

A New Race For Solar

The fate of three new power plants may set the future for U.S. solar energy

By Jeff Johnson

December 16, 2013

This fall, three new solar power plants came to life on large tracts of undeveloped, remote lands in the western U.S. Although solar, these three installations are huge when compared with familiar, traditional rooftop photovoltaic (PV) systems.

Combined, these utility-scale power plants have the capacity to produce more than 800 MW of electricity, equal in output to a large coal- or gas-fired power plant. And one has the capability of storing and providing electricity to the grid for six hours—without sunshine.

The three are the California Valley Solar Ranch near San Luis Obispo in central California; the Abengoa Solana project in



INTO THE HORIZON The Abengoa Solana concentrating solar power project began operating this year at Gila Bend, Ariz., generating 280 MW, using a system of parabolic troughs. Credit: Abengoa

Gila Bend, Ariz.; and the Ivanpah Solar Electric Generating System in California's Mojave Desert.

These are just the first wave of a potential tsunami of large solar plants that are newly operating, under construction, or being planned for the southwestern U.S. They are the fastest-growing sector of a rapidly increasing solar marketplace. However, whether more of these large plants follow will depend on how well these first few fare, and specifically if electric utilities want to buy more of the electricity these plants generate.

Success will also turn on whether developers can overcome growing opposition to the projects' large size and the environmental damage and habitat destruction that can occur with their placement. Of particular concern is their effect on fragile desert ecosystems.

These plants are being built by a mix of engineering firms, energy companies, and solar equipment manufacturers that are benefiting from a host of state and federal incentives intended to reduce carbon dioxide and other greenhouse gas emissions from fossil-fuel power plants. The incentives require electric utilities to purchase growing amounts of renewable energy, such as solar-generated electricity, and these companies are quickly building new solar power plants to make money and meet that demand.

One of the most powerful drivers has been state renewable portfolio standards, particularly California's requirement that electric utilities obtain 33% of their electricity from renewable energy sources by 2020. The requirement has put utilities on a hunt to purchase electricity generated by solar and wind to meet state quotas.

Also backing up these incentives and the push for renewable energy is a billion-dollar Department of Energy program to provide loan guarantees for large-scale renewable energy projects and a federal investment tax credit that provides a 30% tax credit for solar construction.

It's a perfect storm for solar generation, notes Katherine Gensler, director of federal affairs for the Solar Energy Industries Association (SEIA), a trade group. By the end of the year, about half of the U.S.'s 9,500 MW of solar power will be generated by utility-scale power plants; most of this capacity came on-line in the past year.

SEIA figures show some 4,200 MW of utility-scale generation is now under construction and another 23,000 MW of utility-scale projects are being developed. More deals are being negotiated, analysts say.

California accounts for about half the installed utility-scale solar capacity as well as some 13,000 MW of the projects under development.

What will actually be built, Gensler and other analysts note, is a big question—one with too many variables that can be answered only over time as the solar marketplace shifts away from government support.

The federal tax incentive program ends in 2016, and it is unlikely DOE's loan guarantee program will keep its pace. Consequently, the solar expansion numbers are murky, and although solar energy has been on a sharp growth curve over the past couple of years, it still produces only around 1% of U.S. electricity. But that could swiftly change in the topsy-turvy world of energy.