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Floating Solar Panels: What You Need to Know in 2019 | EnergySage

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Not every roof is suitable for solar panels – factors such as shade, obstructions, age, and available space can have property owners looking for other locations for installation.

When it comes to large-scale solar projects, the most common alternatives to rooftop solar panel systems include ground mounts or solar canopies. Here's a newer alternative that's making quite the splash in the solar industry: floating solar.

What is floating solar? How do floating solar panels work?

Floating solar, also known as floating photovoltaic (FPV), is any sort of solar array that floats on top of a body of water. Solar panels need to be affixed to a buoyant structure that keeps them above the surface. If you come across a floating solar installation, it's most likely located in a lake or basin because the waters are generally calmer than the ocean. It's also common to install floating solar structures on large, man-made bodies of water, such as reservoirs.

Floating solar is a relatively new concept. The first patents for this type of technology registered in 2008. Since then, floating solar has predominately been installed in countries such as China, Japan, and the U.K.

Advantages of floating solar

There are a few advantages to installing a floating solar array versus more traditional types of projects:

No loss of valuable land space

One of the biggest advantages of floating solar panels is that the installations do not require valuable land space. Many of these installations can take up unused space on bodies of water, such as hydroelectric dam reservoirs, wastewater treatment ponds, or drinking water reservoirs. This allows for landowners to make use of an area that wouldn't otherwise be

used, rather than installing on sunny land that could potentially serve another purpose down the line. Additionally, installing solar panels out on open water reduces the need for tree removal and forest clearing, a practice used in the case of some larger solar panel installations.

Higher solar panel performance

Solar panels are durable and can perform under high temperatures. But as with other electronics, with higher temperatures come decreased power outputs. Solar panel performance tends to decline as temperatures rise, which can be a concern for property owners looking to install panels in a hot and sunny climate. The bodies of water that host floating solar arrays help cool down the solar equipment, which means the panels produce electricity at higher efficiencies in hot climates than they might otherwise.

Environmental benefits

Floating solar panels can certainly play a role in contributing to healthier environments. With floating solar installations, water not only has a cooling effect on solar equipment: it works the other way as well. The floating solar panel structure shades the body of water and reduces evaporation from these ponds, reservoirs, and lakes. This is a particularly useful benefit in areas susceptible to drought, as water loss to evaporation can add up over time and contribute to a shortage.

The shade provided by these floating solar also help reduce

the presence of algae blooms in bodies of freshwater. Algae blooms can be dangerous for human health if they occur in a source of drinking water, and can also lead to the death of plants and animals living in the body of water.

Lastly, floating solar panels are a source of clean, renewable electricity. The use of renewable energy technologies helps decrease the emissions of greenhouse gas emissions and other pollutants into the atmosphere, leaving a positive impact on the natural environment as well as human health.

Disadvantages of floating solar

While there are numerous advantages to floating solar, there are some disadvantages to the technology.

Costs

Floating solar installations may require additional costs than more traditional types of solar panel installations. Because this is a relatively new technology that requires specialized equipment and more niche installation knowledge, it typically requires a higher price tag than installing similar-sized solar farms on rooftops or solid ground. But as with traditional solar panel systems, the costs of installing floating solar panels are expected to continue to drop as the technology advances.

Applications

Floating solar installations don’t work for just anyone. The majority of floating solar installations are large-scale and

provide power for utility companies, large communities, companies, or municipalities. If you're looking into solar for your home, then it makes much more sense to install a rooftop or ground-mounted system. Those that invest in floating solar often have access to a large body of water to fit hundreds or thousands of solar panels. Unlike these types of installations, the average residential solar panel system has roughly 20 panels. Installation companies and developers installing floating solar projects today are not doing so on small-scale installations.

Notable floating solar companies and installations

Floating solar is still taking off all over the world – these types of projects are only expected to increase in popularity as time goes on.

Here are some more notable floating solar installations:

Largest installation in the world

Location: Anhui province, China
Company: Sungrow Power Supply
Size: 40 megawatts

This floating solar array, the largest in the world, produces enough electricity to power 15,000 homes in China. There are 166,000 panels included on the structure.

First public floating solar system in America

Location: Kelseyville county, California, USA
Company: Ciel & Terre
Size: 252 kilowatts

Ciel & Terre installed the first public floating solar installation in the United States. Comprised of 720 solar panels, this structure floats on top of a man-made wastewater treatment pond. The Lake County Special District financed this system through a municipal lease that has them realizing solar savings from the get-go.

Japan's largest floating solar structure

Location: Chiba Prefecture, Japan
Company: Kyocera
Size: 13.7 megawatts

Kyocera, a popular panel manufacturer, developed what is currently Japan's largest floating solar installation. The system takes up more than 44 acres of space and generates power for Tokyo Electric Power Company (TEPCO).

Case study: pairing floating solar panels with hydropower

In 2017, the world's first combined floating solar and hydroelectric plant was completed in Portugal. As floating solar increases in popularity, expect this pairing to become more and more common due to the numerous benefits of combining hydropower and floating solar panels.

A leading reason to pair the two generating technologies has to do with the reliability at which electricity is generated by hydroelectric systems. Many times, hydroelectric plants produce electricity very predictably due to a constant flow of water year round. But in other situations, seasonal variations in water levels can lead to fluctuating energy production by dams. This is where floating solar panels come in – by installing a floating array on the reservoir created behind most hydroelectric dams, extra electricity can be produced to stabilize the output of the hydroelectric plant when water levels are changing. Extra electricity produced by floating panels during the day means that more water can be held behind hydroelectric dams, which then means that during the night, when the panels don't produce energy, that extra stored

water can be allowed through the hydropower facility so that there's more than enough energy being produced to make it through the night hours.

This stabilization is especially important in areas with weak electric grids where it is essential that every electric generator runs smoothly so as to not interrupt the delivery of energy at any point. By pairing floating solar panels with hydroelectric generation as EDP (the system installation company) did in Portugal, solar energy can provide much needed grid stabilization along with its other various benefits to the environment.

Explore your solar options today

Solar panels can save you money, regardless of the type of installation you're looking for. If you're interested in exploring more traditional alternatives to floating solar (such as rooftop installations, ground-mounted solar, or carports) sign up for our Solar Marketplace. You can receive multiple quotes from pre-screened installers to compare equipment, financing options, and costs, and savings from solar.