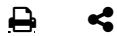


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With ambitions offshore, floating solar makes its first splashes in Europe



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The 27.4-MW Bomhofsplass project in Zwolle, the Netherlands, pictured here, is the largest floating solar project in Europe.

Source: BayWa r.e.

In certain European markets, land for new renewable energy development is becoming scarcer. Some developers are eyeing water as the next frontier, which offers high potential but also requires some pioneer spirit.

In the solar sector, floating technology has already found a foothold in China and other Asian markets but is comparatively nascent in Europe. The most active market currently is the Netherlands, a densely populated country where space for ground-mounted installations is at a premium. The Dutch geography is shaped in floating solar's favor, however, with plenty of inland water in the form of lakes, canals and old sand pits.

The Netherlands' project pipeline is underpinned by a subsidy program, which is credited for the country's pole position. In recent renewables tenders, floating solar developers were able to win support for 500 MW of capacity, in a process where floaters were competing directly with ground-mounted solar projects, said Michel Chatelin, a Dutch-based partner at law firm Eversheds Sutherland.

On average, floating solar projects are still more expensive to develop, but the subsidy wins prove that in some situations and use cases, the technology is already competitive with ground-mounted projects, said Chatelin, who in June advised a consortium of investors on the acquisition of Europe's largest floating solar project, in the Dutch city of Zwolle, from BayWa r.e. renewable energy GmbH's local subsidiary GroenLeven BV.

Utilities needed to drive scale

On a global level, floating solar photovoltaic, or PV, installations on inland waters alone have the potential for 4 TW of capacity, according to consultancy DNV GL. Despite the potential, the industry has not yet found common construction and quality benchmarks, making it difficult for investors and regulators to back these projects, the company said.

DNV GL has created an industry consortium of developers and technology companies to help clear away these stumbling blocks. Members of the group include BayWa r.e., as well as the likes of Statkraft AS, EDP - Energias de Portugal SA, Electricité de France SA and Equinor ASA.

In the Netherlands, the investor community meanwhile is already firmly on board, according to Toni Weigl, project manager for floating solar at BayWa r.e. Solar Projects GmbH. "We experience high interest from the investors as floating

PV is just a different application of solar PV and the proven technology of PV is a very familiar and attractive investment business for them ... The valuation of floating PV is comparable to our standard ground-mounted installations," he said.

Floating solar projects are still mostly done by specialized solar developers. Among the few utilities dipping their toes into the market with pilot projects are Norway's Statkraft and Portugal's EDP, both operators of hydropower plants where floating solar projects can be co-located with existing generation capacity.

Statkraft announced its first floating solar project in Albania, Southeast Europe, in June. The panels will be added to its 72-MW Banja hydropower plant, with a view to achieving 2 MW of added solar power capacity, supported by a fixed-price power purchase agreement. "If the technology is proven successful and the potential for cost-competitiveness can be achieved, a wider application of floating solar may take place also in other Statkraft locations," the company said.

"For floating solar to become competitive, utilities have to get involved," said Chatelin of Eversheds Sutherland — not only power generators, but also water utilities. "They can create the economies of scale," he added.

In the U.K., Thames Water Utilities Ltd., which serves London and parts of southern England, hosts a 6.3-MW floating solar farm built by developer Lightsource BP Renewable Energy Investments Ltd. in 2016 at its Queen Elizabeth II reservoir that feeds London's water network.

The industry is still learning about some of the potential effects of the panels on the water below, especially when it comes to drinking water. Risks include algae growth and birds landing on the water, and for the pilot projects added in recent months, there is no definitive experience data yet.

Thames Water, however, has not seen any impact on water quality in the four years it has hosted the floating plant, a spokesperson said via email. The PV systems can also help reduce evaporation and the cooling effect of the water can improve the yield of the panels.

Selected European floating solar projects					
Name	Location	Capacity (MW)	Developer/operator	Completion	Notes
Bomhofspas	Zwolle, Netherlands	27.4	Baywa r.e. renewable energy GmbH, GroenLeven BV	March 2020	Europe's largest floating solar project
O'Mega 1	Piolenc, France	17.0	Akuo Energy SAS	March 2019	Former quarry site
Queen Elizabeth II reservoir	London, UK	6.3	Lightsource BP Renewable Energy investments Ltd., Thames Water Utilities Ltd.	March 2016	Floating solar array on drinking water reservoir
Godley reservoir	Manchester, UK	3.0	United Utilities Water PLC	Jan. 2016	Floating solar array on drinking water reservoir
Banja power plant	Elbasan, Albania	2.0	Statkraft AS, Ocean Sun	Q4'20	Pilot project co-located with hydropower
Gendringen	Gendringen, Netherlands	1.2	Vattenfall AB	Aug./Sept. 2020	Vattenfall's first floating solar project; array on sand and gravel site
Hesbaye Frost	Geer, Belgium	1.0	Hesbaye Frost SA	Dec. 2017	Floating solar array on on-site water storage basin

Data as of July 29, 2020.
Sources: SolarPlaza; SolarPower Europe; Vattenfall AB; S&P Global Market Intelligence

Back in the Netherlands, floating solar projects are also in uncharted waters when it comes to permitting and legal requirements. "The main difference is the floating bit," said Miriam van Ee, another Dutch-based partner at Eversheds Sutherland. "There can be legal issues around the qualification of ownership. That comes with a specific review discussion."

A clear legal framework for the ownership rights and permitting processes for floating solar projects does not yet exist, so decisions are being made for each individual project. "There are novel questions that you have to deal with," said Chatelin. A low hanging fruit from a legal and practical perspective is the co-location of floating solar for sites that already have industrial permits, however, such as quarries and sand pits.

"Of course [floating solar] is something new for most authorities," BayWa r.e.'s Weigl said in an email, adding that the pre-construction process for floating solar is not much different to the traditional projects. "There is still some more, let's say, educational work to do to resolve potential concerns from decision makers and communities," Weigl said.

Beyond the mainland

Ground-mounted solar farms in the Netherlands are also competing for space with the country's agriculture industry, making creative solutions like floating solar or co-located projects on agricultural land more popular. On top of the government subsidy program, the Netherlands also boasts existing supply chains for water-based installations such as mooring technologies.

Beyond inland waters, developers are exploring the potential for adding floating solar projects to wavy sites in the North Sea, too. In its successful bid for the Hollandse Kust Noord offshore wind farm in the Netherlands, the CrossWind consortium, made up of Royal Dutch Shell PLC and Eneco Groep NV, included a plan for using floating solar panels.

The offshore wind sector is already familiar with floating technology with a series of floating wind pilot projects having been out at sea for years — but the sector is yet to crack a path to scale.

Until recently, floating solar panels in choppy waters sounded like a distant dream, but some Dutch pioneers are taking their first steps in that direction and the European Commission is seeking industry input for including offshore solar in its renewables strategy.

Researchers at the University of Utrecht are currently conducting a design and feasibility study for ocean solar. They will explore options for co-location with wind power sites in tandem with developer Oceans of Energy, which has operated a pilot project in the North Sea since November 2019. So far, so good: Oceans of Energy said the panels have already survived several winter storms.