California Solar Initiative

RD&D: Research, Development, Demonstration and Deployment Program

GO solar CALIFORNIA

Final Project Report:

Sustainable Energy & Economic Development Fund (SEED Fund) Phase 2

Grantee:

Strategic Energy Innovations

December 2016

www.CalSolarResearch.ca.gov

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Additional information and links to project related documents can be found at
http://www.calsolarresearch.ca.gov/Funded-Projects/

Preface

The goal of the California Solar Initiative (CSI) Research, Development, Demonstration, and Deployment (RD&D) Program is to foster a sustainable and self-supporting customer-sited solar market. To achieve this, the California Legislature authorized the California Public Utilities Commission (CPUC) to allocate **$50 million** of the CSI budget to an RD&D program. Strategically, the RD&D program seeks to leverage cost-sharing funds from other state, federal and private research entities, and targets activities across these four stages:

- Grid integration, storage, and metering: 50-65%
- Production technologies: 10-25%
- Business development and deployment: 10-20%
- Integration of energy efficiency, demand response, and storage with photovoltaics (PV)

There are seven key principles that guide the CSI 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; and
7. **Support efforts to address the integration of distributed solar power into the grid** in order to maximize its value to California ratepayers.

For more information about the CSI RD&D Program, please visit the program web site at www.calsolarresearch.ca.gov.

Table of Content

1 Abstract

The Sustainable Energy & Economic Development Fund (SEED Fund) demonstrated an innovative solar collaborative procurement business model that utilized a public-private revolving fund to create a durable mechanism for enabling public participants to overcome adoption barriers with technical support that delivers reductions to overall project, transaction, and administration costs.

The SEED Fund used the momentum and infrastructure developed over 18 months of effort under SEED Fund Phase 1 into the launch of Phase 2. Leveraging existing momentum and program infrastructure developed under a previous California Solar Initiative (CSI) Research, Development, Demonstration, and Deployment (RD&D) grant from Solicitation #2, the SEED Fund broadened its impact and implementation process under the CSI RD&D Solicitation #5 grant. SEED Fund Phase 2 was designed to simultaneously accelerate market adoption of solar in a new region of California, while proving that the SEED Fund model can be scaled.

With the initial CSI RD&D grant, the SEED Fund team created a Phase 1 collaboration pool of 14 public partners that entered contracts to deploy solar photovoltaic (PV) projects across 32 sites that lead to over 5MW of solar contracted in Marin, Napa, and Sonoma Counties. The SEED Fund team, comprised of Strategic Energy Innovations (SEI) and Optony, Inc., provided overall financial, technical, and educational expertise with solar project procurement to reach this goal.

For Phase 2, the SEED Fund team worked with public agencies in Santa Cruz, Monterey, and San Benito Counties of California. As of the writing of the final report, the solar PV procurement pool included 9 public agencies with a cumulative capacity for solar generation of 6.97MW across 32 sites for on-site distributed generation, plus an additional 29.83 MW of potential “solar farm” capacity spread among 4 of those sites.

2 Executive Summary

2.1 Purpose

The Sustainable Energy and Economic Development Fund (SEED Fund) was designed to create a durable financing mechanism for regional sustainability projects that create new economic activity while improving the regional environment. The focus is on supporting renewable energy and energy efficiency deployment for municipalities, schools, and public agencies to help reduce costs while demonstrating leadership in clean energy. The SEED Fund also provides resources and training for stakeholders to build understanding and internal capabilities, and supports interaction across the communities.

Collaborative Procurement, in which several public agencies work together to seek and deploy similar projects, has many demonstrated benefits. There remain, however, potential barriers to participation for many public agencies, such as the upfront costs associate with: conducting site feasibility assessments, procurement development, and management. The SEED Fund initiative seeks to greatly extend the market potential of the collaborative procurement model by operating a revolving fund mechanism that defers upfront costs for public partners and provides expert technical support through the process of analyzing and contracting solar projects. The revolving fund was designed to be a sustainable financing mechanism, enabling the SEED Fund to conduct iterative Phases of collaborative procurement in new geographical territories once the preceding Phase had replenished the revolving fund. This mechanism, then, greatly expands the scope of the initial investment made by CSI and the deployment of distributed solar in California.

The SEED Fund was poised to conduct a second phase to more regions of California after completing Phase 1 of the project. Immediate action was delayed due to the extended timelines for the public contracting process and fund reimbursement of Phase 1.

Despite success, the SEED Fund did not have a funding base prior to the second grant to initiate a second phase and did not want to lose momentum to maximize the benefits for California municipalities. In addition, relationships with stakeholders were developed in other regions across the State to identify active

market interest in SEED Fund participation that may not have been as strong if a second phase were delayed. Follow-on funding from the CSI RD&D Solicitation #5 Grant allowed the SEED team to demonstrate the market potential of the more fully formed SEED Fund in two critical areas: scalability of internal operations and effective market development.

The success of this program has demonstrated that an upfront investment in collaboration, equal to 1-2% of total estimated project costs, results in better pricing (an estimated 8-10% total project cost savings), lower project risks with higher returns, reduced transaction costs and reduced administrative effort (resulting in an estimated 50-70% admin cost savings for participants).

2.2 Project Objectives

2.2.1 Internal Operations

SEED Fund Phase 2 activities demonstrated the streamlined approach of SEED Fund model, that was piloted in Phase 1. By prioritizing the identification of the lead agency, SEED Fund Phase 2 resources were spent implementing the program. With this streamlined approach, Phase 2 demonstrates the scalability of the model for statewide expansion, and the sustainability of its financial structure.

2.2.2 Market Development

Initial market development focused on California's San Joaquin Valley. The SEED Fund team conducted an outreach campaign to cities and counties in the region, including a workshop at the Fresno Council of Governments, to identify interest and willingness to move forward. The level of engagement and ability to move forward was not in alignment with the SEED Fund timeframe, and so a decision was made to develop a potential Phase 3 of the SEED Fund in the San Joaquin Valley, while redirecting resources for Phase 2 in the Monterey/Santa Cruz region.

2.2.3 Performance Objectives

SEED Fund performance objectives focus on the degree to which public participants have been attracted to the collaborative model and the resulting potential solar opportunities identified through the process.

1. Collaboration Development: Leverage the SEED Fund Mechanism developed in Phase 1, and bring at least 8 public partners into the collaborative through signed MOUs
2. Project Analysis: Prescreen at least 50 sites; conduct feasibility assessments for up to 25 sites; and identify at least 5 MW of viable solar projects across all participant sites
3. Proposal Development: Include at least 5MW of viable solar projects in a collaborative RFP; receive bids from qualified vendors on SEED Fund projects

2.2.4 Cost Objectives

SEED Fund's cost objectives are focused on further developing the fiscal structure that was set up in Phase 1 to realize both the financial and Solar PV deployment objectives that make this an effective market leading business model that can continue to grow through future investments from the private sector. Phase 2 cost objectives are to:

1. Facilitate the contracting of at least 5 MW of public (non-utility) PV, with a total project cost of at least $20M based on a conservative $4/watt installed costs for large-scale projects.
2. Create cost-savings of, on average, at least 50% on administrative costs for public participants (compared to the total costs participants would have incurred if acting alone).
3. Create cost savings by achieving at least 10% below market rates on contracted solar (based on regional equivalent project costs).

4. Create a net savings of 8% below market rates (based on the difference between total cost-savings; see above) and SEED Fund reimbursement costs of no more than 2% of total project costs.

3 SEED Fund Approach

The team developed a durable revolving fund mechanism with an initial grant from CSI RD&D to seed the revolving fund. The SEED Fund has enabled public participants to adopt solar power in a very efficient way and with a successful project outcome. The SEED Fund is replenished with a modest reimbursement fee from participants of the program, and through the replenishment mechanism, a durable financing model is established that is available for funding iterative Phases of collaborative efforts in new territories.

3.1.1 Revolving Fund Mechanism

The core of the SEED Fund is the revolving fund business model for project technical services and collaboration support. The SEED Fund supports upfront costs that would otherwise prevent public partners from effectively identifying, evaluating, and procuring distributed solar photovoltaic systems for their operations. Participants thus achieved economies of scale and rapidly overcame the gaps in knowledge that are common in the quickly evolving solar industry. The revolving fund is replenished through a modest reimbursement fee (2%) for projects that move forward based on an expected 10-12% aggregated cost reduction. As the fund is replenished, additional Phases of collaborative procurement are initiated, and this modest initial public investment enables long-term PV market growth in California.

3.1.2 Lead Agency

Deploying a lead agency from the ranks of high-potential participants in the collaborative effort is a key factor of the SEED Fund's success. The lead agency plays the crucial role of leading administrative efforts across all participating agencies. The Lead Agency, for instance, creates and designs the memorandum

of understanding (MOU) that is used to engage additional participating agencies. The lead agency also takes the lead in designing the Request for Proposals (RFP), then leads a selection committee made up of participants to choose the winning proposal. Once the selected vendor is chosen, the Lead Agency initiates contracting negotiations, thereby providing documents from which other participating agencies can work. In this role, the Lead Agency greatly reduces the administrative effort of other SEED Fund participants, thereby helping them to achieve even greater cost savings.

To play this role effectively, the lead agency should be a strong partner who really wants to move forward with adopting solar power and/or who already has experience in this sector. It is advantageous if the Lead Agency is selected very early in the engagement process with participants so that they can support in the outreach efforts.

The public agency that takes on the role of Lead Agency can be the face of the procurement effort. By leading the engagement, RFP, and press efforts, the entity demonstrates leadership locally, regionally, and nationally, and builds a reputation as a leader in sustainability and clean energy policies.

3.1.3 SEED Fund Team

In partnership, Strategic Energy Innovations and Optony Inc. designed and formed the SEED Fund's model, provided technical and logistical support to participants, managed the procurement process and vendor evaluations, and oversaw fund activities to maximize regional impact.

4 Project Outcomes

As of August 5, 2016, the SEED Fund Phase 2 team has draft an RFP, which includes 9 public agencies with 32 sites, and collectively an estimated recommended solar PV capacity of just under 37 MW. The team initially engaged 29 Santa Cruz, Monterey, and San Benito County public agencies in the collaborative procurement process, including 99 high-level site assessments and

48 full feasibility studies. The site-screening process identified potential for over 50 MW of solar power installation, including sites with potential for utility-scale PV installations.

SEED Fund Phase 2 received support from the Association of Monterey Bay Area Governments (AMBAG) and Citizens for Sustainable Monterey County (CSMC), both of which served as convening agencies. AMBAG and CSMC played critical roles in the success of Phase 2 of SEED Fund efforts by conducting direct outreach to local agencies, and organizing informative events for agencies interested in SEED Fund participation.

In May 2016, an agreement was signed with the County of Santa Cruz to serve as Lead Agency in Phase 2 of the SEED Fund. The RFP will be issued in August 2016, and will expect vendor proposals in October of 2016. The vendor selection committee, to be made up of participating agencies, will select the winning vendor. As participants enter contract with the selected vendor, the revolving fund will be replenished through the modest reimbursement fee (2%) for projects that move forward. As the fund is replenished, the SEED Fund team will continue its efforts in facilitating Phase 3 of the program, currently working with public entities in the California Central Valley. Figure 1 shows the overall time-line and activities.

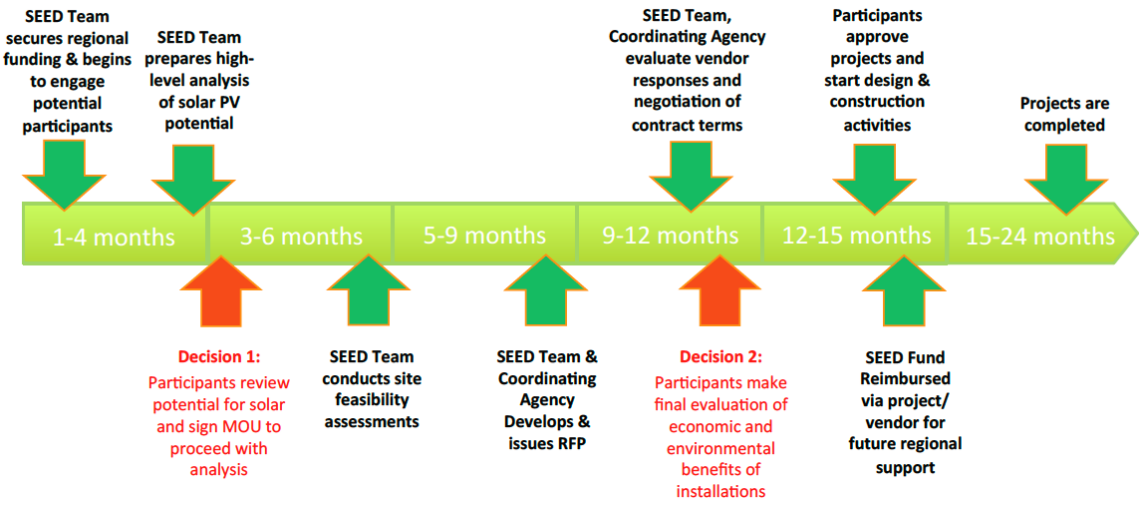

Figure 1: Overview of SEED Program Timing and Activities

4.1 Collaboration Development

The purpose of Task 2: Collaboration Development was to engage partners in the collaboration model. Through this process, the SEED Fund team identified both public partners, as well as a Lead Agency.

The SEED Fund leveraged marketing materials from Phase 1 which provided information about the collaborative partnership, and disseminated them to schools and local governments in the California Central Coast.[1] The SEED Fund team conducted stakeholder meetings with prospective participants and made presentations at municipal and school meetings. The team developed a website for the project, creating a single public point of reference for this effort.[2]

The SEED Fund team worked to reach agreement with public agency participants and a lead agency to sign onto the SEED Fund project by having them execute MOUs.

The SEED Fund team lead stakeholder meetings, including the following:

- 09/2014: Presentation - Collaboration Development at Fresno Council of Governments, in Fresno, CA
- 11/2014 Presentation - Collaboration Development at Solar Forum: Economics of Solar in Seaside, CA
- 11/2014 Webinar - Collaboration Development
- 01/2015 Presentation - Collaboration Development at Association of Monterey Bay Area Governments (AMBAG) in Monterey, CA
- 01/2015 Webinar - Collaboration Development
- 06/2015 Webinar – New Participant Webinar
- 07/2015 – Solar Financing Workshop at Association of Monterey Bay Area Governments (AMBAG) in Monterey, CA

[1] See Appendix: SEED Fund Power Point Presentation
[2] http://www.solarroadmap.com/regional-initiatives/seedmontereybay/

- 08/2015 – Technical Workshop at Cabrillo College, CA

4.2 Project Analysis

The purpose Task 3: Project Analysis was to conduct technical and economic feasibility analyses to identify viable sites for new solar deployment. The SEED Fund team used site analysis and economic modeling resources to determine site viability from both a technical and economic perspective. Through this process, 99 sites were pre-screened for viability. Pre-screening reports included both technical and financial considerations for each site, one-page summaries of all analyzed sites, and recommendations for how to prioritize development of sites based on a ranking of their technical and economic potential. Of the original 99 sites, 48 sites had full feasibility studies performed. The studies were developed by: mapping sites; performing on-site surveys of actual site conditions (e.g. constraints, shading, facility condition, electrical infrastructure, and alternative options); documenting performance expectations; developing financial analysis models for each viable site; interviews with stakeholders to determine goals and priorities. The team used this information, along with knowledge of solar costs, to provide: a summary of each site's potential; estimated ROI for development of each site; and a ranking of priority based on technical, economic, and qualitative factors. As part of the feasibility studies, the team identified projects that, if developed, would yield 50.9 MW of new solar PV.

4.3 Solicit Proposals and Award Contracts

The purpose of Task 4: Proposal Development was to develop an RFP that satisfies participant requirements, attracts qualified contractors, and results in award of contracts that realize cost savings for participants, efficiency for vendors, and integrated SEED Fund repayment criteria into contracts with vendors. For this task, the SEED Fund team leveraged experience from Phase 1 to draft a market leading RFP. This RFP will be issued on August 16 2016 by the Lead Agency, the County of Santa Cruz. Leveraging evaluation criteria and processes developed in Phase 1, the team will provide technical expertise in the evaluation of proposals

and the selection of vendors. Once the selection of a preferred vendor has been made by the Vendor Selection Committee, the SEED Fund team will work with the Lead Agency and all public participants to negotiate contract terms and define final contractual requirements, including reimbursement of SEED funds (2% of project costs). The SEED Fund team will make presentations to key staff and decision-makers about the projects, financing, contracts, and installation plans, and provided needed support to municipal staff to finalize approval from their respective elected officials.

5 Conclusions

By leveraging the initial CSI RDD Solicitation #2 grant and SEED Fund Phase 1 efforts, net costs for implementing Phase 2 were dramatically reduced. Due to the great progress made in Phase 1, the SEED Fund team had both the capacity to act and targets for future Phases of activity, but required additional funding to implement Phase 2. The CSI RD&D Solicitation #5 Grant enabled the team to maintain a stable base for the Fund to deploy the second Phase. SEED Fund reimbursements from Phase 1 continue to come in, and reimbursements are expected from Phase 2 by the end of 2016. With the SEED revolving fund mechanism in full deployment, the team has been able to launch Phase 3. As of August 2016, the SEED Fund team is developing collaboration in the San Joaquin Valley, and thus continues to build additional capacity for expansion throughout California. As outreach continues in the San Joaquin Valley, six public agencies are already involved in the SEED fund process and have received pre-screening reports to determine the viability of their sites for solar PV deployment.

6 Recommendations and Lessons Learned

During the 1st Phase of the SEED Fund, the SEED Fund team gained significant insight and experience about the process of developing a collaborative public

agency solar procurement. Some of those lessons were highly valuable as the team sought to implement a more efficient Phase 2 and thereby broaden the impact of the program. These include:

For Phase I, Outreach efforts began too broadly, resulting in geographically diffuse engagement with public agencies, rather than a geographic cluster of engagement which is required to develop a RFP with a bundle of viable sites. To implement more efficient and successful outreach efforts, the team took on the following efforts:

- Outreach efforts began with a search for the Lead Agency. Since it was difficult to identify a Lead Agency in the San Joaquin Valley, the team instead launched outreach efforts in the Central Coast, where early-on a few agencies indicated their interest in becoming Lead Agency. Once those Lead Agency contenders were identified, the team worked outward to target potential participants using the power of a regional network of increasingly engaged champions to build the program base. The team worked with the Association of Monterey Bay Area Governments and Sustainable Monterey in this capacity. This is a Best Practice and the team will continue to seek out the Lead Agency before engaging a large group of participants.
- Outreach focused on a regional cluster of large-potential participants surrounding the lead agency. In contrast to engaging all possible participants, this approach reduces logistical effort and increases the average project outcome per agency. The size of participants influences potential discounts, as well as administrative and logistical efforts.
- Outreach focused on potential participants with high levels of interest and with significant numbers of high-potential sites. Focusing on this “low-hanging fruit” reduced time spent on sites and agencies unlikely to be good participants for the collaboration.
- The team focused on developing clear messages that were simple and compelling to the audience to build awareness quickly and move towards

engagement without confusion. This is a Best Practice and the team will continue to hone its messaging in subsequent Phases.

- The team continued to refine the deeper technical, legal, and fiscal case for SEED Fund so when participants look at the program they see a strong value proposition that is likely to address multiple priorities.

In Phase 1 the team found that conducting face-to-face meetings with potential participants and group workshops is the most successful way to engage them.

With this Best Practice in mind, the team took on the following activities:

- Outreach efforts focused on in-person meetings/workshops that included many potential participants and then followed up with each lead individually.
- To confront the extremely long lead-time Phase 1 faced in getting new agencies to participate, the team created solid deadlines on participation milestones.

In Phase 1 the team experienced challenges with potential participants not fully understanding how the program worked or how it delivered benefits. As a result, the team, spent unanticipated additional time re-explaining the program and its benefits to stakeholders. To address this, in Phase 2, the team provided a deeper level of education on the technical and financial aspects of solar installations to larger audiences of potential participants.

- The team hosted webinars and workshops introducing the collaborative procurement approach, the SEED Fund model, solar financing structures for public agencies, and all technical considerations of solar installations.
- The team maintained the website to provide easy access to sources of information on the SEED Fund Model, solar financing structures for public agencies, and technical considerations of solar installations.

7 Public Benefits to California

The SEED Fund Program contributes to California State's energy goals by enabling public participants such as cities, counties, and special districts to adopt solar energy in an efficient way. At the close of Phase 2, it is anticipated that 37.7 MW of new PV systems for 9 public agencies will be contracted and installed. These systems will yield an estimated solar energy net increase of 60-75% for public agencies in the region of Monterey, Santa Cruz, and San Benito Counties. This is a great contribution to California's energy goals because, by stimulating the deployment of solar energy systems, the SEED Fund Program helps reduce greenhouse gas emissions and increases renewable energy in California's utilities' power mix.[3]

The SEED Fund Program has demonstrated the benefits of utilizing the collaborative procurement approach coupled with leveraging a revolving fund mechanism. By using this financial model, the SEED Fund program can launch additional Phases in other regions, thereby extending the impact of CSI's grant and its contribution to California's energy goals.

All technical data collected over the course of the SEED Fund program is publicly accessible, from the SEED Fund partner Optony Inc. The assessments of public sites can serve as preliminary examples and comparisons for other stakeholders' sites. Ultimately, this data can be used to indicate solar adoption potential across California's public entities.

[3] http://www.energyupgradeca.org/en/learn/california-state-energy-goals

8 Appendices

1. Marketing materials: SEED Fund FAQ Handout
2. Marketing materials: SEED Fund Overview Presentation