

Solar Plant Generates Power For Six Hours After Sunset

Chris Clarke, KCET (Los Angeles television), 10-11-13

A solar thermal power plant in the Arizona desert just showed that solar power doesn't have to stop working when the sun goes down. On Wednesday, Abengoa Solar announced that its 280-megawatt Solana plant near Gila Bend, Arizona, which just started delivering power to Arizona's largest utility, was able to keep putting out electrical power six hours after the sun set.

Arizona Public Service, which supplies 11 million Arizonans with electricity, will buy all the power generated by the project for 30 years -- and that power will apparently be generated day or night.

The Solana plant, which occupies about 1,900 acres in southwest Arizona's Sonoran Desert, combines parabolic trough mirror technology with molten salt thermal storage.

During the day, the mirrors focus sunlight on pipes carrying a thermal "transfer fluid," which in turn heats steam to turn the plant's generator turbines. Some of that transfer fluid's energy is also used to heat molten salt, which can then be used to generate steam for the turbines when sunlight is no longer available.

According to Abengoa, that thermal storage system is working pretty much as planned: this week, operators generated six hours' worth of power from the energy stored in the plant's molten salt without any help from that large glowing object in the Arizona desert sky.

It's an interesting proof of concept, though adding thermal storage capacity to solar thermal plants is a costly proposition, and can drive the price of power past what many regulatory agencies are willing to allow customers to be charged. That's why few of the high-profile solar thermal projects being built these days incorporate thermal storage. Aside from outliers like Solar Reserve's Crescent Dunes power tower project in Nevada, most big solar thermal power plants end their work day when the sun does.

In fact, an interesting side note: in his post on the Solana plant over at the Institute of Electrical and Electronics Engineers' (IEEE) website IEEE Spectrum, writer Dave Levitan allows himself a little dig at one of the most prominent such projects in California, the Ivanpah Solar Electric Generating System:

The storage part of Solana is what makes it really interesting. Ivanpah, the 377-megawatt behemoth currently holding the mark as the largest solar thermal plant in the world (and currently ramping up toward full production in the Mojave Desert in California), doesn't have a way to store its generated energy, and most other plants built so far also lack that ability.

When a writer for the largest engineering association in the country hints that your project is obsolete before it comes all the way online, that's gotta smart.