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In Race Toward Solar, Environmental Hurdles Litter the Path

By Michael Carroll and Marc Campopiano

The skies look bright for solar energy. Electricity demand is rising, the need for carbon-neutral energy is growing and traditional energy costs have spiked.

Numerous large utility-scale power plants are in the works with many more jamming the pipeline, and solar's potential in California and the Southwest is vast, amounting to some of the best resources in the world. Solar energy also plays a critical role in California's mandate to slash greenhouse-gas emissions to 1990 levels by 2020.

Ironically, the path to constructing new utility-scale solar plants is full of environmental roadblocks. Many solar power-plant projects must wait for the logjam to clear as several environmental issues are resolved, including concerns over impacts to desert wildlife, constructing new transmission lines and finding adequate air-pollution emissions offsets.

While solar power accounted for just 1 percent of all energy use in the United States in 2007, projections suggest solar could realistically supply 10 percent of the nation's energy needs by 2025, according to the 2008 Utility Solar

Assessment Study by consulting firm CleanEdge. The U.S. Department of Energy further estimates that California now generates 92 percent of the nation's solar power.

Much of the current demand for increased solar generation comes from state renewables portfolio standards. California has one of the nation's most aggressive RPS's—20 percent by 2010—and the state is considering a 33 percent-by-2020 standard to reduce greenhouse-gas emissions as part of AB 32.

Moreover, solar power is beginning to reach cost parity with fossil energy sources. DOE forecasts that concentrated solar power could cost as little as 5 cents/kWh by 2020, which is comparable to expected natural gas electricity costs.

But despite solar's clean-energy promise, utility-scale solar power plants present a Hobson's choice for environmentalists. Solar power will require large-scale conversion of sensitive desert lands, potentially resulting in adverse impacts to endangered species, such as the desert tortoise, and the loss of desert habitat.

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Solar companies have particularly targeted previously undeveloped public lands managed by the Bureau of Land Management. In California alone, over 130 applications have been submitted seeking BLM's approval to develop power plants on public land. These applications cover approximately 1 million acres of land and the BLM expects to see more such applications (see CEM No. 981 [18]).

The BLM and DOE initiated a programmatic effort to evaluate environmental impacts of solar facilities on BLM lands, both to handle the flood of permits and in response to pressure from Congress to expedite review (see President George W. Bush's Executive Order No. 13212, and Title II, Section 211, of the Energy Policy Act of 2005, which provides for approval, within 10 years of enactment, of non-hydropower renewable-energy projects located on public lands with a capacity of at least 10,000 MW).

This programmatic environmental impact statement is now in the scoping stage and is anticipated to take approximately two years. Even after the PEIS is finished, projects will still have to undergo project-specific review to receive final BLM approval (see CEM No. 983 [18.1]).

Another key hurdle entails delivering the solar power from its source to the intended destination.

Currently, transmission-line gridlock in Southern California results in a long waiting list for potential new projects to tap into the existing overstretched grid. In addition, renewable-energy projects often are not located near areas traditionally served by high-voltage transmission lines, increasing the need for a broader grid.

To facilitate new transmission-line construction, DOE designated in October 2007 a National Interest Electric Transmission Corridor through certain counties in California and Arizona.

The Federal Energy Regulatory Commission also issued a waiver of certain regulatory requirements aimed to expedite power-line construction. Based on a recent count, California has over 361 interconnection requests representing more than 105,000 MW and of these, more than 68,000 MW are from renewable sources. But several environmental groups have filed suits challenging the DOE's designation for failing to study the impact of the corridor on the environment (see CEM No. 989 [19.1]).

Lastly, air-quality offsets remain a significant hurdle. Under the Clean Air Act, a power plant must purchase emissions offsets to the extent that it exceeds air-pollution threshold limits. However, severe offset shortages have substantially slowed the development of some Southern California power plants in recent years, according to the South Coast Air Quality Management District. This issue affects solar plants because several recently proposed "hybrid" facilities, such as the City of Victorville plant, combine a CSP component with a traditional natural gas generating station that would require emissions offsets.

A recent effort to ease the offset shortage by allowing the sale of "priority reserve" credits has been stalled by a lawsuit from environmental groups over concerns that potential environmental impacts were not properly studied (see CEM No. 990 [16]).

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