Awardees

DOE will invest up to $22 million in the following 24 new PV Supply Chain and Cross-Cutting Technologies projects. The investment is part of $117.6 million in American Recovery and Reinvestment Act funding, which was announced in May 2009. The selected applicants are listed by two topic areas. These project partners will provide more than $50 million in matching funding.

Topic 1: Proof of Concept Technical/Feasibility Assessment

Each project below receives up to $150,000 during a 12-month period to evaluate or assess and test an idea that can impact the solar photovoltaic industry.

Accustrata ($150,000)
College Park, Maryland

- Develop a real-time optical monitoring system based on fiber optic reflectance measurements optimized for use in a thin-film production environment to improve the process flow and reduce costs.

Advanced Cooling ($150,000)
Lancaster, Pennsylvania

- Develop new bonded copper thermal interface for high concentration PV that experiences rapid thermal cycles with a design that targets lower thermal stress and resistance.

Alenas Imaging ($148,000)
Conway, Massachusetts

- Develop an inspection tool to detect micro-cracks in PV cells using thermo-reflectance at one-tenth the equipment cost of the best current methods.

Fraunhofer USA, Inc. Center for Laser Technology ($150,000)
Plymouth, Michigan

- Develop a laser process to create pitting on solar cell surface to increase light absorption with the goal of providing superior optical surfaces, improved device performance, and reduced use of hazardous chemicals.

Optomec, Inc. ($150,000)
Albuquerque, New Mexico

- Enhance an existing non-contact printing mechanism to support fully printed, fine feature collector lines on the front surface of crystalline silicon solar cells.

Palo Alto Research Center, Inc. ($150,000)
Palo Alto, California

- Develop a novel approach to creating the front side metallization and selective emitter layer of crystalline silicon solar cells, using selective laser ablation to create contact points on the front surface and a screen printer to make the connections with conductive paste.

Photonic Glass Corp. ($149,000)
Sharon, Massachusetts

- Reduce glass surface reflectance by ion beam surface modification to create a graded index of refraction.

PPG Industries, Inc. ($149,000)
Allison Park, Pennsylvania

- Develop coatings that can be applied in a continuous automated process at a lower temperature and labor intensity than current PV protective materials like ethylene vinyl acetate.

SiOnyx Inc. ($128,000)
Beverly, Massachusetts

- Develop a silicon surface treatment with femtosecond laser processing technology to enable increased light absorption and significantly larger spectral bandwidth for film silicon PV.

Solar Red ($150,000)
San Jose, California

- Develop an all-AC, building integrated, thin-film cadmium telluride PV system for asphalt shingled sloped roofs. This plug-and-play, snap-in/snap-out AC PV system will significantly reduce installation costs.

Texas Engineering Experiment Station ($147,000)
College Station, Texas

- Develop a novel method for thin film poly-Si cell fabrication that has a low thermal budget that is applicable to large area, low cost substrates for mass production. Texas Engineering will use a pulsed rapid thermal annealing process to convert a-Si to poly-Si via a vertical crystallization mechanism.

University of Houston ($150,000)
Houston, Texas

- Evaluate an ion beam-assisted deposition process to double the efficiency of thin film PV while benefiting from the advantage of thin film manufacturing by the use of less material and roll-to-roll continuous processing.

University of Missouri ($150,000)
Rolla, Missouri

- Develop processes to recycle solar grade silicon from top-cut scraps and slurry wastes from the wire sawing process.

The University of Texas at Arlington ($120,000)
Arlington, Texas

- Demonstrate the feasibility of electrodeposited and solution-doped transparent conducting oxides (TCOs) such as zinc oxide, which is an "on-top" TCO that can be deposited on semiconductors in thin-film and future solar cells including amorphous silicon, copper indium gallium selenide and emerging solar cells.

Washington Technology Center ($136,000)
Seattle, Washington

- Develop nano-imprinted diffraction gratings for light trapping in crystal-silicon film PV, since light trapping is essential in low cost thin crystalline silicon devices to ensure acceptable light absorption and current generation.

Topic 2: Research, Development, and Demonstration

Each project below receives up to $3 million during a 3-year period for research, evaluation, verification, testing, and demonstration. The winners are listed below with more specific project details.

3M ($1.2 million)
St. Paul, Minnesota

- Develop a polymer barrier film that has lower inherent costs and higher transparency, replacing traditional barrier films.

Air Products and Chemicals, Inc. ($1.58 million)
Allentown, Pennsylvania

- Develop an advanced radio frequency plasma chemical vapor deposition process with new gas-phase additives to achieve deposition for thin film silicon solar cells at increased growth rates and reactant utilization.

DuPont ($3 million)
Wilmington, Delaware

- Develop a continuous, in-line manufacturing tool using atomic layer deposition to produce a flexible ultra moisture barrier film to enable new thin film flexible PV products.

General Electric (two awards)
Niskayuna, New York

- Develop a system integrated, distributed PV architecture employing module-level DC to DC Maximum Power Point Tracker, rack, module, and power conversion components that will reduce increasing the energy yield, reducing total lifecycle costs, and improving overall system reliability and availability. ($1.8 million)
- Develop a novel functional thin film platform that will allow for boosting the efficiency of any solar cell using down-shifting materials. Down-shifting is the process of converting high energy near-UV light within the solar spectrum to lower energy light that is more effectively used by the solar cell. ($1.2 million)

Sierra Solar Power ($3 million)
Fremont, California

- Accelerate development of a high-volume manufacturing silicon epitaxy growth system, which is optimized for PV production that will enable the commercial manufacture of cells made from thin layers of monocrystalline silicon on cheap metallurgical-grade silicon wafers, reducing feedstock costs and capital equipment expenses.

Silicon Genesis Corporation ($3 million)
San Jose, California

- Accelerate development of a silicon wafering tool that enables a dramatic reduction in silicon waste by utilizing a cleaving process as opposed to the conventional wire saw process.

Varian Semiconductor ($3 million)
Gloucester, Massachusetts

- Develop a manufacturing tool that produces sheets of single-crystal film silicon in a continuous mode with significantly higher throughput and lower material costs than conventional manufacturing processes.

XeroCoat ($2.96 million)
Redwood City, California

- Develop and commercialize a low-cost, novel glass antireflective coating that enables high transmission of light and therefore higher energy output from any glass PV module.

*Source: U.S. Dept. of Energy