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Stanford unveils innovative solar generating station

Leading the way in sustainability and innovative green technologies, Stanford celebrated the opening of the Stanford Solar Generating Station in Kern County, Calif. The station will provide more than 50 percent of Stanford's electricity.

BY TAYLOR KUBOTA

The solar generating station is the last major piece of Stanford Energy Systems Innovations, which will reduce the university's greenhouse gas emissions by 68 percent and use of fossil fuels by 65 percent.

It was a cold, blustery day in Rosamond, Calif., but spirits were high in a small, wind-rattled tent where about 30 people gathered for the dedication of the Stanford Solar Generating Station.

The last major piece of **Stanford Energy Systems Innovations** (SESI) – which will reduce Stanford's greenhouse gas emissions by 68 percent and use of fossil fuels by 65 percent – the nearly 155,000-panel array will produce the equivalent of over half of the electrical power used by the Stanford campus.

“When I think that Stanford University, our little city, is running off the sun, that's phenomenal,” said Joseph Stagner, executive director of Sustainability and Energy Management at Stanford, in his remarks during the dedication ceremony.

Powered by the sun

For the project, Stanford teamed up with SunPower, a solar energy company founded by Richard Swanson '74, which designed and built the plant in a western valley of the Mojave Desert, about 20 miles north of Palmdale. The area around the plant is high desert, spotted with tumbleweed and Joshua trees, with nearby snow-peaked mountains and a windfarm to the northwest. Critters in the area include kit foxes, badgers, burrowing owls and the green Mojave rattlesnake.

“Stanford’s commitment to use solar power to serve 53 percent of its total campus electricity demand demonstrates unparalleled leadership in responsibly meeting our energy and climate challenges,” said Tom Werner, SunPower CEO and president. “SunPower is proud to partner with Stanford on its on-campus rooftop solar systems, as well as Stanford Solar Generating Station. The SSGS helps the university meet its bold renewable energy goals without requiring use of any on-campus land, an innovative approach that offers the benefits of large-scale solar regardless of space constraints.”

The construction took five months and was done by more than 430 workers. The 67-megawatt plant contains about 19.9 million solar cells and covers approximately 200 acres. The panels track with the sun, turning as it moves through the sky to optimize harvest, and are outfitted with dampeners to avoid damage from high winds, which otherwise enhance the panels’ performance by keeping them cool.



Stanford’s solar array uses robots to clean the panels. The robots, which use less than half a cup of water per panel, can increase efficiency of the energy harvest by up to 15 percent. *(Image credit: L.A. Cicero)*

Bill Kelly, ’85, SunPower vice president, Commercial Americas, and provost John Etchemendy also addressed the crowd at the dedication. Although dotted with interruptions from the wind gusting through the tent, each speech was deeply heartfelt. Prepared remarks were largely cast aside, the speech-givers inspired to express their joy, excitement and relief at the completion of this ambitious project.

“SunPower is extremely proud to be sharing a podium with Stanford in the dedication of the 67-megawatt solar generating station,” said Kelly, adding that Stanford’s mission to become a more sustainable campus is also making a difference in renewable energy development in general.

A living laboratory

Although the station is not wired directly to Stanford, Stanford will buy all the power the station generates for the next 25 years at a fixed price that is about 20 percent less than what Stanford had originally expected to pay for electricity through the SESI project, explained Stagner.

“It’s a living laboratory for a university that champions sustainability, champions innovation, education and research to show the world that this can be done, and it can be done in a way that makes good business sense for the long term,” Stagner said.

Etchemendy began his remarks highlighting the work of Stagner, whom he remembers hiring in 2006 and now considers an essential force in making SESI what it is today. Describing Stagner’s work on SESI’s **revolutionary heat recovery system**, which involved replacing 22 miles of pipes and retrofitting 155 buildings to recycle waste heat, Etchemendy called it “the most innovative and the most risky” project Stanford has done.

“I have been provost for 16 years and we have done a major amount of construction on campus,” said Etchemendy. “But the project that I’m most proud of is the SESI project because of its innovation. It’s leading the country, it’s leading the world, in the provision of utilities for a large campus like ours.”

In describing the overhaul of campus involved in SESI, the provost had especially high praise for the people at Stanford’s **Lands, Building and Real Estate** (LBRE) organization, of which SESI is a part. “They are an order of magnitude better than any of their counterparts at any university in the world,” he said.

Ahead of schedule

Following the speeches, the crowd braved the elements for a ribbon cutting in front of Stanford’s solar array and to see a demonstration of the robots used to clean the panels. Compared with traditional methods of cleaning solar panels (a bucket of water and a

squeegee), these robots, created by SunPower, use less than half a cup of water per panel and can increase efficiency of the energy harvest by up to 15 percent.

With the Stanford Solar Generating Station properly celebrated and test exports of energy already underway, it is forecasted to be officially up and running Dec. 13, weeks ahead of schedule. From there, it is expected to play a significant role in meeting Stanford's energy needs and commitment to sustainability for the next quarter-century.

"I hope all of the students that pass through Stanford have a chance to understand, not only that they're learning in a very sustainable environment, but to learn about sustainability and energy and what they can do in their own lives to help people move toward this in the interest of everybody in the future," said Stagner.

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