



Market Transformation

Solar technology research and development (R&D) is a key activity of the U.S. Department of Energy (DOE). But beyond improvements to technology, it is equally important to address non-R&D issues and market barriers to solar. Otherwise, the drive to integrate solar into the national energy landscape could stall or fail.

The Market Transformation subprogram is designed to facilitate the commercialization of solar technologies by identifying and addressing significant non-R&D barriers. Within this effort, DOE is actively engaging key stakeholders and early adopters through a diverse portfolio of activities that includes education on important issues, policy analysis, and technical advisement.



Denver, a Solar America City, installed a 2-megawatt PV system at Denver International Airport.

The Challenges

DOE is addressing the following obstacles to the widespread dissemination of solar technologies:

- Inconsistent interconnection, net metering, and utility rate structures and practices for solar systems
- Inconsistent incentives and drivers for developing solar projects

- Complex and expensive solar installation permitting procedures
- Lack of flexible, well-proven financing mechanisms for solar projects
- Limited education and experience among building trades.

Tackling the Challenges

DOE is successfully addressing these challenges, as demonstrated in the following Market Transformation activities.

Benefiting the Industry

Solar ABCs. DOE established the Solar America Board for Codes and Standards (Solar ABCs) to ensure the responsiveness, effectiveness, and accessibility of photovoltaic (PV) codes and standards nationally and internationally. The board welcomes active participation from all stakeholders and serves as a point of contact for organizations working to transform local energy and building codes and regulations. The board conducts targeted studies on the most pertinent issues, and an initial set of studies will be available by the fall of 2008. These studies and additional resources on solar codes and standards are available on the Solar ABCs Web site, www.solarabcs.org.

Benefiting U.S. Cities

Solar America Cities. Cities are critical allies in accelerating the deployment of solar electricity. DOE selected 25 Solar America Cities (SAC) in 16 states as partners, including 6 of the 10 largest cities in the country. Each city receives \$200,000 in direct financial assistance and approximately \$250,000 in technical assistance. Cities are committed to achieving a sustainable citywide solar infrastructure by engaging decision makers such as city councils, tax boards, and planning commissions. This approach facilitates mainstream adoption of solar technologies and also provides a model for other local jurisdictions to spur creativity and community enthusiasm for solar among their residents and businesses. Additional information on SAC can be found at www.SolarAmericaCities.energy.gov.

Solar America Showcases. DOE provides hands-on technical assistance for large, high-visibility solar installations initiated by businesses, developers, cities, states, or other entities. These Solar America Showcases have been selected based on project size, impact, use of a novel solar technology, and/or use of a novel application for a solar technology. In addition, the project must be

replicable or have replicable components. These projects can showcase PV, concentrating solar power (CSP), and solar water/air heating systems.

Benefiting States and Utilities

State and Utility Outreach. States and utilities are also critical partners in achieving cost competitiveness of solar technologies. DOE has established partnerships with the following national organizations:

- Interstate Renewable Energy Council (IREC)
- National Conference of State Legislators
- Solar Electric Power Association
- National Association of Regulatory Utility Commissioners
- Clean Energy Group.

Through these partners, DOE provides information on solar policies and technologies to state and utility decision makers.

Addressing New Needs

Workforce Development. A well-trained workforce is critical to a successful solar market, ensuring quality installations,

cost reductions, and continued consumer acceptance of the technology. DOE currently supports installer and code official training activities through IREC and DOE Regional Experimental Stations. It is also evaluating workforce development needs along the entire value chain. The priority in the short term is increasing the ability of educational institutions to meet industry demand for well-trained installers and code officials.

Cross-Cutting Analysis. DOE is harnessing the knowledge and expertise of its national laboratories to conduct analyses on specific issues such as finance and market barriers. One recent analysis addressed the industry's concern about the cost and complexity of external disconnects switches for PV installations. Reports on these issues as well as many other topics can be accessed at www.solar.energy.gov.

Solar Program Priorities

Market Transformation is one of the four subprograms within the DOE Solar Energy Technologies Program, along with PV, CSP, and Grid Integration. The SETP subprograms focus on accelerating the advancement of solar energy technologies to make solar electricity cost competitive with conventional forms of electricity. To learn more about SETP activities, visit www.solar.energy.gov.

Fire Code Collaboration

To address an emerging issue, the DOE Solar America Board for Codes and Standards (Solar ABCs) acted quickly to participate in discussions about fire code guidelines on PV installations in California, a major solar power market. Firefighters were concerned about the safety of their colleagues and building occupants, while the solar industry was concerned about potential regulations that could hinder PV installations. Representing Solar ABCs, Bill Brooks of Brooks Engineering in Vacaville, California, worked with the California Office of the State Fire Marshall, California Solar Energy Industries Association, and other stakeholders to develop guidelines that addressed these concerns.

"It helped to have a neutral voice in the room," said Brooks. "Passions can run high in these situations, and the Solar ABCs codes and standards expertise was instrumental in moving participants toward workable solutions."

The final document gives firefighters room on PV-equipped residential and commercial roofs to safely perform fire suppression and rescue operations without unnecessarily increasing the cost of PV systems. Solar ABCs is a primary project of the DOE solar Market Transformation efforts. The final draft of the California Solar PV Guidelines is available at <http://osfm.fire.ca.gov/pdf/reports/solarphotovoltaicguideline.pdf>.

SOLAR SNAPSHOT

The U.S. solar energy market has changed dramatically in the past year, as highlighted in the activities described below.

- Pacific Gas and Electric Company announced a 550-megawatt (MW) PV plant and a 250-MW PV project, both to be constructed in phases between 2010 and 2013.
- On Feb. 21, 2008, Arizona Public Service Co. (APS) announced plans for one of the world's largest solar facilities—a 280-MW CSP plant called the Solana Generating Station. Once operational by 2011, it will produce enough energy to serve 70,000 APS customers when operating at full capacity.
- Duke Energy Carolinas has a \$100-million plan to install solar panels (20 MW) at up to 850 North Carolina sites including homes, schools, stores, and factories.
- Florida Power & Light Company plans to install 25 MW of solar panels at a site in DeSoto County, east of Sarasota, and will also install a 10-MW PV project at the Kennedy Space Center.
- Pepco Energy Services will install a 2.36-MW PV system on the roof of the Atlantic City Convention Center in New Jersey, with completion expected by the end of 2008.
- Large retailers Kohl's and Macy's have dramatically ramped up their solar installations. Kohl's Department Stores is expanding its solar program to 43 locations in six states and plans to include 85 additional sites in the program. By the end of 2008, Macy's will have solar panels on more than 30 of its stores, primarily in California. These installations will offset a significant amount of each store's energy use.
- At the end of 2007, 11 states and Washington, D.C., had committed to installing 550 MW by 2010 and 6,700 MW by 2025 of solar by requiring solar set-asides in their renewable portfolio standards.

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