HYDROMX
Energy Saving Solution

CASE STUDY

SOLAR PANELS

PROJECT NAME: Hydronic Solar Panel Improvement Research

LOCATION: California State University – Dominguez Hills

TYPE: University Campus

RESULTS: 15-25% increase in solar panel performance

CSUDH is beta testing several solar technologies

BACKGROUND

California State University – Dominguez Hills has been actively working to reduce energy consumption and prevent greenhouse gas emissions from campus equipment. This has involved numerous energy-saving initiatives: installing LED lights, replacing their direct-fired natural gas chillers with electric ones, installing a 4 mWh "behind the meter" battery for clean energy during peak demand, and installing smart lighting controls, occupancy-based sensors, and smart valves on air handling units.

"It's a combination of a whole bunch of things," says Kenny Seeton, the central plant manager at CSUDH. "I'm always looking at how things intertwine and work together. How can we get the best bang for our buck out of these new devices? We push the limits of the technology."

CSUDH has a history of piloting cutting-edge technologies and has received statewide recognition for its efforts. Studies released by the California Energy Commission have used their campus buildings as models of what the best practices in energy efficiency look like in the real world.

Seeton and the rest of the CSUDH campus facilities team are continually looking for new ways to increase efficiencies and decrease their reliance on natural gas for heating and cooling.

SOLAR RADIATION	ΔT - BEFORE	ΔT - HYDROMX®	GAIN %
600–650	22.3	26.3	**18%**
650–700	23.5	27.0	**15%**
700–750	22.5	28.1	**25%**
>750	23.0	27.9	**21%**

The campus uses less electricity now than in 2017, despite having added 300,000 square feet of building space.

CHALLENGE

Hydronic solar panels are among these emerging technologies that Seeton has been testing. “We’ve started to play around with solar thermal,” he reports, “making hot water from the sun.”

He initiated a beta test for a grouping of hydronic solar panels to serve a portion of the hot water loop at CSUDH. At first, the panels were running on a 30% glycol blend, a standard heat transfer fluid mix that one might find in a traditional hydronic system. The panel array produced a certain amount of Btu, though not as much as they predicted.

Facilities management has been investigating new technologies to make this loop more efficient, including upgrades to the solar panels and more efficient heat transfer fluids. When they heard about Hydromx, it seemed to be a natural fit.

“We heard about Hydromx and wanted to try it out,” says Seeton. “It seemed like a great opportunity to swap out the fluid. It’s not a whole lot, and we had all the metering on board [for data reporting].”

SOLUTION

CSUDH initiated the beta test of Hydromx in their hydronic solar panels in February 2022.

RESULTS

The solar panels experienced near-immediate efficiency gains once the loop ran on Hydromx. “From the data, it looked like **we were getting an increase in productivity when we switched the fluids,**” Seeton reports.

While running on glycol, the capacity of each solar panel maxed out at around 105 Btu. With Hydromx, the capacity of the panels increased immediately to 120 Btu.

The rate of heat transfer also improved with Hydromx. As the data show [Table 1], Hydromx increased the delta T of the system as the amount of solar radiation increased. This means the the panels produced higher leaving fluid temperatures with a simple change of the fluid.

ABOUT HYDROMX®

Hydromx® is a nanotechnology heat transfer fluid that saves a significant amount of energy. Hydromx ethylene-based or propylene-based fluid outperforms not only other glycols, but also outperforms water. Hydromx has been proven in multiple installations to save 20–35% energy in heating and cooling systems around the world.

FOR MORE INFORMATION, VISIT **HYDROMX.COM**.

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