
Alternative Energy Projects Stumble on a Need for Water By TODD

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AMARGOSA VALLEY, Nev. — In a rural corner of Nevada reeling from the recession, a bit of salvation seemed to arrive last year. A German developer, Solar Millennium, announced plans to build two large solar farms here that would harness the sun to generate electricity, creating hundreds of jobs.



Isaac Brekken for The New York Times

Ed Goedhart, a farmer and Nevada legislator, said farmers would grow less of alfalfa if they decide to sell their water rights.



Isaac Brekken for The New York Times

An irrigation riser at Ponderosa Dairies farm in Amargosa Valley, Nev.

But then things got messy. The company revealed that its preferred method of cooling the power plants would consume 1.3 billion gallons of water a year, about 20 percent of this desert valley's available water.

Now Solar Millennium finds itself in the midst of a new-age version of a Western water war. The public is divided, pitting some people who hope to make money selling water rights to the company against others concerned about the project's impact on the community and the environment.

"I'm worried about my well and the wells of my neighbors," George Tucker, a retired chemical engineer, said on a blazing afternoon.

Here is an inconvenient truth about renewable energy: It can sometimes demand a huge amount of water. Many of the proposed solutions to the nation's energy problems, from certain types of solar farms to biofuel refineries to cleaner coal plants, could consume billions of gallons of water every year.

“When push comes to shove, water could become the real throttle on renewable energy,” said Michael E. Webber, an assistant professor at the [University of Texas](#) in Austin who studies the relationship between energy and water.

Conflicts over water could shape the future of many energy technologies. The most water-efficient renewable technologies are not necessarily the most economical, but water shortages could give them a competitive edge.

In California, solar developers have already been forced to switch to less water-intensive technologies when local officials have refused to turn on the tap. Other big solar projects are mired in disputes with state regulators over water consumption.

To date, the flashpoint for such conflicts has been the Southwest, where dozens of multibillion-dollar [solar power](#) plants are planned for thousands of acres of desert. While most forms of energy production consume water, its availability is especially limited in the sunny areas that are otherwise well suited for solar farms.

At public hearings from Albuquerque to San Luis Obispo, Calif., local residents have sounded alarms over the impact that this industrialization will have on wildlife, their desert solitude and, most of all, their water.

Joni Eastley, chairwoman of the county commission in Nye County, Nev., which includes Amargosa Valley, said at one hearing that her area had been “inundated” with requests from renewable energy developers that “far exceed the amount of available water.”

Many projects involve building solar thermal plants, which use cheaper technology than the solar panels often seen on roofs. In such plants, mirrors heat a liquid to create steam that drives an electricity-generating turbine. As in a fossil fuel power plant, that steam must be condensed back to water and cooled for reuse.

The conventional method is called wet cooling. Hot water flows through a cooling tower where the excess heat evaporates along with some of the water, which must be replenished constantly. An alternative, dry cooling, uses fans and heat exchangers, much like a car’s radiator. Far less water is consumed, but dry cooling adds costs and reduces efficiency — and profits.

The efficiency problem is especially acute with the most tried-and-proven technique, using mirrors arrayed in long troughs. “Trough technology has been more financeable, but now trough presents a separate risk — water,” said Nathaniel Bullard, a solar analyst with New Energy Finance, a London research firm.

That could provide opportunities for developers of photovoltaic power plants, which take the type of solar panels found on residential rooftops and mount them on the ground in huge arrays. They are typically

more expensive and less efficient than solar thermal farms but require a relatively small amount of water, mainly to wash the panels.

In California alone, plans are under way for 35 large-scale solar projects that, in bright sunshine, would generate 12,000 megawatts of electricity, equal to the output of about 10 nuclear power plants.