

Solar Maker Settles In

French company Soitec to make high-tech modules in Rancho Bernardo, plans to hire 450

French semiconductor maker Soitec is moving forward with plans for a solar manufacturing plant within San Diego city limits, putting the region at the forefront for deployment of a promising and relatively new photovoltaic technology.

The factory in Rancho Bernardo will produce concentrated photovoltaic modules that use optical lenses to focus sunlight onto tiny solar cells measuring one-tenth of an inch. Researchers say the technology, pioneered on space missions, is poised for a commercial breakthrough next year on utility-scale electricity generating projects and may soon compete broadly with traditional silicon solar panels, even as panel prices plummet.

Soitec foresees employing 450 full-time workers when its plant opens in October. The production capacity will be equivalent to 200 megawatts of generation capacity, enough to power about 80,000 local residences.

That's the largest plant for concentrated photovoltaics, or CPV, announced anywhere to date, said Sarah Kurtz, a principal scientist at the National Renewable Energy Laboratory in Golden, Colo. An Amonix CPV plant in North Las Vegas produces about 100 megawatts of equipment a year.

Soitec raised \$200 million through a stock offering to finance the plant, dedicating \$30 million to the purchase of land and facilities. But the venture is effectively underwritten by electricity ratepayers across San Diego and southern Orange County, where San Diego Gas & Electric has signed power purchase agreements for six solar farms that rely on Soitec's trademark Concentrix technology.

The terms of those 25-year agreements will not be made public until at least 2017 under state regulations intended to ensure competition and reasonable costs.

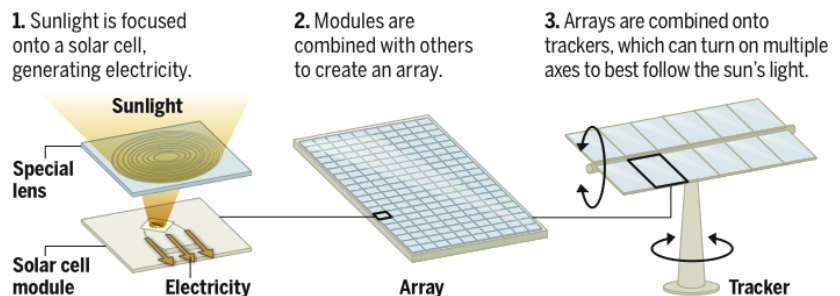
The power will count toward state requirements for utilities and other retailers to procure one-third of their electricity

from renewable energy generation sources, such as wind turbines, geothermal plants, small-scale hydropower and solar installations.

California's aggressive goals for renewable energy played an important role in Soitec's decision to locate near the state's southern deserts, where it could substantially reduce delivery costs to future utility projects, said Clark Crawford,

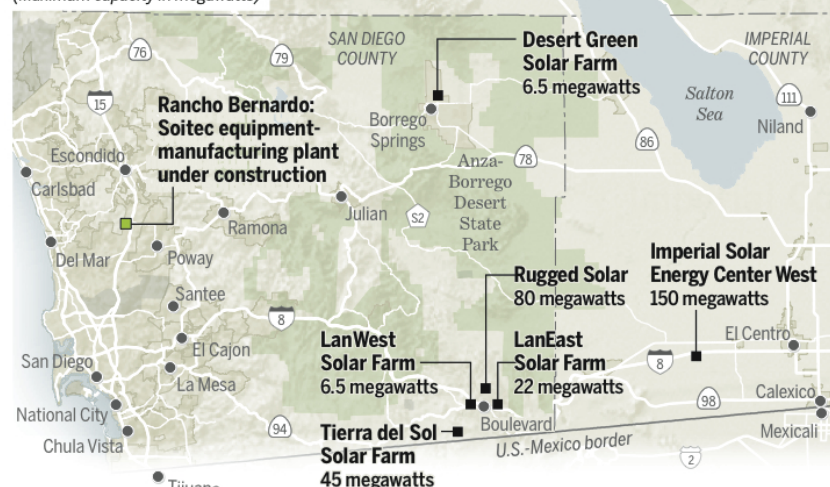
Soitec's Concentrix technology

Unlike conventional silicon photovoltaic technology, Soitec uses special lenses to concentrate light 500 times onto its small, highly efficient solar cells. A look at how the process works:



Area Soitec projects

(Maximum capacity in megawatts)



Sources: Soitec; California Public Utilities Commission; ESRI; Tele Atlas; USGS

AARON STECKELBERG • U-T

vice president for sales and business development for Soitec's U.S. operations, based in La Jolla.

California's property-tax exclusion for solar energy systems and federal tax incentives also benefit Soitec in its role as a developer on five of the solar-generating facilities, in Boulevard and Borrego Springs, in which power will be sold to

Concentrix debuted in San Diego at the University of California San Diego, which two years ago linked a sun-tracking module to the campus' independent microgrid. A second, larger tracker was recently installed.

Soitec's Concentrix panels are nothing like those you see on rooftops across Southern California.

Jim Avery, who buys electricity for SDG&E, said CPV technology "competes head-to-head right now" with standard photovoltaic solar.

Recent SDG&E power-purchase agreements should be enough to keep Soitec's new factory busy for a year and a half.

Soitec is likely to supply equipment for a 150-megawatt solar plant, developed by an affiliate of Omaha, Neb.-based energy company Tenaska, on more than 1,000 acres of vacant farmland in the Imperial Valley west of El Centro. Tenaska's contract leaves open the possibility of using standard photovoltaic panels.

The California Public Utilities Commission initially balked at the prices of SDG&E's CPV-based contracts, responding to criticism from its Division of Ratepayer Advocates. Confidential terms have since been renegotiated and approved.

"Because of these contracts, it's provided the wherewithal for Soitec to commit to make a factory," Avery said. "We would not have entertained these contracts at the time were Soitec not to build a factory."

Federal tax breaks also factor into the deals.

Tenaska is pursuing a federal-stimulus cash grant for the project under provisions of the American Recovery and Reinvestment Act that are set to expire at the end of this year. The Soitec-developed solar plants will be eligible for investment tax credits.

Government backing also is benefiting Amonix of Seal Bay, Soitec's closest competitor. The Department of Energy in September announced it would guarantee a \$90.6 million loan for a 30-megawatt solar plant in south-central Colorado that uses Amonix CPV hardware.

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By Morgan Lee



Soitec adds one of its new sun-tracking concentrated solar photovoltaic panels to the East Campus Utility Plant at UCSD. Engineer Luc Mader directs a crane operator. — Sean M. Haffey

SDG&E. Soitec was not lured to San Diego by local tax breaks or incentives.

Local business leaders watched with some dismay last year as Spanish panel assembler Siliken Solar moved its 130-employee manufacturing center in Otay Mesa to Tijuana across the Mexican border, primarily to reduce labor costs.

Soitec found that the workforce in Rancho Bernardo was a good match for a highly automated factory — with an annual payroll of \$22 million — that requires many computer engineers and technicians, Crawford said. Soitec, which hired consultant Deloitte to help select its manufacturing site, also saw benefits in joining a growing cluster of companies working to get energy from the sun and wind — including NRG, AES and Enel Group.

A publicly traded company based in Bernin, France, Soitec entered the CPV business in 2009 with the purchase of Concentrix Solar, a spinoff of the Fraunhofer Institutes, a network of publicly funded research centers in Germany. Soitec already has 1,300 employees and six factories around the world, including a solar production plant in Friburg, Germany.

They rotate on two axes to align directly with the sun's rays, hour by hour and day by day. That allows the modules to produce nearly full power shortly after sunrise and late into the afternoon, when utilities like SDG&E need electricity the most.

The technology's chief economic advantage, however, stems from the reduced use of semiconductor material — utilizing a lentil-sized solar cell where standard flat-plate panels rely on a broad film of crystalline silicon.

Efficiencies continue to improve significantly each year for the multijunction concentrator cells at the core of CPV modules, said Kurtz of the National Renewable Energy Laboratory.

The international marketplace, however, remains an open question.

"At this point, we need to first demonstrate the technology and show that it really can meet the prices," she said. "The conventional silicon-module prices keep coming down. It makes it harder and harder for the concentrator systems to be able to show an advantage."