

# Getting renewable power to the people

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Sunday, December 28, 2008

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The Southern California desert could produce a gusher of renewable energy.

Strong sunlight bathes its open plains, even in winter. Powerful winds stream through its mountain passes. Fractures in the earth along the San Andreas Fault heat pools of underground water - the perfect fuel for geothermal power plants.

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## IMAGES



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There is, however, a problem. Most Californians don't live there.

Any electricity generated in the desert by solar plants or wind farms needs to travel via power lines to the cities, most of them clustered along the coast. And the state's grid of transmission lines can't do the job. It doesn't have enough lines in the right places to carry all that power.

Electrical transmission could turn into a bottleneck for renewable energy.

"There's a real concentration of renewables in southern California," said David Hawkins, lead renewable power engineer with the California Independent System Operator, which runs the state's electrical grid. "Now the question is, how do you get it to the load centers? How do you get it to Northern California?"

The same question applies across the country. The places best suited for solar plants or wind farms often lie far away from America's population centers. The Great Plains, for example, are a perfect place for wind farms but hold few people. A U.S. Department of Energy study this year found that wind could supply 20 percent of America's electricity by 2030 - if the country spends \$20 billion expanding and improving the grid to move that power.

Now, renewable-power advocates hope that President-elect Barack Obama will make expanding and upgrading the nation's power grid part of his economic stimulus package.

They have joined the long line of interests vying for an infusion of federal cash and attention, sensing a rare opportunity to generate interest in a topic most Americans ignore. Some have already put in specific requests. Politicians from Idaho, Montana, Oregon and Washington recently asked that the stimulus package include \$5 billion to finance improvements to their region's power grid.

## Power lines have enemies

But power lines have a way of generating enemies. No one wants one running through their neighborhood, and many environmentalists remain deeply suspicious of any plan to build lines across open wilderness.

California energy regulators earlier this month approved plans by San Diego Gas and Electric Co. to build a \$1.9 billion power line that

environmentalists had bitterly fought for years. The Sunrise Powerlink will run from the inland desert, near the Salton Sea, to the coast.

"Why the heck should we pay for this line when we can use rooftop solar and get the energy we need?" asked Denis Trafecanty, co-founder of Protect our Communities, one of several groups fighting the project.

His comments point to another potential obstacle. Some environmentalists want to do away with the old model of distributing power - building a big power plant somewhere and hooking it to a big transmission line.

Instead, they want to use large amounts of small-scale, distributed power generation, such as rooftop solar panels or fuel cells. The grid would still need to be improved, but those improvements would focus on integrating small amounts of power from many places. Sunrise Powerlink opponents embraced a 2007 study showing how that approach could supply San Diego's future energy needs.

"We have this opportunity to rethink the way we organize the grid and democratize generation," said John Farrell, with the Institute for Local Self-Reliance in Minnesota. He co-wrote a paper arguing that states should focus on meeting their renewable energy goals by building smaller-scale projects within their own borders, eschewing long-distance transmission lines that can cost more than a \$1 billion apiece.

"That cost can pretty quickly add up to other renewable projects that you could have built if you weren't building this power line," Farrell said.

The price is certainly significant. But so is the need, say those who favor building more lines.

California law requires that the state's big investor-owned utilities get 20 percent of the power they sell from renewable sources by the end of 2010. A report this year by the California Independent System Operator found that the state should be able to hook up enough renewable power to meet that goal, if the Sunrise Powerlink and a transmission project in the Tehachapi Mountains get built.

But California officials now want to up the ante, requiring 33 percent renewable power by 2020. The same report said the state would probably need six more transmission projects, costing roughly \$6.5 billion, to meet that goal.

The current power grid won't suffice. Neither will relying on solar panels planted on homes and carports, Hawkins said.

"Distributed generation is important - it has a role to play," he said. But, "you're just not going to get enough power out of rooftops and parking lots."

## **Long-distance lines**

Some of the power may come from out of state. Utilities have proposed several long-distance power lines to connect California to the Southwest, the upper Great Plains - even British Columbia.

Meanwhile, several California government agencies are working together to figure out where to place new transmission lines so that they can hook large amounts of renewable power to the grid at the lowest possible price. Dubbed the Renewable Energy Transmission Initiative, the group also consults with the utilities and environmental groups.

"There's no question that the grid needs to be upgraded," said Carl Zichella, regional director for the Sierra Club, who is working on the transmission initiative. "We will need to build some additional lines. We can also get more out of the existing system."

But Zichella's organization doesn't embrace all power lines.

## **Sierra Club fought project**

The Sierra Club fought hard against the Sunrise Powerlink project. At first, opposition focused on the line's proposed route through the arid mountains of Anza-Borrego Desert State Park. In approving the project this month, the California Public Utilities Commission rejected that route and instead chose one that runs south of the park, close to the Mexican border.

San Diego Gas & Electric called the project a much-needed pathway for renewable power, and the commissioners agreed. It will link San Diego to Imperial County, which already has geothermal plants and could one day host large solar installations as well.

"The lack of transmission has slowed the development of renewable energy in California," said Commissioner Rachelle Chong. "Approving Sunrise Powerlink helps remove this barrier."

But location wasn't Sunrise's only issue. Environmentalists suspect that San Diego Gas & Electric wants the line to carry electricity from fossil fuel power plants in Mexico - not renewable power from Imperial County. The utility has consistently rejected that argument.

"Our concern all along about this project has been that it's a bait and switch," said Micah Mitrosky, one of the Sierra Club's organizers against the Sunrise project.

Most power line opponents, however, agree that the nation's power grid will need to be run in a new way as the use of renewable power grows.

Fossil fuel power plants can produce the same amount of electricity hour after hour, day after day. But solar plants and wind farms don't work that way. Solar power rises and falls with the sun, and wind can howl one day only to die the next. Also, wind power in California tends to peak at night.

Balancing all those sources on the same power lines will require better technology, more planning and careful management by the people operating the grid, said Stephen Lee, senior technical executive at the Electric Power Research Institute.

"They need to really increase their vigilance over what's happening," he said. "Blackouts could happen if things are behaving in a way that the system was not originally planned to handle."

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