



Testing an Innovative New Type of Solar Cell at the Port of Tokyo

The flexible, lightweight solar cells are being tested on pillars at the Tokyo International Cruise Terminal.

Tokyo is promoting the implementation of light and flexible next-generation solar cells, which can contribute to decarbonization.



The thin, flexible solar cells are bendable and can be installed on curved surfaces.

As the world races to reduce greenhouse gas emissions to mitigate climate change, companies like SEKISUI CHEMICAL CO., LTD. are developing new technologies to generate clean electricity. One such highly anticipated technology is iodine-based, film-type solar cells using a specific type of crystal structure.

In contrast to stiffer, heavier silicon solar cells—which currently command a global market share of over 97 per cent—film-type cells are lightweight and flexible, meaning they can be installed in places where silicon cells are untenable. SEKISUI CHEMICAL and its partners are testing the cells in various environments, including at power plants, in agriculture, on building exteriors, floating in swimming pools, and at public facilities such as the Tokyo International Cruise Terminal.

“In crowded places, which is often the case in Japan, there is not enough land for traditional silicon solar cells,” says Hisata Shinichi, a marketing team senior expert with SEKISUI CHEMICAL’s solar cell project. The company is intentionally targeting places with high solar potential but which are unsuitable for silicon cells, he explains.

Alongside high expectations, manufacturers are also working to overcome remaining challenges, including understanding how outdoor conditions will impact the cells, ensuring safe usage of—or finding alternatives to—the cells’ lead content, and lowering production costs. However, strong interest from Japan’s national government, local governments, and partner corporations shows that there is plentiful support to overcome these challenges.

A Verification Test Site that Anyone Can Visit

The Tokyo Metropolitan Government (TMG) aims to take the lead in promoting the visibility and implementation of next-generation solar cells, as part of its efforts toward decarbonization.

Following an installation at a wastewater treatment facility, in May 2024 the TMG and SEKISUI CHEMICAL launched a verification test at the Tokyo International Cruise Terminal to monitor

the cells’ power generation efficiency and response to the bay area’s environmental conditions.

The implementation team wrapped the cells around pillars on the cruise terminal’s fourth-floor balcony, which also offers a sweeping view of the port. Electricity generated by the cells is stored in batteries and used to help illuminate the terminal’s towering “Tokyo” sign directly overhead.

“We hope this type of solar cell will become familiar to citizens,” Hisata says. “At the cruise terminal, anyone who wants to see the cells up close can do so without needing special permission.” The TMG was one of the first organizations to partner with SEKISUI CHEMICAL to help test and promote these cells, he adds.

“In addition to tests at TMG-owned facilities, this fiscal year the TMG has begun to subsidize development costs for companies that conduct demonstration projects in Tokyo, to encourage early commercialization,” explains an official from the TMG’s Bureau of Environment, Climate Change Division. “We will continue to study and implement measures necessary to expand the use of next-generation solar cells.”



Tokyo International Cruise Terminal

Aiming for a Decarbonized Power Supply

If all goes to plan, these solar cells will soon be hitting the market. As SEKISUI CHEMICAL prepares for commercialization, the company aims to source from domestic suppliers as much as possible. Luckily, Japan boasts the world’s second-largest production share of the cells’ primary material, iodine, and which is especially concentrated in a natural gas field near Tokyo.

Learning from supply chain disruptions during the COVID-19 pandemic, Hisata says his company is “working on procuring materials that can be adequately supplied even in the event of a disaster.” Domestically produced materials, although sometimes more expensive than imports, can also lower the cells’ lifecycle greenhouse gas emissions by reducing transportation-related emissions.

“Alongside improving service life and power generation efficiency as technological development progresses, we expect mass production will lower manufacturing costs and create an environment in which anyone can easily generate power anywhere, including at their home, using these solar cells,” notes the Bureau of Environment official.

Informed by the ongoing verification test results, the TMG and SEKISUI CHEMICAL will continue working to refine solar cell technology and expand its deployment, aiming for a decarbonized power supply.