



The Parker Ranch installation in Hawaii

Update on Solar Program Activities

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1. Summary of \$1/W Workshop from August 2010
2. Current Request for Information (RFI)
3. Questions

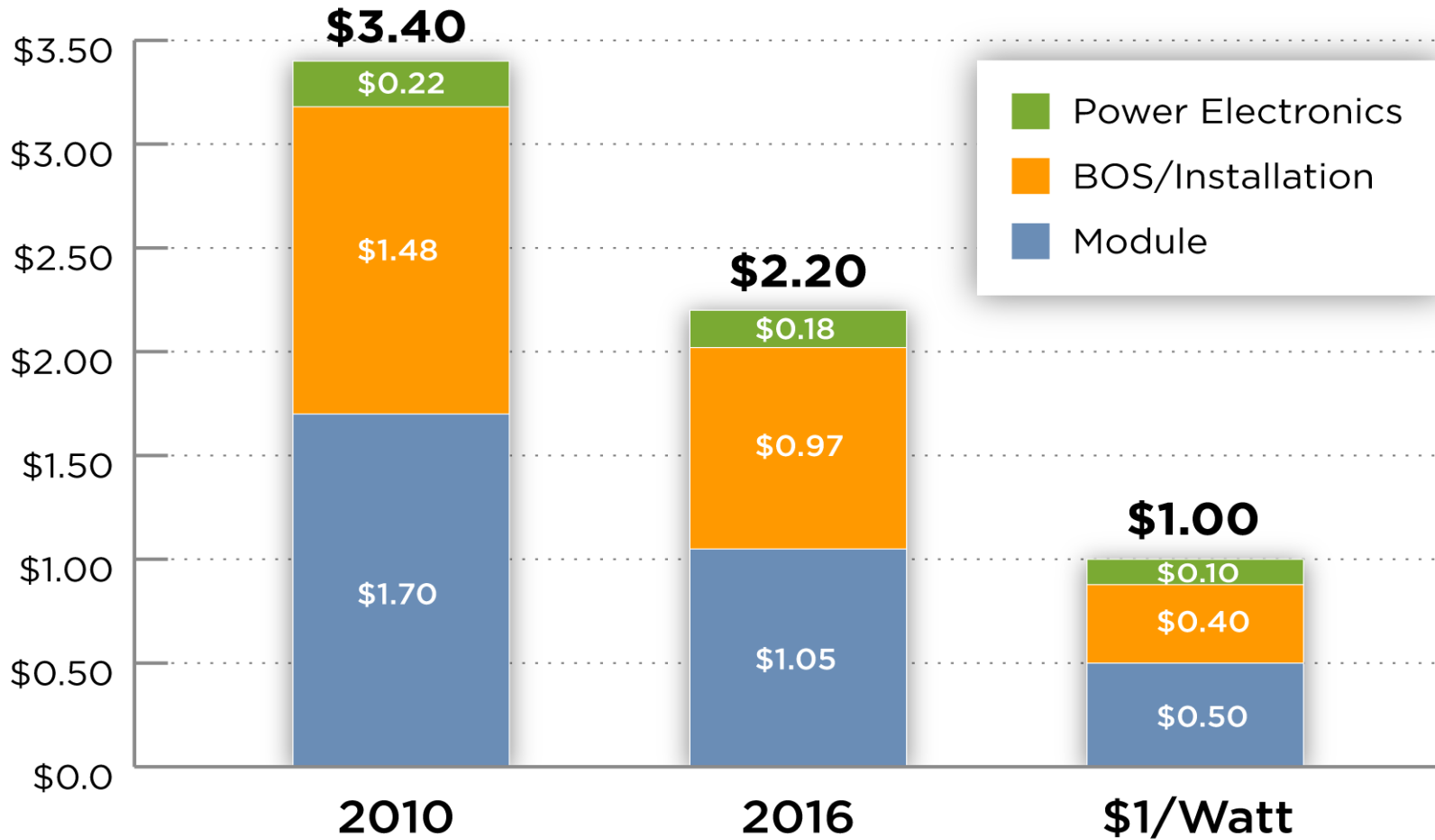
- Date: August 11th and 12th, 2010
- Attendees: 86 total; 11 for Power Electronics breakout (mix from Federal Govt., academia, industry)
- Format: Introductory comments; breakout sessions; plenary discussion to discuss results
- Read-ahead: \$1/W Photovoltaic Systems – White Paper to Explore a Grand Challenge for Electricity from Solar

\$1/watt installed by 2017: Defining the Objective

- **By 2017:** Demonstration of all key components and installation methods in systems at least 5MW in size and initial production orders for equipment capable of delivering \$1/watt installed systems in 2017
- Includes all components, equipment and installation processes to produce grid compatible electricity
- Target could be met with systems installed on the ground or on buildings
- Earth-abundant materials
- Recyclable components
- Meets all applicable safety and environmental standards

From the \$1/W White Paper

System Installed Price (\$/W)



From the \$1/W White Paper

Centralized Power Electronics	
Goals	Key Take-Aways
Reduce first cost	<ul style="list-style-type: none"> • Economies of scale could reduce inverter cost 5¢/watt. • Higher frequency switching could reduce cost an additional 3-4¢/watt .
Improve reliability to 30 years	<ul style="list-style-type: none"> • Maintenance contracts could be cheaper than designing inverter for higher reliability. • Manufactures know what fails – and solder joint failures have multiple solutions.
Integrate smart grid functionality	<ul style="list-style-type: none"> • Adding reactive power capability is relatively inexpensive and recommended. • Adding ability to manage storage may cost 6-7¢/watt for a bi-directional converter and is a nice to have extra.
Understand Implications for system cost	<ul style="list-style-type: none"> • Operating at a higher voltage will drive out system wire cost. • Higher frequency switching will reduce converter size and weight.

Decentralized Power Electronics	
Goals	Key Take-Aways
Reduce first cost	<ul style="list-style-type: none"> • Need high volume production to drive down cost. • Limited availability of high voltage switches. • Need to integrate components to achieve scale manufacturing. • No 3-phase micro-inverters available for utility-scale applications.
Improve reliability to 30 years	<ul style="list-style-type: none"> • Limited field experience - need tools to understand/predict failures and monitoring to better identify failure issues.
Integrate smart grid functionality	<ul style="list-style-type: none"> • Challenge for micro-inverters is coordinating thousands of converters. • Reactive power relatively easy to add. • Storage solutions not clear.
Understand Implications for system cost	<ul style="list-style-type: none"> • Decentralized power electronics could increase system yield 4-8% reducing all system components and related costs (including inverter). • 3-phase AC system results in lower cost of wiring, protection features and labor.

The screenshot shows a Windows Internet Explorer browser window displaying the URL http://www1.eere.energy.gov/solar/financial_opportunities.html. The page header includes the U.S. Department of Energy logo and navigation links for EERE Home, Programs & Offices, and Consumer Information. The main navigation bar features links for HOME, ABOUT, RESEARCH & DEVELOPMENT, MARKET TRANSFORMATION, FINANCIAL OPPORTUNITIES (highlighted), INFORMATION RESOURCES, NEWS, and EVENTS. A search bar is located in the top right corner.

The main content area is titled "Solar Energy Technologies Program" and "Financial Opportunities". It includes a sidebar with links for Recovery Act, Current Opportunities, Upcoming Opportunities, Past Opportunities, and Related Opportunities. The main text describes the program's mission and provides a link to a newsletter subscription form. A "FEATURES" section on the right lists several projects and awards, including CSP Heat Transfer and Thermal Storage Projects, SEGIS Awards, University PV Product and Process Development Awardees, and Next Generation PV Awards.

Financial Opportunities

The U.S. Department of Energy (DOE) Solar Energy Technologies Program (Solar Program) posts current and past funding opportunities for all [program areas](#), including research and development (R&D) for [photovoltaics](#) and [concentrating solar power, systems integration](#), and [market transformation](#) projects. In addition, links to related opportunities from DOE national laboratories and other federal agencies are available.

In carrying out its vision and mission, the federal Solar Program conducts a broad portfolio of activities to make electricity from solar technologies more cost competitive with conventional forms of electricity.

This open, competitive solicitation process is designed to meet the top technology needs identified by industry's roadmaps. SETP funding opportunities encourage collaborative partnerships among industry, universities, national laboratories, federal, state, and local governments and non-government agencies and advocacy groups. Solicitations, when available, include financial and technical assistance.

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http://www1.eere.energy.gov/solar/financial_opportunities.html

Title: \$1/W PV Systems: Solar Energy Grid Integration Systems, Advanced Concepts

Subject: DOE is requesting information on Solar Energy Grid Integration Systems, Advanced Concepts (SEGIS-AC) and how changes in power electronics impact the cost of the PV system as a whole.

Due Date: February 4, 2011

The RFI seeks feedback on:

a) Investment Amount

\$7-9M annually for three years (\$24-27M), subject to annual appropriations

b) Topic Areas

(1) *Smart-Grid Functionality*

(2) *Using Power Electronics to Address Balance of System Costs*

c) Evaluation Criteria

SEGIS-AC Meeting, February 9th, Washington DC

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Questions?

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