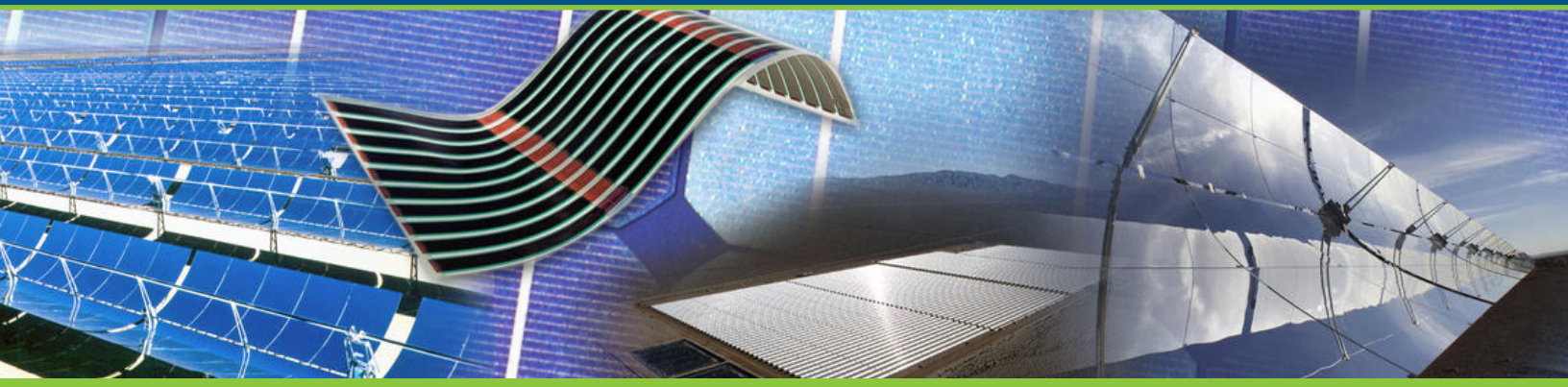


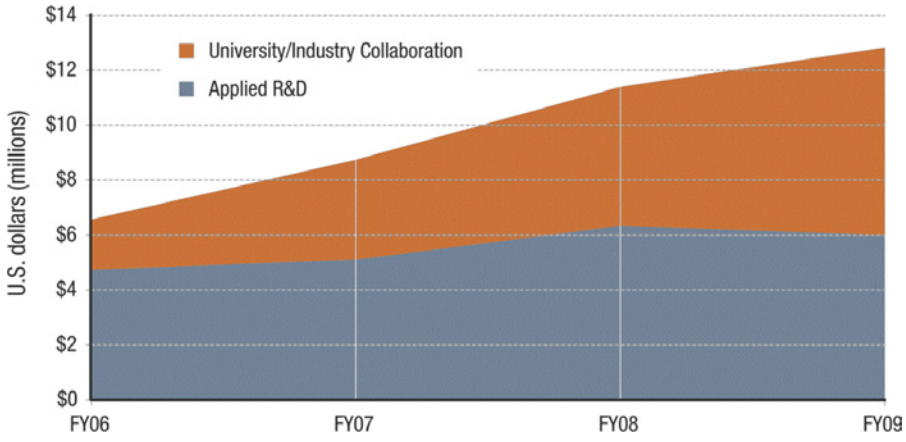
SOLAR ENERGY TECHNOLOGIES PROGRAM NEWSLETTER

APRIL 2008

Program Notes

University Product & Process Award Decisions

On March 12, DOE announced its investment of up to $13.7 million of federal funding, over three years (FYs 2008–2010), for 11 university-led projects that will focus on developing advanced photovoltaic (PV) technology manufacturing processes and products. Combined with a minimum university and industry cost share of 20%, up to $17.4 million will be invested in these projects.[1] These projects are part of the Solar America Initiative (SAI), an integral part of the President's commitment to diversify our energy resources through grants, incentives, and tax credits. SAI has stimulated the commercialization of new technologies, and DOE is supporting more than 70 companies and 30 universities on projects to drive down the costs of solar energy and enhance the industry's growth. The chart below illustrates the growing support for universities under SAI.



[1] *The goal of this effort is to fund university R&D activities to support the Solar America Initiative. Therefore, 75% of the total project funding, as determined by budget (federal and cost share) must be retained by the university. Only 25% of the total project cost may be used for work by sub-tier recipients.*

U.S. Department of Energy
Energy Efficiency and Renewable Energy

Program Notes

Industry Update

Market Transformation

Awarded universities will leverage their fundamental understanding of materials and PV devices to help industry partners advance manufacturing processes and products. Each of the universities will work closely with an industry partner to ensure the projects retain a commercialization focus and that results are quickly transitioned into market-ready products and manufacturing processes. These projects have the potential to significantly reduce manufacturing costs and enhance PV efficiencies with multijunction cells, improved device architectures and innovative least-cost processes for a range of technologies. Additionally, students will be exposed to diverse PV-related commercialization efforts, enhancing workforce development efforts to retain qualified scientists in the growing domestic PV research and development (R&D) industry.

Selected projects are:

- **Arizona State University (Tempe, AZ) with SolFocus, Inc. and Soliant Energy, Inc.:** *Reliability Evaluation of Concentrator Photovoltaics per IEC Qualification Specifications.*
- **California Institute of Technology (Pasadena, CA) with Spectrolab, Inc.:** *100 Millimeter (mm) Engineered InP on Si Laminate Substrates for InP-based Multijunction Solar Cells.*
- **Georgia Institute of Technology (Atlanta, GA) with SiXtron Advanced Materials, Inc.:** *Rear Contact Technologies for Next-Generation High-Efficiency Commercial Silicon Solar Cells.*
- **Massachusetts Institute of Technology (Cambridge, MA) with CaliSolar, Inc., and BP Solar International, Inc.:** *Defect Engineering, Cell Processing, and Modeling for High-Performance, Low-Cost Crystalline Silicon Photovoltaics.*
- **North Carolina State University (Raleigh, NC) with Spectrolab, Inc.:** *Tunable Narrow Bandgap Absorbers for Ultra High Efficiency Multijunction Solar Cells.*
- **Pennsylvania State University (University Park, PA) with Honeywell, International, Inc.:** *Organic Semiconductor Heterojunction Solar Cells for Efficient, Low-Cost, Large-Area Scalable Solar Energy Conversion.*
- **University of Delaware Institute of Energy Conversion (Newark, DE) with Dow Corning:** *Development of a Low-Cost Insulated Foil Substrate for CIGS Photovoltaics.*
- **University of Delaware (Newark, DE) with SunPower Corporation:** *High Efficiency Back Contact Silicon Heterojunction Solar Cells.*
- **University of Florida (Gainesville, FL) with Global Solar Energy Inc., International Solar Electric Technology Inc., Nanosolar Inc., and Solyndra Inc.:** *Routes for Rapid Synthesis of CIGS Absorbers.*
- **University of Toledo (Toledo, OH) with Calyxo USA, Inc.:** *Improved Atmospheric Vapor Pressure Deposition to Produce Thin CdTe Absorber Layers.*
- **University of Toledo (Toledo, OH) with Xunlight Corporation:** *High-Rate Fabrication of a-Si-Based Thin-Film Solar Cells Using Large-Area VHF PECVD.*

For more information about the awards, please visit www.eere.energy.gov/solar/solar_america/university_product_process_development_support.html.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

DOE and Department of Interior to Conduct Programmatic Environmental Impact Statement of Solar Projects on BLM Lands

In January, DOE signed a Memorandum of Understanding with the U.S. Department of the Interior to cooperatively conduct a Programmatic Environmental Impact Statement (PEIS) for solar power projects on lands managed by the Bureau of Land Management (BLM). The PEIS describes, analyzes, and compares the potential environmental impacts on these lands.

A pre-planning kickoff took place March 11-12 at Argonne National Laboratory. Argonne will be doing assessment with NREL to target high-resource BLM and DOE land that is not located in environmentally sensitive areas. A Notice of Intent (NOI), to be published in June, will initiate the public comment and scoping period. Public comment will be gathered and information about the PEIS will be provided on a public Web site and through numerous meetings in and around the lands that will be part of the PEIS. About 1 year following the NOI, a draft PEIS will be issued for public review. A 90-day public review of the draft PEIS will follow, and the final PEIS is planned for public release in early 2010.

Sandia Labs Hosts Kick-Off Meeting to Develop PV Field Measurement Protocols

In February, members of Sandia National Laboratories, NREL, Southwest Technology Development Institute (SWTDI), and Florida Solar Energy Center (FSEC) met to discuss best practices for field system testing. The meeting, held at Sandia, included topics such as personal safety, equipment safety, test planning, proper use of reference instrumentation, necessary measurements, field test equipment, and proper testing for the many PV technologies and applications. The collaborative effort was conducted to begin development of a standard test protocol for field-installed PV systems. The adoption of a standard field test procedure will ensure that field data are reliable and consistent independent of the testing organization. Reliably collected data lay the groundwork for improved solar model verification, model comparison, PV system output validation, and system comparison. Furthermore, the group hopes that applying analytical techniques to shared data sets will improve our understanding of the benefits of various approaches. Future plans include broadening the participatory group to include industry representatives to review and enhance the preliminary results from this exercise.

DOE Announces New Round of Solar America Cities Partners

On March 28, DOE announced the winners of the second Solar America Cities solicitation. Twelve new cities join the inaugural 13 cities, bringing the total number of partner cities to 25. The new Solar America Cities partners, representing cities from across the country with varying degrees of solar maturity, are:

- Denver, CO
- Houston, TX
- Knoxville, TN
- Milwaukee, WI
- Minneapolis-St. Paul, MN
- Orlando, FL
- Philadelphia, PA
- Sacramento, CA
- San Antonio, TX
- San Jose, CA
- Santa Rosa, CA
- Seattle, WA

The Solar America City partnerships have committed to developing a sustainable solar infrastructure that removes market barriers and encourages the adoption of solar energy by residents and businesses, and increases the number of solar installations within the cities. Each city will receive up to $200,000 in funding from DOE, with an equal amount to be matched by the city. Additionally, cities will receive up to $200,000 in technical assistance provided by DOE's national laboratories and other experts. This is the final round of awards that DOE will make for this effort. The lessons learned and experience garnered by these 25 cities will serve as a model for other cities to follow.

Industry Update

SolarPACES Conference Held in Las Vegas

The United States hosted the International Energy Agency (IEA) 14th Biennial Solar Power and Chemical Energy Systems (SolarPACES) Symposium in Las Vegas, Nevada, March 3–7. SolarPACES is an IEA Implementing Agreement for Concentrating Solar Power and Solar Chemistry and comprises 14 member countries at this time. Dr. Tom Mancini of Sandia National Laboratories organized the event, while Mark Mehos of NREL served as technical chair. The Symposium attracted more than 400 attendees from 25 countries and featured more than 100 technical papers in the subject topic areas. An "industry" day featured updates on projects, policy, and market development. There are currently power purchase agreements in place for more than 6 gigawatts (GW) of CSP capacity worldwide. The highlight of the conference was a tour of the newly opened Nevada Solar One parabolic trough plant.

Nevada Solar One™ Dedication

The Nevada Solar One CSP plant was dedicated on February 22. The ceremony took place at the Acciona facility located near Boulder City, Nevada. The 64-megawatt (MW) parabolic trough plant contains 182,000 curved mirrors spread over 400 acres. Nevada Solar One is the first utility-scale CSP plant to be built in the United States in 17 years and is the third largest of its kind in the world.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Outdoor Test Facility at NREL Expands SAI's Testing Capabilities

The Outdoor Test Facility (OTF) at the National Renewable Energy Laboratory (NREL) was expanded to house a new solar simulator and additional environmental chambers used for accelerated exposure testing. The new simulator will allow NREL to test solar modules from Solar America Initiative (SAI) partners that are 266% larger than can be accommodated with the current simulator. Before the expansion, NREL was receiving solar modules from industry to test that were significantly larger than could be accommodated on the old SPIRE 240A solar simulator with a test bed of 80 cm x 100 cm (2 ft x 4 ft). Standard module size is increasing, especially among manufacturers of building-integrated PV products; the new solar simulator, a SPIRE 4600 with a test-bed area of 137 cm x 200 cm (4.5 ft x 6.5 ft), will allow NREL to more efficiently test the new larger modules, as well as increase the number of modules being tested because there is now more space for module delivery and handling.

"The OTF expansion enhances our ability to deal with the increased demand associated with SAI subcontracts—particularly from Technology Pathway Partnerships and PV Incubator," said Pete Sheldon, who manages NREL's PV Measurements and Characterization R&D Group.

The OTF expansion added 1780 square feet of space and reconfigured another 1650 square feet. The expanded laboratory space will also provide space for additional environmental chambers, which will further support DOE's emphasis on reliability.

NREL's OTF is used to evaluate prototype, pre-commercial, and commercial solar electric modules. OTF researchers study and evaluate advanced or emerging PV technologies under simulated, accelerated indoor and outdoor, and prevailing outdoor conditions. One of the major roles of researchers at the OTF is to work with industry to develop uniform and consensus standards and codes for testing PV devices. Researchers also calibrate primary reference cells for in-house use and for use by other national laboratories, calibration and testing labs, and PV manufacturers. NREL is an ISO 17025-accredited PV calibration laboratory and one of two labs in the world that is ISO accredited for both primary and secondary cell calibrations and secondary module calibrations. The solar industry relies on NREL to maintain an independent and reliable measurement capability for both solar cells and modules.

Attendees at the event included master of ceremonies, Ed Begley Jr., Apple computer co-founder Steve Wosniak, and the first American female astronaut in space, Sally Ride. Presenting via a video-recorded message was Dr. Rajendra K. Pachauri, the 2007 Nobel Peace Prize recipient. Tommy Rueckert represented the Solar Program for DOE.

Following the ceremony, EERE Principal Deputy Assistant Secretary John Mizroch addressed reporters at a press conference to highlight DOE's successful $3 million cost-shared project which evaluated Acciona collector designs, one of which Acciona selected for the plant.

To read more about DOE involvement in the project, please visit www.eere.energy.gov/news/daily.cfm/hp_news_id=102.

Ed Begley, Jr., Steve Wosniak, and astronaut Sally Ride are joined by representatives from Acciona, Nevada Power, and DOE at the Nevada Solar One dedication ceremony.

Global Solar Energy Opens New 40-MW Thin-Film CIGS Solar Factory in Tucson, AZ

On March 6, Global Solar Energy, Inc., held a ribbon-cutting ceremony at its new Tucson, Arizona, campus to celebrate the commencement of operations of its cutting-edge 40-MW thin-film Copper Indium Gallium diSelenide (CIGS) solar factory—the largest CIGS plant in the United States and one of the largest thin-film PV factories in the world. Global Solar Energy plans to expand the Tucson facility to more than double capacity to 100 MW by 2010. The company also announced the ground breaking for a privately owned, on-site, 750-kilowatt (kW) solar field that will be the largest CIGS system in the world. The solar field will generate electricity for the factory and will also enable further testing of its CIGS technology in a real-world application.

"Given that Global Solar is producing the highest volume of CIGS thin-film solar material available, the opening of its plant in Tucson is a remarkable event," said Tom Kimbis, SETP Acting Program Manager. "Production from this facility will help satisfy the strong demand for solar products across the world, while providing local residents of Tucson, already a Solar America City, with jobs in a rapidly growing, high-tech industry. The addition of the Tucson Global Solar plant will help meet the 2015 goal of the Solar America Initiative of achieving solar electricity cost competitiveness with grid electricity, especially through the use of flexible CIGS thin-film technologies in building-integrated applications."

The 64-megawatt Nevada Solar One power plant went on-line in June 2007 (Photograph provided courtesy of Acciona).

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

NREL Solar Models Presented at SolarPACES Conference

Two solar energy computer modeling programs developed at NREL were presented at the SolarPACES conference held in Las Vegas, Nevada, in March 2008.

NREL staff presented two papers on computer modeling of CSP power systems and PV. One paper presented results from the Regional Energy Deployment System Model (ReEDs), which examines the ability of CSP and other renewables to contribute to the U.S. electric sector over the next 50 years. The paper was presented in an industry panel to the entire conference.

The second NREL paper presented DOE's Solar Advisor Model (SAM) for modeling the costs, finances, and performance of CSP and PV systems. NREL developed SAM in partnership with DOE and Sandia National Laboratories to support the implementation of the Solar America Initiative. For more information about the SAM, visit www.eere.energy.gov/solar/solar_america/solar_advisor_model.html.

NREL Provides R&D Support to World's Largest Solar Power Plant

NREL's concentrating solar power research team will support testing of the receivers and collectors for the largest concentrating solar power plant in the world being constructed near Phoenix, Arizona, for Arizona Public Service. When completed in 2011, the power plant will produce 280 MW of solar energy. NREL will also support Abengoa with the development of a local test site for testing of their collectors and will work closely with their staff to support testing of advanced collector and receiver concepts that will be used in follow-on plants.

Global Solar is a U.S. corporation that employs 200 people in the United States, and it is growing to employ 90 people in Germany. It is a world leader in large-scale production of CIGS, and it provides military-grade portable solar systems to U.S. and allied armed forces using U.S. intellectual property.

Abengoa Solar Plant Announced

Abengoa Solar has signed a 30-year power purchase contract with Arizona Public Service Co. (APS) to build, own and operate a 280-MW CSP trough plant near Gila Bend, Arizona. This will be the largest solar plant in the world when it goes on-line in 2011. Named Solana, the plant will cover 1,900 acres, have six hours of thermal molten-salt storage, and produce enough electricity to power 70,000 homes. Solana marks the first commercial plant in the United States to have thermal storage.

Silicon Solar Consortium Kickoff Meeting Held February 27-28

The Silicon Solar Consortium (SiSoC) held its kickoff meeting in Atlanta, Georgia, on February 27-28. The goal of SiSoC is to partner universities directly with industry by allowing industry partners to direct the research efforts of the university research projects. In exchange for industry membership fees, these companies collectively decide the direction and scope of the research and retain rights to the intellectual property generated from the work. This program is an Industry/University Cooperative Research Centers Program through the National Science Foundation and is made up of 14 industry partners and two universities. The objectives of the meeting were to present progress reports for the ongoing SiSoC research projects; present white papers, and select by vote the future projects to be funded; and finalize the SiSoC bylaws.

Market Transformation

Florida's Public Service Commission Ratifies Net Metering and Interconnection Rule

On March 4, Florida's Public Service Commission ratified its December 18, 2007, decision on a rule addressing net metering and expedited interconnection standards. The Commission considered comments received from participants in the rulemaking proceeding but made no changes to the rule. The net-metering rule is intended to promote the development and interconnection of customer-owned renewable generation, and minimize costs for customers attempting to interconnect to their utility. It encourages the development of renewable generation by: (1) expanding the size of eligible systems from 10 kW to 2 MW; (2) expanding the type of eligible systems from solely photovoltaic to all renewable technologies; (3) expediting the interconnection of customer-owned renewable generation; and (4) allowing customers to offset consumption through net metering. DOE funded the Interstate Renewable Energy Council to participate in the rulemaking process and provide information to the Commission on best practices. This decision in the nation's fourth most populous state is a significant advancement for the solar community.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

IEEE Conference Adds PV Technology Velocity Forum

Each year, IEEE's Photovoltaic Specialists Conference brings together the industry's leading scientists and engineers to advance PV technologies. This year, IEEE has added a PV Technology Velocity Forum to provide a unique opportunity for regulators, policy makers, legislators, investors and PV-industry executives to engage with scientists and technologists and, together, explore methods for driving superior emerging technologies through production and into the market. Invited speakers and panelists will engage with attendees to explore issues affecting the adoption of new PV technologies, such as policy development, regulations and market-based project management. The opening session will showcase some of the finest research and development programs from around the world, including government-, state- and privately-funded programs. Different program designs and the resulting interactions among researchers will be examined as they enable or inhibit moving ideas from research to development. Subsequent sessions include a panel discussion with investors, industry management, and technical leaders to examine the communication process required to move technology through development and into production; a presentation of successful case studies in the European Union; and a panel discussion on macro and micro PV economics. John Benner, Principal Scientist at NREL, will lead the new forum. For more information, visit the conference Web site: www.33pvsc.org.

SES and Sandia National Labs Establish New World Record for Solar-to-Electric Efficiency

From ScienceDaily (Feb. 17, 2008) – On a perfect New Mexico winter day—with the sky almost 10 percent brighter than usual—Sandia National Laboratories and Stirling Energy Systems (SES) set a new solar-to-grid system conversion efficiency record by achieving a 31.25 percent net efficiency rate. The old 1984 record of 29.4 percent was toppled Jan. 31 on SES's "Serial #3" solar dish Stirling system at Sandia's National Solar Thermal Test Facility.

The conversion efficiency is calculated by measuring the net energy delivered to the grid and dividing it by the solar energy hitting the dish mirrors. Auxiliary loads, such as water pumps, computers and tracking motors, are accounted for in the net power measurement.

Solar America Cities Launches Web Site

The new Solar America Cities Web site (www.solaramericacities.energy.gov) was launched on March 28. This initial Web site includes overview information on Solar America Cities, pertinent news and events, information on each of the 2007 participating cities' activities, and links to resources that all cities can use in their efforts to transform the solar market. Best practices and other resources will be added continually to the Web site as they become available. Many thanks to the partner cities for their review and contributions to the city pages! Information on the 12 new partner cities will be added soon!

Plans are under way for additional functionality to be added to the Web site in the near future, including a discussion board in which cities can communicate with each other and with DOE. We are already beginning to see information sharing among our partner cities, with several cities exploring the feasibility of adopting the City of Berkeley's property-tax solar-financing model. We hope that this Web site will serve not only as an informational resource, but also as a communication tool that can provide additional avenues for collaboration.

First Annual Meeting of Solar America Cities to be Held in Tucson

DOE and its city partners are gearing up for the Solar America Cities First Annual Meeting. The group will meet in Tucson, Arizona, April 14-16, to discuss best practices, share lessons learned, present new ideas, and engage in networking opportunities. The meeting will include presentations by solar energy experts on best practices and national trends, as well as presentations by city teams. More information can be found at www.eere.energy.gov/solar/solar_america/sac_meeting.html.

DOE Presents Tucson with Solar America City Sign at "Zoo School" Ribbon-Cutting

On February 13, Arizona Governor Janet Napolitano delivered the keynote address at the dedication of Tucson's Lee H. Brown Family Conservation Learning Center at Reid Park Zoo. The "zoo school," as the center is colloquially known, is the greenest, most eco-friendly commercial building in southern Arizona. The new 10,000-square-foot, two-story educational center replaces the 900-square-foot building originally used as an admissions booth in the 1940s. Among the building's many green features are solar panels donated by Tucson Electric Power, two rainwater harvesting cisterns, insulation made from recycled blue jeans, furniture that uses corn-based fabrics, and a host of energy efficiency measures. The ribbon-cutting for this showcase solar-powered building proved an ideal venue for DOE to present the City of Tucson with its Solar America City sign. Steve Palmeri of DOE's Golden Field Office presented the sign to Tucson Mayor Bob Walkup. Earlier that day, Palmeri met with the Tucson Solar America Cities team to discuss ongoing solar plans for the city.

Steve Palmeri (left) of DOE presents Tucson Mayor Walkup with a Solar America City sign at the dedication of the new Lee H. Brown Family Conservation Learning Center. Governor Napolitano applauds in the background.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Sandia National Laboratories Reviewing Solar Energy Grid Integration Systems (SEGIS) Proposals

The SEGIS program is a 3-year effort that is part of the Solar America Initiative, and it focuses on R&D by industry to develop hardware to integrate PV systems into the utility grid at high penetration levels. Through SEGIS, new inverters, power-system controllers, and overall energy-management systems will be developed that will facilitate the evolution of our electric grid to accommodate and optimize high penetration of distributed renewable generation. Sandia is managing the SEGIS program on behalf of DOE, with supporting technical leadership from NREL. Twenty-six SEGIS proposals were received from industry teams. The proposals are currently under review, and winners will be determined in early April. Cost-shared contracts will then be awarded to as many as 14 winning teams for the first stage of the program, "Concept R&D and Market Analysis." SEGIS' first-stage expected hardware developments include innovative, highly reliable, and advanced inverters, controllers, and balance-of-system hardware for systems that include value-added communications and energy management to meet the goals of the program. Stages 2 and 3 include a 1-year prototype development stage and a 1-year commercialization stage that culminates in pilot production of new products. Extensive testing and analysis will be conducted at Sandia and contractor sites.

Solar Shines at New Orleans Home and Garden Show

The 53rd Annual New Orleans Home and Garden Show, the largest home and garden show of its kind with over 70,000 attendees, returned to the Superdome February 28–March 2. DOE and its New Orleans Solar America Cities partners staffed a booth that was part of the BuildSmart Expo at the show. The Expo featured a special exhibit area for energy efficient and green building businesses and products; a full schedule of informative workshops, including workshops on solar energy, led by top professionals; and a display of full-scale demonstration models showcasing energy efficiency and green building products and techniques. A large PV panel was displayed at DOE's booth, and information on solar energy, the New Orleans Solar America Cities partnership, and the new Louisiana 50% solar tax credit was provided to visitors. Outside the Superdome, a large billboard drew onlookers' attention to the new www.SolarPowerNola.org Web site and Louisiana solar tax credit.

Solar Energy Technologies Program Reaches Out to Builders

Professionals in the building industry learned more about solar technologies and the benefits of incorporating solar into their building plans at the International Builders' Show (IBS), February 13-16, at the Orange County Convention Center in Orlando, Florida – the site of a planned 1-MW PV installation. SETP exhibited along with other federal agencies (Environmental Protection Agency/Energy Star, Housing and Urban Development/Partnership for Advancing Technology in Housing, Building America, Lighting for Tomorrow) in a larger pavilion, entitled "Ask the Experts." During the show, three new publications for builders were introduced with educational, technical, and financial resources.

- *Making Cents Out of Solar: Put More Power Into Your Building Plans*
  www.eere.energy.gov/solar/pdfs/making_cents.pdf

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Sandia and NREL Host Accelerated Aging and Reliability Workshop April 1-2

Sandia National Laboratories and NREL are teamed in an expanded DOE-sponsored PV reliability project with multiple elements. These include establishing and employing methodologies, such as Failure Modes Effects Analysis and Fault Tree Analysis, to drive development of new accelerated tests and generate lab data to be used in developing a predictive model for PV technologies and systems. Other lab efforts include development of protocols, such as technology screening protocols, that can be applied in the product development process. Data sources for the predictive model will include lab-based experimentation, including accelerated lifetime tests, long-term aging experiments in extreme climates, and partner-owned installations. An industry outreach element of this activity is a workshop on Accelerated Aging and Reliability to be held in Lakewood, Colorado, on April 1-2, 2008. The high level of industry interest in PV reliability is evident in the list of more than 100 registered participants representing more than 30 companies from the PV industry, as well as other organizations. Attendees will delve into how reliability is defined across the various sectors of the industry and how installed photovoltaic system reliability can be improved. The steering committee expects to gather input from attendees and publish a summary of the results by May 2008.

- *Planning for PV: The Value and Cost of Solar Electricity*
  www.eere.energy.gov/solar/pdfs/planning_for_pv.pdf
- *Solar Successes: The Best of Today's Energy Efficient Homes*
  www.eere.energy.gov/solar/pdfs/solar_success.pdf

With nearly 100,000 IBS attendees, the pavilion garnered 600 leads from builders, developers, engineers, architects, and homeowners who are interested in energy efficiency and solar. Additionally, this year, for the first time, the National Association of Homebuilders (NAHB) held "Green Day," celebrating all things green in the building industry, and officially launched the NAHB National Green Building Program and the Certified Green Professional designation.

Orange County, FL, Convention Center PV System to be the Largest in the Southeast

On January 31, SETP Acting Program Manager, Tom Kimbis, and Mayor Crotty of Orange County, Florida, announced plans to install a large-scale rooftop PV system at the Orange County Convention Center in Orlando. The 1-MW system will be the largest PV system in the southeastern United States. It is expected to occupy about 200,000 square feet of roof, and will generate 1,300 to 1,500 MW-hours of electricity per year, equivalent to the amount needed to power 80 to 100 typical homes. This project is one of DOE's Solar America Showcases—high-visibility, large-scale solar installations for which DOE provides technical assistance. Bob Reedy from the Florida Solar Energy Center is leading DOE's team of technical assistance experts for this effort. The project is also being supported by the Orlando Utilities Commission, Florida Department of Environmental Protection, and Orange County.

Other Solar America Showcases under way include Forest City Military Communities in Honolulu, Hawaii, and the City of San Jose, California, which plans to install multi-MW solar arrays on a cluster of city buildings. The 2008 Solar America Showcases solicitation is open, with a closing date of June 12. A previous 2008 solicitation closed on March 12.

Summary of Solar Program Funding Opportunities

Pipeline of Program Activities

The Solar Energy Technologies Program (SETP) is engaged with a range of stakeholders and activities along the solar pipeline. From Materials and Device Concepts to key Market Transformation efforts, SETP is supporting the development of innovative projects to accelerate the growth of the U.S. solar industry.

See Figure 1. Summary of Solar Program Funding Opportunities on the following page.

Solar informational panels will be placed outside the U.S. Botanic Garden (Photo courtesy of U.S. Botanic Garden).

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

U.S. Botanic Garden to Display Informational Panels on Solar America Cities

This summer, visitors to the U.S. Botanic Garden will be greeted with 11 Solar America Initiative (SAI) informational panels. The panels will cover topics ranging from general information about solar energy and SAI, to details about what individual Solar America Cities are doing to achieve SAI goals. The panels will be positioned along the walkways leading up to the garden entrance, through which nearly 500,000 visitors pass each summer. The panels are expected to be ready for the opening of the Botanic Garden's exhibit, "One Planet – Ours!", which runs from May 24 through October 13. The summer exhibit will focus on sustainability as it applies to gardens, landscape, and communities. The Botanic Garden has also partnered with a number of government agencies and nongovernmental organizations—the U.S. Environmental Protection Agency, National Wildlife Federation, American Horticultural Society, among others—to showcase various displays and themes. For more information about the exhibit and the U.S. Botanic Garden, visit www.usbg.gov.

Figure 1. Summary of Solar Program Funding Opportunities

CLOSED PENDING OPEN PROPOSED

FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) OR SOLICITATION	AWARD DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Systems Development and Manufacturing: Technology Pathway Partnerships (TPP)	March 8, 2007	$168 M over 3 years	Cost-shared industry-led projects for PV systems development, and manufacturing demonstrations. Collective portfolio of projects will reduce direct manufacturing and installation costs by at least 30% by 2010, and will deliver up to 2.4 GW of new manufacturing capacity by year-end 2010.	• Amonix (CA) • Boeing (CA) • BP Solar (MD) • Dow Chemical (MI) • General Electric (DE) • GreenRay (MA) • Konarka (MA) • Miasole (CA) • Nanosolar (CA) • Soliant (CA) • SunPower (CA), includes PowerLight (CA) • United Solar Ovonic (MI)
Market Transformation: Codes and Standards	March 26, 2007	$4.2 M over 5 years	Working Group will address code development and outreach activities in areas of critical importance to solar market penetration (e.g., interconnection procedures, net metering, product safety, international standards coordination). Will lead to a major improvement in the responsiveness, effectiveness, and accessibility of codes and standards to U.S. solar stakeholders at all levels.	Solar America Board of Codes and Standards (SolarABCs) PV Capacity Credit Valuation Study: • State University of New York (NY) • Tucson Electric Power (AZ)
Market Transformation: State/Utility Solar Technical Outreach	March 27, 2007	$1.7 M over 3 years	Will conduct tailored solar technical outreach to states and utilities and will provide resources and best practices to address solar issues faced by states and utilities.	Utility Technical Outreach: • Solar Electric Power Association (DC) State Technical Outreach: • Clean Energy Group (VT) • National Association of Regulatory Utility Commissioners (DC) • National Conference of State Legislatures (CO)
Component and Pilot Scale Production: PV Module Incubators	March 27, 2007	$27 M over 18 months	Projects focused on solving technical challenges that must be overcome to scale-up manufacturing and commercialize new products by 2010 and shortening the timeline for companies to transition pre-commercial PV technologies into full-scale manufacturing.	• AVA Solar (CO) • Blue Square Energy (MD) • CaliSolar (CA) • EnFocus Engineering (CA) • MicroLink Devices (IL) • Plextronics (PA) • PrimeStar Solar (CO) • Solaria (CA) • SolFocus (CA) • SoloPower (CA)

Continued on following page

Summary of Solar Program Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	AWARD DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Market Transformation: Solar America Showcases (SAS)	May 16, 2007	Technical assistance only	Showcases are designed to help facilitate large-scale installations that involve cutting-edge solar technologies, novel applications of solar, high-visibility sites, and/or high likelihood of replicability. SAS does not provide financial assistance; instead, it provides technical assistance through teams of DOE-funded solar experts from the National Renewable Energy Laboratory, Sandia National Laboratories, the Southeast and Southwest Regional Experiment Stations, and private firms.	• City of San Jose (CA) • Forest City Military Communities (HI) • Orange County Convention Center (FL)
Market Transformation: Solar America Cities	June 21, 2007	$2.5 M and technical support over 2 years	Cities will integrate solar technologies into city energy planning, zoning, and facilities; streamline city-level regulations and practices that affect solar adoption by residents and local businesses (e.g., permitting, inspections, local codes); and promote solar technology among residents and local businesses (e.g., outreach, curriculum development, and/or implementation, incentive programs).	• Ann Arbor (MI) • Austin (TX) • Berkeley (CA) • Boston (MA) • Madison (WI) • New Orleans (LA) • New York (NY) • Pittsburgh (PA) • Portland (OR) • Salt Lake City (UT) • San Diego (CA) • San Francisco (CA) • Tucson (AZ)
Device and Process Proof of Concept: Future Generation PV Devices and Processes	November 8, 2007	$21.7 M over 3 years	For companies to perform exploratory R&D for developing innovative, highly disruptive future-generation solar electric technologies. Device and manufacturing process research targeted here is expected to produce prototype cells and/or processes by 2015, with full commercialization in the 2020–2030 timeframe.	• Arizona State University (Tempe, AZ) • California Institute of Technology (Pasadena, CA) • Massachusetts Institute of Technology (Cambridge, MA) • Mayaterials, Inc. (Ann Arbor, MI) • Pennsylvania State University (University Park, PA) • Rochester Institute of Technology (Rochester, NY) • Solasta, Inc. (Newton, MA) • Solexant, Inc. (Sunnyvale, CA) • Soltaix, Inc. (Los Altos, CA) • Stanford University (Stanford, CA) • University of California, Davis (Davis, CA) • University of California, San Diego (La Jolla, CA) • University of Colorado (Boulder, CO) • University of Delaware (Newark, DE) • University of Florida (Gainesville, FL) • University of Illinois (Urbana, IL) • University of Michigan (Ann Arbor, MI) • University of South Florida (Tampa, FL) • University of Washington (Seattle, WA) • Voxtel, Inc. (Beaverton, OR) • Wakonda Technologies (Fairport, NY)

Continued on following page

Summary of Solar Program Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	AWARD DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Concentrating Solar Power Funding Opportunity Announcement	November 29, 2007	$5.2M for Phase 1	For companies to develop storage solutions, manufacturing approaches, and new system concepts for large-scale concentrating solar power (CSP) plants. Collaborative public/private partnerships established herein will work to reduce the nominal levelized cost of energy of CSP power plants from 13-17 ¢/kWh in 2007 to 7-10¢/kWh by 2015 and 5-7¢/kWh by 2020.	• 3M (St. Paul, MN) • Alcoa (Alcoa Center, PA) • Brayton Energy (Hampton, NH) • Hamilton Sundstrand (Canoga Park, CA) • Infinia (Kennewick, WA) • PPG Industries (Pittsburgh, PA) • Skyfuel (New York, NY) • Solar Millennium (Berkeley, CA) • Solucar (Lakewood, CO)
Systems Development and Manufacturing: University Product and Process Development Support	March 12, 2008	Up to $13.7M over 3 years	For universities to perform targeted materials science and process engineering research that offers direct, near-term improvements in PV products and development processes for commercialization by 2010.	• Arizona State University (Tempe, AZ) • California Institute of Technology (Pasadena, CA) • Georgia Institute of Technology (Atlanta, GA) • Massachusetts Institute of Technology (Cambridge, MA) • North Carolina State University (Raleigh, NC) • Pennsylvania State University (University Park, PA) • University of Delaware Institute of Energy Conversion (Newark, DE) with Dow Corning • University of Delaware (Newark, DE) with SunPower Corporation • University of Florida (Gainesville, FL) • University of Toledo (Toledo, OH) with Calyxo USA, Inc. • University of Toledo (Toledo, OH) with Xunlight Corporation
Solar America Cities	March 28, 2008	$2-$3 M over 2 years	Building on the success of the initial Solar America Cities FOA, the Solar Program issued a similar FOA to allow more cities to participate. Solar America Cities are recognized as partners who are highly committed to solar technology adoption at the local level.	• Denver (CO) • Houston (TX) • Knoxville (TN) • Milwaukee (WI) • Minneapolis-St. Paul (MN) • Orlando (FL) • Philadelphia (PA) • Sacramento (CA) • San Antonio (TX) • San Jose (CA) • Santa Rosa (CA) • Seattle (WA)

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Summary of Solar Program Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	CLOSING DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Component and Pilot Scale Production: Solar Energy Grid Integration Systems	January 21, 2008	Up to $24 M over 3 years	To perform exploratory R&D targeting dramatic improvements in inverters and energy management technologies for solar electricity production.	The Solar Program released this FOA on November 28, 2007, which will provide up to $6.25 M per year for 3 years. There will be up to fourteen Phase 1 recipients in FY 2008. Applications are due on January 10, 2008, and decisions are expected by mid March 2008.
Solar America Showcases	March 12, 2008	Technical assistance only	The first Solar America Showcases Notice of Technical Assistance (NOTA) was well received and the Solar Program released a similar NOTA. To receive technical assistance for a Solar America Showcase, the project must be a large-scale (>100 kW), high-visibility solar installation that uses a novel solar technology, a novel application for a solar technology, and replicable components.	Applications received and currently under review. Decisions expected in April 2008.
FOA OR SOLICITATION	CLOSING DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Component and Pilot Scale Production: PV Module Incubators-Round 2	April 18, 2008	$3 M per award	Projects focused on solving technical challenges that must be overcome to scale-up manufacturing and commercialize new products by 2010-2011 and shortening the timeline for companies to transition pre-commercial PV technologies into full-scale manufacturing. PV Incubator is led by the National Renewable Energy Laboratory.	LOI released: March 3, 2008 Technical Questions Due: March 24, 2008 Responses due: April 18, 2008 Responses reviewed: April 25-June 11, 2008 Selections announced: August 2008 Awards made: Late-August, 2008
Solar America Showcases	June 12, 2008	Technical assistance only	The Solar America Showcases Notice of Technical Assistance (NOTA) was well received and the Solar Program plans to release a similar NOTA. To receive technical assistance for a Solar America Showcase, the project must be a large-scale (>100 kW), high-visibility solar installation that uses a novel solar technology, a novel application for a solar technology, and replicable components.	Notice of Technical Assistance currently open, see: http://e-center.doe.gov/iips/faopor.nsf/8373d2fc6d83b66685256452007963f5/c21e8d152fceb9e1852573b8007c40a8?OpenDocument.

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Summary of Solar Program Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	RELEASE DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Concentrating Solar Power: Advanced High Temperature Storage Solicitation	FY 2008	$18 M over 3 years	Two topic areas are of interest for this solicitation to support CSP technologies: (1) advanced high temperature heat transfer fluids (HTF) with an objective to identify and characterize novel fluids or fluid types that possess the physical and chemical properties required for an improved HTF and thermal storage fluid for CSP technologies; and (2) novel concepts for high temperature thermal energy storage (TES) with an objective is to generate and evaluate novel concepts for TES that have potential to reduce the cost of TES to less than $15/kWhthermal and achieve round trip efficiencies greater than 93%.	Funding has been appropriated. The solicitation notice is in review and release of the announcement is anticipated in April 2008.
PV Supply Chain	FY 2008	TBD by appropriations	The PV Supply Chain solicitation will address the grid parity goals of SAI by developing subsystem components, materials, or processes that can be supplied across the industry to reduce cost, enhance performance, or extend lifetime over today's technology.	
Minority University Research Associates	FY 2008	TBD by appropriations	DOE plans to provide support to attract and encourage qualified science, engineering, and business minority undergraduate and graduate students to pursue advanced degrees and careers in science and technology by providing scientific and technical R&D opportunties in solar energy technologies. Will solicit applications from accredited universities and colleges defined as Minority Serving Institutions.	

SOLAR EVENTS CALENDAR

APRIL '08

PV Technology and Investor Conference
April 2-4, 2008, Munich, Germany
www.photon-expo.com

4th International Congress on Energy Efficiency and Renewable Energy Sources
April 7-10, 2008, Sofia, Bulgaria
www.viaexpo.com/congress-ee-vei/eng/congress.php

Solar, Wind & Earth Energy Trade Fair 2008
April 8-10, 2008, Gwangju, Korea
www.sweet.or.kr

Solar America Cities 1st Annual Meeting
April 14-16, Tucson, AZ
www1.eere.energy.gov/solar/solar_america/sac_meeting.html

Northwest Solar Expo 2008
April 16 -20, 2008, Portland, OR
www.nwsolarexpo.com/

Organic Photovoltaics 2008
April 21-23, 2008, Philadelphia, PA
intertechpira.com/alternativeenergy

MAY '08

SOLAR 2008 -
The National Solar Energy Conference
May 3-8, 2008, San Diego, CA
www.ases.org/solar2008/

Semicon Singapore 2008
May 5-7, 2008, Singapore
www.semiconsingapore.org

SNEC 2nd International
Solar and PV Conference
May 10-12, 2008, Shanghai, China
www.snec.org.cn/

33rd IEEE Photovoltaic
Specialists Conference
May 11-16, 2008, San Diego, CA
www.33pvsc.org/public

International Green Energy Expo Korea 2008
May 21-23, 2008, Daegu, Korea
www.energyexpo.co.kr/eng

Solar Innovations & Investment Summit
May 21-23, 2008, London, UK
www.greenpowerconferences.com/renewablesmarkets/sii_london.html

Energethica 2008
May 22-24, 2008, Genoa, Italy
www.emtrad.it *(not in English)*

4th European PV Hybrid
and Minigrid Conference
May 29-30th, 2008, Athens, Greece
www.otti.de/kolleg.htm

JUNE '08:

Solar Taiwan 2008
June 11-13, 2008, Taipei, Taiwan
www.optotaiwan.com

Intersolar 2008
June 12-14, 2008, Munich, Germany
www.intersolar.de

Photovoltaics Summit 2008
June 18-20, 2008, San Diego, CA
intertechpira.com/alternativeenergy

JULY '08:

Intersolar North America 2008
July 15-17, 2008, San Francisco, CA
www.intersolar.us

World Renewable Energy Congress X
and Exhibition
July 19-25, 2008, Glasgow, UK
www.wrenuk.co.uk

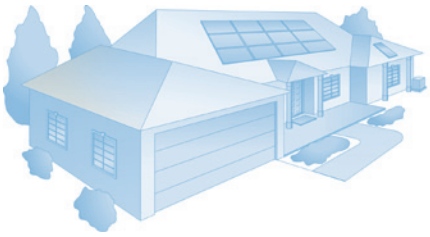
PV Japan 2008
July 30 - Aug 1, 2008, Tokyo, Japan
www.pvjapan2008.org

SEPTEMBER '08:

23rd European Photovoltaic Solar Energy Conference and Exhibition
Sept 1 - 5, 2008 , FERIA VALENCIA Convention & Exhibition Centre, Valencia, Spain
www.photovoltaic-conference.com

WE WANT TO HEAR FROM YOU

This *DOE Solar Energy Technologies Program Newsletter* is for you—the participants and stakeholders in the DOE Solar Program and the Solar America Initiative. We envision sending this newsletter every quarter. If you have any comments or suggestions about the frequency or content of the newsletter, please e-mail solar@ee.doe.gov.



A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

For more information contact:

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