

Is Solar Power Dead in the Water?

By Robert Glennon
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Congress's rush to embrace solar power is having some unintended consequences. It will turn over a large chunk of federal land to private energy companies, and it may involve withdrawing billions of gallons of water from sensitive desert habitat.

By 2015, Congress wants the Interior and Energy Departments to place, on federal land, renewable energy projects that can generate at least 10,000 megawatts of electricity. [The Energy Policy Act of 2005](#) has set off a frantic land grab as solar and wind energy companies rush to obtain permits for projects in Arizona, California, Colorado, Nevada, New Mexico and Utah.

As of mid-March, the Bureau of Land Management had received 158 applications for permits for solar power plants, covering more than one million acres of land -- an area larger than Rhode Island. Most of the proposed plants are located near the border of Arizona, California and Nevada. This area of the Mojave Desert seems perfect for solar power; it's hot and flat and vast. What the Mojave Desert doesn't have is water.

Most people think of solar power as the flat panels on a neighbor's roof that are used to heat water. This photovoltaic system directly converts the sun's waves into electricity. But so far, it's not commercially feasible. The power is costly and there's no juice at night, but utilities want cheap power 24/7. On the plus side, photovoltaic solar uses almost no water.

In contrast, most large solar power projects use a system called concentrating solar power, or CSP, that heats a fluid that boils water to turn a turbine. CSP, just like any thermal power plant, produces waste heat as a byproduct. In most cases, cooling towers release the heat to the atmosphere through evaporation, a process that [uses](#) gobs of water. In fact, CSP uses four times as much water as a natural gas plant and twice as much as a coal or nuclear plant.

It is possible to use an air-cooled system, but CSP plants in the Mojave Desert face an obvious problem: It's hot outside, which makes air cooling inefficient. According to a 2007 DOE [report](#), dry-cooled CSP plants take up more space, cost almost 10 percent more to build and generate 5 percent less electricity. Given that solar power is competing with low-cost natural gas and coal-fired plants, power companies would naturally prefer to use wet-cooling systems.

To date, only a few CSP plants have been permitted on federal land, but that will change soon. The Obama administration is now evaluating the impact of solar power development, a process that may be completed next year. The National Park Service, which is concerned about the impact of wet-cooled plants on endangered species in southern Nevada, [wants](#) the federal government to deny permits for water-cooled plants. Air-cooling would cut the water use by 80 to 90 percent.

The Park Service is right. As the process moves forward, the administration should insist that CSP plants embrace air-cooling. There is no reason to permit hundreds of new groundwater wells to be drilled in the Mojave Desert. It doesn't have the water.

If solar companies want to use wet-cooling towers, they can purchase land and water rights from the private sector. Over the last year, Arizona Public Service Company, the state's largest electric utility, has partnered with solar power companies to build two large-scale CSP projects on private land. The land, more than six square miles, has been used to grow alfalfa and cotton. These wet-cooled plants will use less water than the farms are already using.

This reallocation of water -- from farming to power generation -- offers a lesson for the country as a whole. As the United States confronts inevitable water shortages, we need to insist that power companies, developers and others who need water offset the impact of their new uses by persuading existing water customers to use less. That's a lot smarter than trying to squeeze water from the stones of the Mojave.

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