

# Policies to Spur Solar

LOOMING INNOVATIONS MERIT NURTURING

BY ALEX MARKER

**EVERY HOUR, THE SUN SUPPLIES** the Earth with more energy than humanity consumes in a year, yet the world derives less than one percent of its power from solar energy. But that may soon change.

As traditional power generation cost rises rapidly, public concerns about energy sustainability and security grow and technology improves, solar power becomes more economical and preferred. Meanwhile, the United States lacks effective legislation to promote further innovation and create a broader market.

Booming solar markets in Spain, Germany and Japan prove that effective policies rapidly develop a market. Policies that stimulate demand lead companies to improve efficiencies and reduce costs through economies of scale.

With effective federal policies and incentives – most importantly a long-term investment tax credit for solar energy – the United States could see similar results. The country's potential exceeds Europe's, thanks to the large American economy and huge areas of intense sunlight

Several coming innovations promise reduced solar energy costs – technologies that concentrate the sun's energy onto photovoltaic modules, for example. In the thin-film area, companies are achieving incremental efficiency improvements. Thin film uses less silicon, which has been in short supply, than polycrystalline PV. Thin film makes less-efficient modules, but research is closing the gap.

Traditional photovoltaic energy conversion efficiencies are 13 to 16 percent. New studies report efficiencies as high as 40 percent. Companies are looking at not only how the sun's energy is absorbed, but also how solar energy is collected, through tracking systems for photovoltaics.

For utility-scale solar power generation, concentrated solar plants have proven reliable. Next-generation power plants being developed follow distinct paths.

The first uses lighter-weight materials and

simpler systems, such as linear Fresnel, to reduce production, operating and maintenance costs, mitigating efficiency sacrifices in the process.

The second dramatically improves efficiencies with alternative heat transfer fluids made for higher temperatures and uses lighter-weight, lower-cost mirrors. High-temperature coatings and larger usable absorptive areas improve receiver efficiency at the parabolic mirrors' focal points.

A cost-prohibitive yet technically feasible method uses molten salt that stores thermal energy long enough into the evenings to match utilities' peak energy demand curves. Many utilities need cost-competitive peak power that, with proper federal incentives and policy, CSP could deliver, with the ultimate goal of continuous power generation. Research and development financed with a long-term investment tax credit extension may lead to effective thermal storage and concentrating solar power systems that operate around the clock. With increased demand and a growing market, companies would invest in larger, newer and more efficient production lines. If more photovoltaic and concentrating solar power systems were installed, solar installations would benefit from greater efficiencies stemming from lower manufacturing, distribution and installation costs.

Extending the investment tax credit would promote America's solar energy transition. Conservatively, the photovoltaic market could reach 900 megawatts by 2012. A long-term extension of the credit would more than triple the market to nearly 3 gigawatts of installed capacity by 2012. The pipeline has almost 4 gigawatts of installed concentrating solar thermal power capacity waiting for passage of the tax credit.

Solar energy represents fixed-cost, proven, reliable and clean energy. An effective energy policy could solve many current challenges. An extension of the tax credit would create tens of thousands of jobs, stabilize national energy production and reduce costs for a technology we can all agree we need and want.

America is solar energy's sleeping giant. With a long-term extension of the investment tax credit, the giant would awaken.

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