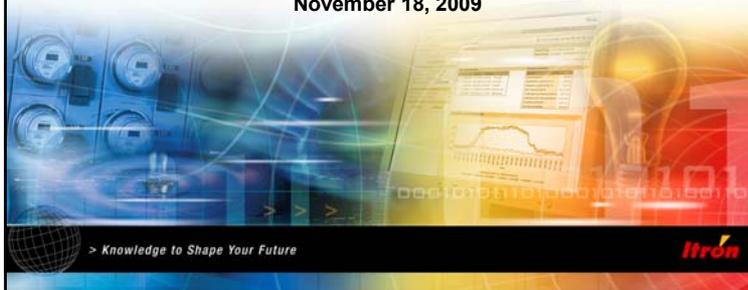


California Solar Initiative

Implementation Plan for the CSI
Research, Development, Demonstration
and Deployment Program

November 18, 2009



Purpose of Today's Workshop

- ❑ Provide an overview of the goals and objectives of the CSI RD&D Program
- ❑ Provide a status on activities conducted to date on the program
- ❑ Compare the program status against the goals and objectives
- ❑ Obtain feedback from you on the following questions:
 - Is the RD&D Program on target with respect to the program goals and objectives?
 - Is the Program addressing the critical RD&D issues facing California?
 - Does the RD&D Program have the correct amount of market connection?
 - Are there RD&D topics that have been missed and should be addressed?
 - Are appropriate methods for outreach and coordination being used?



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Background on the CSI RD&D Program

- ❑ **SB1 was signed August 2006**
 - Authorized the CPUC to allocate \$50 million of the California Solar Initiative (CSI) funds for research, development, demonstration, and deployment of solar technologies
- ❑ **CPUC established the CSI RD&D Program**
 - The Program was established in Sept 2007 under CPUC Decision 07-09-042
 - Allocated \$50 million for research, development, demonstration and deployment (RD&D) projects
 - Adopted the CSI RD&D Plan
- ❑ **CSI RD&D Plan set forth:**
 - Goals and objectives
 - Allocation guidelines for project funding
 - Criteria for solicitation, selection and project funding



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Goals and Objectives of the CSI RD&D Program

Goal: Help build a sustainable and self-supporting industry for customer-sited solar in California

Objectives:

- ❑ Help lower solar technology electricity prices to levels where they are comparable to retail electricity prices, and
- ❑ Help support the deployment of distributed solar to accomplish the CSI goal of **3000 MW** by 2016
 - CPUC: 1940 MW
 - CEC: 360 MW
 - POU: 700 MW



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Key Principles of CSI RD&D Plan

□ The Adopted Plan established the following seven key principles that are the focus of the RD&D Program

1. Improve the economics of solar technologies by reducing technology costs and increasing system performance.
2. Focus on issues that directly benefit California, and that may not be funded by others.
3. Fill knowledge gaps to enable successful, wide-scale deployment of solar distributed generation technologies.
4. Overcome significant barriers to technology adoption.
5. Take advantage of California's wealth of data from past, current, and future installations to fulfill the above.
6. Provide bridge funding to help promising solar technologies transition from a pre-commercial state to full commercial viability.
7. Support efforts to address the integration of distributed solar power into the grid in order to maximize its value to California ratepayers.

Summary of Funding Guidelines from Plan

	Allocation Guidelines	Budget Amount in million
Program Administration & Evaluation	15%	\$7.5
Program Manager and associated IOU/PA cost of accounting	12%	\$6
Reserved for program evaluation	3%	\$1.5
Various Stages of RD&D:		
Research - Helios	20%	\$10
Development	5% - 10%	\$ 2.5 - \$ 5
Demonstration	45% - 55%	\$22.5 - \$27.5
Deployment	5% - 10%	\$ 2.5 - \$ 5
Total RD&D Budget		
		\$50
Target Activities within RD&D Stages:		
Production Technologies	10% - 25%	\$5 - \$12.5
Grid Integration	50% - 65%	\$25 - \$32.5
Business development and deployment	10% - 20%	\$5 - \$10
Risks and Results Timeframes		
Project results in 8+ year horizon	20%	\$10
Project results in 4-7 year horizon	20%	\$10
Project results in 1-3 year horizon	60%	\$30

Allocation of Funding by RD&D Stages

□ Five RD&D Stages Established with Funding Allocation Guidelines

- Research: 20%
 - Basic and fundamental research
 - The research component (\$10 million) is dedicated to the Lawrence Berkeley National Laboratory / UC Berkeley Helios Project
- Development: 5-10%
 - Activities that convert research outcomes into prototypes
- Demonstration: 45-55%
 - Activities that bring promising technologies closer to market using demonstrations
- Deployment (Market Support): 5-10%
 - Activities that enhance the competitiveness of new technologies or help reach a "tipping point" into commercialization

Allocation of Funding by RD&D Targets

□ Three Target Areas Established with Funding Allocation Guidelines

- Production Technologies: 10-25%
 - Supporting commercialization of new photovoltaic (PV) technologies
- Grid-Integration: 50-65%
 - Improving PV integration with transmission and distribution systems
- Business Development and Deployment: 10-20%
 - Supporting the solar market and end-users

Guidelines for Project Solicitation and Selection

□ Project Solicitation

- Program Manager prepares and releases draft Request for Proposal (RFP)
- Final RFP prepared following public comment period
- Public Notice of Final RFP issued by CPUC
- Program Manager conducts Pre-Bid Workshop

□ Project Selection

- Program Manager reviews and evaluates proposals based on project characteristics and selection criteria
- Program Manager issues recommendations for funding based on advice letter to the Energy Division (ED)
- ED prepares a Resolution for Commission consideration
- Commission approves project funding through the resolution process

Project Characteristics

□ Eligible technologies

- Solar technologies and other distributed generation technologies that employ or could employ solar energy for generation or storage of electricity; or to offset natural gas usage
 - First solicitation for PV
 - Second solicitation for improved solar technologies and innovative business models

□ Eligible recipients

- Preferences to fund in state businesses or in-state sponsor

□ Project location

- Preference to fund in-state projects or project component

Project Selection Criteria

□ Guidelines for selection criteria to include:

- Milestones targeted
- Benefits accrued to California ratepayers
- Level of funding requested from RD&D Program
- Potential to expand PV market opportunities or reduce barriers
- Institutional or regulatory feasibility
- Utility participation
- Match funding provided
- Visibility and educational component
- Capabilities, qualifications and experience of team
- Size of RD&D grant
 - \$3 million cap (except Helios)

CSI RD&D Activities To-Date

□ Initial Program Tasks

- Developed initial 6 month scope of work and following 9 month SOW
- Developed CalSolarResearch.ca.gov website
- Communicated/ Coordinated with Potential Partners
- Investigated topic areas for solicitations
- Initiated grant agreement for the Helios Project
- Established grant agreement template

CSI RD&D Activities To-Date

- ❑ **First Grant Solicitation (up to \$15 million available)**
 - Targets Integration of PV into the Utility Grid
 - Planning and Modeling for High-Penetration PV
 - Testing and Development of Hardware and Software for High-Penetration PV
 - Addressing the Near Term Integration of Energy Efficiency, Demand Response and Storage with PV
 - Solicitation released June 2009 with proposals received August 24, 2009

- ❑ **Second Grant Solicitation (up to \$15 million available)**
 - Targets Improved PV Production Technologies and Innovative Business Models
 - Testing and Demonstrations of New Solar Technologies with Improved Performance / Reliability or Lower Costs
 - Testing and Demonstrations of Innovative Business Models to Help Expand Cost-Competitive Solar Technologies
 - Solicitation released November 2009 with proposals due January 13, 2010

Comparison of Activities to Goals & Objectives

- ❑ **Comparison against stages and targets**
- ❑ **Comparison against key principles**
- ❑ **Comparison against solicitation and selection guidelines**

Comparison Against Stages and Targets

	Allocation	Sol#1	Sol#2	Gap
RD&D Stages				
• Research	20% (\$10,000,000 – LBNL – Helios)	NA	NA	Zero
• Development	5-10%	Est. \$2 million (5%)	?	Up to 5% (~ \$2 million)
• Demonstration	45-55%	Est. \$10 million (27%)	?	Up to 28% (~ \$10 million)
• Deployment	5-10%	Est. \$3 million (8%)	?	Up to 2% (~ \$0.7 million)
Targets				
• Production Technologies	10-25%		Est. \$10 million (27%)	No gap if \$10 million awarded
• Grid Integration	50-65%	Est. \$15 million (40%)	?	Up to 25% (~ \$9 million)
• Business Development and Deployment	10-20%		Est. \$5 million (13%)	Up to 7% (~ \$2.6 million)

Comparison Against Key Principles

Key Principle	Sol #1	Sol #2
Improve Economics	<ul style="list-style-type: none"> • Lowering inverter costs • Reducing T&D infrastructure costs • Reducing need for more expensive peakers 	<ul style="list-style-type: none"> • Focus on technologies (solar and storage) with lower costs & improved performance • Innovative business models that help reduce costs or increase value of solar in the market
California Benefits	<ul style="list-style-type: none"> • Addressing high T&D congestion • Integrating EE/DR/PV 	<ul style="list-style-type: none"> • Increased ability for solar to cover peak demand periods, with commensurate reduction in costs and environmental impacts
Fill Knowledge Gaps	<ul style="list-style-type: none"> • High resolution (spatial and temporal) solar data sets • Improved PV production models, verified by field tests • Optimal location of PV 	<ul style="list-style-type: none"> • Development of improved reliability and long life inverters • Development of inverter/smart meter communication hardware, software and testing
Overcome Significant Barriers	<ul style="list-style-type: none"> • Tools enabling deployment of high penetration levels of PV • Tools enabling customers, installers and utilities to better understand PV/EE/DR choices (increasing deployment to broader market) 	<ul style="list-style-type: none"> • Addressing market/cost barriers through innovative business models and new tariff concepts • Movement towards integrating solar into the future smart grid
Use Existing Data and Knowledge	<ul style="list-style-type: none"> • Leveraging existing CA solar models, utility involvement and solar contractor role 	<ul style="list-style-type: none"> • Leveraging existing CA solar models, utility involvement and solar contractor role
Provide Bridge Funding	<ul style="list-style-type: none"> • Leveraging of funds to support demonstrations 	<ul style="list-style-type: none"> • Leveraging of funds to support demonstrations
Integrate Solar into CA Grid	<ul style="list-style-type: none"> • Tools, processes and demonstrations for integrating increasing amounts of PV into the electricity system. • Integrating of PV with EE and DR 	<ul style="list-style-type: none"> • Development of inverter/AMI communication • Development of improved energy storage for solar with EE/DR options

Comparison Against Selection Criteria

Selection Criteria	Sol #1	Sol #2
Milestones targeted	Yes: criteria looking at probability of project success	Yes: criteria looking at soundness of project as well as proposed path to market
Benefits accrued to California ratepayers	Yes	Yes
Level of funding requested from RD&D Program	Yes	Yes
Potential to expand PV market opportunities or reduce barriers	Yes	Yes
Institutional or regulatory feasibility	Yes: criteria looking at probability of success	Yes: criteria looking at soundness of project as well as proposed path to market
Utility participation	Yes	Yes
Match funding provided	Yes	Yes
Visibility and educational component	Yes	Yes
Capabilities, qualifications and experience of team	Yes	Yes
Size of RD&D grant	Yes: limits specified in RFP	Yes: limits specified in RFP

Feedback

- Is the RD&D Program on target with respect to the program goals and objectives?
- Are the critical RD&D issues facing California being addressed?
- Does the RD&D Program have the correct amount of market connection?
- Are there RD&D topics that have been missed and should be addressed?
- Are the methods for outreach and coordination appropriate?
- Other issues that should be addressed?
- Other comments or suggestions?

Contact Information

Thank you for your suggestions and comments

Additional comments can be addressed to:

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