

SolarEdge Helps Keep Water District Afloat

Floating PV System Filters Smart Energy into Savings for Wastewater Plant

“A lack of roof and ground space put our creative minds to work, ultimately driving the floating solar concept. So far in 2020, our SolarEdge DC-optimized solution for Lake County Special District’s Kelseyville Wastewater Treatment Plant has generated about 16% more energy than predicted from the computer simulation, and it produced 389,580 kWh of clean, free electricity in its first year. By reducing operating costs, they can now redirect funds to capital improvement projects.” – Brian Hines, President, North Coast Solar

Background

Too Much Energy Overhead

For many local governments, drinking and wastewater plants account for up to 30-40% of total energy consumed, due to the electricity required to pump large volumes of water. Ever-increasing electricity prices are a challenge to water districts attempting to keep water and sewer rates stable, and preventing them from reinvesting in critical infrastructure projects.

“Drinking water and wastewater systems account for approximately 2% of energy use in the United States, adding over 45 million tons of greenhouse gases annually.” EPA.gov

The Challenge

Rising Electricity Rates and Limited Space for Solar

California electric utilities have been raising rates 3-5% every year. Increased frequency of wildfires in Northern California will have an even greater impact on rising rates. Leadership for the Lake County Special Districts knew the solution to controlling wastewater treatment plant costs was turning to cheaper, renewable sources of electricity. However, they were concerned that the property did not have adequate land or rooftop space to install a PV system large enough to offset consumption.

The Solution

Turning to Water for Solar

After issuing an RFP and reviewing the bids, Lake County Special Districts concluded that the unused wastewater treatment pond provided an incredible opportunity, and a large enough footprint, to install a floating solar system.

North Coast Solar, a pioneering solar firm in Santa Rosa since 1984, won the project with a proposal to install a solution from Ciel Et Terre – well-known developers of the Hydrelia floating solar power system.



This included a 252 kW design, using Canadian Solar modules and SolarEdge power optimizers/inverters. The solution would cover the plant's annual kWh usage, and projected annual electricity savings of \$90,000, which would grow over time as PG&E rates increase and monthly lease payments stay constant.

And, with the innovative municipal lease financing arranged by North Coast Solar, only minimal upfront investment was required, allowing them to generate positive cash flow in the first year of operation.

Floating Solar Makes Sense

More Energy. Less Environmental Impact.

Floating solar power plants improve energy production by keeping the solar system cooler, which prolongs the lifetime of the PV system and improves performance. This cooling factor is an even bigger benefit in Lake County where summer temperatures can reach 106° F.

Utilizing the pond surface for a solar plant also reduces algae growth, bank erosion (through reducing water movement), and evaporation, while generating virtually free energy. Benefits also include reduced greenhouse gas emissions, offsetting 131 tons of CO₂ per year - enabling the County to meet specific carbon reduction goals.



SolarEdge – By Land and Water

Maximum Power. Maximum Safety.

“After experiencing module-level monitoring you don’t go back. The SolarEdge three phase commercial inverters with Synergy technology are pretty brilliant - they’re modular, lightweight and allow for very long string lengths. Plus, the advanced safety capabilities are huge, especially on water. Each power optimizer includes the built-in SafeDC™ feature which automatically reduces voltage to a safe level, providing protection to our installation and maintenance personnel.” – Brian Hines, President, North Coast Solar



With modules on water, on-site monitoring, maintenance, and the safety of personnel are potentially more challenging. Through module-level monitoring, SolarEdge power optimizers help reduce maintenance visits and costs through remote problem-solving and upgrades. SolarEdge meets safety regulations by complying with NEC requirements for Arc Fault Protection (AFCI) and Photovoltaic Rapid Shutdown System (PVRSS). SolarEdge power optimizers are also designed to meet IP68 and NEMA6P rating for water and humidity resistance.

Module mismatch is almost always unavoidable, especially with floating (moving) installs. SolarEdge’s maximum power point tracking ensures each module produces at its maximum power. SolarEdge technology also allows up to 40% less DC cabling compared to string inverter solutions - cutting down on the amount of material needed in a typical floating PV installation with long rows of solar modules in landscape orientation. In addition, long power optimizer input cables support the landscape orientation that is standard for floating PV installations.



Installation Details:

- Kelseyville, California
- 252 kW PV system
- 1 x SE100K, 2 x SE66K SolarEdge three phase inverters with synergy technology
- 360 x P800s SolarEdge power optimizers
- 720 x 350W Canadian Solar modules
- Year 1 energy production: 389,580 kWh

Environmental Savings:

This PV system produces energy equivalent to:



683,495 miles driven in a passenger car



32 homes energy use for 1 year



360 acres of US forests in 1 year



303,507 pounds of coal burned

About SolarEdge:

SolarEdge is a global leader in smart energy, delivering innovative commercial and residential solutions that power our lives and drive future progress. Leveraging world-class engineering and worldwide experience, SolarEdge developed a ground-breaking intelligent inverter solution that changed the way power is harvested and managed in photovoltaic (PV) systems. As a result of this and other innovations, today SolarEdge is the world's #1 solar inverter company in revenue with millions of systems installed in 133 countries. SolarEdge addresses a broad range of smart energy market segments through its PV, storage, EV charging, battery, UPS, and grid service solutions.

Visit www.solaredge.com to learn more.

Environmental Savings Source: EPA.Gov Calculator