DE-EE0005690

Developing Solar Friendly Communities

Colorado Solar Energy Industries Association

FINAL REPORT based on

STATEMENT OF PROJECT OBJECTIVES

The report is organized in the SOPO format, with summaries under each objective and under each SOPO task for easy reference.

A. PROJECT OBJECTIVES

The goal of the Solar Friendly Communities project is to achieve measurable improvements in market conditions for rooftop solar through an innovative program to streamline processes and reduce costs. Specifically, there are four primary objectives:

1. Establish best practices for streamlined and standardized permitting, interconnection, financing, and other related areas based on quantifiable data and stakeholder input

We established best practices based on an extensive stakeholder process which examined quantifiable data, national standards and the experiences of the Colorado solar industry. We codified them into " 12 Best Practices: A Roadmap for a Solar Friendly Community'' as an easy-to-follow guide for streamlining permitting, advancing financing and addressing other issues.

2. Provide education regarding best practices through trainings, online tools, hands on support, and quantifiable progress assessments.

We provided a half-day training workshop with each of our four core communities and then provided three regional trainings attended by 75 key stakeholders to introduce the program once we finalized the 12 Best Practices. We developed an extensive set of online tools including print materials and three professional videos that is accessible at our website http://www.solarcommunities.org . We provided individualized hands- on support to more than 25 individual communities interested in the program. We provided quantifiable progress assessments in the form of an application form online

that allows communities to measure their progress and earn points for adopting certain best practices.

3. Recognize leading communities which are following best practices through a high profile and structured recognition program consistent with DOE branding, as available.

We created a recognition program based on points for following a range of best practices grouped under the 12 main topic areas. It included recognition levels of Bronze (starting at 700 points), Silver (900 points), Gold (1100 points) and Platinum (1400 points) . We worked with communities to achieve recognition and had success with all five of Colorado's biggest communities. We recognized a total of 14 cities and counties with a combined population of more than 2 million people. These included three Gold level communities (Denver, Fort Collins and Lafayette), seven Silver level communities (Aurora, Lakewood, Boulder County, Carbondale, Pikes Peak Regional Building , Superior, Golden) and four Bronze level communities (Arvada, Nederland, Parker, Lyons). Recognition ceremonies included presentation to mayors and county commissioners of a plaque and a road-worthy road sign with our attractive logo, along with press releases and public attention. Citizens in each certified community are eligible for the Solar Friendly Communities Discount, $500 off the cost of each residential rooftop solar system , a voluntary program offered by 16 participating solar installation companies recruited through the project.

4. Develop a scalable model that can be efficiently expanded nationwide in a cost-effective manner

We created a turn-key program that includes educational materials, an easy-to-follow roadmap of best practices, an appealing reward of public recognition, discounts for citizens, and a method for ongoing engagement with the recognized communities. This model can be efficiently expanded nationwide in a cost-effective manner and we have seen significant interest from all parts of the U.S. at participating in this program.

Narrative summary overview:

With soft costs now representing more than half the cost of an average rooftop solar energy system, the need to target cost reductions in these areas is critical. Local jurisdictions have a big role to play in the permitting and inspection realm which was the focus of our program. Especially in Colorado, a state with a strong tradition of local control, cities and counties are resistant to outside entities dictating or even suggesting changes. That's why the Solar Friendly Communities program provided a positive incentive for participating in streamlining solar costs. This proved to be the most powerful aspect of the project. The branding, materials and format were developed into a turn-key product that can be scaled nationally.

Local authorities tend to be overworked as many of their offices contracted during the Great Recession. At the start of the project in February 2012, the first reaction from many local officials when we suggested streamlining solar permitting was a version of "Why should I ? I have many higher priorities than giving special treatment to solar. "

This has been borne out nationally: motivating local officials to take steps to change can be one of the biggest obstacles to soft cost reduction.

Following in-depth workshops with each of our four core communities to identify barriers and opportunities, the Solar Friendly Communities project worked to create an easy-to-follow roadmap correlated with the goals of the Rooftop Solar Challenge. Uniquely among the Rooftop Solar Challenge teams, the project was led by a solar industry group, the Colorado Solar Energy Industries Association. This provided good access to industry leaders. They were engaged early on and remained active participants throughout the project. The "12 Best Practices: A Roadmap to a Solar Friendly Community'' was developed through months of discussion and consultation with national experts and local installers, city and county government officials and non- profit analysts. It provides a menu of options for local officials to follow in streamlining solar permitting in order to bring down soft costs. We emphasized in every community that the program is designed so local governments can choose what makes the most sense for their community.

The project structure worked well in developing the 12 Best Practices and in the introduction of the program. COSEIA provided overall management and leadership throughout. Rocky Mountain Institute was engaged in developing the pre-launch workshop and took the lead in planning the "Deep dive'' workshops for each of the four communities and writing follow-up reports. RMI helped develop the 12 Best Practices and scoring for each action. RMI also scored the applications and determined what certification, if any, communities were eligible for. However, RMI had a smaller role in the overall project, and very little role in the second year during the NCTE period, than the original funding anticipated. RMI was busy with numerous other grants and programs and had anticipated its role falling in the front end of the project. The lower level of involvement and funding for RMI freed up funds for COSEIA to continue the program in 2013. ASES also had a limited involvement in the project, largely due to the organization's financial difficulties. The ASES involvement consisted primarily of including Solar Friendly Communities as a sponsor at its 2013 national conference, including the program on a soft costs panel, and running advertisements for the Discount Program in the print and online versions of *SOLAR TODAY*.

The Steering Committee members from each of the four core communities participated throughout the project in biweekly calls and served as an effective oversight body. They represented various disciplines included in the project, from sustainability officers to building officials and utility engineers. But all of them are very busy people and this project was an add-on to their regular duties, so beyond the steering committee calls and coordinating their own community's certification progress, their role was limited.

The roadmap is weighted to favor standardized permitting forms and procedures: the biggest single point total is given to the Solar ABCs expedited permitting process in part to encourage nationally standardized forms and procedures. Cities and counties are eligible to apply for recognition by completing all of the first three steps which address the front end of the project. This decision was made by the team after extensive consultation because providing transparency and clarity in permitting seemed a prerequisite to other steps.

Most communities adopted some but not all of the first three steps and instead worked across other areas addressing inspections, and wider community goals such as solar friendly planning and zoning.

The program lays out a total of 1600 possible points with recognition starting at 700 points (Bronze). While we expected numerous communities to seek to do the minimum, we were surprised at how many made more effort in order to achieve higher levels of Silver (900 points) or even Gold (1100) points. We wondered about a four-tier recognition program, but the extra effort many cities went through confirmed the validity of this approach. Of the 14 cities and counties certified, three earned Gold level certification, 7 earned Silver level certification and only 4 settled for Bronze level. The population of the certified communities exceeds 2 million people and includes the five biggest cities in Colorado and other major communities.

The chance to earn public recognition as a Solar Friendly Community was certainly a primary motivator of all the cities and counties that participated-- including some that have not yet achieved certification. By offering a public recognition ceremony in each community where we presented the mayor or commissioners an attractive plaque and a large road sign, the local officials got a much appreciated pat on the back for their efforts. The media coverage of each event in turn spurred a "keeping up with the Joneses'' interest in neighboring communities which wanted to get their recognition too. The recognition as a Solar Friendly Community resulted in real streamlining of procedures, but installers told us of an equally important psychological change. Permitting officials were less likely to seek to throw up roadblocks and more likely to seek to solve problems in a quick manner. Installers could also remind them when they were not behaving in a solar friendly manner.

One of the most powerful aspects of the program-- still just starting to play out in its effect-- is the Solar Friendly Communities Discount Program. We did extensive outreach via a conference workshop, email and in personal phone calls to COSEIA member solar installation companies about offering a discount to residents in certified communities. We conducted an online poll and chose the option most favored: a $500 discount on each system for residents in certified communities. A total of 16 companies signed up and completed registration forms. The benefit to them is primarily lead generation: they are included in advertising and promotion generated by the program. Most significantly, each of the certified communities helps in outreach by publicizing the program through neighborhood group newsletters, city communications, flyers in inspectors' trucks, websites and other methods.

After a year of experience, tweaks to the roadmap that would be beneficial have become apparent, particularly if we decide to export the program beyond Colorado. Some of the last three steps that move beyond permitting and inspection into broader community goals could be more clearly laid out and more explicitly tied to points. Developing a change management process and making these tweaks was planned as an early task for the next phase of the project.

As we introduced the 12 Best Practices, some of the early adopters had already done many of the steps. This could result in criticism: that we were recognizing cities that didn't have to do very much to earn certification. This was true in a few cases but in nearly all cases, cities and counties had to change

procedures and had to improve communication between departments and make transparent processes that only a handful of insiders had been privy to before the Solar Friendly Communities program. By posting procedures on a web site, they were codifying practices for all to understand. In many cases, going through the certification process required a rethinking and a change in procedures. In many communities, including Denver, the project brought together city staffers from a variety of departments who had never before gathered together to discuss improvements in solar permitting. In Fort Collins, for example, the project led to a major improvement in communication between the municipal utility and the building department and cutting the permitting time by about a week. In other cases, major changes such as a move to electronic permitting, were part of the certification process.

As we worked with individual cities seeking recognition, we realized that they earned points in a variety of ways in order to accumulate enough points for recognition. We would like to go back to each one systematically and suggest next steps. For example, while permit costs are capped at $500 under Colorado's Fair Permit Act, some communities tack on various other fees and use taxes. We hear criticism from installers about this issue and others. If we are able to secure funding to continue the program, we intend to go back to each community on roughly the one-year anniversary of certification and examine practices with the city staff and recommend changes in order to move to the next level of certification. We would also like to quantify the financial impact of the changes.

Additionally, the separate process of interacting with the utility to achieve interconnection approval adds a different set of obstacles. We set forth to address this with Xcel Energy by querying installers about the parts of the utility interconnection process that are most difficult, and by conducting an interactive exercise at the 2013 Solar Power Colorado workshop on Solar Friendly Communities which identified barriers from Xcel as the biggest headache for installers. We also did systematic outreach to COSEIA members on this issue and solicited information on the most problematic parts of Xcel's process. We produced a report outlining improvements that would make the most difference. But when Xcel Energy submitted a proposal to completely change the rules for net metering in Colorado as part of a compliance plan filing with the Public Utilities Commission in mid- 2013, the opportunities for collaboration on this issue grew very limited. COSEIA is focused on trying to protect net metering and other important solar policies in the regulatory arena at this time.

The Solar Friendly Communities project throughout 2013 gained in momentum as opportunities to present the 12 Best Practices and recognition program to both individual cities and in group settings multiplied. Presentations on the program to national audiences were made throughout 2013 and were generally met with enthusiastic response. COSEIA did targeted outreach to the 50 biggest cities and counties in Colorado and engaged with more than 20 of them in the second half of 2013. In 2012, the City and County of Denver became the first to win certification while in 2013, the number of certified communities reached 14, with numerous others still working on the program.

As we worked with more cities, officials frequently wanted to understand the economic development impacts that increased solar energy development could have in their communities, in part as a way to motivate their administrations to take more action. There was a dearth of solid information about

the impact of solar energy in Colorado. For this reason, Solar Friendly Communities contracted with The Solar Foundation to do the most extensive study of its kind on the impact of solar energy in Colorado. The report, previously shared with the DOE, had impressive findings:

-Direct, indirect, and induced employment impacts of approximately 10,790 job-years (or full-time equivalents), leading to employee earnings of over $534.1 million;

-Total economic output of $1.42 billion;

- Aggregate state and local government tax revenues of between $34.1 million and $59.7 million, including property taxes ($3.1 million - $9.3 million), sales taxes ($18.7 million - $38.1 million), and income tax revenues of $12.3 million;

- Approximately $24.3 million in environmental benefits achieved through avoiding emissions of pollutants tied to conventional electricity production, and;

- Savings of nearly 300 million gallons of water, which would have otherwise been consumed as part of the electricity generation process.

This information was shared widely and provided another good motivator for participation in reducing soft costs of solar.

Creating and rolling out a comprehensive program of this nature works best as a long-term project. While we are grateful that through NCTE we were able to continue the work through most of 2013, the program really was gaining momentum as funding ended. Since DOE rejected the proposal to expand Solar Friendly Communities regionally in July 2013, efforts have been underway to seek other funding. But none has been secured yet.

B. PROJECT SCOPE

This project aims to achieve measurable improvements in market conditions for rooftop photovoltaics (PV), with an emphasis on streamlined and standardized permitting and interconnection processes. This project directly supports the goals of the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE), Solar Energy Technologies Program (SETP) and the SunShot Initiative.

C. TASKS TO BE PERFORMED

Task 1.0 - Project Governance: Develop the operational structure to ensure effective execution and successful implementation of this program. (Jan-Dec 2012) – COSEIA – Deliverable: Core team to meet every other week throughout program, plus program overview website ready Q1 2012.

1.1 Project Management and Reporting: As Lead Applicant, Colorado Solar Energy

Industries Association will provide program management oversight, training development, and program recognition implementation and promotion. Rocky Mountain Institute will play a key role in leading best practice development and quantifiable analysis. Denver, Boulder County, Golden, and Boulder County will be early program adopters and will provide real-world insights on program design from a local government perspective. The American Solar Energy Society will help support the program design and multi-state rollout as we move from Colorado to the southwest region and beyond. COSEIA will submit project progress reports, financial reports, and other deliverables provided in accordance with the Federal Assistance Reporting Checklist DOE F 4600.2 and the instructions therein.

The team members performed the tasks outlined above and all periodic reports were provided on time and as specified.

1.2 Develop Program Communication: Develop communication channels to introduce program to potential collaborators, build email lists, create program overview webpages, and develop initial graphics to ensure an appropriate look and feel.

The team designed, facilitated, and executed a pre-kickoff workshop with the four core communities, industry representatives, and other government officials at Solar Power Colorado 2012. This workshop helped set the stage for Solar Friendly Communities work.

Outreach to potential collaborators began in earnest at the outset of the program and continued throughout the grant period. The Solar Friendly Communities website describing the full program with its own graphic look and feel launched within 6 months of the grant award. It is located at http://www.solarcommunities.org

1.3Establish Stakeholder Groups: Establish two primary groups of committee stakeholders: a core steering committee to guide the process and to make strategic decisions (representatives from each of: COSEIA, RMI, Denver, Boulder County, Golden, Fort Collins, and ASES) and an extended stakeholder group that includes 30-60 representatives from interested local governments, solar businesses, utilities, and others across Colorado to provide feedback, analysis, build sense of ownership, and build credibility that attracts followership. Review program scope, schedule, and resources.

A core steering committee guided the process and made strategic decisions by meeting by teleconference every two weeks throughout the project. Members were: Jessica Scott, City and County of Denver strategic sustainability officer; Norm Weaver, Fort Collins Utilities energy services engineer; Gary Goodell, Chief Building Official, Boulder County; Theresa Worsham, City of Golden Sustainability Coordinator, Jesse Morris, Rocky Mountain Institute analyst; Seth Masia, ASES Communications Director. Rebecca Cantwell, COSEIA Senior

Program Director chaired the group, called the meetings, sent out agendas and sought the group's guidance on all major decisions.

Work began at the outset of the grant and continued throughout to ensure that a variety of other stakeholders had input into the work. A letter was sent to all members and affiliates of the Colorado Solar Energy Industries Association and about 30 expressed interest in participating. From this, a representative group of industry participants with a particularly strong interest were asked them to serve on the Solar Industry Working Group. About a dozen members of this group met in person, with more on the phone on in March 2012. A very lively discussion ensued about issues that solar installers and designers have with specific jurisdictions, and issues that they think would generally help reduce costs by speeding permitting. A detailed report of the meeting was disseminated. This process helped shape the 12 Best Practices and many of these solar representatives remained engaged in the program throughout the life of the grant.

Outreach was also conducted to Colorado Code Council leaders, to the Denver Regional Council of Governments, to the Colorado Municipal League, to sustainability coordinators and to other local government groups.

Task 2.0 - **Pre Program Assessment and Root Cause Analysis**: Establish a regional Baseline and Framework for Action. This builds on the metrics in the initial Market Assessment to better understand root causes behind the metrics: key challenges/pain-points faced by stakeholders, current processes, how city/county dynamics vary by community size, current market dynamics, and emerging changes. (Jan-May 2012) – RMI – Deliverable: Summary of Conclusions comparing local/regional findings with national findings, root cause analysis, and regional baselines. Q2 2012.

In preparation for the "deep dive'' workshops with key decision-makers in each of our four core communities, RMI completed conducting baseline assessments of the four core partner communities to identify potential efficiency improvements.

The team successfully completed in-depth workshops and follow-up work with each of the four core communities of Denver, Boulder County, Fort Collins and Golden. Through these workshops, a variety of specific ways the jurisdictions will continue to make progress in streamlining permitting and inspection procedures were identified and detailed. Officials in each community actively pursued these follow-up tasks and we continued to work closely with them to assist their implementation efforts. Post-workshop reports for each community were submitted to the DOE.

2.1 Establish BOS Framework Working Committee: Identify a subset of the extended stakeholder group to serve on the balance of system framework working committee, clarify committee scope, deliverables, chairperson, and schedule. Ensure involvement by key influencer communities and champions (including involvement from the Participating Local Governments)

The Solar Industry Working Group continued to work on developing best practices. The steering committee, composed of key representatives of Fort Collins, Boulder County, Denver and Golden along with RMI, COSEIA and ASES continued to discuss best practices in biweekly meetings.

At the same time, extensive study and analysis of best practices was conducted in conjunction with a wide range of stakeholders. From this, the "12 Best Practices: A Roadmap to a Solar Friendly Community'' was developed, detailing what communities can do in each area to streamline solar permitting, inspections, planning and zoning and finance.

2.2. Clarify the Problem to Solve and Compelling Need: Identify potential efficiency improvements and publish findings.

In addition to conducting thorough baseline analyses of each community and surveying dozens of best practices in the action areas of the Rooftop Solar Challenge, RMI produced a white paper outlining several major areas of innovation to help frame the issues for the Solar Friendly Communities team. The paper was disseminated to stakeholders and posted on RMI's website.

2.3 Assess National Data on Existing Frameworks Related to BOS Process Costs in the Four Action Areas: Identify existing best practice data for process and policy across all action areas of the Rooftop Solar Challenge using existing NREL/SolarTech survey data on process balance of system costs..

While the initial survey was administered to Denver and Boulder County, the team also surveyed two other cities, Fort Collins and Golden to provide detailed data for reviewing their progress.

2.4 Survey Working Group and Regional Constituents to compare National Data with Regional/Local data: Leverage existing data using results from the SolarTech/NREL Process

Balance of System Costs survey to benchmark initial project partner communities. Where data is lacking, survey project partner communities for more specific information on the four action areas of the Rooftop Solar Challenge

At the outset, the project team completed a baseline assessment of existing market conditions within the core communities and identified potential efficiency improvements within each community. In addition, the communities were compared to national cost data to better situate the Solar Friendly Communities team in the U.S. market. As a part of the baseline assessment of each community, several databases (including NREL's OpenPV database) were used to compare costs and process across jurisdictions and identify operational inefficiencies within each community.

2.5 Identify Root Causes behind the Survey Data: Facilitate discussions with working group members to better understand process pain-points by stakeholder type, impacts, variances by community size, market dynamics, and other salient gaps to better understand root causes.

Extensive interviews with local developers, inspectors, and installers allowed the team to identify root causes behind many of the issues identified in the baseline assessments.

2.6 Establish Regional Baselines: compare to national data, and identify leading communities with in-place best practice non-hardware BOS-oriented processes and policies; compare regional process and policy best practices to national data; assess, determine gaps, additional considerations, and report conclusions.

Regional cost and process baselines were established for each of the core communities for reference during our in-depth workshops. The team reviewed this information with communities at the workshops and identified the gaps each community can work on first.

Task 3.0 - Program Design and Best Practices Development: Utilizing Pre Program Assessment as a starting point, identify solutions to address pain-points, process complexities, and gaps, then seek to incorporate DOE recognition program, or develop a structure, as needed (Feb-Jul 2012)-COSEIA/RMI – Deliverable: completed best practices document. Q3-2012.
3.1 Brainstorm Solutions to Address Key Needs: Brainstorm potential solutions with Participating Local Governments and other stakeholders that can help address the pain-points identified, root causes, complexities in each of the four main action areas based on analysis of survey data and stakeholder feedback received.

The four workshops with the core local governments of the Solar Friendly Communities team set the groundwork. These workshops were attended by chief building officials, other code officials, and in some cases by high-ranking community policy makers. A solar installer active in the area was present at each workshop. These three to four hour sessions highlighted

several specific areas for follow up work to will help drive down the costs of solar in Colorado.

3.2-Analyze and Prioritize Alternatives: Evaluate potential solutions with Participating Local Governments and other stakeholders to determine relative impact, ease/likelihood of implementation, and extent they would be likely to be supported by stakeholders. Compare recommended solutions to achieve cost reduction goals and BOS area process and policy improvements for the program (from Baseline) and adjust activities as needed in each action area to ensure process improvements / cost reduction goals likely to be achieved. This task will result in a suite of best practices for each Rooftop Solar Challenge action area that will be implemented in participating jurisdictions by the end of the project period. Report conclusions.

A report from each workshop highlighted next steps and summarized the brainstorm sessions that took place. The white paper referenced above and all four reports from the workshops were shared with DOE program contacts.

Information about progress toward establishing best practices was communicated regularly with the extended stakeholder group of more than 100 people who expressed interest in the work. Their suggestions were incorporated.

The Industry Working Group remained active as the team developed best practices and then the framework for a recognition program. The 20 Industry members were all emailed a draft of the recognition program framework and in meetings and through emailed comments provided valuable feedback.

The steering committee was asked to provide detailed feedback on the proposed best practices and recognition program numerous times and their thoughts were incorporated into subsequent drafts.

At the same time, work continued on developing communication channels. Audiences for presentations on Solar Friendly Communities ranged from agricultural communities on Colorado's Eastern Plains to the World Renewable Energy Forum.

3.3- Identify Strategies to identify and promote jurisdictions that are friendly to solar development. : Work with the U.S. DOE to determine status of development of any potential DOE-branded program to recognize/reward communities that are proactively adopting recommended solutions raised. If no such national recognition program is ready, develop scalable recognition program (define weighted point system, structure, logistics, and evaluation processes) in collaboration with DOE stakeholders. Report conclusions.

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In the third quarter of 2012, the Best Practices were finalized after months of work with scores of stakeholders. We released: "12 Best Practices: a Roadmap to a Solar Friendly Community'' based on the criteria outlined above. The program is based on local government input that offers a simple roadmap with examples of how to perform each action, and gives communities a menu of options.

The program offers a total of 1600 points with communities able to earn Bronze designation at 700 points, Silver at 900 points, Gold at 1100 points and Platinum at 1400 points. Points are awarded based on how much each action is likely to bring down soft costs and lead to greater consistency. For example, the biggest single point total is available to communities that adopt the Solar ABCs Expedited permitting process as a way to encourage national standardization.

After development, design, and writing, the program website launched at http://www.solarcommunities.org. **. The website provides a guided tour of the program as well as resources to help communities achieve designation.**

The online application form is live on the website, along with PDF and Word versions of the program for communities to use. The process for certifying communities is explained on the website and in personal communications.

Local officials fill out the form and provide quantifiable data, mainly in the form of web links, to verify their information. The goal is to make the process as easy as possible but also transparent and verifiable.

Throughout the program, the team continued to express interest in working with the DOE to ensure that this program is consistent with any recognition program that the DOE is planning. We continue to believe that this program can serve as a pilot that is now ready to be scaled up nationally in collaboration with other stakeholders.

Task 4.0 - Develop Educational Content: to highlight best practices identified in task 3.2 listed above, highlight rational benefits for involvement by wide range of stakeholders (targeted to different audience) (Apr-Sep 2012) –COSEIA – Deliverables: training materials & online educational toolkit. Q3 2012.

The basic educational toolkit was completed in conjunction with the website launch with materials posted by the time the site went live in August 2012. Many of the educational materials are grouped under each of the 12 Best Practices. For each best practice, clickable links show what other communities are doing representing each best practice. The results are posted at www.solarcommunities.org.

4.1-Establish Education Working Group: Identify a subset of the extended stakeholder group to serve on the education working group, clarify committee scope, deliverables, chairperson, and schedule.

The education working group provided regular feedback on our recognition program framework. The group also took the lead in the second quarter 2012 on another important product. Based on conversations with the Colorado chapter of the International Code Council, we offered to develop a best practices guide for rooftop PV systems. We hope this guide will be useful to solar contractors and that a companion guide outlining permit requirements will be adopted by Colorado code officials and posted at front counters of building departments. We met with the standards committee of the Colorado Chapter of the ICC in July 2012 and presented our draft for their use.

We have continued to consult with the education working group and advisors throughout our process.

4.2-Develop Outline of PV-focused Learning Objectives: Develop outline for regional trainings and online toolkit based on conclusions from Program Design tasks and recommended best practices. Outlines and learning objectives should be targeted to different audiences (validate approach with education working group – collect feedback, adjust according).

An outline for regional trainings was developed based on the "12 Best Practices: A roadmap for a Solar Friendly Community'' model.

Rather than segregate different audiences, we found throughout the project that one of the strongest benefits is to get different groups talking to one another. Thus at each September workshop, we invited code officials, sustainability officers, elected officials, solar company officials, nonprofit champions, vendors and others. The resulting conversations were robust.

The curriculum for each training session included a presentation by Kristen Ardani of NREL who helped provide context about the importance of reducing the soft costs of solar in the context of the NREL Vision Study. COSEIA leaders detailed the economic development and job creation benefits local communities can realize by promoting solar energy.

Then we walked participants through the 12 Best Practices with examples of communities that are already doing each one of the recommended activities. By focusing on real world

examples of communities already enacting the best practices, the audience had a tangible goal to focus on.

We also held lively discussions at each workshop and gathered valuable feedback which we are incorporating into the ongoing work. We had participants fill out detailed forms that enabled us to follow up with them individually and address issues in their cities and counties.

4.3-Develop Content / Graphics to fulfill the learning objective outlines for each of the targeted audiences (review/validate content with education working group – collect feedback, adjust accordingly).

The Solar Friendly Communities logo and website were designed to be bright and engaging. The website is aligned with the look and feel of the logo. The centerpiece is our 12-step wheel of best practices in bright oranges and yellows that invites users to take a tour. By clicking on each of the 12 wedges, users go a page that describes the various parts of the best practice and offers links to helpful resources and tips for enacting the practice in their community. We also had signs made showing our logo which we used for the trainings.

As part of the launch activities, we also wrote and produced an introductory video that is linked on the website, posted on YouTube, and was used as an introduction in our September workshops. The video was also promoted in other outreach and educational efforts. Key to the messaging is featuring the local officials who have served on our steering committee to recommend our program to their peers. We have found the peer-to-peer messaging very effective. Numerous community representatives said things at the workshop like, " If Denver is on board, we should be also,'' Thus, letting the community representatives make the case for the program has had lasting benefits.

A second training video was conceived, written, produced and edited later in 2012, called "A Million Trees and a Million Solar Roofs: Can we have Both?"

The issue of conflict between trees and rooftop solar was flagged during the in-depth workshop in Denver as a major issue inhibiting solar development and affecting soft costs from a planning and zoning perspective -- with very little useful educational content available. In Denver, the issue grew heated when there was a major conflict between a 650-unit rooftop solar project for the Denver Housing Authority and large mature trees marked for removal which angered residents. We used this real-world example, and the "win-win'' compromise the city worked out to end the conflict, as the centerpiece of our video.

Stakeholders engaged in the discussion presented on this topic at national gatherings and on nationally advertised webinars.

4.4-Incorporate Content/Graphics into Online Toolkit and Go Live: program website based on content above and launch website. Identify and promote model ordinances for easy adoption by local communities. Conduct website usability and navigation test on the production site initially, then on live website – review/validate content with education working group – collect feedback, adjust accordingly).

Since the website launch, the team regularly updated and improved content and functionality. For example, when communities reported that the online certification application was difficult to use and hard to review, a new form was created and we and posted PDF and Word documents that allow communities to print out the forms and prepare documentation.

Throughout 2013, we continued to add resources and links to the website with the intent of developing enough online tools that communities can find most of what they need to achieve certification as Solar Friendly Communities.

In the third quarter of 2013, we made extensive upgrades and improvements to the website, based on one year's experience with the program. We systematically improved the usability, and added educational resources and online tools based on successes in the Rooftop Solar Challenge.

We posted several new navigation tools designed to work as a guide to local officials interested in the program in order to help them navigate through the application process.

For each of the 12 Best Practices, we have examples posted on our web site. In the third quarter, we reviewed all this material, added new examples and templates where relevant and posted a number of forms to make it easier for permitting officials to streamline their processes.

Additionally, while the 12th Best Practice is titled " Track Your Solar Progress'' we realized that this would best be done through a more unified effort. In the third quarter, we spent considerable time evaluating whether to take over the Denver Regional Council of Governments Solar Map, which that agency can no longer fund. We evaluated many aspects from usefulness of the tool to the required software upgrades and coding required for new data, We regretfully determined that the ongoing costs were too great to take on, given that grant funding is ending.

Additionally, we produced a third video by the end of the grant period. ``Going Solar: The Time is Right'' is a more public-facing communication than the first two videos. It is designed to be used by certified Solar Friendly Communities and other interested parties to promote the Discount Program and participation in the work generally. Like the other two videos, it is linked from the home page at http://www.solarcommunities.org.

4.5- Develop Phone Support: develop job aides, FAQs, and other strategies to efficiently respond to hotline inquiries from local government and local community stakeholders. Report conclusions.

Throughout the grant period, we continued to develop materials to respond to inquiries.

In early 2013, we held two Solar Friendly Communities webinars as part of our ongoing outreach to our extended stakeholder group, consisting of municipal and county officials, solar installers and others. Materials from these sessions are available on the website.

In the first webinar, Representatives from Denver's sustainability office and experts on trees and solar presented a robust program. Denver officials detailed their work at becoming the first Solar Friendly Community and explained how others might follow. Experts from the parks department detailed how to avoid conflicts between trees and solar. We directed participants to the video we produced on trees and solar available from our website at www.solarcommunities.org.

The second webinar focused on Fort Collins and included an overview of the community's sustainability goals as well as steps the city and its municipal utility are taking to promote solar energy.

A very successful Solar Friendly Communities workshop took place at COSEIA's annual conference Solar Power Colorado 2013. Before more than 60 attendees, the Steering Committee members presented an overview of our program and then we held an interactive session geared toward the large number of solar installers present. We did instant polling and gained valuable insights into the key permitting, interconnection, inspection and other issues that installers say are keeping the costs of solar high.

Task 5.0 - Announce Program: Begin pre-announcing program and rollout as ready once educational content complete. Develop news releases and articles for inclusion by regional and industrial media and industry partners to encourage participation far beyond the initial participating communities to a broad representation of the extended stakeholder team and beyond. Report conclusions. (May-Nov 2012) – COSEIA – Deliverable: media kit of 3-6 news releases and sample newsletter articles for easy inclusion in newsletters, websites,

etc. Q2-Q3 2012.

We wrote newsletter articles, press releases and e-mail blasts about the program throughout the grant period. We garnered media attention throughout the grant period, including coverage of virtually all of our recognition events. Press releases are included in the "Success stories'' section of the web site.

In anticipation of recognition events, we had a plaque designed with our logo which was customized for each recognized community. We did significant research into road signs before settling on specifications chosen by Denver Public Works to ensure that the road signs will stay road-worthy for years to come.

The SFC team presented the program far and wide to groups including the Denver Regional Council of Governments, Colorado Springs' Sustainability Series, Solar Power Colorado and more than a dozen individual cities and counties.

In June 2013, we were invited to present to the Colorado Municipal League, the umbrella organization for more than 200 cities and towns in Colorado. Participating were Steering Committee members from three cities and Rebecca Cantwell representing Solar Friendly Communities and COSEIA. The panel attracted one of the day's largest audiences, more than 50 municipal leaders from all over Colorado, and the reaction was interested and enthusiastic. We have followed up with community leaders who expressed interest in learning more about how they can participate.

The program was also presented to numerous national audiences beginning with the World Renewable Energy Forum in spring 2012. In April 2013, Rebecca Cantwell presented Solar Friendly Communities on a soft costs reduction panel at the national conference of the American Solar Energy Society in Baltimore. Serving as a conference sponsor and presenting was a major way of engaging ASES in this program as they were a listed partner from the beginning. The conference served as an excellent way to discover interest in the program from other national stakeholders and groups from Vermont and New York to California expressed interest in getting involved. We also took advantage of the opportunity to talk with interested members of the public and various advocacy groups.

Rebecca Cantwell also presented on a DOE permitting webinar on success stories from the Rooftop Solar Challenge in June, and at other venues.

In the third quarter, SFC sponsored a very successful outreach event attended by more than 100 individuals ranging from Xcel Energy officials and top state energy policy experts to a variety of local officials and solar company representatives. The event: ``Solar Friendly

Communities: A German Perspective'' featured a breakfast talk by Andreas Kraemer, who founded and directs the Ecologic Institute, one of Germany's top think tanks on renewable energy.

In July and August 2013 another concerted round of outreach was made to all of the largest cities and counties in Colorado. We assembled an updated mailing list and shared information with contacts in the 50 largest communities in Colorado . They were invited to the breakfast highlighting solar permitting in Germany. They were emailed information about the Fire Code compromise, and invited to engage in the program.

Mid- 2013 communications also highlighted the Solar Friendly Communities Discount Program. The program enrolled 16 installers who have each signed an agreement to offer a $500 discount on each residential system in a certified community.

SFC also commissioned a technical report to examine the economic benefits of rooftop and other forms of solar energy in order to have better data for approaching communities with the value proposition of engaging in soft cost reduction. The report, done by the Solar Foundation, was completed at the end of August and was the most detailed study of its kind ever done in quantifying economic and jobs benefits of solar energy to the state. The data will be used to bolster the economic arguments for engaging in streamlining permitting and we hope this data will have benefits in attracting new communities to the program. We have distributed it widely.

Task 6.0 - Conduct Regional Trainings: Proactively encourage participation from local governments in regional training and hands on support to identify roadblocks to adoption of the recommended best practices. Collect/assess feedback. Report to educational working group and extended stakeholder committee. Adjust program accordingly, as needed. Report conclusions. (Jul-Oct 2012) – COSEIA – Deliverable: at least 20 cities / counties to participate in regional trainings. Q3-Q4 2012.

We launched the Solar Friendly Communities Program through initial trainings in 2012 held on September 18 in Centennial, September 19 in Denver and September 20 in Boulder in order to provide different dates, times and venues to make the events as convenient as possible.

We achieved participation from representatives of about 20 communities and umbrella groups such as the Colorado Municipal League and the Metro Mayors Caucus. The 75 people who attended included local solar champions, code officials and other county and municipal officials.

At the workshops, the program was introduced through a video and by explaining the 12 Best Practices, the point system, and the way communities can gain designation as a Solar Friendly Community.

After the workshops, a comprehensive strategy of personal contact and coaching with communities was enacted. Outreach to new communities, and regular check ins with communities that had earlier expressed interest in the work continued through the project.

Training work in 2013 focused on the 2012 International Fire Code. The three-foot setback requirements are of significant concern to the industry and we have long been talking about the need for greater flexibility. After we discussed the issue on numerous calls with our Steering Committee, Steering Committee member Golden enlisted fire and building officials with sustainability officials to develop a compromise. The city issued its draft guidance for alternative methods of compliance, which the SFC team has recommended as a good basis for other Colorado jurisdictions to consider.

Then, at our request, the Colorado Energy Office convened a group of stakeholders including code and fire officials, state officials, solar company leaders and others. A training session on the fire code issues and a forum to discuss solutions occurred. We promoted the "alternate means of compliance'' developed by our steering committee member the city of Golden.

SFC team leaders decided to work in a more concerted way with the city of Boulder, which was on track to adopt the code in the summer of 2013. COSEIA representatives explained to the Boulder Planning Commission that strict interpretation of the code would make more than half the 2012 installations in Boulder uneconomical. At the commission's direction, COSEIA and the Boulder Fire Marshal negotiated a compromise, which was unanimously endorsed by the City Council. Because the Boulder Fire Marshal also chairs the Colorado Fire Marshals Association, we began to promote the compromise as a workable statewide solution.

We wrote an article for the Colorado Municipal League newsletter, which reaches 2000 city officials, promoting the compromise. The Colorado Energy Office and the Colorado Association of Fire Marshal's held a special training in January 2014 attended by roughly 50 fire marshals from across Colorado in which both the Golden and Boulder compromises were presented and recommended for adoption by these jurisdictions.

We also worked with IREC in the third quarter 2013 on a model PV Inspection Checklist, helping by soliciting input from code officials we have worked with and disseminating the final product.

Task 7.0 – Evaluate Progress, Recognize Successes, Encourage Participation.
Evaluate progress and effectiveness of recognition program implementation against program objectives. Incorporate any DOE (or regional) recognition program to acknowledge and promote jurisdictions that are friendly to solar development. Recognize leading communities, highlight successes in media and through partner organizations for wide reach and impact. Adjust program as needed. Report progress. (Sep-Dec 2012) – COSEIA – Deliverable: at least 12 cities / counties to participate in recognition program. Q4 2012 – Q1 2013

The recognition program was launched in the fall of 2012 and by the end of the grant period in the fall of 2013, we had certified 14 cities and counties as Solar Friendly Communities, with several other working on recognition.

The process for the certification and recognition of communities is relatively simple but provides verification and transparency.

Communities fill out an online application and provide supporting web links, to support their claim for points offered for a variety of activities under the program. A separate scoring tool was developed for internal use to evaluate applications. In general, the evaluation entailed communication between the scoring entity, RMI, and the community, to ensure that the proper score was arrived at. Once communities were determined to have earned sufficient points, they were notified of their status by the Program Director.

The SFC director worked with each certified community to design recognition events at the time they choose, with the staff responsible for ensuring that city workers who made the recognition possible were invited. A mayor or other elected leader in each community was presented a plaque and a road sign. Most of these ceremonies occurred at City Council meetings where all elected officials were in attendance, along with members of the public.

The recognition program is a very effective way at engaging communities and providing them with the motivation to continue working on reducing soft costs by streamlining their processes. In many cases, deciding to engage in the program has resulted in communication and collaboration across departmental boundaries that never happened before. Co-workers engaged on mutual solutions to achieve points in the Best Practices roadmap. Municipal staff focused attention on these subjects as one coherent set of issues and the program helped city officials think of streamlining solar permits in a more holistic way rather than as steps in silos of different departments. It has resulted in discussions and actions on combining forms, streamlining inspections, lowering fees and using Solar ABCs uniform documents.

After certifying Denver as a Gold level Solar Friendly Community with a ceremony that attracted national media attention, other cities were eager to complete their applications. We had worked with all of them in shaping the program. We certified the second-largest metro city, Aurora, as a Silver level community, and then the third-largest metro city, Lakewood as a Silver level community. We certified steering committee member Fort Collins as a Gold level community and steering committee member Boulder County as a Silver level community and another large Denver metro city, Arvada as a Bronze level community in the first few months of 2013.

The largest next certification was of the Pikes Peak Regional Building Department, the permitting agency for Colorado Springs, El Paso County and the smaller communities of Fountain, Manitou Springs, Green Mountain Falls, Monument and Palmer Lake. This region, ravaged by the two most costly wildfires in Colorado history in the past two years and then hit with major flooding, still made a significant effort to streamline its solar permitting to earn Silver Level designation.

We also certified the town of Lafayette, which earned Gold Level recognition after engaging in a lengthy process with us to streamline processes and add a variety of solar-friendly policies.

Nederland, Carbondale, Parker, Lyons, Superior and Golden are the other cities and towns that earned certification as Solar Friendly Communities before the end of the grant period.

The most significant addition to the program in 2013 was the Solar Friendly Communities Discount Program. The idea came from a solar installer: Why not invite companies to offer discounts to citizens in certified communities as a way of quantifying the value of soft cost reduction, providing marketing help to participating installers, and adding another "carrot'' of incentive to communities?

We discussed the idea at our Solar Power Colorado conference in February 2013 and won more than 80 percent support in an instant poll. We then opened up a dialog with interested installers about how to design the program, and eventually did an online poll to let our COSEIA members vote on the type of incentive. They chose a $500 flat discount for standard residential systems. We developed a participation agreement for member companies to sign, clarifying that the details of the program are between the company and the customer.

We launched the program in the second quarter. Our partner ASES provided some of the value of their participation in the grant through placing ads we created in SOLAR TODAY magazine promoting the $500 discount.

Thanks to extensive outreach and communication, a total of 16 solar installers signed up to offer the discount in Solar Friendly Communities, an impressive level of participation. They receive the benefit of lead generation through the publicity about the program generated by project efforts and through the materials supplied to certified communities, which they disseminated to citizens.

While the grant funding ended, we intend to continue the program and seek funding elsewhere. Officials from more than 10 additional communities have told us they are interested in achieving certification and some are actively working to change policies to earn enough points to qualify.

We also continue to field inquiries from other states and believe that this is a turnkey program which can be used in other jurisdictions. We are continuing to explore the best way to expand Solar Friendly Communities nationally.

Task 8.0 - Conduct Post-Assessments: evaluate progress from start to finish of program, identify what worked best/adjustments needed; scalability; conclusions and report to DOE; project close**-**RMI / COSEIA (Jan 2012) – Deliverable: Final report summarizing results and lessons learned. Q1 2013.

This document constitutes our final report.

Task 9.0 - Market Assessment

Complete a final Market Assessment and input the data into the US DOE/NREL Solar Metrics Rooftop Solar Challenge Database. The Market Assessment will be completed by the last day of the project year and will reflect substantial and demonstrable improvements in market conditions to be achieved through the above tasks.

We completed the final Market Assessment data by the deadline and also loaded a screen shot summary to the PMC. Below is the narrative summary that was included at that time:

Denver

Baseline Score: 798

2013 Score: 820

Prior to the beginning of the Solar Friendly Communities (SFC) program, Denver was a local government leader and champion for solar energy. From their streamlined all-in-one website

containing comprehensive jurisdiction-specific solar information to their ongoing community workshops that educate residents and businesses on solar and energy efficiency finance opportunities, Denver has made great strides over the past decade.

Several opportunities still exist to further reduce soft cost barriers and expand solar deployment in Denver. In partnership with COSEIA, RMI, and over 25 local government stakeholders, several opportunities were identified for Denver to consider moving forward:

- ***Bulk Plane Analysis Requirements***
  - **For non-flush mounted systems or systems impinging upon Denver's setback requirements, solar installers are required to perform bulk plane analyses to evaluate shading issues. These analyses require extra staff and add cost and time delay to each system installed. To address these costs, Denver is reviewing the requirement and considering alternatives.**
- ***Inspection Staff***
  - **While many installers reported excellent experiences with local inspectors, some noted that specific inspectors have onerous personal requirements that go above and beyond existing code and regulations. Denver was encouraged to continue incentivizing inspection staff participation in solar workshops to ameliorate this small issue.**
- ***Urban Forestry Issues / Community Solar***
  - **Denver is home to the sometimes-competing goals of increasing rooftop solar capacity and expanding urban tree cover. The team produced a video on how to accommodate both community values and is disseminating it widely.**
  - **Stakeholder groups identified community solar as a potential solution to this issue for several neighborhoods in Denver. Stakeholders were particularly interested in locally-cited rooftop solar community gardens. While the Xcel community solar program is exciting, demand for such projects far outstrips the supply officially created by Xcel. Accordingly, the city has been encouraged to work with developers to explore additional community solar opportunities outside of the existing Xcel program. Meanwhile, groundbreaking was held in early April on the first Denver Xcel community solar project.**

Boulder County

Baseline Score: 659

2013 Score: 827

Boulder County has earned its designation as a leading solar community by creating a financial and regulatory environment capable of fostering healthy and growing levels of rooftop solar adoption. In addition, the county established friendly zoning, siting, and planning guidelines for the installation of rooftop solar and access to sunlight. Boulder

County's success is largely due to the jurisdiction's well-educated inspectors, solar-friendly planning and zoning, and a land use staff that constantly engages with the local installer community.

In addition, the county is actively working with local land and building owners to help residents and businesses prepare for community solar garden projects in the near future.

As with the other Solar Friendly Communities jurisdictions, a number of opportunities specific to Boulder County have surfaced throughout the last year for the county to help reduce soft rooftop solar costs:

- ***Permitting Challenges***
    - **Boulder County has a small buildings department staff and severely constrained resources. Accordingly, streamlining the permitting process is in the interest of the jurisdiction. While the existing website hosts a great deal of information and resources, the SFC team has recommended Boulder County consider including the Solar ABCs permitting package in order to streamline their operations further.**
    - **In addition, Boulder County typically takes upwards of two business weeks to process solar permit applications. By switching to a standard permit template with simple diagrams (such as Solar ABCs), it was estimated that permit-turnaround could be cut in half, with potential for over the counter permitting in the next five years as budget realities are established for the county.**
- ***Inspection Issues***
    - **Although local industry feedback had nothing but good things to say about their experience with local inspection staff, several issues were raised with Boulder County's rough-in inspection requirement (in addition to the final inspection). Requiring two inspections requires additional time and money, adding to the cost of solar systems in the area. Boulder is reviewing their current rough-in requirement (as are other front range communities) to assess the costs and benefits of the policy for county residents and businesses.**