State of Arizona

Rooftop Solar Challenge

Award Number: DE-EE0000549

Project Period

December 1, 2011 – June 30, 2013

Final Report

Submitted by:

Governor's Office of Energy Policy

September 30, 2013

Arizona Rooftop Solar Challenge
Final Report
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I. Program Introduction

In December 2011, Arizona's Rooftop Solar Challenge (ARC) team, led by the Governor's Office of Energy Policy (GOEP), was awarded $708,992 from the U.S. Department of Energy. ARC is a statewide coalition involving the cities of Phoenix, Tucson, and Flagstaff; Arizona State University (ASU); and AZ SmartPower, a non-profit solar education organization. The award was issued under DOE's SunShot Initiative which seeks to make solar electricity cost competitive without subsidies by the end of the decade. Arizona was one of 22 regional teams funded to work to reduce the non-hardware costs or "soft costs" of installing rooftop solar electric systems. These soft costs can make up 40% of the installed cost of a rooftop photovoltaic (PV) system.

DOE's Rooftop Solar Challenge Program has four action areas:

1. Permitting and Interconnection Processes.
2. Financing Options.
3. Planning and Zoning Rules.
4. Net Metering and Interconnection Standards.

DOE's focus is on rooftop PV systems for residential (typically less than 10 kW) and small commercial PV systems of less than 300 kW. At the onset of the program, Arizona's team established Tasks, Milestones, Timetable and Outcomes for each of the four program action areas.

II. Program Summary – Action Areas

DOE's Rooftop Solar Challenge Program has four action areas: Permitting and Interconnection Processes; Financing Options; Planning and Zoning Rules; Net Metering and Interconnection Standards.

This program is focused on streamlining processes and reducing costs to make solar more affordable for the residential and small-scale commercial sectors. These solar best practices are important to lowering "Balance of System (BOS)" costs (non-hardware costs associated with design, installation, permitting and financing).

A. Permitting

The object of the permitting portion of the grant is to determine best practices throughout Arizona and work with jurisdictions to implement those practices.

Best Solar Permitting Practices were created based on two ARC activities: the municipal and solar installer survey responses and a consultant report. The survey reviewed a wide range of permitting activities while the consultant report focused on recommended solar permitting improvements in nine Arizona jurisdictions.

Permitting Best Practices- Outcomes:

- Prepare a direct path to solar permitting information on the jurisdiction's website.
- Provide a detailed solar permitting checklist.
- Provide a solar-specific permit application form.
- Allow for electronic submission of permit applications, drawings, and payments.
- Revise/shorten permitting review time to 5 days or less.

Many of the jurisdictions demonstrating best practices have included some of these procedures in their permitting process.

B. Net Metering & Interconnection

This portion of the study is to achieve models for a more simplified and more uniform statewide net metering and interconnection policy that can be used by the utilities throughout Arizona.

Net Metering & Interconnection Streamlining ideas:

- Encourage the local utility to provide an online application for interconnection.
- Recommend more streamlined interconnection standards for smaller systems than for larger systems.

C. Financing

The object of this portion is to Increase the financing opportunities by reducing barriers to innovative financing techniques.

Arizona municipalities encourage residents to consider installing solar on their homes and businesses. However, limited financial resources exist to make this an affordable option. ARC investigated a number of ways municipalities could promote solar through financing models that reduce the cost of capital and provide residents with innovative ways to finance solar.

Financing Options for jurisdictions:

- Use lessons learned from the Solar Phoenix 1 and 2 models: http://solarphoenix2.org, Solar Benefits Tucson: http://www.mygroupenergy.com/group/tucson and/ or Solarize models: http://solarizect.com to encourage additional communities to offer similar programs to aid in customer acquisition and financing of solar
- Develop innovative financing models to broaden the options for financing solar, including loans, leases, interest rate buy-downs, and backstops.

To educate communities on funding models and customer acquisition options, ARC held financing workshops and webinars explaining options available for adoption which would make it easier for residents to choose solar. The ARC team highlighted the above financing models to help lower out-of-pocket costs which are easily adaptable for Arizona municipalities.

D. Planning and Zoning

The object for the planning and zoning portion of this study is to achieve a model solar access document that could be used by jurisdictions throughout Arizona.

Solar-oriented planning and zoning is critical to solar deployment. It guides municipal development and helps officials cater to the needs of residents and businesses within the built environment. After reviewing zoning regulations, two model language recommendations were developed to ensure solar access of buildings in Arizona, one for desert cities and one for high elevation communities.

Regulations we recommend adopting and ideas on how to implement:

- Communities should adopt the model language appropriate for their area to ensure solar access of buildings in Arizona. www.azenergy.gov/rooftop.aspx

- Communities should include solar access in their general plans and zoning codes to protect solar access for new and existing structures.

The solar access element focuses on general plans and zoning ordinances by establishing provisions that protect access to the sun. This is imperative because property owners do not have control over shading created by neighboring structures

III. Arizona's Rooftop Solar Challenge Team

The Arizona Rooftop Solar Challenge (ARC) is a regional partnership of the Rooftop Solar Challenge. Funded through the U.S. Department of Energy's SunShot Initiative, this program is focused on streamlining processes and reducing costs to make solar more affordable for the residential and small-scale commercial sectors.

Led by the Governor's Office of Energy Policy, ARC is a statewide coalition of the following core partners: City of Phoenix; City of Tucson; City of Flagstaff; Arizona State University (ASU); and AZ SmartPower, a nonprofit solar education organization.

Over 40 municipalities and a wide range of solar installers were surveyed regarding permitting and planning and zoning practices. The survey has provided a basis to identify best practices and future steps for communities.

IV. Program Initiatives

A. Market Assessment - Solar Metrics for 10 Participating Communities

A Market Assessment Survey, required by DOE was conducted, using the 3 core partner cities: Phoenix; Tucson; and Flagstaff and 7 participating cities/towns: Tempe; Gila Bend; Clarkdale; Goodyear; Payson; Prescott Valley; and Surprise. This market assessment was completed twice by each jurisdiction, once prior to the award and again upon grant completion.

The Market Assessment Survey focused on the following seven areas:

- Permitting Process
- Interconnection Process
- Enabling Financing Options
- Siting, Planning and Zoning
- Net Metering
- Interconnection
- Installed PV Capacity and PV Costs

All 10 of Arizona's community partners showed improvement by scoring higher in their Solar Metrics Reports. On average, there was a 16% improvement, with one community registering a 46% improvement. By digging deeper into the survey results, it was discovered that one of the Sections with the greatest level of improvement was the Enabling Financing Option. The survey numbers verify that increases in participation of the Solar Phoenix 2 and the branching out of the metro areas by the solar leasing companies resulted in an increase of installations. According to the arizonagoessolar.com website for APS, residential installs in Prescott Valley in 2011 were 26 (with 150 kW) and in Prescott Valley in 2012 there were 65 (with 400 kW). For one of Arizona's

smaller participating communities, Payson, residential installs in Payson in 2011 were 26 (with 147 kW) and in Payson in 2012 there were 93 (with 487 kW). Obviously, rebound of the economy and housing market has played a role, in the increases in installation. One cannot underestimate the expansion of the leasing opportunities throughout the state.

B. ASU Permitting Survey of Arizona Communities and Results

The primary objective of the grant is to reduce the overall cost of installed solar energy systems, making them more cost-competitive with conventional forms of energy and encouraging deployment of these systems throughout the United States. This report delves into obstacles faced by applicants and cities while carrying out the permitting and inspection processes and is dedicated to establishing permitting and inspection best practices for rooftop solar projects throughout Arizona communities. The report is the outcome of a year-long process of surveying city building officials, permit technicians, system inspectors, and installers to understand the inefficiencies that exist throughout the solar permitting and inspection landscape, finally arriving at effective solutions for unifying broad ideas and strategies with the ability to adapt to local effects.

C. ASU Planning and Zoning Surveys of Arizona Communities and Results

Jurisdictions across Arizona were surveyed to find best practices in Planning and Zoning. ASU has created two documents, one for High Country in Arizona and another for Arizona Desert Cities. These documents are intended as a guide to municipalities in Arizona for incorporating a solar access element into their zoning ordinances.

A solar access element is typically a document that is intended to guide zoning ordinances of cities in providing provisions to protect the unimpeded access of buildings to sunlight for the purposes of supporting solar energy systems that can generate electricity or heat water using the sun's energy.

The goal of the element is to protect the solar access of neighboring properties, since property owners do not have control over shading created on their property by structures or landscape on neighboring properties, whether they are privately owned or owned by a government.

D. City of Tucson and their Contractor's In-Depth Study of 9 Arizona Cities and Towns

The City of Tucson coordinated the hiring of I. K. Consulting to conduct in-depth studies of the permitting procedures of 9 Arizona cities and counties. Each jurisdiction received a copy of the report with recommendations. Low-cost recommendations included: placing an icon on their website that directs the homeowner or installer to the solar permitting forms; purchasing software like Adobe Pro X which will allow markup and plan review via email.

For those communities that had on-line permitting, but did not have it for solar permitting, an upgrade to their software was recommended.

V. Program Events

A. Eco-Loco Prescott Valley

The Town of Prescott Valley sponsored their inaugural Eco-Loco Arizona Renewable Energy Conference, which was held on Friday, September 7, 2012. The purpose of this conference was to bring Arizona Communities of all sizes together to learn about ongoing efforts in the development of renewable energy resources statewide.

Keynote Speaker, Leisa Brug of the Governor's Office of Energy Policy, discussed what had been achieved up to that point and what everyone could do together to maximize renewable energy resources for the benefit of their communities.

The Arizona Rooftop Challenge Committee offered a number of seminars and workshops related to streamlining permitting, planning and zoning, and financing processes to lessen the burden of compliance on residents and staff alike. Communities were able to get updates on how this pilot project was progressing and how it could ultimately benefit them.

B. Permitting Workshop with City of Phoenix

The City of Phoenix held a workshop on September 26, 2012, which highlighted best practices and standards in the areas of solar permitting, installation, interconnection and inspection. The training included a session about the 2011 National Electrical Code and the 2012 International Fire Code, International Building Code, International Residential Code, and International Green Construction Code as they pertain to PV installations.

The ARC Members shared information about work in Arizona being done regarding solar permitting, zoning, financing and net metering. There were over 150 attendees including design professionals, vendors, solar installers, permitting staff and electric utilities.

C. Financing Workshop at ASU

The Arizona Rooftop Solar Challenge team hosted a Financing Workshop on February 6, 2013. This workshop included a very knowledgeable group of speakers to bring the most current information on the following topics:

- The Arizona Governor's Solar Energy Task Force White Paper on Financing
- Solar Phoenix I & II – Financing Models
- Community Approaches to encourage Participation and drive down costs
- PACE and Solar Investment – Is it an Economic Development Tool?

D. City of Tucson Sponsored Webinars

The City of Tucson hosted 4 webinars which covered each topic under the grant, to ensure that all communities had the opportunity to receive program information.

- January 29, 2013 – How Coordination and Technology Can Simplify the Permitting Process
- March 7, 2013 – Planning Methods to Encourage Solar Growth
- April 9, 2013 – Driving Down the Cost of Financing
- April 23, 2013 – Reducing Customer Acquisition Costs

E. Northern Arizona Workshop

The City of Flagstaff hosted "Removing Barriers to Solar Workshop" on January 17, 2013.

Discussions included:

- Background on the Arizona Rooftop Challenge

- Best practices in online permitting and review of a needs assessment from select Arizona Cities.
- Model solar access elements for general plans and zoning code, case studies from the City of Flagstaff, and the role of building code in solar.
- Various financing options available throughout Arizona.

F. AZBO Conference in Payson

Traditionally the building inspector has been tasked with verifying that construction meets the minimum standards for safety as defined in the various codes. Today's building inspector's role is expanding as building practices expand to include new functions, efficiency, and sustainability. This Conference was focused on this changing dynamic. Bruce Plenk, ARC partner, used this opportunity to inform the audience of the Arizona Rooftop Solar Challenge. He also was able to seek suggestions to improve and streamline solar permitting in Arizona. Everyone received a chance to share ideas about possible improvements, including electronic permitting and see how other Arizona jurisdictions expedite their permits.

G. League of City & Towns Conference

The ARC Team was invited to this week-long event to present on the Arizona Rooftop Solar Challenge and encourage the audience to become involved.

H. Arizona Rooftop Solar Challenge- Utility Meeting

One of our goals is to move toward an on-line interconnection agreement system. Our first step in moving in such a direction was to gather a room full of experts, including professionals from all Arizona utilities to discuss current best practices.

During the meeting we were able to gain more knowledge on what possibilities were within reach as well as attain important partnerships to achieve better productivity. During this meeting we gained an understanding of how all utilities felt about how interconnection in Arizona can improve and what steps were already being taken toward that goal.

VI. Attachments

1. Best Practices Brochure for Communities
2. Access Element for Zoning Ordinances for Desert Cities in AZ (8 pgs.)
3. Access Element for Zoning Ordinances for High Country Cities in AZ (9 pgs.)
4. Fact Sheet on Zoning for Desert Cities in Arizona (2 pgs.)
5. Fact Sheet on Zoning for High Country Cities in Arizona (2 pgs.)
6. Newsletters
7. Permitting and Inspection Best Practices Document (32 pgs.)
8. Financing Rooftop Solar – Best Practices for Local Government (22 pgs.)
9. Arizona Rooftop Solar Challenge – Executive Summary (6 pgs.)
10. Press Release – Janice K. Brewer, Governor, State of Arizona

VII. Conclusion

If jurisdictions implement these best practices, it will streamline the permitting process, reduce the time taken to get a permit, and lessen the installation cost; all making the system less expensive for the property owner. Solar access for buildings will be protected so even more solar can be installed in the future

When more homeowners decide to install solar on their rooftops, it will increase the number of solar-related jobs in that community. Not only will this be an economic driver for communities by increasing jobs, it will also leave homeowners with more disposable income from the reduction in their utility bills.