

Questions and Responses for the CSI RD&D Solicitation #1: PV Grid Integration

Q: Is there a requirement in terms of power rating that defines high penetration PV? Does the term "High-Penetration PV" refer to achieving a generally high level of solar deployment penetration?

A: The definition of PV penetration is based on the output of PV systems operating within the distribution system relative to the peak load of the distribution system.

Percent (%) of PV penetration = AC output of PV divided by peak load capacity.

Based on studies of wind energy systems, less than 15% penetration of PV is usually not considered a concern to the utility grid. Penetration levels of 15% to 30% are considered medium to high penetration and could have some impacts. Anything over 30% is considered high penetration and could be expected to show more certain impacts.

The purpose of this solicitation is to develop and demonstrate products and methods to address those impacts (e.g., improve the ability of PV systems to relieve peak load on the distribution system).

Q: Is Itron permitted to submit proposals to and receive awards from this solicitation?

A: No.

Q: Please explain the relationship between the CPUC, Itron and the Grantee, and in particular, regarding data.

A: The CPUC established the CSI RD&D Program via CPUC Commission Decision D.07.09-042. The Decision directed the Energy Division to select a Program Manager via a competitive solicitation. Itron was selected and entered into a three year contract to administer the CSI RD&D Program. Itron will administer solicitations and oversee the grant evaluation and selection process. A Committee will score proposals and determine which grants Itron should recommend to the CPUC for funding awards. The CPUC provides direction to Itron and makes all decisions regarding the CSI RD&D Program, including final selection of grant recipients for consideration at a CPUC public meeting. As a result of CPUC action and direction, Itron will enter into a grant agreement with

each grantee. In addition, Itron will provide ongoing oversight and project management for each grant project and report progress to the CPUC on an ongoing basis.

Itron has been very deliberate in its role as the CSI RD&D Program Manager to ensure that it gains no unfair business advantage as a result of serving as Program Manager. The CSI RD&D grant solicitation clearly indicates that applicants are not to include confidential or proprietary information in the grant proposals. In addition, all deliverables developed by the grantees under this Program become the property of the CPUC (not the Program Manager). Furthermore, all data produced under this program shall be the property of the grantee. In accordance with the Grant Agreement, Itron may request data from the grantee if it is identified as useable for the CPUC or the CSI RD&D Program. All of the products, deliverables and reports from the CSI RD&D Program will be distributed publicly via the www.CalSolarResearch.ca.gov website and other websites.

The CSI RD&D Program Manager contract is held by Itron until 9/30/2011. The CPUC is responsible for selecting a Program Manager to administer the second phase of the CSI RD&D Program.

Q: Will proposals for projects over \$3 million be accepted?

A: No, the CPUC's Decision¹ establishing the CSI RD&D Program limits the size of any individual grant to \$3 million.

Q: Do applications need to be directly related to how PV impacts the smart grid, or can they generally address removing key market barriers to solar adoption?

A: This solicitation targets projects that support the integration of high penetration PV into the grid. To the degree that integration ties into smart grid capabilities, then the proposal can address the smart grid. However, there is no requirement that proposals address the smart grid. Similarly, proposals should contain descriptions of how the proposed project will help resolve key market barriers to integration. However, more broad questions regarding market barriers to solar development will be addressed in the next solicitation. The focus of the next solicitation is on production technologies and business development and deployment.

¹ CPUC Decision 07-09-042, Section 3.4.2 Project Selection

Q: Because of the smart grid references, is this solicitation more focused on utility-scale solar deployments -- will applications focusing on removing market barriers for distributed PV be considered?

A: This solicitation is focused on large-scale deployment of small distributed PV systems on the customer side of the meter; and not utility scale PV deployment or PV deployment on a distributed basis on the utility side of the meter.

Future solicitations will target projects that address market barriers and assist in business development and deployment.

Q: Are there any ride-through voltage requirements for PV inverters? How much ride-through is typically required? What % of its rating and for how long?

A: The ability for PV inverters to provide low voltage ride-through capability provides distinct benefits to a distribution system under high PV penetration levels. However, there are currently no US interconnect requirements for ride-through voltage for PV systems. In 2008, Germany passed ride-through voltage requirements for larger-scale PV systems that contribute power to the electricity system at medium voltage levels. For example, the German regulations require fault-ride-through capability (i.e., the PV system must stay connected to the grid during a fault) and must ride through voltage drops all the way to zero for a duration of less than 250 milli-seconds, with differing degrees of percentage of voltage dips for longer durations (e.g., up to 2 seconds). We anticipate similar ride-through voltage requirements may be adopted in the future in the US for PV inverters. As such, sub-section 2.3 enables consideration of proposals for testing and demonstrating PV systems with ride-through voltage capability. We have not established specific ride-through voltage targets for this solicitation. Proposals in this area should identify the ride-through capabilities to be demonstrated or tested.

Q: Are there any power factor correction or reactive power requirements for PV inverters? What % of its rating?

A: There is no pre-established power factor correction or reactive power requirements with this solicitation. In high PV penetration scenarios, the ability of advanced inverters to provide power factor correction and maintain reactive power provides benefits to the local distribution system. Teams considering

demonstrating inverter controls on volt-amp-reactive (VAR) power should describe the capabilities within the context of the VAR issues typical in the distribution system in which the inverters are to be tested.

Q: In Section 2.3 sub-section 2 - “Response capabilities to controlling reverse power flows”- Can you give us additional information on what is meant here?

A: Reverse power flow refers to the flow of power from the PV system to the utility instead of the more conventional “utility to end-user” flow direction. Under high PV penetration levels, sufficient flow of power from PV systems could potentially cause over-voltage problems on distribution feeders; increase the possibility of short circuits and possible breach of distribution system protection mechanisms. Consequently, control systems that can dynamically address reverse flow events can provide benefits to both the distribution system and the PV system owner.

Q: In Section 2.3 sub-section 2 “ability of PV systems to respond to utility controls” is there any guidelines for dynamic dispatching of inverters?

A: We do not have any pre-established guidelines or requirements for dynamic dispatching of inverters. The Department of Energy has issued reports focused on integration issues associated with high PV penetration. Approaches for PV system control and dispatch are discussed in the DOE Renewable Systems Interconnection reports. These reports are available at the DOE web site: <http://www1.eere.energy.gov/solar/rsi.html>

Q: How can Section 2.3 Sub-sections 3 and 4 be addressed in a product? Aren't these studies to account for the product's impact on the distribution grid? Do we need to address these in our application?

A: The intent of sub-section 3 is to address projects wherein an applicant is proposing to demonstrate the ability to control higher penetration levels of PV in a localized area like a micro-grid or mini-grid. Similarly, sub-section 4 is intended to use modelling tools to identify optimal locations for high PV penetration. These are suggested demonstration and verification concepts and you are not required to address these in your proposal.

Q: We recognize that the projects must be completed in two years. Is it acceptable if installations are completed in two years, and ongoing testing and monitoring occurs after the two-year window (if no funding is requested for this testing and monitoring)?

A: Yes, ongoing testing and monitoring can occur for up to 1 year beyond the project completion date. Applicants should make it clear in their proposal how reporting on the project will be affected and /or conducted if the testing and monitoring occurs after the end of the grant term.

In addition, the term of grant agreements may be extended for an additional one year upon approval by Itron and the CPUC.

Q: If a proposal addresses elements that span two of the three target areas, how should we make note of that in the proposal, and what is the funding limit on such a grant?

A: This should be noted on the Grant Application Cover Page (Exhibit A) section b. Solicitation Target Area (check those that are appropriate). This should also be discussed, as appropriate, in the Project Summary, Project Goals, Project Performance Objectives and Scope of Work. The funding ceiling will be limited to the proportion of project that falls within each of the areas. For example, if 50% of a project is for planning / modelling and 50% for testing and demonstrations of hardware software, then the funding will be limited to \$2 million (50% at \$1 million, 50% at \$3 million).

Q: On the webinar you mentioned that the maximum funding limit on a grant would be \$3M. Does that “hard limit” apply to all three target areas, or are the “estimated per-project funding” guidelines in the solicitation package accurate? Specifically, is the maximum funding available for the target area of “addressing the near term integration of EE/DR/ES and PV” \$1M or \$3M? Could a grant be made in that category for \$2M?

A: Projects applying for grant funding from this solicitation are limited to the ceilings outlined in the solicitation. The maximum funding available for Near Term Integration of EE/DR/ES and PV is \$1 million per project.

Q: Can match funding come from Canadian sources?

A: Yes, as long as the project that will be used as match provided benefits to California ratepayers.

Q: Does development of a 'best practices' need to be a stand-alone project, or can it be combined with other elements projects?

A: Applicants have a great deal of flexibility in putting together projects to respond to this solicitation. A 'best practices' project can be combined with other project elements.

Q: Will the proposals be public documents?

A: Yes, the proposals are public documents. If a grant applicant believes certain portions of their proposal are confidential or contain sensitive information, they may file those sensitive portions under seal using proper CPUC protocol, which will be protected under General Order 66-C². The grant applicants should use the seal discriminately and only when necessary.

Q: What are the American Recovery and Reinvestment Act (ARRA) opportunities?

A: The known opportunities that relate to this solicitation have been posted on the www.CalSolarResearch.ca.gov website.

Q: Will preference be given to proposals that are submitted by a collaborative?

A: Not necessarily. Proposals will be evaluated based on the quality of the team, the proposal and the partnerships.

Q: What is the length of the grant period?

A: Two years.

² <http://docs.cpuc.ca.gov/Published/Graphics/644.PDF>