

Solar: A Clean Energy Source for Utilities

Utilities across the country are offering solar electricity to their customers as a viable source of clean energy. To continue accelerating the adoption of solar energy, the U.S. Department of Energy (DOE) Solar Energy Technologies Program (SETP) collaborates with utilities to remove the technical, regulatory, and market challenges they face in deploying solar technologies.

Through targeted funding activities, each of SETP's four subprograms is addressing these barriers. In 2010, the Solar Program funded \$247 million to accelerate the research, development, and deployment of solar technologies.

Photovoltaics

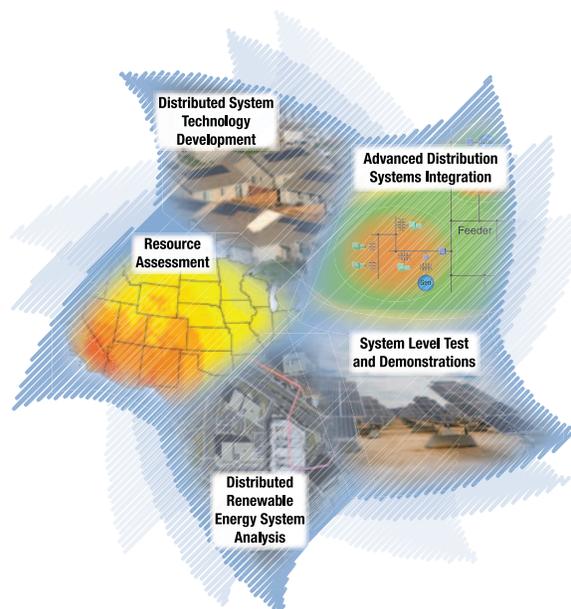
The widespread use of solar energy as a clean, carbon-free, cost-effective electricity source will expand through the development of a variety of photovoltaic (PV) technologies. These technologies will meet the diverse requirements of various market segments, focusing on residential and commercial markets for distributed systems as well as utility-scale markets for centralized systems. Through its primary research and development (R&D) efforts, the PV subprogram's goal is for PV technology to achieve grid parity by 2015.

To meet this goal, DOE is funding approaches across the development pipeline—from basic cell technologies to manufacturing scale-up to total system development—that demonstrate



Credit: Florida Power and Light/PIX 17364

The DeSoto Next Generation Solar Energy Center in Florida is the largest solar photovoltaic plant in the country. The annual estimated generation is about 42,000 megawatt-hours of power to serve approximately 3,000 homes.



The Systems Integration subprogram focuses on these R&D areas.

progress toward minimizing the effective life cycle cost of solar energy. In addition, DOE is partnering with national laboratories, start-up companies, universities, and integrated industry teams.

Although electricity from PV systems is still more expensive than electricity from the utility grid, features such as diversity and adaptability provide the potential for solar to expand rapidly and become a significant part of the national energy supply as additional advancements are made and grid parity is reached.

Credit: Acciona Energy Corporation/PX 15996



Nevada Solar One, near Boulder City, Nevada, is the third-largest CSP plant in the world with 64 megawatts of capacity. The plant can produce enough electricity to power more than 14,000 homes annually.

Concentrating Solar Power

Concentrating Solar Power (CSP) technologies can generate electricity at relatively low cost and deliver power during periods of peak demand. In addition, integration with low-cost thermal storage adds significant value to the energy delivered from CSP plants. The public is becoming more familiar with the availability, benefits, and economic feasibility of CSP. And researchers are continuing to discover ways to reduce costs and improve efficiencies.

DOE is ramping up its CSP research, development, and deployment efforts, leveraging both industry partners and the national laboratories. DOE’s goals include increasing the use of CSP in the United States, making CSP competitive in the intermediate power market by 2015, and developing advanced technologies that will reduce systems and storage costs, enabling CSP to be competitive in the baseload power market by 2020.

DOE is working to achieve these goals through cost-shared contracts with industry, advanced research at its national laboratories, and collaboration with other government agencies to remove barriers to deploying the technology.

Systems Integration

The Systems Integration subprogram funds projects that address the regulatory, technical, and economic barriers to large-scale deployment of solar technologies, specifically distributed and central stations.

As solar technologies provide a larger part of the U.S. electricity supply, it is increasingly important that they be integrated seamlessly into the nation’s electric grid. This requires new ways of thinking about how the country generates and distributes electricity to make it simple, safe, and reliable for solar to feed into the grid.

DOE Solar Program funding addresses generation planning, interconnection, communication and control, and energy management to support the seamless integration of solar into the nation’s electric power grid.

Market Acceleration

Solar technology R&D is a key activity, but it is equally important to address non-R&D solar challenges. The Market Acceleration subprogram is investing in stakeholder education, policy analysis, and technical

assistance to help remove barriers and speed rapid penetration of solar technologies.

Some of these market barriers include:

- A shortage of information about solar and little consumer awareness
- Inconsistent interconnection, net metering, and utility rate structures and practices for solar systems
- Inadequate codes and complex and expensive permitting procedures
- Inconsistent and insufficient state and local financial incentives
- A lack of flexible, sophisticated, and proven financing mechanisms
- Limited education for and insufficient numbers of trained and experienced personnel and services.

DOE is addressing these challenges and fueling solar market growth through partnerships that address utility integration, guide finance mechanisms and incentives, and accelerate the development of a well-trained solar installer workforce.

To learn more about Solar Program activities, visit www.solar.energy.gov.

Top 10 Utilities by Solar Megawatts Installed

In May of 2010, the Solar Electric Power Association (SEPA) released its “2009 Top Ten Utility Solar Integration Rankings.”

| Utilities | Solar Power Megawatts (MW) |
|--|----------------------------|
| Pacific Gas & Electric Company (San Francisco, California) | 85.2 |
| Southern California Edison (Rosemead, California) | 74.2 |
| Public Service Electric & Gas Company (Newark, New Jersey) | 29.6 |
| Florida Power & Light Co. (Miami, Florida) | 29.5 |
| San Diego Gas & Electric (San Diego, California) | 17.6 |
| Public Service Co. - Xcel Energy (Denver, Colorado) | 16.3 |
| Arizona Public Service Co. (Phoenix, Arizona) | 9.9 |
| Salt River Project (Tempe, Arizona) | 5.8 |
| Sacramento Municipal Utility District (Sacramento, California) | 4.92 |
| Los Angeles Dept. of Water 7 Power (Los Angeles, California) | 4.9 |

*This chart includes solar projects that came online and were interconnected between January 1, 2009, and December 31, 2009.