation. The subsidized company and project implementer Nissin Electric signed a project agreement in August 2024 with TATA Power-DDL and subsequently started the demonstration research.

This is the first demonstration project of a micro substation with a PVT*2 in India.

2. Details of the demonstration project

Nissin Electric will apply its transformer technology to test micro substations that can obtain low voltage power (240 V) directly from EHV power (66 kV or higher) from transmission lines using a high-capacity PVT for power supply.

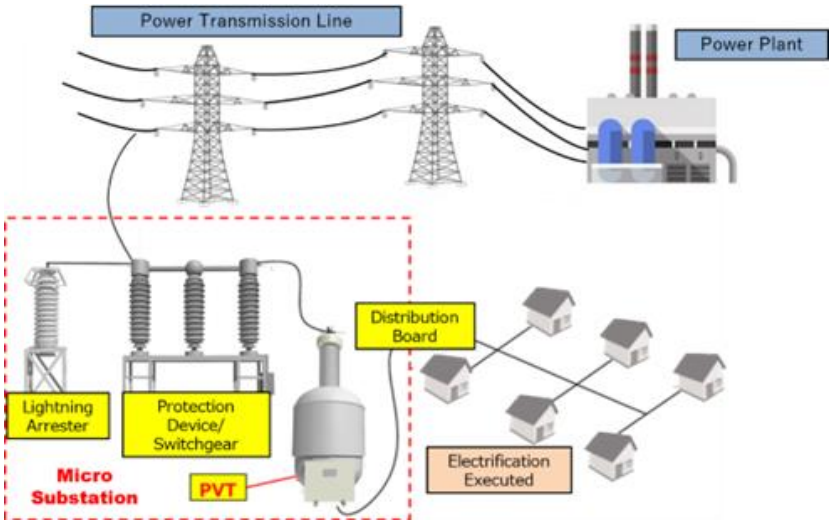

Figure 2 : How power is supplied from a micro substation with a PVT

A micro substation consists of protective devices, switchgear, lightning arresters, and a distribution board, as well as a PVT. A PVT makes it possible to acquire about 100 kVA of low voltage power, enough to supply roughly 50 to 100 households per substation, directly from transmission lines without installing a conventional large-scale distribution substation. In addition, since it only requires stationary devices*3 for operation, it has a simple configuration and high reliability. The following list shows its advantages over a conventional substation or power supply system using a diesel generator:

(1) **Low operation cost.** Since refueling and frequent maintenance of a generator are not required, running costs can be reduced.
(2) **Space saving.** It can be installed in a smaller space than conventional substations.
(3) **Lower environmental burden.** A significant CO_2 reduction (about 45%) can be achieved compared to a diesel generator.

*Figure 3 :*The PVT developed for the demonstration

By installing a micro substation with a PVT, it is possible to supply stable power inexpensively without the need to build a large-scale substation. Nissin Electric plans to expand this technology to other regions in India and other countries facing similar issues.

3. Ceremony celebrating the start of operation

On June 18, 2025, a ceremony celebrating the start of operation was held at the Smart Grid Lab of TATA Power-DDL in New Delhi. It was attended by many of the parties involved from Japan and India.

*Figure 4 :*Opening ceremony for India's 1st Micro Substation

[Notes]

*1 demonstration project:

Project Name: Demonstration research on micro substations to realize power supply with low environmental impact in areas with underdeveloped power distribution networks (India)

Project Period: FY2020 to FY2025

Project Overview: International Demonstration Project on Japan's Technologies for Decarbonization and Energy Transition

*2 PVT (Power voltage transformer):

A transformer that can supply power by directly converting extra high voltage to low voltage through instrument transformer technology.

*3 stationary devices:

A general term for power equipment that does not have moving parts, such as voltage transformers, current transformers, and switchgear.

4. Contact Information

(For inquiries regarding the content of this news release)

NEDO International Projects Department

Tel:＋81-44-520-5190

Nissin Electric Corporate Planning Department Public Relations Group

Email：kouhou_media[*]ml.nissin.co.jp

** To send an inquiry by email, please replace [*] with @ in the above email address.*

**When introducing our organization in newspapers, TV, etc., please use "NEDO (New Energy and Industrial Technology Development Organization)" or "NEDO".*