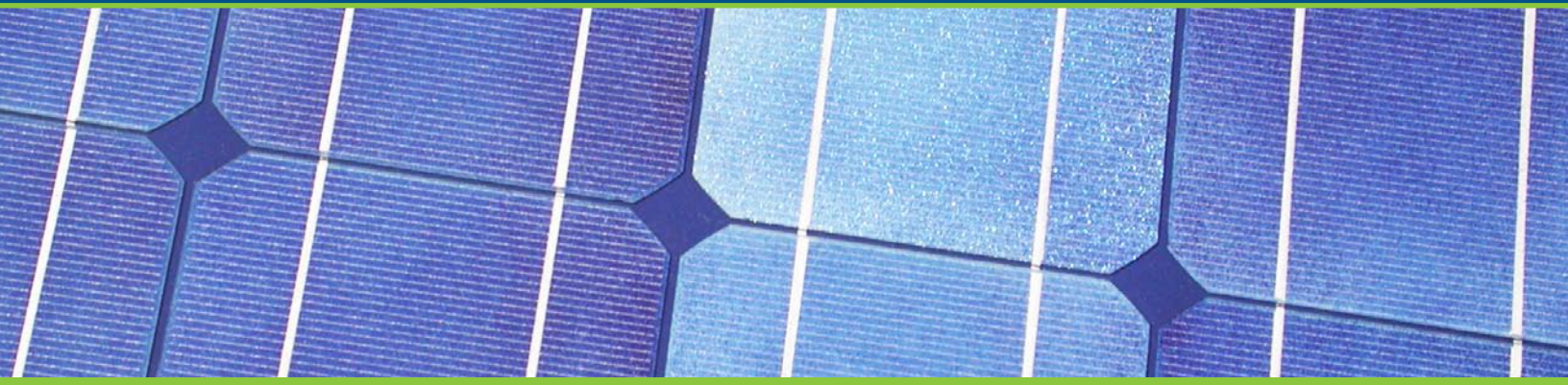


SOLAR ENERGY TECHNOLOGIES PROGRAM NEWSLETTER

Solar Program Status and Updates

Beyond the Lab: Solar Program Support for Early Stage Market Penetration

The Solar Energy Technologies Program (SETP) has spent the past several months expanding our concentrating solar power (CSP) and photovoltaic (PV) technologies programs. Building on the initial progress of the Solar America Initiative (SAI), we are continuing to aggressively support innovative research while accelerating the rate of deployment for proven CSP and PV technologies by supporting market transformation activities. The programs are growing more robust to reach the priorities and goals of the SAI. These programs include:

- **Technology Pathway Partnerships** – to reduce the full system costs of new product designs targeted at residential, commercial, and utility markets by funding the development of low-cost manufacturing processes and new technology;
- **Solar Incubators** – to address the challenges faced by small businesses in taking proof-of-concept technologies to pilot and full-scale manufacturing;
- **Solar America Cities** – to assist municipalities with policy and technical issues as communities increase their usage of CSP and PV energy;
- **Solar America Showcases** – to accelerate demand for solar technologies among key end-use market sectors by supporting large-scale, high-visibility projects;
- **Education, Training, and Certification** – to provide national coordination of the development of training curricula, and consistent accreditation and certification requirements for PV installers;
- **University Process and Product Development Support** – to assist the efficient transition of PV technology from laboratory to marketplace by supporting universities so they may leverage their knowledge and offer guidance to industry;
- **Future Generation PV Device and Processes** – to support the development of long-term technological advances through exploratory R&D.

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

OCTOBER 2007

Solar Program Status & Updates

Technology Development

Market Transformation

News & Updates

To complement the on-going programs, researchers at the National Renewable Energy Laboratory (NREL) have drafted a first set of PV Technology Roadmaps for the solar community. We are seeking to improve these Roadmaps with inputs from industry and universities. We are also working with the Solar Energy Industries Association (SEIA) to develop an updated Industry Roadmap that will serve as an important tool for players in the quickly evolving solar market.

The SETP program will host a feature event – the Solar Decathlon – in Washington, D.C. from October 12-20, 2007. The Solar Decathlon is held once every two years on the National Mall to highlight energy efficiency and solar energy technologies, and to encourage young people to pursue careers in science and engineering. Twenty university teams will compete against one another to design, build, and operate the most attractive and energy-efficient solar-powered house. For more information, please visit the Solar Decathlon website: www.solardecathlon.org.

Technology Development

Solar Energy Technology Program Develops Technology Roadmaps to Define Paths for Photovoltaic R&D and Determine Research Planning at the National Labs

Historically, NREL and Sandia National Laboratory (Sandia) have been home to the largest PV research program in the United States. As today's global PV industry grows to more $10 billion in sales and private investment in R&D measuring in the hundreds of millions of dollars, the scale of private investment is outpacing federal investment. In response to this and to the fact that the global PV industry doubling every two years, SETP has established the Technology Roadmaps as a means by which it, and industry, can assess and guide the progress of PV R&D.

The Roadmaps cover the following ten PV R&D areas: Wafer-Silicon, Thin Film Silicon, Copper Indium Gallium Diselenide (CIGS), Cadmium Telluride (CdTe), Concentrating Photovoltaics, Organic Photovoltaics, Sensitized Cell Photovoltaics, Multiple-Exciton-Generation Photovoltaics, Intermediate-Band Photovoltaics, and Nano-Architecture Photovoltaics. Each Roadmap defines metrics for measuring its technology's current status and estimating its future potential and defines the R&D needed to reach that potential. The first drafts of the Technology Roadmaps can be found at http://www1.eere.energy.gov/solar/solar_america/planning.html. Public input can be sent to the contacts listed on the website or offered at the Annual Solar Program Review Meeting in March 2008.

The Roadmaps are focused on the rapidly changing needs of the industry. The first Roadmaps were drafted in 2007 by researchers at NREL with informal input from industry and university participants; DOE plans to update them every two years with formal input from relevant industry players. This bi-annual review of R&D goals will allow NREL and Sandia to operate with greater flexibility and dynamism in responding to the needs of a rapidly changing industry, providing the national labs with relevant metrics and near-term goals. These Roadmaps will also serve as a yardstick for industry to measure its progress.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

NREL Supports Field-Testing of SEGS Heat-Collection Elements

NREL has provided significant support to FPL Energy, owner of seven parabolic trough Solar Electric Generating Stations (SEGS) in southern California, and to SunRay Energy, owner of two SEGS, for the temperature measurement of heat-collection elements (HCEs). Almost 100,000 HCEs have been imaged and characterized using a measurement system developed at NREL in FY 2007. The system measures the thermal insulation of receivers and allows assessment of methods for in-situ restoration of receiver performance. NREL has trained FPL personnel to perform the tests on their own. The nine SEGS have a combined 354 MW installed capacity, making them the largest solar installation of any kind in the world.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

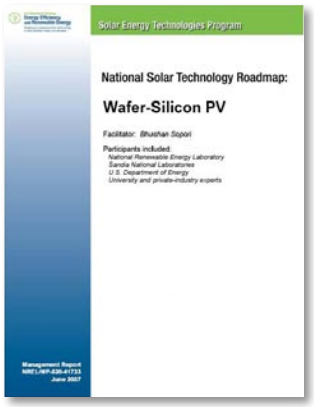
DOE/NREL Sponsor the "REAP 2007" Conference

DOE/NREL sponsored the Minority University Research Associate (MURA) Program's 2007 Renewable Energy Academic Partnership (REAP) Conference and Review Meeting. REAP was held in Newark, DE, on August 20-22 in conjunction with the "Sustainable Energy from Solar Hydrogen" National Science Foundation (NSF) Integrative Graduate Education Research Training Program (IGERT) Workshop at the University of Delaware. Participation included undergraduate and graduate students, along with faculty, from eight MURA Program Universities and the University of Delaware's NSF/IGERT program. Participants presented more than 30 talks and 20 posters that described their research involving various renewable technologies. In addition to the technical sessions, the conference included a professional development workshop, as well as invited talks from NREL, university, and industry leaders.

DOE SETP is currently using the Technology Roadmaps to make funding decisions for Fiscal Year 2008 in the PV R&D programs at NREL and Sandia National Laboratories. The Roadmaps have also generated ideas for research that could be jointly funded by industry partners via Cooperative Research and Development Agreements (CRADA's). With the industry changing so rapidly, the Roadmaps are enabling the program to operate with greater dynamism and flexibility. NREL and Sandia staff collected their best ideas to respond to the needs outlined in the Roadmaps, and prepared proposals of work they could do with various levels of funding. NREL, Sandia, and DOE management reviewed the proposals and selected those with the most promise of helping make the solar industry successful in the coming years. External reviewers will be used in the future to bring the wisdom of the larger solar community into this process. The use of the Technology Roadmaps together with the competitive planning process will greatly enhance the SETP.

Figure1. PV Wafer Silicon Roadmap Metrics & PV Roadmap Cover

Parameter	Present Status (2007)
Polysilicon Cost	$45-$60/kg
Wire Sawing Cost	$0.25/W
Wafer Size	~ 250 cm^2
Wafer Thickness	200-250 µm
Volume Manufacturing	100-200 MW/yr plants
Automation	Partial
Efficiency - Best Lab Cells	25%
Efficiency - Commercial Module	12%-18%
Module Manufacturing Cost	$2/W (at $30/kg)



CSP Deployment: DOE Plans and Market Development

Despite the high initial costs presently associated with CSP technology, plants are being developed in the U.S. and abroad, due in part to DOE's financial and technological support of this burgeoning industry. At present, DOE is reviewing applications submitted for the Concentrating Solar Power FOA (see Figure 2), with the decision helping to shape the Solar Program's CSP direction. Additionally, DOE is providing technical support to the Joint Development Group – a consortium of utilities in the Southwestern United States working to determine how to best utilize power from CSP. The past two years brought about the construction and activation of two new parabolic trough solar power plants in the Southwest. A 1 megawatt (MW) solar trough plant, Arizona's first and the first built in the U.S. in 18 years, came online in April 2006 in Red Rock. The second plant, Nevada Solar One in Boulder City, is the third largest CSP plant in the world with 64 MW, began operating in June 2007 with the sale of all electricity to Nevada Power Company and Sierra Pacific Power Company. As much as 4,000 MW of additional CSP projects are currently proposed or under development in the U.S. Southwest. Furthermore, Pacific Gas & Electric recently announced the signing of a 25-year power purchase agreement to buy the electricity produced from the proposed $2 billion, 553-MW Mojave Solar Park.

Aerial photo of Acciona's Nevada Solar One, a 64-MW parabolic trough power plant near Las Vegas, NV, that covers 280 acres (photo credit: Acciona Solar Power).

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Receiver Heat-Loss Tests Completed

NREL completed receiver heat-loss tests on Solel and Schott heat-collection elements delivered in FY 2007 for testing. Researchers used a receiver test facility developed in FY 2006. Heat loss from receiver tubes was measured over a wide temperature range. A paper detailing the results of the tests was delivered to DOE as a 3rd-quarter Joule milestone.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

SAM Now Includes Detailed Parabolic Trough Model

A detailed parabolic trough performance, cost, and finance model has been integrated into the Solar Advisor Model (SAM), a comprehensive solar technology systems analysis model accessible at www.nrel.gov/analysis/sam/. The trough model, which includes a storage option, has found use from developers and due-diligence firms. Dish/Stirling-engine system modeling is nearing completion and will be integrated into SAM in FY 2008. NREL is also working with a university partner and industry to develop one or more central receiver models to be integrated into SAM in FY 2008 or 2009.

Projects assisted by DOE are also influencing the international CSP market, where installations are on the rise as well. The DOE-supported Solar One and Solar Two power tower projects, built in the 1980s and 1990s respectively, in the U.S. are the conceptual models for the 17-MW Solar Tres power tower in the Andalusia region of Spain. It will be the first commercial molten-salt central receiver plant in the world and will have a 15-hour molten-salt thermal storage system. Elsewhere in Spain, operation began in Seville earlier this year at the PS10 plant, an 11-MW, 115-meter high power tower surrounded by 624 moveable mirrors used to concentrate the sun's rays; and construction is underway in the province of Granada to build AndaSol 1 & 2, both 50-MW trough plants with a 7½-hour molten-salt thermal-storage system. Likewise in North Africa and Israel, CSP plants, and markets for CSP plants, are under various stages of development. They include: Israel's 150-MW trough plant in the Negev desert; Egypt's 150-MW trough plant in Kuraymat; Mexico's 30-MW trough plant in the Sonora region; and a South African power tower with molten-salt thermal-storage.

Preliminary Grid Integration Study Results Delivered

The SETP Grid/Building Integration Program has received interim results in the form of more than 100 specific objectives from the Renewable Systems Interconnection (RSI) study. An outgrowth of the Solar America Initiative (SAI), the RSI study was created to address the technical, regulatory, and business issues related to interconnection that have the potential to limit the market uptake of distributed PV and other renewable technologies.

The study was catalyzed by the recognition that the deployment of PV is occurring at a far more rapid rate than previously anticipated in some regions of the country. This accelerated deployment of distributed electricity sources that will be feeding power back into the grid has the potential to create problems on the distribution system, a system that was designed for unidirectional rather than bidirectional flow of power.

DOE has brought together a team of industry experts for the study. When completed, it will consist of 14 individual reports that address issues related to distributed systems technology development, advanced distribution systems integration, system level tests and demonstrations, technical and market analysis, and resource assessment. Given that integration-related issues are likely to emerge first for PV technology, the RSI study focuses primarily on distributed PV. The combined efforts of the 14-report RSI have yielded a number of objectives, which include improved stand-alone capabilities of distributed PV with storage capabilities; development and validation of remote monitoring and dispatch control platforms (e.g., software, sensors); establishment of grid infrastructure design and operation requirements for local and regional grids; and development of new solar resource forecasting capabilities for short- and long-term system planning and cash flow analyses. The final study results are scheduled to be delivered in December 2007. From these findings, the Grid/Building Integration Program is developing a Multi-year Research Plan which will coordinate efforts among DOE and key states. The Executive Summary of the report can be accessed on the SETP website at: http://www1.eere.energy.gov/solar/pdfs/rsi.pdf.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

2007 Parabolic Trough Workshop Hosted by NREL

The 2007 Parabolic Trough Technology Workshop was hosted by NREL on March 8-9 in Golden, Colorado. NREL worked closely with DLR, the German Aerospace Center, to organize this workshop whose purpose was to: (1) exchange technical information, (2) collaborate on SolarPACES projects relating to receiver testing and dry cooling, and (3) gather industry input on laboratory R&D directions. Nearly 150 people attended, with representatives from the national laboratories, universities, manufacturing companies, major Southwestern utilities and developers, finance firms, and consultants in the solar community. This attendance is a fivefold increase in participation over previous years. The workshop featured presentations on the following parabolic trough power plant topics: current and future market vision, project developments, solar resource assessment, technology trends, molten-salt heat-transfer fluids, direct steam generation, and advanced tools and testing capabilities. Presentations and poster session material can be found at www.nrel.gov/csp/troughnet/wkshp_2007.html.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

National Academy of Sciences Study

The SETP presented at the National Academy of Sciences for a study of electricity generation from renewable technologies on September 18, 2007. All of DOE's EERE programs are taking part in the review, titled "America's Energy Future: Panel on Electric Power Generation from Renewable Energy Sources." This was the first meeting of the on-going study.

Market Transformation

Solar America Cities Update

Announced in June 2007, the Solar America Cities awards were given to 13 cities who have committed to achieving a sustainable solar infrastructure through a comprehensive, city-wide approach that facilitates mainstream adoption of solar energy. DOE is providing a total of $2.6 million in financial assistance to the Cities program, in addition to approximately $3.25 million in technical assistance that is being provided by Tiger Teams led by NREL, Sandia, the Florida Solar Energy Center and New Mexico State University.

To learn more about the unique challenges and technical assistance needs of the awardees, DOE officials visited with participants and interested stakeholders in all 13 cities. All cities showed tremendous enthusiasm in pulling together a diverse set of motivated stakeholders and partners who will actively work on implementing the Solar America Cities activities. The cities also showed a strong interest in setting up collaborative networks with other cities to share best practices and lessons learned. Currently, DOE is working to facilitate collaboration between cities and deploy Tiger Team technical assistance. In 2008, DOE will award another 8-12 cities, bringing the total number of Solar America Cities to roughly 21-25.

Solar America Board of Codes and Standards (Solar ABCs) Update

The Solar ABCs held its first stakeholder meeting at the end of the Solar Power 2007 conference in Long Beach, CA. More than 200 people participated in this initial meeting. Led by 13 Steering Committee member organizations, the Solar ABCs will identify current issues, establish a dialogue among key stakeholders, and catalyze appropriate activities to support the development of codes and standards that facilitate the installation of high quality, safe PV systems. Interested stakeholders are encouraged to participate in and provide input to any of the Solar ABCs'10 panels through stakeholder meetings and discussion forums on the Solar ABCs website at: http://www.SolarABCs.org. A quarterly Solar ABCs newsletter will report on panel activities and list opportunities for involvement in future activities. For more information on how you can become involved, please contact Solar ABCs Project Administrator Larry Sherwood at larry@sherwoodassociates.com.

State and Utility Technical Outreach Update

As part of DOE's outreach to state legislators, the National Council of State Legislatures is hosting a two-day Solar Energy Institute in conjunction with the Solar Decathlon. The Institute is an opportunity for interested state legislators to learn more about the current status of solar technology and policy within the U.S. Through state policies, state legislators can influence the market uptake of solar technologies, as well as other energy efficient and renewable energy technologies.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

TroughNet Website Focuses on Parabolic Trough Issues

TroughNet is a technical resource for evaluating parabolic trough solar power plant technologies. The TroughNet website at www.nrel.gov/csp/troughnet/ provides up-to-date information in the following areas:

- Technologies—solar fields, thermal energy storage, and power plant systems.
- Market and economic assessment—market overview; solar resource assessment and siting; cost reduction opportunities; financing, incentives and barriers; economic and environmental benefits; and market development and deployment initiatives.
- Research and development—in the areas of solar fields, thermal energy storage and heat-transfer fluid, and power plant technologies.
- Data resources—including industry partners; U.S. power plant data; solar data, models and tools; and system and component testing.
- FAQs, workshops, and publications—answers to common questions, information on upcoming workshops and material from past workshops, and a guide to selected documents.

You can subscribe at www.nrel.gov/csp/troughnet/subscribe.html to receive updates when new information is added to the site.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Thermal-Storage Plan Developed

NREL and Sandia, with support from industry, have developed a thermal-storage development plan, which was delivered to DOE as a 1st-quarter Joule milestone. The report provides a detailed plan for developing thermal-storage systems for parabolic trough systems. It also describes the market conditions that would contribute to the successful penetration of concentrating solar power in baseload markets.

Figure 2. Summary of Solar Program R&D 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 Assocation of Regulatory Utility Commissioners (DC) • National Conference of State Legislatures (CO)
Market Transformation: Solar America Showcases (SAS)	October 11, 2006	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)

Continued on following page

Summary of Solar Program R&D Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	AWARD DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
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)
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)
FOA OR SOLICITATION	CLOSING DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Device and Process Proof of Concept: Future Generation PV Device and Processes	April 5, 2007	Up to $4M per year 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.	Applications were received. In Merit Review process, decisions expected by late October 2007.
Concentrating Solar Power Funding Opportunity Announcement	May 24, 2007	$10M–$20M over 2 years	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.	Applications were received. In Merit Review process, decisions expected by late October 2007.
FOA OR SOLICITATION	CLOSING DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Systems Development and Manufacturing: University Product and Process Development Support	October 16, 2007	Up to $30M 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.	

Continued on following page

Summary of Solar Program R&D Funding Opportunities, *Continued*

CLOSED PENDING OPEN PROPOSED

FOA OR SOLICITATION	RELEASE DATE	FUNDING AMOUNT	DESCRIPTION	STATUS
Component and Pilot Scale Production: Solar Energy Grid Integration Systems	Fall 2007	$20M–$25M over 3 years	'To perform exploratory R&D targeting dramatic improvements in inverters and energy management technologies for solar electricity production.	The Solar Program is scheduled to release this FOA in early October 2007, which will provide up to $6-$8 million per year for 3 years. There will be up to fourteen Phase 1 recipients in FY08. The FOA will close 60 business days after it is released.
Component and Pilot Scale Production: PV Module Incubators	FY 2008	TBD by appropriations	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.	
Solar America Cities	FY 2008	TBD by appropriations	Building on the success of the initial Solar America Cities FOA, the Solar Program plans to issue a similar FOA to allow more cities to participate. This initiative may select up to 10 cities for awards. Solar America Cities are recognized as partners who are highly committed to solar technology adoption at the local level.	
Solar America Showcases	FY 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.	
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 opportunities in solar energy technologies. Will solicit applications from accredited universities and colleges defined as Minority Serving Institutions.	

News & Updates

The Solar Program Welcomes New Additions

Three new members have recently joined the SETP: Kevin Lynn, a senior PV Engineer contractor with Sentech, Inc., and two 2007 Presidential Management Fellows, Hannah Muller and Katie Bolcar.

Before joining SETP, **Kevin Lynn** was a Senior Research Engineer at the Florida Solar Energy Center and the principal investigator at the Southeast Regional Experiment Station (SERES), a project with the Department of Energy focused on PV system research. This work included developing training materials for installers and code officials, working with builders, and testing the performance of PV modules and inverters. Kevin has a MS in Mathematics and Materials Science, with his graduate work focused on developing novel methods of manufacturing Copper Indium Diselenide (CIS) solar cells. Kevin will be working on coordinating technical assistance for the Solar America Cities and Solar Showcase programs, as well as providing support on training and solar codes and standards.

Hannah Muller has joined SETP as an Energy Technology Program Specialist. Hannah earned her Master's in Environmental Policy from the Bren School of Environmental Science and Management at UC Santa Barbara and will use her experience with local climate change initiatives and environmental planning to enhance the technical outreach efforts of the Market Transformation team.

Katie Bolcar graduated from Duke University with a joint Master in Public Policy and Environmental Management, where she focused on energy policy including climate change, international development, and electricity markets. As part of the SETP Market Transformation group, she will be leading the Education, Training, and Certification activities as well as assisting in other areas.

(top) Craig Cornelius, Acting SETP Program Manager at Solar Power Conference. (bottom left) Attendees at the 22nd EU PVSEC in Milan, Italy. (bottom right) Some of the residential scale inverters on display at EU PVSEC

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

Solar Power 2007 Conference

More than 12,000 people participated in this year's Solar Power Conference in Long Beach, California on September 24-27. Craig Cornelius, DOE's Solar Program Manager, led a delegation that participated in a range of discussions. Presentations from DOE such as, "Update from Washington: The Federal Solar Policy Landscape," and "DOE Solar Programs: What's Hot, What's Next," gave audiences details on how program funds are being allocated, as well as how the program is geared to address the near-term challenges in solar energy.

NATIONAL LABORATORY TECHNOLOGY DEVELOPMENTS & DOE NEWS

22nd EU PVSEC in Milan, Italy

The 22nd European Photovoltaic Solar Energy Conference and Exhibition took place in Milan, Italy during the first week of September. Representatives from the national labs and SETP joined other global leaders in PV at the conference to gain perspective on how the global market is evolving, in addition to participating in discussions on the technical issues facing the industry.

Event Spotlight: Solar Decathlon

October 12-20, 2007, on the National Mall, Washington, D.C.

The third Solar Decathlon competition (www.solardecathlon.org) will be taking place October 12-20 on the National Mall in Washington, D.C. There will be 20 college teams participating in the competition: 16 teams from 13 states and four teams representing Canada, Germany, Puerto Rico, and Spain. The competition challenges each team to design, build, and operate a house that will be judged on effective utilization of solar energy, energy efficiency, practicality, and aesthetics. During each of the past two Solar Decathlons, more than 100,000 visitors flocked to the National Mall to visit the "solar village."

Opening Ceremony

FRIDAY, OCTOBER 12, 10AM-11AM

- Master of Ceremonies, *Assistant Secretary, Alexander Karsner*
- Welcome, *Secretary of Energy Samuel W. Bodman*
- Introduction of Solar Decathlon Teams
- Ribbon Cutting
- Tour of Homes

Consumer Workshops

The U.S. DOE and other event sponsors are offering solar energy and energy efficiency workshops for consumers:

- WEEKENDS:
  10:00AM
  11:30AM
  1:00PM
  2:30PM
  4:00PM
- WEEKDAYS *(except Oct. 18)*:
  10:00AM
  11:30AM
  1:00PM
  2:30PM

Building Industry Day

THURSDAY, OCTOBER 18

Workshops for the building industry will be offered at:

9:00AM Solar Applications for Homes *(John Quale, ASHRAE)*

10:00AM Enabling Solar Energy *(Audey Korpus, Xantrex)*

11:00AM Creating Differentiation in a Cooled Housing Market *(Charlie Popeck, Honeywell)*

12:00PM Introduction to the National Green Building Program *(NAHB)*

1:00PM Zero Energy Homes *(Jeff Christian, DOE)*

2:00PM Strategies for Successful Green Homebuilding *(Jay Hall, USGBC)*

3:00PM Solar Hot Water System Performance *(Duncan Prahl, DOE)*

4:00PM Solar for Builders *(Paul Garvison, BP)*

5:00PM Presolarizing: What To Do Before You Innovate *(Dana Bres, PATH)*

The U.S. DOE and other sponsors will also be presenting an "Ask the Experts" panel from 9AM-5PM to answer questions on green buildings.

Winner Announced

FRIDAY, OCTOBER 19, 2PM

Scenes from the 2005 Solar Decathlon. View the map and event schedule on the following page.

Contests and Scoring

The Decathlon consists of 10 contests, which all have their own point values that make up a raw score to determine the winning college/university.

- Architecture – 200 points
- Engineering – 150 points
- Market Viability – 150 points
- Communications – 100 points
- Comfort Zone – 100 points
- Appliances – 100 points
- Hot Water – 100 points
- Lighting – 100 points
- Energy Balance – 100 points
- Getting Around – 100 points

Figure 3. Solar Decathloon Map

Figure 4. Solar Decathlon Schedule

2007 SOLAR DECATHLON SCHEDULE

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
This is a preliminary schedule and is subject to change.		Oct 2 (Day 0) REGISTRATION (4 p.m. – 8 p.m.) ALL-TEAM MEETING (6 p.m. – 8:30 p.m.)	Oct 3 (Day1) ASSEMBLY (24 hours; Start at 12:01 a.m.)	Oct 4 (Day 2) ASSEMBLY (24 hours)	Oct 5 (Day 3) ASSEMBLY (24 hours)	Oct 6 (Day 4) ASSEMBLY (24 hours)
Oct 7 (Day 5) REST DAY (Use of heavy machinery prohibited during designated hours, but quiet, light work may continue) (24 hours)	Oct 8 (Day 6) ASSEMBLY (24 hours) "SOLAR-ONLY" BEGINS (7 a.m.)	Oct 9 (Day 7) ASSEMBLY (24 hours)	Oct 10 (Day 8) ASSEMBLY (24 hours)	Oct 11 (Day 9) ASSEMBLY (midnight – 7 a.m.) FINISH WORK and COMMISSIONING (7 a.m. – 4:30 p.m. and 6:30 p.m. – midnight) OPENING CEREMONY DRESS REHEARSAL (1 p.m.) SPONSOR TOURS & MEDIA OPEN HOUSE (5 p.m. – 6:30 p.m.)	Oct 12 (Day 10) FINISH WORK and COMMISSIONING (midnight – 9 a.m.) OPENING CEREMONY (10 a.m. – 11 a.m.) PUBLIC and VIP TOURS (11 a.m. – 3 p.m.) COMMISSIONING (3 p.m. – 7 p.m.) IMPOUND (7 p.m. – midnight)	Oct 13 (Day 11) IMPOUND (midnight – 7 a.m.) CONTESTS (8 a.m. – 6 p.m.) PUBLIC TOURS (10 a.m. – 5 p.m.) IMPOUND (7 p.m. – midnight)
Oct 14 (Day 12) IMPOUND (midnight – 7 a.m.) CONTESTS (8 a.m. – 6 p.m.) PUBLIC TOURS and WORKSHOPS (10 a.m. – 5 p.m.) IMPOUND (10 p.m. – midnight)	Oct 15 (Day 13) IMPOUND (midnight – 7 a.m.) CONTESTS (8 a.m. – midnight) ARCHITECTURE AWARDS (10 a.m.) PUBLIC TOURS and WORKSHOPS (11 a.m. – 3 p.m.) IMPOUND (10 p.m. – midnight)	Oct 16 (Day 14) IMPOUND (midnight – 7 a.m.) CONTESTS (24 hours) COMMUNICATIONS AWARDS (10 a.m.) PUBLIC TOURS and WORKSHOPS (11 a.m. – 3 p.m.) IMPOUND (10 p.m. – midnight)	Oct 17 (Day 15) IMPOUND (midnight – 7 a.m.) CONTESTS (24 hours) LIGHTING AWARDS (10 a.m.) WORKSHOPS ONLY (No public tours) (11 a.m. – 3 p.m.) IMPOUND (10 p.m. – midnight)	Oct 18 (Day 16) IMPOUND (midnight – 7 a.m.) CONTESTS (24 hours) AWARDS CEREMONY REHEARSAL (10 a.m.) MARKET VIABILITY AWARDS (10 a.m.) PUBLIC TOURS and BUILDING INDUSTRY DAY (Workshops for building industry only) (9 a.m. – 6 p.m.) IMPOUND (10 p.m. – midnight)	Oct 19 (Day 17) IMPOUND (midnight – 7 a.m.) CONTESTS (8 a.m. – 11:00 a.m.) ENGINEERING AWARDS (2:00 p.m.) PUBLIC TOURS ONLY (No workshops) (11 a.m. – 3 p.m.) AWARDS CEREMONY (2 p.m. – 2:30 p.m.) IMPOUND (10 p.m. – midnight)	Oct 20 (Day 18) IMPOUND (midnight – 7 a.m.) PUBLIC TOURS and WORKSHOPS (10 a.m. – 5 p.m.) "SOLAR-ONLY" ENDS (6 p.m.) VICTORY RECEPTION and IMPOUND (7 p.m. – 10 p.m.) DISASSEMBLY (10 p.m. – midnight)
Oct 21 (Day 19) DISASSEMBLY (24 hours)	Oct 22 (Day 20) DISASSEMBLY (24 hours)	Phase I - Unrestricted Assembly: Day 1, 12:01 a.m. – Day 6, 7:00 a.m. All power sources are permitted, provided they comply with the Solar Decathlon Rules and Regulations. Phase II – Restricted Assembly: Day 6, 7:00 a.m. (beginning of "Solar Only" – Day 9, 7:00 a.m. Same as Phase I except that only the house power system (including solar thermal) can be used to charge house battery, mechanical, and thermal mass systems. Note: The Organizers will deliver water to the teams' designated tanks early in Phase II. Phase III – Commissioning and Contests: Day 9, 7:00 a.m. – Day 18, 6:00 p.m. (end of "Solar Only") The use of power sources that are not considered part of the house power system (including solar thermal) is prohibited. Phase IV – Disassembly: Day 18, 6:00 p.m. –Day 21, 12:00 a.m. (*Disassembly does not continue into Day 21*) Same as Phase I.				

SOLAR EVENTS CALENDAR

Semicon Europa 2007
October 9-11, 2007: Stuttgart, Germany
www.semi.org/semiconeuropa

Photovoltaic Forum & Exposition Taiwan 2007
October 11-12, 2007: Taipei, Taiwan
www.taipeitradeshows.com.tw/pv

2007 Solar Decathlon
October 12 -20, 2007: Washington, DC
www.solardecathlon.org

Solar Energy Asia 2007
October 16-19, 2007: Singapore
www.terrapinn.com/2007/solar/

Southeast Solar Summit
October 24-25, 2007: Oak Ridge, TN
www.ornl.gov/sci/solarsummit/

Solar Industry Conference 2007
October 24-25, 2007, Madrid, Spain
www.solarpraxis.de

The 2nd Annual Investing in Solar
October 29-30, 2007: Las Vegas, NV
www.frallc.com/conference.aspx?ccode=B544

The Concentrated Solar Power Summit
November 5-6, 2007: Seville, Spain
www.csptoday.com

Greenbuild 2007
November 7-9, 2007: Chicago, IL
www.greenbuildexpo.org

PVTech Expo 2007
November 11-15, 2007: Rome, Italy
www.pvtech.it

Energy Efficiency Global Forum and Exposition
November 11-14, 2007: Washington, DC
www.eeglobalforum.com

2007 Material Research (MRS) Fall Meeting
November 26-30, 2007: Boston, MA
www.mrs.org/meetings

PVSEC-17: 17th International Photovoltaic Science & Engineering Conference
December 3-7, 2007: Fukuoka, Japan
www.pvsec17.jp

Solar Silicon and PV Production Equipment Conference
January 15-16, 2008: Shenzhen, China
www.photon-expo.com

Int'l Renewable Energies Exhibition & Conference
February 17-21, 2008: Adelaide, SA, Australia
www.solarcitiescongress.com.au

Solar 2008
February 24-28, 2008: Cairo, Egypt
www.photoenergy.org

Washington Int'l Renewable Energy Conference
March 1-7.2008, Washington, DC
www.acore.org

23rd Photovoltaic Symposium
March 5-7, 2008: Bad Staffelstein, Germany
www.otti.de

Asia Solar Energy PV Exhibition and Forum
March 5-7, 2008: Shanghai, China
www.asiasolarexpo.com

DOE SOLAR WEB SITES

SOLAR:

Solar America Initiative:
www.eere.energy.gov/solar/solar_america

EERE Solar Energy Technologies Program:
www.eere.energy.gov/solar

NREL Solar Research: www.nrel.gov/solar

PHOTOVOLTAICS:

NREL PV Research: www.nrel.gov/pv

SNL PV Systems R&D: www.sandia.gov/pv

BNL PV Environmental, Health and Safety Assistance Center: www.pv.bnl.gov

ORNL Solar Technologies Program:
www.ornl.gov/sci/solar

PV Value Clearinghouse:
www.nrel.gov/analysis/pvclearinghouse/

CONCENTRATING SOLAR POWER:

NREL CSP Research: www.nrel.gov/csp

TroughNet: www.nrel.gov/csp/troughnet

BUILDINGS:

EERE Buildings Technologies Program: www.eere.energy.gov/buildings

NREL Buildings Research:
www.nrel.gov/buildings

Solar Decathlon:
www.solardecathlon.org

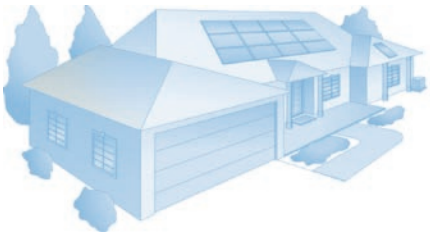
OTHER:

Golden Field Office:
www.eere.energy.gov/golden

Industry Interactive Procurement System (IIPS):
https://e-center.doe.gov/iips/faopor.nsf/ViewMenu?ReadForm

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:

EERE Information Center

1-877-EERE-INF (1-877-337-3463)

www.eere.energy.gov