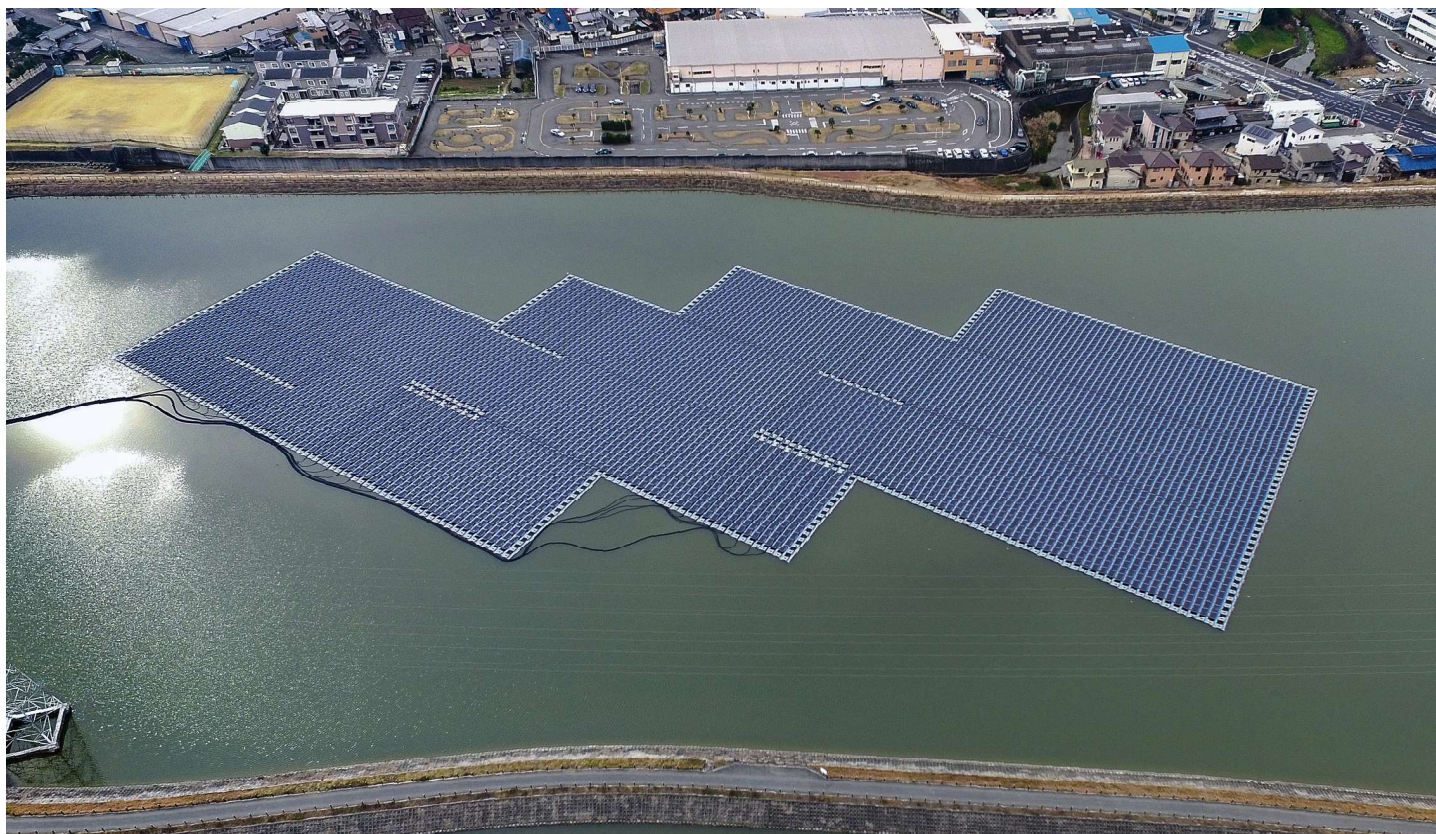


## Building floating mega solar power plants in reservoirs Adopting panels compatible with on-water use with a 20-year long-term guarantee



### Customer

#### Futagawa Manufacturing Co., Ltd.

- Kakogawa, Hyogo Prefecture, Japan (head office)
- Established in 1943. Futagawa's primary business is the manufacture of construction machinery, such as hydraulic shovels, industrial robots, and industrial machine parts.
- Kawarayama Ike Floating Solar Power Plant (this solution)/ Inami-cho, Hyogo Prefecture



### Implemented product

#### High-output crystalline photovoltaic module

- ND-250FR (custom order) x 5,712 modules = 1,428kW
- Modules are fixed on high-density polyethylene floats, which are anchored in the reservoir.
- Operation started from December 2015  
Retailer: MIKIKOGYO CO., LTD.

## This is what we realized.

### Challenges before implementation

As it has become harder to find suitable land when newly building a mega solar power plant, we looked into developing a floating mega solar plant by taking advantage of the regional characteristics with many reservoirs. We required solar panels that were suitable for on-water installation.

We created a 1.4MW mega solar power plant on the reservoir using the on-water installation compatible panels that are equipped with high moisture-resistant back sheets.

The drop in power generation efficiency is suppressed by installing the panels on the water, where the ambient temperature does not rise easily even in the summer.

The water surface usage fee has become a new source of income for the residents who manage the reservoir and have helped vitalize the local community.



Masaya Futagawa  
The president  
Futagawa Manufacturing Co., Ltd.

■ Background of implementation

**Finding land for development has become difficult, so we looked into on-water installation in an irrigation reservoir as an alternative.**

Since 2013, we have been developing solar power generation projects on land, mostly in the Kyushu area. We had been looking for new development opportunities in Hyogo Prefecture, where we are located. Since it was difficult to find land suitable for development, we looked at using irrigation reservoirs. We wanted to use the regionality of Hyogo Prefecture, which has many reservoirs and install the solar panels on the water to create new solar power plants.

■ Reasons for selection

**Reassured by 20-year long-term guarantee achieved through back sheets having excellent resistance for use on the water surface.**

MIKIKOGYO recommended Sharp's solar panels (build-to-order). The biggest advantage was that the modules that protect the photovoltaic cells are backed with high moisture resistant sheets and are guaranteed to be used on the water surface for 20 years. Sharp has a rich record with solar power generation and has high reliability. We were reassured that we could operate the system for a long time, and decided to implement this system.

■ Effect after implementation

**1.4MW mega solar power plant installed in the reservoir. Suppressing drop in power generation efficiency during the summer.**

The solar panels are fixed to floats and then set onto the water surface to complete the mega solar power plant with 1.4MW power generation capacity. The annual average power generation amount is approx. 1,710,000 kWh and income from power sales are expected to reach approx. 54 million yen. Stable business profits are ensured for the next twenty years.

On-water installation keeps the ambient temperature from rising and suppresses a drop in power generation efficiency during the summer. The panels block the sunlight from radiating into the water and suppress the generation of aquatic weeds. We expect that the solar panels will help preserve the reservoir's environment.

■ Future prospects

**Planning to generate a total of 4.3MW with floating mega solar power generation. Revitalizing the local economy with water surface usage fees.**

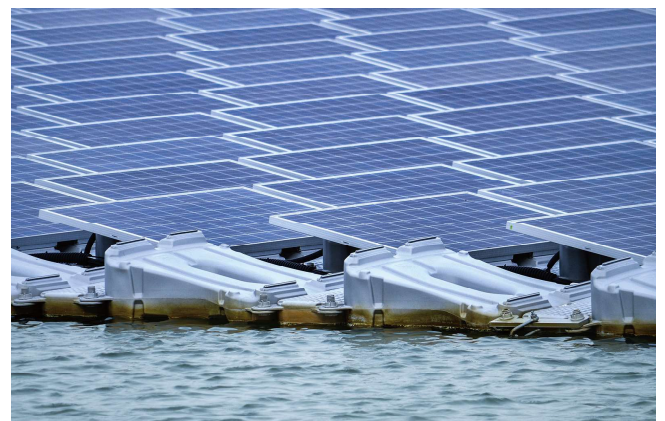
We are hoping to operate four floating solar power plants in addition to this plant to generate a total of 4.3MW of power. We want to advance these initiatives for renewable energy, which places little burden on the environment. Using the reservoir as a power plant and paying water usage fees, we can provide a new source of income for the local residents who manage the irrigation reservoir, which had previously failed to make a profit. We hope to actively contribute to the vitalization of the local economy.



Beautiful installation with consideration to the environment was highly praised.



Panels on the water can receive ample sunlight without being obstructed by buildings.



Solar panels are fixed on floats and installed on water.