

# One Floating PV Installation - Double the Benefits

Case Study



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# Pushing PV boundaries on land and now on the water

When the De Krim Resort on Texel Island in the Netherlands decided to become more energy independent, their main requirements were the generation of green energy, and an installation that would not be visible from the street level.

The tender was awarded to Texel4trading because of their resourceful proposal to place floating PV modules — maximized with SolarEdge technology — on the rainwater reservoir used to irrigate the resort's golf course. This novel approach resulted in a number of unique benefits for the resort, and the installation also qualified for an incentive program from the Dutch government (SDE+). The resort outputs the solar power it generates to its local public grid provider.

**/ “De Krim Resort invested in a solar PV system to be environmentally friendly and generate our own electricity. Thanks to asset reuse, high performance, and a positive impact on water quality, the floating installation is expected to far exceed the estimated return on our investment.”**

**Iwan Groothuis, Managing Director, De Krim Resort**



The floating installation covers the majority of the water surface, reducing fresh water evaporation and growth of algae on the water surface.



- Installation Date: August, 2017  
De Krim Resort, Texel Island, NL
- Floating PV Design:\* Texel4trading
- 780 kWp
- Modules: 2390 x 327 Wp
- Power optimizers: 1195 x P800
- Inverters: 24 x SE27.6K

\* The De Krim Resort chose an innovative and productive route to green energy by installing a floating solar PV installation on a 7728 sq. meter rainwater reservoir that irrigates their golf course.

## Floating installation - cost-effectiveness and increased yield

The placement of PV modules on the reservoir derives revenue from a property asset that would otherwise have had no financial yield. By repurposing the reservoir for the PV installation, the resort eliminated the need to allocate any other costly land, and maintained the beauty of the surrounding environment. And, because the PV modules cover most of the surface of the reservoir, they reduce the amount of direct sunlight hitting the water, bringing an added environmental and financial benefit.

When fresh water is protected from direct sunlight, there is a twofold effect. First, there is a reduction in the plant and algae growth on the water surface, which, if untreated, can cause costly damage to the pumps in an irrigation system. And second, there is a reduction in water surface evaporation, resulting in a preservation of valuable fresh water. As a consequence of this effect, the resort expects to reduce fresh water losses by up to 30%.

Based on a predicted PVsyst performance ratio of 0.9, the installation is expected to generate 700 MWh per year, however, placing the modules on the reservoir produces a natural water cooling effect which should improve PV system performance. Texel4trading Manager Nicol Schermer explains:

**/** “This cooling effect has been shown to produce greater energy generation, and, based on results from previous installations, Texel4trading expects that the floating solar installation will generate between 770 MWh and 800 MWh per year, some 10 - 15% more energy compared to a similar ground-mounted installation. This will offset the additional costs of installing a floating installation. We are seeing growing interest in installing floating solar parks to conserve fresh water, including at hydroelectric plants, and especially in arid countries.”

Nicol Schermer, Manager, Texel4trading

## Meeting the challenges of a 'floatovoltaic' installation

Floating PV installations come with many benefits, but also have unique design and maintenance considerations. Modules and components require planning for attaching on to concrete pontoons or plastic floats. The fact that the modules are located on water makes on-site monitoring and maintenance of the installation, and the safety of maintenance personnel, potentially more challenging due to location and access issues. SolarEdge power optimizers monitor the performance of modules and communicate performance data to the web-based SolarEdge monitoring platform, reducing the number of actual site visits needed and the time spent on-site in each visit.



24 x SE27.6K inverters are installed next to the pond.



The PV installation was set on a concrete pontoon above the reservoir.

## Design flexibility and superior safety

When working with SolarEdge inverters, SolarEdge power optimizers maintain a fixed string voltage, allowing installers even greater flexibility with longer strings and strings of different lengths in order to design optimal PV systems.

Modules positioned at different tilts and orientations cause energy losses when connected in a single string to traditional inverters. With the SolarEdge solution, energy yield from each module is optimized independently, eliminating these energy losses.

In addition, every power optimizer is equipped with the SafeDC™ feature, which is designed to automatically reduce modules' DC voltage to a safe level.



The installation includes 1195 power optimizers which reduce module-level mismatch, maximizing the energy collected from each module.



SolarEdge's design flexibility enables the system to maximize yield even from modules at different tilts and orientations.

## SolarEdge — A technological solution for all environmental conditions

As the De Krim Resort is located in close proximity to the sea, protection of the PV installation from the effects of the salt mist corrosion and other harsh environmental conditions was an important consideration when planning the installation. To this end, SolarEdge power optimizers and inverters were installed together with modules resistant to salt-mist and humidity mounted on saline-resistant frames on concrete pontoons in the reservoir. Having long warranties, SolarEdge inverters and power optimizers are designed to respectively meet IP65 and IP68 ratings for water and humidity resistance. SolarEdge's exceptional module-level monitoring, design flexibility, and improved O&M throughout the system lifetime all further contribute to higher yields and reduced costs.



The SolarEdge monitoring platform dashboard shows status updates, alerts and other information transmitted from the site. Users can drill down to see the physical layout as well as detailed charts about system performance so as to reduce costs by monitoring operations remotely.