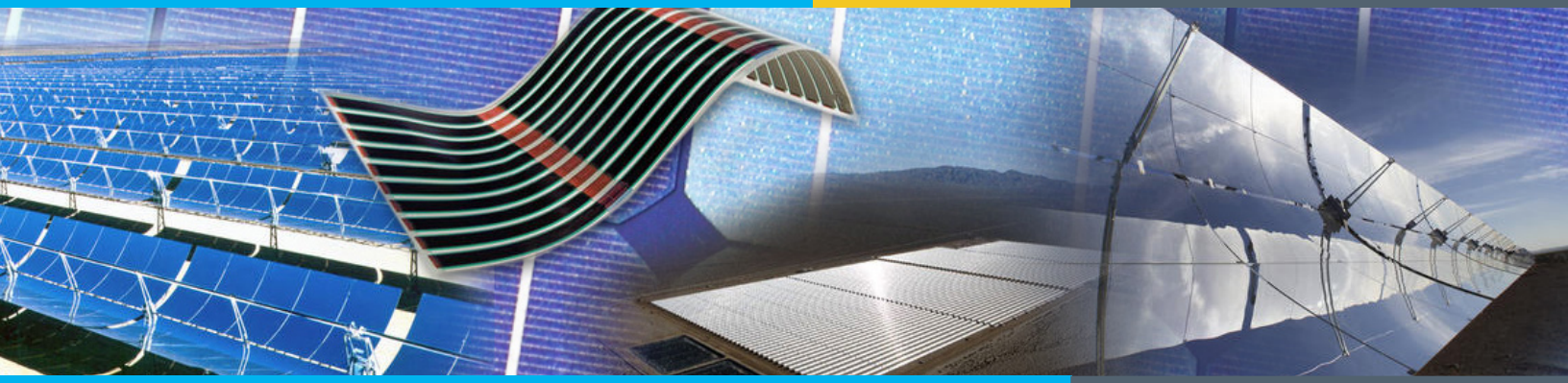

Solar Energy Technologies Program Newsletter

1ST QUARTER 2010

Proposed FY2011 Budget Includes 22% Increase for Solar Program

President Obama released his FY2011 budget request on February 1. The proposed budget includes $302.4 million for the Solar Energy Technologies Program (Solar Program), a 22% increase from FY2010. The investments are part of the Administration's focus on continuing to advance America's clean energy economy.

Areas of particular focus in the Solar Program budget include the advancement of domestic photovoltaic (PV) manufacturing; development of a new Concentrating Solar Power (CSP) demonstration program; increased CSP thermal storage research; and continued support of PV component reliability.

The FY2011 proposed Solar Program budget breakdown by program area is:

- **Photovoltaics:** $152 million
- **Concentrating Solar Power:** $98.2 million, *(includes $50 million for a CSP demonstration program)*
- **Systems Integration:** $30.7 million
- **Market Transformation:** $21.5 million.

Additional investments in the FY2011 budget that may help advance solar research and integration include: $144 million for research and development of the electricity transmission grid; a $5 billion expansion of the Advanced Manufacturing Tax Credit to support domestic manufacturing of clean energy technologies; an additional $500 million to support loan guarantees for innovative energy efficiency and renewable energy projects; and funding for programs to advance innovation and science, including Energy Innovation Hubs, Energy Frontier Research Centers, and Advanced Research Projects Agency – Energy.

For an overview of the President's FY2011 budget, visit www.whitehouse.gov/omb/budget/.

For more information about the Solar Program, visit www1.eere.energy.gov/solar/.

Program Happenings and Highlights

DOE Announces $12 Million to Support Early Stage Solar

U.S. Department of Energy Secretary Steven Chu announced on January 20 that DOE's National Renewable Energy Laboratory (NREL) will invest up to $12 million in total funding, including $10 million from the American Recovery and Reinvestment Act (Recovery Act), in four companies to support the development of early stage solar energy technologies to full commercial scale. The awards are part of NREL's PV Incubator Program.

Selected companies will work with NREL to transition prototype and pre-commercial PV technologies into pilot and full-scale manufacturing. Funding will be awarded in 18-month phased subcontracts.

This investment helps further DOE's goal to expand a clean energy economy and make solar more cost-competitive with conventional sources of electricity.

Each partnership project can receive up to $3 million under the award. The project awardees are:

Alta Devices, Inc. (Santa Clara, California)
Development of a high-efficiency (>20%), low-cost compound-semiconductor PV module.

Solar Junction Corporation (San Jose, California)
Development of a manufacturing process to produce a very high efficiency multi-junction cell.

Tetra Sun (Saratoga, California)
Advancement in back surface passivation for high efficiency crystalline silicon solar cells.

Semprius, Inc. (Durham, North Carolina)
Development of a massively parallel, microcell-based concentrating photovoltaic receiver.

For more details about the awards, visit www.nrel.gov/news/press/2010/802.html.

NATIONAL LABORATORY UPDATES

NREL Project Leader Elected President of International Renewable Energy Society

Dr. David Renné, principal project leader for analysis at the U.S. Department of Energy (DOE) National Renewable Energy Laboratory (NREL), has been elected president of the International Solar Energy Society (ISES), a United Nations-accredited non-governmental organization that supports its members in the advancement of renewable energy technology, implementation, and education.

Renné's term began at the start of 2010 and runs through Dec. 31, 2011. He has been a member of the ISES board of directors since 2004, and was vice president of science and technology in 2008 and 2009. Renné also has been active in the American Solar Energy Society (ASES) as a board member and treasurer.

In his current role as a principal project leader at NREL, Renné develops and manages programs on renewable energy resource assessment and analysis. He also manages DOE's Solar Resource Assessment activities under the DOE Solar Program.

ISES, which was founded in 1952, has members in more than 50 countries.

Event News

PAST EVENTS

DOE Solar Program Holds Concentrating Solar Review

The Solar Program recently held a review for its Concentrating Solar Power (CSP) program area. The Program Review was held February 8-11, 2010, at Sandia National Laboratories (SNL). The review involved representatives from DOE, SNL, NREL, and the CSP program area's funding opportunity recipients. Objectives of the meeting were to update DOE on supported research and provide detailed information about the capabilities the labs can offer awardees to help advance their research.

Presentations from the meeting are available at: www.solar.energy.gov/csp_prm_2010.html.

Program Hosts Photovoltaic Module Reliability Workshop

The DOE Solar Program sponsored a Photovoltaic (PV) Module Reliability Workshop in Denver, Colorado, February 18-19, 2010. The objective of the workshop was to share information to help improve PV reliability and, ultimately, reduce the cost of solar and increase investor confidence.

Participants at the workshop included representatives from DOE, SNL, NREL, industry, and academia. Topics ranged from predicting long-term performance of PV products to packaging and thin film issues. Presentations from the event are available at www1.eere.energy.gov/solar/pv_module_reliability_workshop_2010.html.

UPCOMING EVENTS

Solar America Cities Annual Meeting

The Solar America Cities program hosted its 3rd Annual Meeting April 13-16, 2010, in Salt Lake City, Utah. The meeting brought together DOE's partners from the 25 Solar America Cities, leading solar experts, and policymakers. Discussions at the meeting focused on how Solar America Cities are paving the way for local governments across the United States to advance solar in their communities.

Topics included solar financing, utility engagement in solar, permitting and codes, community outreach, workforce and economic development, and more. Presentations from the meeting will be posted in the Events section of the Solar America Cities Web site: www.solaramericacities.energy.gov.

Solar Program to Host Program Peer Review

The Solar Program will host its next Program Peer Review May 24-27, 2010, in Washington, D.C. The annual review provides an opportunity for researchers to report on program-supported research and development activities. Details and presentations from the meeting will be posted in the "Information Resources" section of the Solar Program Web site.

NATIONAL LABORATORY UPDATES

Sandia CSP Engineer Named Asian American Engineer of the Year

Sandia National Laboratories' (SNL) Cliff Ho has been named 2010 Asian American Engineer of the Year by the Chinese Institute of Engineers – USA (CIE-USA). The award is given annually to outstanding Asian American engineers who are making significant and lasting contributions in the field.

Ho is currently a principal investigator in SNL's Concentrating Solar Power (CSP) team. His work focuses on modeling and analysis to improve CSP system performance and predict the effects of changes in variables such as gravity, wind, and weather. Ho also uses probabilistic models and sensitivity analysis to quantify uncertainties that can affect CSP systems.

Ho has been with Sandia since 1993. His previous work with the lab includes modeling for the Yucca Mountain project and microchemical sensor systems for environmental monitoring.

Prior recipients of the annual CIE-USA honor include current U.S. Secretary of Energy Steven Chu.

Solar America Cities Notes

For information and updates about Solar America Cities activities, visit the appropriate city's page at: www.solaramericacities.energy.gov.

Con Edison Proposes Development of 25 MW of Solar in NYC

New York City regional utility Con Edison has filed a proposal with the New York State Public Service Commission to support the development of 25 megawatts (MW) of solar energy resources in the city by 2015.

The proposal outlines incentives targeting smaller solar projects for both residential and commercial applications. Incentives include rebates for customers based on the power produced by their PV panels and a program to facilitate deployment of solar in the low-income residential market.

Con Edison also has proposed a "100 Days of Solar" program. Through this program, the company would sponsor a task force of representatives from government agencies, the solar industry, and nonprofits to reduce the time it takes to get approval to install solar panels from one year down to 100 days.

Minneapolis Approves Solar for Convention Center Roof

The Minneapolis City Council recently approved a proposal to install solar panels on the roof of the city's convention center. The city has applied for a $2 million state energy grant to offset the capital costs.

The Minneapolis Convention Center includes 475,000 square feet of exhibit space and an additional 83,000 square feet of ballroom space. The center will use a portion of the energy generated by the panels.

The city has chosen a local company to build and maintain the array, which will be composed of panels manufactured in California.

Tucson Installs Seventh Solar Project Financed by CREBs

On March 24, 2010, the City of Tucson Water Department dedicated its newest solar installation at the Roger Road Reclaimed Water Reservoir, a roof-mounted 110 kW system. This installation is the last of seven solar projects built by SPG Solar for the city and financed by $7.6 million in interest-free Clean Renewable Energy Bonds (CREBs).

The installations are estimated to save the city $3.4 million over their expected 25-year system life.

NATIONAL LABORATORY UPDATES

NREL Receives Project Funding from Center for Revolutionary Solar Photoconversion

NREL has been selected as one of four research institutions to receive funding in the second round of the Center for Revolutionary Solar Photoconversion (CRSP)'s Shared Research Program.

CRSP is a research center of the Colorado Renewable Energy Collaboratory. Total funding in this competitive round was $800,000, which was awarded to NREL, Colorado State University, Colorado School of Mines, and the University of Colorado at Boulder. The 10 pre-competitive CRSP projects included eight new research proposals and two renewals of projects funded last year.

Topics selected for this round of the program include inorganic materials and novel device architectures for advanced solar cells, novel organic/polymeric/hybrid inorganic-organic solar cells, third generation PV, and solar fuels.

Since its inception in April 2008, CRSP has funded two rounds of shared research projects totaling $2 million. Funding for the Shared Research Program comes from CRSP corporate members and matching funds from the Collaboratory via the State of Colorado.

Milwaukee PACE Program Signed into Law

On March 11, 2010, Milwaukee Mayor Tom Barrett signed the Milwaukee Shines Solar Property-Assess Clean Energy (PACE) Loan Program into law. The program is a revolving loan fund that allows homeowners to voluntarily attach 100% of the approved expenses of installing a solar electric or solar hot water system to their property tax bill. We Energies provided a start-up funding grant for the program.

Milwaukee anticipates making nine to 12 loans in the amount of $5,000 - $20,000 each beginning April 1.

Twelve Solar America Cities Cross-Cutting Projects Underway

Twelve cross-cutting projects under the Solar America Cities program are underway. These projects are designed to address issues relevant to all major cities in their efforts to promote local solar. Projects focus on a wide range of topics, including new solar financing models, best practices for installing solar on historic buildings, solar applications for emergency management, and community solar project best practices.

Summaries for each project will be posted on the Solar America Cities Web site shortly.

State & Industry Updates

DOE Loan Guarantee Provides Boost for BrightSource

Energy Secretary Steven Chu announced in January that the Department had awarded conditional commitments of more than $1.37 billion in loan guarantees under the American Recovery and Reinvestment Act to BrightSource Energy, Inc. The loan guarantees will support the construction and start-up of three utility-scale concentrated solar power plants with total generating capacity of 400 megawatts.

The plants, to be located on federally-owned land in California's Mojave Desert, use BrightSource's Luz Power Tower technology. Electricity from the project will be sold through power purchase agreements with Pacific Gas & Electric and Southern California Edison Company. The first plant is expected to begin construction in the second half of 2010 and come on line in 2012.

The loan guarantee is conditioned on financial and environmental requirements BrightSource must meet before closing on the loan. This includes local, state, and federal regulatory approvals.

For more information about the loan guarantee program, visit www.lgprogram.energy.gov.

NATIONAL LABORATORY UPDATES

Sandia Co-Sponsoring International Conference on Renewable and Distributed Energy Resources

SNL will co-sponsor the 4th International Conference on Integration of Renewable and Distributed Energy Resources, December 6-10, 2010, in Albuquerque, New Mexico. This conference is jointly organized and hosted by SNL and the Electric Power Research Institute (EPRI). SNL also leads the Scientific Committee for the conference.

This bi-annual, international conference brings together North American, Asian, and European researchers and experts in the fields of renewable energy and distributed energy resources (DER). Discussions focus on technical, market, and regulatory issues that challenge the integration of distributed and renewable energy resources into the electric grid.

Sessions at the 2010 event will include discussions about barriers to DER integration, reviews of regional programs in DER, and current and future research concepts and approaches to DER.

This year's conference is sponsored by the DOE, SNL, EPRI, Natural Resources Canada, the Solar Electric Power Association (SEPA), and Public Service Company of New Mexico.

The International Conference on Integration of Renewable and Distributed Energy Resources originated in 2004 in Brussels, Germany. Subsequent conferences were held in Napa, California (2006), and Nice, France (2008).

Massachusetts Awards $20M for Solar on State Facilities

Massachusetts has authorized $20 million for the installation of solar panels at 12 regional and municipal water and wastewater facilities throughout the state. The funding is part of $185 million in Recovery Act dollars provided to the state by the U.S. Environmental Protection Agency to support water and wastewater projects.

The 12 contracts represent the state's largest ever award for solar installation at public facilities. The projects are expected to be completed by July 2011 and will generate a total of more than 4 MW of power.

Renewable energy project developer Nexamp and its partner, Florence Electric of Taunton, won the contracts through competitive solicitation.

Spire Corporation to Enter Phase II of Program with NREL

Spire Corporation has announced that its wholly-owned subsidiary, Spire Semiconductor LLC, has completed Phase I of its high efficiency concentrator solar cell program with NREL.

Under the 18-month, $3.7 million cost-share subcontract, Spire Semiconductor is developing technology aimed at cost-effective manufacture of 42% efficient, 500-sun concentrating photovoltaic solar cells.

The project passed the NREL Stage Gate review, a pivotal decision point designed to validate that progress meets contractual objectives. The company has been notified that NREL has authorized Phase II of the project.

Tessera Solar and SES Unveil First Commercial-Scale Solar Thermal Plant

Tessera Solar and Stirling Energy Systems (SES) unveiled its Maricopa Solar power plant in Arizona in January. The plant is the first commercial project for SES's SunCatcher™ CSP technology.

SunCatcher was designed and developed in the United States through a public-private partnership with DOE.

Maricopa Solar will provide 1.5 MW of power to customers in the greater Phoenix region through utility Salt River Project. Tessera has additional utility-scale projects underway in California and Texas, scheduled to break ground late this year.

DOE's Sandia National Laboratories (SNL) closely supported SES in the development and deployment of these systems, particularly in the optimization of optics and controls. Four of the systems have been installed and are operational at SNL. Refinements discovered and studied at Sandia were integrated into the installation at Maricopa.

Solar Program Manager John Lushetsky and representatives from Sandia's CSP program attended the unveiling.

NATIONAL LABORATORY UPDATES

SNL Solar Facilities Begin Upgrades

The National Solar Thermal Test Facility (NSTTF) and Distributed Energy Technologies Laboratory (DETL) at SNL have begun implementing upgrades funded by the American Recovery and Reinvestment Act. Both facilities are located at SNL's Albuquerque, New Mexico site.

The NSTTF is the focal site of SNL's CSP research. The CSP team serves technical and programmatic roles in developing advanced concepts such as thermal storage, Sunshine to Petrol, modeling, components, and systems.

Upgrades at NSTTF include new and upgraded molten salt test facilities, an optical methods test laboratory, a new test bed concentrator and heliostat, and a trough alternate working fluids test facility. The enhancements will expand SNL's unique capabilities in high heat-flux testing of CSP materials and system components and cross-cutting characterization of CSP technologies.

Engineers at DETL conduct advanced R&D in PV-related areas such as high-penetration integration, component and system performance, reliability, modeling, cyber-security technology integration, microgrid communications, load control, and specialized tests such as intentional islanding and surge tolerance.

Upgrades planned for DETL include installation of additional photovoltaic (PV) panels and a PV simulator, a 200 kW interconnected diesel GenSet, a new microinverter test bed, and enhancements to communications controls and programmable load banks.

The upgrades will advance the lab's capabilities and further its research in interoperability, reliability, and high penetration of PV, as well as codes and standards, and cyber-security. Additional upgrades also are planned for the SNL Photovoltaic Systems Evaluation Laboratory.

U.S. Thin Film PV Product Shipments Estimated at 72% in 2009

According to Navigant Consulting, early estimates suggest that U.S.-made thin film PV product shipments increased to 72% in 2009 from 65% in 2008. U.S.-made product shipments were 65% in 2008. Companies identified as playing a contributing role in this growth are First Solar, Uni-Solar, Global Solar, Energy Photovoltaics, and Solyndra. Eighty percent of these companies were supported by the U.S. Department of Energy through the National Renewable Energy Laboratory's (NREL) National Center for Photovoltaics in the early stages of technology development under the Thin Film PV Partnership Program (TFPPP).

The first subcontract in the TFPPP was awarded to Solar Cells, Inc., the predecessor company of First Solar, in January 1991. In 2009, First Solar was the world leader, with shipments estimated at 1000 MW.

For more information about NREL's National Center for Photovoltaics, visit: www.nrel.gov/pv/ncpv.html.

Global Restaurant Chains Considering Solar Thermal HVAC

Several major restaurant chains, including McDonald's, Kentucky Fried Chicken, and Burger King, have contacted DCA Systems, Inc. looking for more details about the company's new solar thermal powered dehumidifier heating, ventilation, and air-conditioning (HVAC) systems.

The systems consist of rooftop solar collectors integrated with DCA's HVAC system using evacuated tubes and heat pumps. They can replace standard rooftop HVAC designs without changes to existing ducts.

The systems were tested in restaurants in Florida and Mississippi as part of a partnership among TECO Energy, the City of Tampa, DOE, and the University of South Florida.

DOE Solar Program & Partner Publications

A Homebuilder's Guide to Going Solar

DOE Office of Energy Efficiency and Renewable Energy

www1.eere.energy.gov/solar/pdfs/44792.pdf

2008 Solar Technologies Market Trends Report

DOE Solar Energy Technologies Program

www1.eere.energy.gov/solar/pdfs/46025.pdf

PV Manufacturing Initiative Request for Information Draft Summary Report

DOE Solar Energy Technologies Program

www1.eere.energy.gov/solar/pdfs/rfi_pv_manufacturing_initiative.pdf

Continued on following page

NATIONAL LABORATORY UPDATES

Sandia Leads Renewable Energy Modeling Task Force for Solar Program

The DOE Solar Program has tasked Sandia National Laboratories with coordinating the Renewable Energy Modeling Task Force (REMTF) under the Western Electricity Coordinating Council (WECC). The task force will work with industry to improve modeling of photovoltaic (PV) systems for planning studies, and to specify, validate, prototype, and implement PV models for dynamic and power flow simulations.

Models developed by REMTF are intended to support bulk-level transmission planning studies involving high penetration of both distribution- and transmission-connected PV systems. The models also may be applied to preliminary interconnection studies. REMTF's models will be nonproprietary, a feature which is intended to foster their usefulness across a range of regional grid planning applications.

The models will be implemented in the General Electric Power System Load Flow SLF and Siemens-PTI PSS/E (define acronym)simulation platforms. REMTF will disseminate information from the models through WECC and other industry forums.

Interconnecting PV on New York City's Secondary Network Distribution System

National Renewable Energy Laboratory

www.nrel.gov/docs/fy10osti/46902.pdf

Solar Ready Buildings Planning Guide (Solar America Cities)

National Renewable Energy Laboratory

www.nrel.gov/docs/fy10osti/46078.pdf

Consortia Focused on Photovoltaic R&D, Manufacturing, and Testing: A Review of Existing Models and Structures

National Renewable Energy Laboratory

http://www.nrel.gov/docs/fy10osti/47866.pdf (PDF 568 KB)

NATIONAL LABORATORY UPDATES

NREL and 3M Sign Agreement on Renewable Energy Research

NREL has announced a series of Cooperative Research and Development Agreements (CRADAs) with 3M, an established technology company based in St, Paul, Minneapolis.

Work under the CRADAs will last at least one year and will include joint identification and development of renewable energy technologies and accelerated testing of 3M designs and commercial scale-up of successful prototype technologies.

The CRADAs establish joint investigation in three areas, including new moisture barrier films and flexible packaging for copper indium gallium diselenide thin-film photovoltaics and new reflective coatings to enhance the performance of lower-cost mirrors for concentrating solar power.

Solar Program Funding Opportunities

Pipeline of Program Activities

The Solar Energy Technologies Program conducts a range of research and development activities along the solar pipeline. Funding opportunities are available for photovoltaics, concentrating solar power, systems integration, and market transformation activities. The Solar Program provides opportunities for both financial and technical assistance.

Current Opportunities

To view all current funding opportunities, visit www.solar.energy.gov/financial_opportunities.html.

To view all past funding opportunities, visit www.solar.energy.gov/past_opportunities.html.

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 at least every quarter. If you have any comments or suggestions about the newsletter, e-mail solar@ee.doe.gov.

For More Information

Contact the EERE Information Center 1-877-EERE-INF (1-877-337-3463) or visit eere.energy.gov/informationcenter.

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