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## A Solar Grand Plan

By 2050 solar power could end U.S. dependence on foreign oil and slash greenhouse gas emissions

By Ken Zweibel, James Mason and Vasilis Fthenakis &nbsp;&nbsp; |  
December 16, 2007 |&nbsp;&nbsp;  717

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### Today's Alternative Energy

**Promising technologies to wean the world from fossil fuels, including offshore wind, solar, geothermal and hydrogen cars, among others »**

October 20, 2008

High prices for gasoline and home heating oil are here to stay. The U.S. is at war in the Middle East at least in part to protect its foreign oil interests. And as China, India and other nations rapidly increase their demand for [fossil fuels](#), future fighting over energy looms large. In the meantime, power [plants](#) that burn coal, oil and natural gas, as well as vehicles everywhere, continue to pour millions of tons of pollutants and greenhouse gases into the atmosphere annually, threatening the planet.

Well-meaning scientists, engineers, economists and politicians have proposed various steps that could slightly reduce fossil-fuel use and emissions. These steps are not enough. The U.S. needs a bold plan to free itself from fossil fuels. Our analysis convinces us that a massive switch to [solar](#)

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### In Brief

A massive switch from coal, oil, natural gas and nuclear power plants to solar power plants could supply 69 percent of the U.S.'s electricity and 35 percent of its total energy by 2050.

A vast area of photovoltaic cells would

[power](#) is the logical answer.

have to be erected in the Southwest. Excess daytime energy would be stored as compressed air in underground caverns to be tapped during nighttime hours.

Large solar concentrator power plants would be built as well.

A new direct-current power transmission backbone would deliver solar electricity across the country.

But \$420 billion in subsidies from 2011 to 2050 would be required to fund the infrastructure and make it cost-competitive.

—*The Editors*

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