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Tokyo Gas and Power Roll Launch Joint Demonstration of Low-Cost Next-Generation Perovskite Solar Cells

~Advancing collaboration toward widespread adoption and domestic supply chain development~

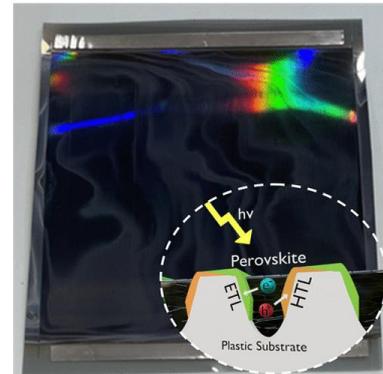
Tokyo Gas Co., Ltd.

Power Roll Ltd.

Tokyo Gas Co., Ltd. (President: Shinichi Sasayama; “Tokyo Gas”) and Power Roll Ltd. (CEO: Neil Spann; “Power Roll”) have signed a joint development agreement and commenced a demonstration project (“the Project”) in Japan for low-cost, next-generation perovskite solar cells.



Power Roll’s perovskite solar panels



Perovskite solar cell



Enlarged view of the cell structure

Power Roll’s perovskite solar cell adopts an innovative structure that does not require indium tin oxide (ITO), the material used in transparent conductive oxide (TCO) substrates that typically account for 40–60% of materials cost in conventional perovskite solar cells.

Because ITO uses the rare metal indium, it is expensive and poses a major barrier to cost reduction. Concerns also exist regarding stable supply due to depletion risks and country-specific geopolitical risks. While many companies across the industry are pursuing alternative materials, Power Roll has achieved a breakthrough by eliminating ITO altogether and forming electrodes on its proprietary micro-grooved film. By fundamentally removing the need for ITO through a re-designed cell structure, dramatic cost reductions—previously difficult with conventional technologies—are expected.

Overview of the Demonstration Project

In this Project, Tokyo Gas will apply its advanced installation technologies—including its proprietary adhesive-based construction method—together with its expertise in distributed energy system deployment and operation. Over approximately one year, the Project will monitor and evaluate power generation performance, durability, and other factors. The goal is to verify and improve performance and reliability under Japan’s climate and environmental conditions.

The two companies will also identify potential use cases in Japan, examine requirements for certification systems essential for social implementation, and explore the possibility of jointly building a manufacturing and supply framework (domestic supply chain) in Japan.

Through this Project, Tokyo Gas and Power Roll aim to accelerate the social implementation of film-type solar cells, contributing to increased adoption of renewable energy in Japan and the realization of a carbon-neutral society.

Reference: About Each Company

Power Roll

Power Roll is a UK-based company developing lightweight and flexible solar films that combine micro-groove structures, perovskite light-absorbing materials, and scalable roll-to-roll manufacturing technologies.

Using its proprietary technique of creating micro-grooves on plastic film, the company produces solar films that are thin, lightweight, and highly efficient at converting light into electricity. This unique structure eliminates the need for expensive ITO—commonly used in perovskite solar cells—which significantly reduces manufacturing cost.

The technology also minimizes power loss even when partial shading or defects occur, offering stable real-world performance and strong potential for high-volume manufacturing. Power Roll aims to expand solar installation into areas previously unsuitable for conventional panels, such as low-load roofs, building façades, and curved surfaces.

Tokyo Gas

Through its “Hinatao Solar” on-site PPA service, Tokyo Gas utilizes ultrathin lightweight panels and its proprietary adhesive installation method to enable deployment on low-load roofs and to make effective use of unused spaces. This proprietary construction approach has been validated through stringent testing, including wind-resistance and accelerated aging tests, and is recognized for its high reliability.

Tokyo Gas is also expanding its offerings to meet diverse customer needs, including VPPAs and support for J-Credit certification. The company continues to evaluate the potential of next-generation perovskite solar technologies and pursue early commercialization and social implementation.

Reference: Background of the Project

Japan’s 7th Strategic Energy Plan targets solar power to account for 22–29% of electricity generation by 2040. However, challenges such as roof load limitations, installation space constraints, operational restrictions, and mismatches between installation sites and demand centers continue to hinder deployment in certain areas.

Perovskite solar cells—being thin, lightweight, and flexible—are expected to unlock the potential of locations where conventional solar panels have been difficult to install.