



# DOE to Invest up to \$24 Million for Breakthrough Solar Energy Products

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## **Twelve Industry Teams Partner with DOE to Advance Integration of Solar Energy Systems into Electrical Grid**

**WASHINGTON** – U.S. Department of Energy (DOE) Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy John Mizroch announced today that DOE will invest up to \$24 million in Fiscal Year 2008 and beyond—subject to the availability of funds—to develop solar energy products to significantly accelerate penetration of solar photovoltaic (PV) systems in the United States. The Solar Energy Grid Integration Systems (SEGIS) projects will provide critical research and development (R&D) funding to develop less expensive, higher performing products to enhance the value of solar PV systems to homeowners and business owners. These projects are integral to President Bush’s Solar America Initiative, which aims to make solar energy cost-competitive with conventional forms of electricity by 2015. Increasing the use of alternative and clean energy technologies such as solar energy is critical to diversifying the Nation’s energy sources to reduce greenhouse gas emissions and dependence on foreign oil.

“Harnessing the natural and abundant power of the sun and cost-effectively converting it into energy is an important component of our comprehensive strategy to commercialize and deploy advanced, clean, alternative technologies to enhance our energy security and reduce greenhouse gas emissions,” DOE Principal Deputy Assistant Secretary Mizroch said. “Our investment in these grid integration projects will lay the groundwork for high levels of solar photovoltaic market penetration to help meet the President’s goal of making solar power cost-competitive with conventional sources of electricity.”

The SEGIS funding opportunity was announced on November 15, 2007. The projects selected for negotiation of awards focus on collaborative research and development by U.S. industry teams to develop products that will allow PV to become a more integral part of household and commercial smart energy systems. For example, research teams will work to develop intelligent system controls that integrate traditional building energy management systems with solar systems. The developments will allow building energy managers to better respond to time-of-use pricing and weather conditions to minimize building energy costs and stabilize the effect on the electricity grid. The applicant teams will also develop products that facilitate interaction between solar energy systems and plug in hybrid vehicles, to provide a secure back-up power sources during outages. The intelligent controls and energy management efforts are a critical step towards developing net-zero-energy homes, buildings, and communities.

DOE has selected 12 industry teams to participate in cost-shared cooperative agreements focusing on conceptual design of hardware components, and market analysis. For these 12 winning projects, \$2.9 million total in DOE funding is leveraging \$1.7 million in industry cost-share. The plan is to award additional contracts in Fiscal Year 2009 and in the out years—subject to the availability of funds— for projects demonstrating the most promising technology advancements exhibiting a high likelihood of commercial success. When the below projects are combined with the overall industry cost share of up to \$16 million, more than \$40 million in total could be invested in these SEGIS projects, with future federal funding subject to appropriations from Congress. The Department’s Sandia National Laboratories in Albuquerque, NM will provide project management support to these projects.

These projects will help develop products that maximize the value of PV systems and offer consumers greater control of their electric consumption and costs:

**Apollo Solar (Bethel, Conn.):** To develop advanced modular components for power conversion, energy storage, energy management, and a communications portal for residential-size solar electric systems. The inverters, charge controllers, and energy management systems will be able to communicate with utility energy portals to implement the seamless two-way power flows of the future.

**EMTEC (Dayton, Ohio) Emerson Network Power, Liebert Corporation, Hull and Associates, and Ohio State University:** To develop large, three-phase, highly efficient, small footprint, advanced and innovative power conversion, energy storage and energy management components for commercial- and utility-scale PV systems. The new products will include an integrated grid interface controller that works in conjunction with a customer smart meter to respond to time of day pricing signals. The total system provides improved economics for power distribution and minimizes wide fluctuations in supply and demand of electricity.

**Enphase Energy Inc. (Petaluma, Calif.):** To develop a complete module-integrated solar electric solution controlled by an energy management system, to interface with utilities and allow advanced control for modular utility-interactive applications.

**General Electric (Niskayuna, N.Y.) and Sentech, Inc. in collaboration with candidate utilities including American Electric Power, Duke, and Hawaii Electric Company:** To develop product concepts for integrating solar PV generation with the electrical grid for commercial and residential use. The residential improvements will integrate energy storage, responsive loads, and utility demand side management and are expected to reduce homeowner energy bills and support utility needs to reduce peak loads. New and enhanced inverter and distribution system control concepts for both commercial- and utility-scale installations will be developed.

**Nextek Power Systems (Detroit, Mich. and Hauppauge, N.Y.) with Houston Advanced Research Center:** To modify an existing power gateway design to incorporate bi-directional current flow capability, higher voltage operation, and added functionalities that include integrated communications and an energy management system for value-added PV utility interconnections.

**Petra Solar (Somerset, N.J.) with Florida Power Electronics Center, and Florida Solar Energy Center:** To focus on multi-layer control and communication with PV systems to achieve grid interconnectivity, cost reduction, system reliability, and safety - resulting in a cost competitive, easy to install, modular and scalable system.

**Premium Power (North Reading, Mass.):** To develop an inverter system that makes PV economically viable in terms of initial investment, operating costs, and system lifetime. An intelligent PV system that optimizes the value of PV generation will be developed for commercial- and utility-scale applications with an advanced inverter having energy management.

**Princeton Power Systems (Princeton, N.J.) with TDI Power and World Water and Solar Technologies Corp.:** To develop a complete design for a 100-kW demand response inverter based on Princeton Power Systems' proprietary inverter technology. The design will be optimized for low-cost, high-quality manufacture, and will integrate control capabilities including dynamic energy storage and demand response through load control.

**PV Powered (Bend, Ore.) with Portland General Electric Team, South Dakota State University, and Northern Plains Power Technologies:** To develop a suite of maximum power point tracking algorithms to optimize energy production from the full range of available and emerging PV module technologies with communications integration, facility energy management systems and utility management networks.

**SmartSpark Energy Systems, Inc. (Champaign, Ill.) with Evergreen Solar and Innovolt, Inc:** To design, construct, test, and commercialize an alternating-current PV module with smart building systems interfaces that provide system diagnostics, data logging, and advanced utility interconnection.

**The Florida Solar Energy Center of the University of Central Florida (Orlando, Fla.) with SatCon, Sentech, Inc., EnFlex, SunEdison, Northern Plains Power Technologies, Lakeland Electric Utilities and additional utilities:** To develop new grid integration concepts for PV that incorporate optional battery storage, utility control, communication and monitoring functions, and building energy management systems. The Florida Solar Energy Center of the University of Central Florida will validate an anti-islanding strategy for PV inverters to allow PV generation to remain connected to the grid during some grid disturbances, while still meeting safety operation requirements. New inverter architectures with advanced controls will be introduced, bringing even more stability and security to the home.

**VPT Inc. (Blacksburg, Va.) with Center for Power Electronics, Plug-in Conversions, Moonlight Solar, Breakell Inc., and Delta Electronics:** To develop component circuits and an overall system design for an integrated energy system. The R&D will include inverter controllers that can be used with existing inverters to add sophisticated home interoperability, active anti-islanding and intentional islanding control, and a bidirectional power converter designed for plug-connected vehicles. The bidirectional power converter will also be useable for stationary DC/AC grid-interactive applications.

Learn more from the [Office of Energy Efficiency and Renewable Energy](#).

More information about the Solar Energy Grid Integration Systems program and the solicitation is available on the [Solar Energy Technologies Program website](#).

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