SolarTech
An initiative of Silicon Valley Leadership Group

Addressing Institutional Barriers

Opportunities for Streamlining Solar PV Project Timelines

A SolarTech Industry Analysis

in collaboration with CALSEIA

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Message from the Executive Director

It has been almost three years since a few of us were sitting around a table and first envisioned an organization like SolarTech: an organization to lead the industry in streamlining processes, removing hidden barriers and hidden costs, and thus enable a sustainable vibrant solar industry. This first meeting led to the development of a white paper on the state of delivering solar PV to the market and proposals to improve it. This white paper's theme was *market transformation.* Although the economic events of the past year or two, specifically the global credit crisis, has dampened the demand for our industry's renewable energy solutions there are still opportunities for SolarTech and our partners to lead, with reduction of institutional barriers inherent in hidden costs rising to the forefront.

SolarTech is a member driven collaborative organization. Successes, such as this document, are the result of partners coming together to find common ground, propose, debate and develop solutions to industry issues. In addition to our Committee Chairs (Permitting: Greg Sellers of Burhnam Energy; Interconnection, Ark McAuley, PG&E; Installation, Doug Eakin, Wieland Electric), we must acknowledge the support of our partnering organization, CalSEIA and their Executive Director Sue Kateley. All of these individuals put considerable time and energy into making this project, the resulting document, and SolarTech a success.

However, this isn't the end of the trail. There is more to do. SolarTech needs your support in order to accomplish real results that will transform the industry. High value cost saving initiatives, such as this one, need your support. If you are not a member of SolarTech, then consider joining now. Become a member and contribute to the next wave of solutions that will transform and accelerate the solar PV industry.

Sincerely,

Doug Payne
Executive Director

Executive Summary

This proposal builds on direct content provided by SolarTech and CalSEIA to a study by Navigant Consulting, "*Addressing Institutional Barriers, Opportunities for CSI RD&D Support*" (April, 2009) prepared for the California Public Utilities Commission. In the study SolarTech provided the specific recommendations describing the institutional barriers inhibiting the market acceleration of solar PV to meet the CSI goals.

This paper focuses on proposing methodologies for improving overall project end-to-end cycle times for distributed generation solar PV projects.

Benefactors

City and County Governments would have a high quality, repeatable and highly manageable project delivery process. Through adoption of draft or formal resolutions, they would be indicating their support of streamlining internal/external barriers which would translate directly into reduced costs to the industry over time.

Installers / Integrators would have a uniform and automated process from permit jurisdictions and would provide a higher level of service to consumers. Installers would benefit from the more efficient and predictable use of their capital, labor and financing and could pass these savings on to the California solar market.

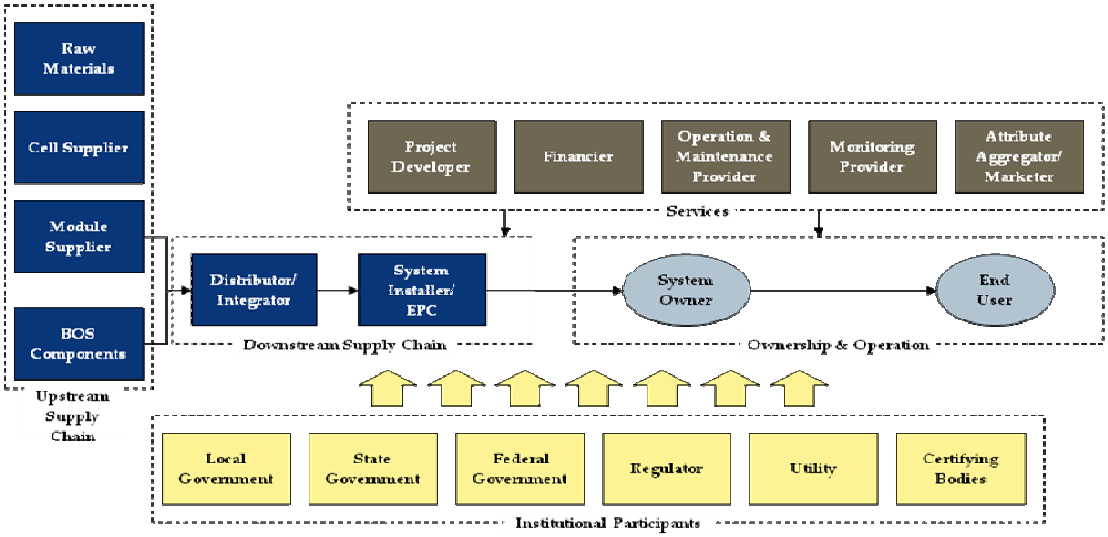
Solar technology consumers would benefit for the reduced time and possible reduced costs in implementing solar technologies.

California solar industry would benefit from the multiple positive gains due to improved efficiencies.

Background

As a solar PV system moves from the initial customer request to the final system commissioning, a number of members of the solar market network must interface and complete a chain of steps in the request-thru-commissioning process. The solar market network is illustrated in Figure 1 from Navigant Consulting.

Figure 1, Typical PV Value Network



In 2009, SolarTech identified the most obstructive steps in the request-thru-commissioning process and identified the various steps between the Institutional Participants and the other members of the solar market network as one of the more significant barriers. This guidance was also been provided by SolarTech and CalSEIA to the California Public Utilities Commission via recommendations from industry to Navigant Consulting in early 2009.

Current Situation and Challenges

This section discusses how policies, regulations, standards, and business practices of institutions create barriers preventing adoption of distributed generation PV in California. SolarTech and CalSEIA do not intend this to be a comprehensive study of all institutional barriers present in California. Rather, both partner organizations used their respective internal market knowledge in conjunction with ongoing feedback from member companies to identify high priority areas where exposing these issues to the broader solar industry community can make a large impact in the near- and mid-term in California (and potentially nationally).

SolarTech and CalSEIA have identified two key areas which create institutional barriers in California: lack of key standards within and across business process interfaces, and long installation cycle times.

PV Project Cycle Time

Installing a distributed generation (DG) PV system that makes use of a CSI rebate or incentive involves many steps, as shown in Figure 2. For this study, SolarTech refers to the time required to complete each of these steps as the installation cycle time. Figure 3 lists the parties involved in each step. Figure 2 also shows the estimated time requirements of each step. Figure 2 is based upon high level estimates developed by SolarTech. Overall time requirements can range from 22 weeks for a best-case small, residential system to 50 weeks for a worst-case large, commercial system.

Purchase	–
Rebate Application (in parallel)	2 – 3 weeks
Rebate Approval (in parallel)	3 – 5 weeks
Material Lead Times (in parallel)	3 – 5 weeks
Utility Interconnection Application	2 – 3 weeks (<15 kW) 8 – 10 weeks (large systems)
Building Permit Submittal & Approval	1 day – 8 weeks
System Installation (controlled by installers)	3 – 5 days (<15kW) ~20 kW / week
Inspection	8 hours (nominal)
Utility Interconnection	2 – 3 weeks
Rebate Payment	15 – 18 weeks

Figure 2. California DG PV Project Steps and Estimated Time Requirements [data est. by SolarTech]

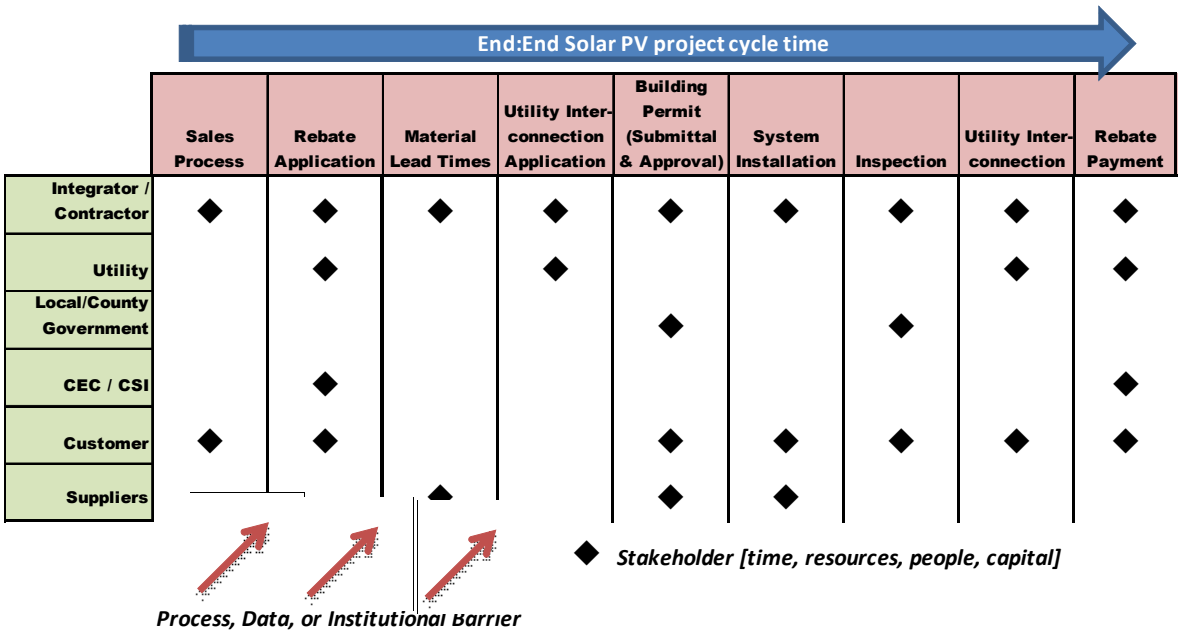


Figure 3. Stakeholers Involved at Each Project Process Step

The current challenges for the industry relate more to the ability to move projects, data, information, seamlessly from one step to another, automated or otherwise, with a high degree of predictability and quality. These "process barriers" are the focus of efforts to streamline institutional barriers limiting execution of solar energy systems.

The extent to which information, transactions, and data flow seamlessly across or through these barriers will dramatically reduce the "soft, hidden" internal administration costs associated with delivering projects of all sizes.

To put a finer point on the current state, the overall process time is long compared to the physical time required to actually install the system. As an example, the typical 4kW – 5kW basic residential installation will take only 3-5 days onsite, (or ~20kW/week for larger systems). However, the **total elapsed project time can** be upwards of 100-120 days. The time drivers in these processes are not the person-hours required to complete the tasks, but rather delays within each step and between each step, increases administrative costs and adding risk or uncertainty to revenue, cash flows, and profitability. A few examples of business processes which cause delays include:

1. Most applications are written manually as opposed to digitally.
2. Redundant data requirements across different rebate forms.
3. Broad variation in permitting requirements, both in data requested and time required, for different jurisdictions.
4. Uncertain inspection scheduling

All of these delays result in increased overhead for contractors because staff is either idle waiting for results; spending extra time on multiple trips or phone calls to check on the status of an application; or spending time on manual applications. Some of these costs are passed on to the system purchaser, resulting in increased costs, but in circumstances where a firm price was given to a customer and unanticipated delays arise, the extra costs are absorbed by the installer. This erodes the contractor's margins. These delays also result in time delays and cost for the institutions involved.

Possible Solutions

Project Cycle Time methodologies

Several in the PV industry – primarily system purchasers and contractors – experience the impacts of long cycle times. To date, SolarTech has taken the lead in addressing this issue by creating a set of **project cycle time goals, as seen in Figure 4 below**, for the California DG PV industry to strive towards. The overall intent of SolarTech's roadmap is look at the total end-to-end project cycle time as a competitive advantage, and where opportunities exist to improve, it is to the industry's overall benefit. SolarTech is currently focusing on reducing permitting time one of several areas identified. At the national level, the U.S Department of Energy's Solar Energy Technologies Program has a program dedicated to market transformation for solar technologies and has several technical outreach programs aimed towards overcoming knowledge gaps in several institutions, which could help reduce project cycle times. Also at the national level, Solar ABC's has developed a recommended permit expediting process (as a component of total project cycle times) for small scale systems (less than 15 kW) that could be adopted by jurisdictions throughout the U.S. A released version of the expedited permit process is currently undergoing stakeholder review is available at www.irecusa.org.

Call to Action

A role exists for the CPUC to help alleviate this issue by commissioning a pilot project to develop solutions and best practices for reducing project cycle time. The pilot project could take 5-10 real projects in 5-7 different municipalities across the CSI territory and involve 1-2 utilities and several contractors working in California. The goal of the pilot project would be to bring all the key stakeholders (Fig. 3 - local government, utilities, and contractors) together to review each step of the cycle while the process is happening. Each step of the process would

involve looking at the current situation, discussing possible solutions, and recording best practices already in place or developed as part of this study. The final deliverable of the study would be a paper discussing each step, solutions developed and a list of best practices at each step, along with quantifiable result relative to end: end cycle time goals The results of this study could help improve practices not only in California's solar industry, but the solar industry across the U.S.

The pilot should involve project sizes ranging from small residential (~2 kW) to large commercial (~ 1MW) in order to capture processes at each step that vary by system size. The pilot should also involve a range of cities to capture variations in current permitting and inspection practices.

Purchase	–
Rebate Application (in parallel)	5 business days
Rebate Approval (in parallel)	
Material Lead Times (in parallel)	1 – 3 weeks
Utility Interconnection Application	5 days 2 – 3 weeks
Building Permit Submittal & Approval	1 day (<15 kW) 2 weeks (large systems)
System Installation (controlled by installers)	3 – 5 days (<15kW) ~20 kW / week
Inspection	2 hour window
Utility Interconnection	5 business days
Rebate Payment	4 weeks

Figure 4. SolarTech's Project Cycle Time Goals

The pilot project would bring together a group of contractor, utilities, system purchasers, and local governments to collaborate and coordinate throughout the full project cycle for several actual projects. The project goals would be four-fold:

1. Enhance transparency to all parties throughout the whole installation cycle.
2. Develop solutions to issues that arise or are uncovered during the process.
3. Collect best practices already in place.
4. Solutions should be integrated from the local/regional level to the federal level for rapid scaling and deployment, assuming successful project completion

The project would consist of: a coordinating group, 5-10 system purchasers, 3-5 contractors, 5-6 cities, and 1-2 utilities in order to capture variations across system size, company size, geography, etc. The result of the project would a best practices and solutions paper to be disseminated throughout California.

Fund should be secured to go toward a group/firm that would be responsible for:

1. Creating a framework and schedule for the project.
2. Finding and selecting system purchasers, contractors, cities and utilities to work with.
3. Coordinating and facilitating stakeholder meetings.
4. Cataloging issues throughout the process.
5. Documenting current best practices and solutions developed as part of the project.
6. Publishing a paper on best practices.
7. Integrating and aligning local/regional/state efforts with federal organizations to ensure rapid deployment, scalability

Objectives and Impact on CSI Goals

A shorter project cycle would reduce the installed cost of a system, along with reducing the burdensome administrative costs as a relative percentage of total installed system costs, which would improve system economics and result in increased DG PV adoption. Shorter project cycle times would also likely result in less unanticipated costs being absorbed by contractors resulting in improved margins improving the sustainability of the DG PV industry in California. This process would also reduce costs and time requirements for the institutions involved (e.g. utilities, local building departments, CEC, etc.).

Timeframe

This activity could begin immediately, but given that project timelines currently vary from 22 to 50 weeks and that many parties will be involved in the project, this project will likely take 18 months to complete.

Feedback and Revision Process

As with any guideline or best practice recommendation this should not be considered an all encompassing study. This is a living document that will evolve through a formal feedback, review and ratification process. In addition, this single document can not possibly cover all of the various jurisdictions around the nation or various markets. In addition to improvements to this document, SolarTech envisions other variations to address needs not covered in this document. There are two ways to provide your feed back and have your voice heard:

1. Join the SolarTech or CalSEIA as members in good standing
2. Send a written review to the SolarTech Product Manager.
    i. Contact Debbie Lee at dlee@solartech.org

The key is getting involved, and submitting your suggestions, questions and concerns. Your feedback will be reviewed, along with others, classified, prioritized, and if appropriate scheduled for incorporation into the next revision. New revisions will then provided an opportunity to be reviewed by the membership and commented on. Upon close of the comment period, and a review of the submitted comments, the final draft will be issued to the member ship for a final vote of approval.

SolarTech and CalSEIA envision the possibility of several improved releases over the next few years as a result of this process. However, the first step is to get involved. Collaboration is the key to success and your feedback is important.

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