

# ***PROFILES IN REGIONAL SOLAR PLANNING: A HANDBOOK AND RESOURCE GUIDE***

***2nd Edition***



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The **National Association of Regional Councils** (NARC), along with the International City/County Management Association (ICMA), the American Planning Association (APA), and a team led by ICLEI-Local Governments for Sustainability USA, was selected by the U.S. Department of Energy (DOE) to form the SunShot Solar Outreach Partnership (SolarOPs). The goal of this effort is to increase the amount of installed solar capacity throughout the country and reduce the cost of solar energy by sharing information and tools that encourage regional collaboration and local government implementation of solar energy. Visit SolarOPs online at [www.solaroutreach.org](http://www.solaroutreach.org).

The *Profiles in Regional Solar Planning: A Handbook and Resource Guide (Guide)* will provide guidance to regional planning organizations on the unique roles they can play to move solar energy deployment forward in their regions. This *Guide* is organized into three main components: first, an introduction and overview of the main issues and opportunities of solar energy at a regional scale; second, a series of case studies highlighting regional planning organizations that have adopted solar-related work and projects; and third, a concise, user-friendly toolkit of several applicable planning tools that regional planning organizations can consider to grow solar energy prospects.

NARC understands that regional planning organizations look to their peers for unique ideas and promising practices, as well as lessons learned. The *Guide* is meant to be used along with other readily available resources, including the U.S. DOE's *Solar Powering Your Community: A Guide for Local Governments*. By providing examples on a variety of solar-related projects, a concise toolkit of actionable steps, and resources for additional information, this *Guide* seeks to provide the regional planning community, as well as the local governments they represent, with the knowledge and expertise to help expand the growth of solar energy deployment.

## About NARC

The **National Association of Regional Councils** (NARC) is a 501(c)(3) nonprofit membership organization and public interest group which advocates for building regional communities through the representation of multi-purpose, multi-jurisdictional regional councils and metropolitan planning organizations. These organizations serve local elected officials and community leaders in developing common strategies for addressing complex issues in the areas of transportation, economic development, homeland security and environmental challenges.

A recognized authority and leading advocate for regional planning organizations and regional solutions, NARC is a unique alliance with representation from local elected officials, regional councils and metropolitan planning organizations nationwide. NARC has an active membership, representing over half of the national network of regional councils. Of the 39,000 local governments in the United States (counties, cities, townships, etc.), 35,276 are served by regional councils. NARC's membership covers 97 percent of the counties and 99 percent of the population in the country.

# About this Guide

This *Guide* was written for regional council directors and their energy, sustainability or environmental planners, as well as the local elected officials that govern the regional councils, to learn how regional planning organizations can play a key role in moving solar energy deployment forward in their region. By focusing on case studies and regionally-specific tools, the *Guide* seeks to be a practical and applicable resource for taking full advantage of the opportunities in regional solar energy deployment partners on the ground, among many other items.

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## About the SunShot Solar Outreach Partnership

The Solar Outreach Partnership (SolarOPs) is designed to help accelerate solar energy adoption on the local level by providing timely and actionable information to local governments. Funded by the U.S. Department of Energy (DOE) SunShot Initiative, SolarOPs achieves its goals through a mix of educational workshops, peer-to-peer sharing opportunities, research-based reports, and online resources.



To perform the work of SolarOPs, U. S. DOE selected the National Association of Regional Councils (NARC), International City/County Management Association (ICMA), American Planning Association (APA), ICLEI – Local Governments for Sustainability USA and its partners. These organizations and their partners help local governments take a comprehensive approach to solar energy deployment by:

- Conducting outreach and sharing best practices for increasing solar energy use with thousands of local governments across the nation;
- Working in partnership with industry experts and national membership associations to enable local governments across the U.S. to expand their local solar markets; and
- Providing information in relevant areas, such as solar policies and regulations, financial incentives, workforce training, and utility and community engagement.

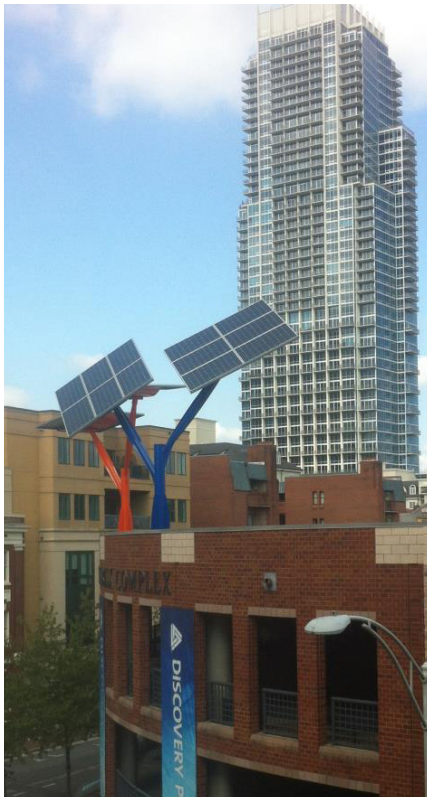
For more information on SolarOPs, visit [www.solaroutreach.org](http://www.solaroutreach.org)





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The Discovery Place, Charlotte, NC. (V); SolarOPs banner (H).  
*Credits: SolarOPs.*



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# Introduction

There is rising interest in understanding and planning for clean, safe, reliable sources of energy at regional level, especially in solar technology. As the demand for energy continues to grow and as budgets shrink, communities often look regionally to find energy solutions. Thanks to recent technology advancements, cost reductions, and policy and incentive changes, solar energy is a viable, cost-effective solution for communities. In addition, with the increased attention, funding for sustainable “green” businesses and development, communities recognize the great opportunity in developing a strong renewable energy economy at the regional level.

Regional planning organizations (RPOs) often step into the role of organizing and moving such efforts forward. However, energy planning, and specifically the role of renewable energy sources, is still a relatively new area of practice. Therefore, this *Guide* seeks to share promising practices and case study examples of how regional planning organizations can play a role in successfully driving solar adoption in their jurisdictions.

The three common solar technologies are photovoltaic (PV), concentrating solar power (CSP) and solar thermal. PV and CSP technologies directly generate electricity from sunlight whereas solar thermal (and solar space heating and cooling) collectors capture the sun’s energy to heat water. More details about these technologies can be found on the U.S. Department of Energy’s (DOE) *Energy Efficiency and Renewable Energy* website.<sup>1</sup> Although all of these technologies are growing in use throughout the country, the focus of this *Guide* is on the regional deployment of PV, as this is likely the sector with the most potential for nationwide application and local government influence.

This *Guide* is organized into six sections:

- **Section I: *Making the Case for Solar*** introduces why regional planning organizations should consider solar and sheds light on some of the main myths about solar energy implementation.
- **Section II: *Barriers to Solar*** identifies the most regionally-relevant barriers to solar, both regulatory and financial.
- **Section III: *Regional Solutions*** examines how regional planning organizations can play a unique and significant role in overcoming these barriers.
- **Section IV: *Case Studies*** along with the profiles highlighted throughout Sections I, II and III, provide practical examples of how regional planning organizations have been able to take steps to encourage and support the adoption of solar energy in their jurisdictions.
- **Section V: *Toolkit*** provides user-friendly, one-page descriptions of specific tools that a regional planning organization can consider, ranging from basic topics on making the case for solar to more in depth strategies, such as streamlined permitting.
- **Section VI: *List of Acronyms*** provides a list of acronyms for clarification.

Please note: this *Guide* is meant to be used along with the U.S. DOE’s *Solar Powering Your Community: A Guide for Local Governments*, which has, in great detail, further information on several of these topics.<sup>2</sup> Another useful tool for further information is the Database of State Incentives for Renewables and Efficiency’s (DSIRE) *Solar Policy Guide*, which is updated frequently.<sup>3</sup>



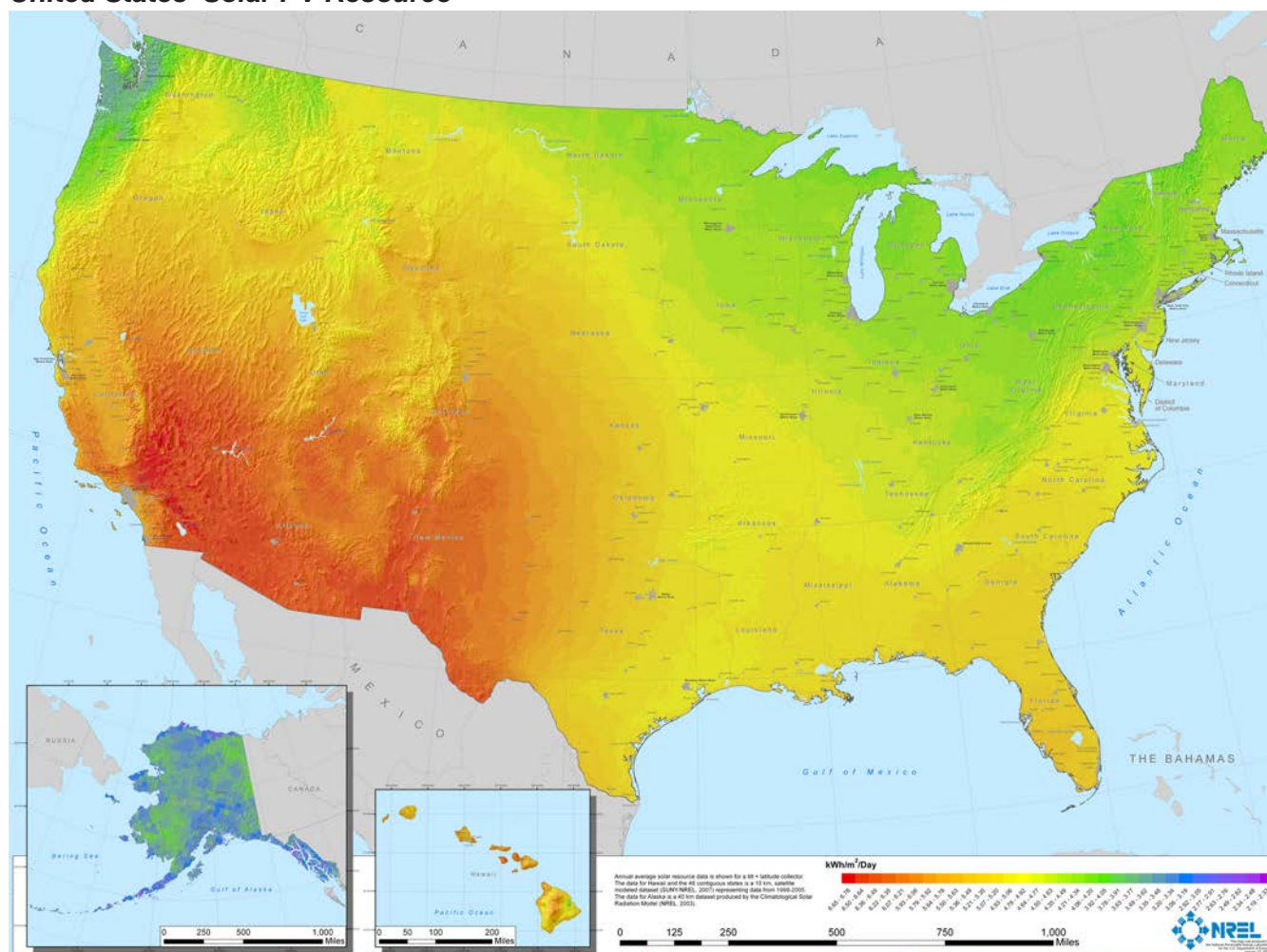
# Making the Case for Solar

Every hour, enough solar energy strikes the Earth to power human activities for over a year.<sup>4</sup> PV technologies have been around for more than 40 years, can be rapidly deployed, and have proven to be able to provide significant amounts of electricity at the time of peak energy use on the electric grid (i.e., sunny afternoons). Yet there is a widespread misconception about the viability of solar as a practical energy resource.

Why is solar not more widely adopted? There are several myths and misunderstandings about solar energy that act as obstacles to its use, as well as real barriers to widespread solar implementation. Regional planning organizations interested in pursuing solar energy initiatives will most likely come up against these misconceptions and barriers.

- **“My Region is Too Cloudy.”** Communities and regions often fail to realize their own solar potential. Solar can be successful in all 50 states, even in areas with high precipitation, cloudy days and extreme weather. Germany is the world’s leader in installed solar capacity and receives roughly the same amount of sunshine as Alaska. The figure below examines the nation’s solar resource and explains why solar is not just for “sunny” California. According to the map, Boston, Massachusetts has 90 percent as much solar potential as Miami, Florida.<sup>5</sup>

## United States’ Solar PV Resource



Map credit: National Renewable Energy Laboratory.

- **“My Region Can’t Afford Solar.”** Solar is often dismissed as too expensive. However, the cost of installing PV is decreasing rapidly, and is already cost effective in many locations across the country.<sup>6</sup> Since 2011, the price of solar modules has dropped by over 60 percent.<sup>7</sup> Last year, the average price of solar PV systems fell 27 percent.<sup>8</sup> Solar is flexible and can be developed on rooftop, landfills or other underutilized areas. In addition, there are new financing options for homeowners and businesses to reduce or eliminate the up-front cost of solar and allow for a quicker return on investment. This *Guide* explores some of these financing options and promising practices, which RPOs can use to help overcome high up-front costs to solar.
- **“My Region Wants to Invest in Proven Industry & Technology.”** There is a misconception that solar technology is immature and inefficient. Solar technology is improving daily. Current systems are built to reliably provide clean affordable energy for 25-30 years. A typical residential rooftop system can cover an entire home’s energy needs. There are national certifications for equipment and installers, ensuring panels are safely and effectively installed. Several states have implemented equipment certification requirements and/or installer licensing requirements. RPOs can play a key role in organizing installers, providing training and offering certification opportunities. These certifications and licensing requirements offer quality control as well as a level of consumer protection that consequently strengthen the industry.
- **“My Region Doesn’t Need Subsidized Energy.”** Some skeptics view solar and other clean energy efforts as a “trendy” government project that cannot be sustained without subsidies. It is important to remember that every major energy source and technology has benefited from federal government research, development support and incentives, including oil, natural gas, hydroelectric, nuclear and biofuels. Each of these technologies, including solar, continue to receive support today. The current subsidies for renewable energy industries, like solar and wind, are a fraction of what fossil fuels enjoy.<sup>9</sup>
- **“My Region Has More Pressing Needs than the Environment.”** Solar should not be viewed as part of an “environmentalist” agenda. According to an independent poll, nine out of ten Americans want to see more solar.<sup>10</sup> The U.S. military is one of the largest purchasers of solar power. Currently, the U.S. military has installed enough solar to power 22,000 American homes.<sup>11</sup> Solar power provides military bases with dependable and easily portable power. In addition, solar installations can now be found on fire stations, factories, stadiums and NASCAR tracks.

In addition to overcoming these misconceptions, there are several real barriers to deploying solar power systems. They mainly are related to cost and regulations, and are discussed in greater detail in Section II: *Barriers to Solar*. Clearly understanding which issues are real – versus perceived – can help a regional planning organization focus on finding solutions to these barriers.



Credit: SolarOPs

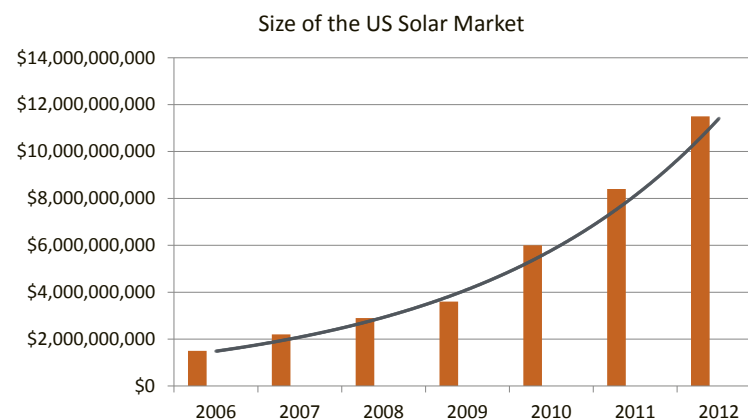
# Today's Context for Solar

In early 2011, the Obama Administration announced the SunShot Initiative – a U.S. Department of Energy (DOE) effort to make solar energy systems cost-competitive with traditional forms of energy by the end of the decade. SunShot aims to reduce the cost of solar energy systems by investing in improvements in solar technologies, manufacturing and bringing down the “soft” costs of solar panels, such as financing and permitting, which can constitute up to 40 percent of the cost of installation.<sup>12</sup> Increasing the use of renewable energy sources like solar power remains a core component of President Obama’s strategy to develop every available source of American-made energy.<sup>13</sup>

Concurrent to the surge in government support, the solar industry has seen explosive growth over the past few years. In 2012, U.S. solar PV installations grew 76 percent, totaling 3,313 megawatts.<sup>14</sup> Solar PV has been one of the fastest-growing energy sources in the nation over the past six years. In 2013, the U.S. surpassed ten gigawatts of solar PV installations, making the U.S. the fourth country in the world to reach this milestone.<sup>15</sup>

As of September 2012, there are more than 119,016 solar jobs in the U.S., a 13.2 percent increase in the solar workforce since 2011.<sup>16</sup> This is even more significant considering the continued economic downturn, and that the rest of the economy saw around a 2 percent growth in jobs during the same timeframe.<sup>17</sup> President Obama stated in his Climate Change Speech in June 2013, “over the past four years, we’ve doubled the electricity that we generate from zero-carbon wind and solar power. And that means jobs... jobs installing the solar panels that now generate more than four times the power at less cost than just a few years ago.”<sup>18</sup> The growth of the industry indicates that the economy is ripe for new investments in solar. Companies will be looking to expand and regions with “solar-friendly” development and building codes will be more attractive for development.

## Economic Benefits of Solar PV



This graph depicts the rise in the size of the U.S. Solar Market since 2006.

Chart credit: SolarOPs

Furthermore, this growth in the solar industry is projected to continue with new positions in installation, manufacturing, sales and distribution. Often these jobs require advanced skill sets and training, and these new installers will require certification. To address this need, the U.S. DOE partnered with the U.S. Department of Labor and Education to form the Solar Instructor Training Network (SITN).<sup>20</sup> SITN seeks to provide high-quality, local and accessible training in solar energy system design, installation, sales and inspection via nine regional resource centers around the country. DOE also finances accreditation of solar trainers and training programs, certification of installers and installation instructors, and distribution of best practices for training programs.

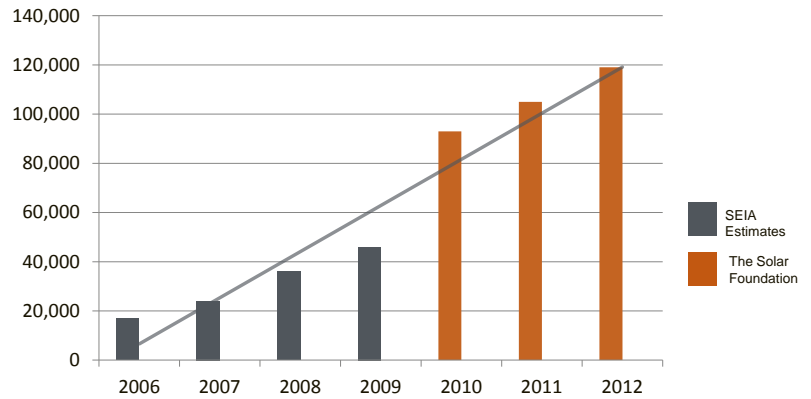
### U.S. Solar Gains in 2012<sup>19</sup>

- Over 190,000 solar jobs created
- One in 230 jobs created are solar
- Solar PV Installations grew 76%
- Solar installations were valued at 11.5 billion, compared to 8.6 billion in 2011
- The solar industry is one of the fastest growing industries in any sector across the U.S.



Along with the industry growth and government support for solar, there are thousands of jurisdictions working on solar at the regional and local level. A survey conducted in 2010 by the International City/County Management Association (ICMA) compiled information on local government's actions to adopt solar energy.<sup>21</sup> The results highlighted many of the barriers local governments face, such as high costs, aesthetic concerns and lack of awareness. The survey also confirmed that there is great opportunity for local governments to take steps to make their zoning, building codes, financial incentives, permits and processes more amenable to solar. Only 18 percent of the respondents currently working on solar issues reported working with neighboring jurisdictions, which could present another opportunity for regions to get involved in the process.

### Solar Job Growth in the U.S.



This graph depicts the growth of the solar industry in the U.S. since 2006.

Chart credit: SolarOPs

### Toledo Metropolitan Area Council of Governments

Toledo, Ohio  
[www.TMACOG.org](http://www.TMACOG.org)

The Toledo Metropolitan Area Council of Governments (TMACOG) represents four counties and many local jurisdictions in Ohio and Michigan in the greater Toledo metropolitan area. Solar development in the region has been traced to the region's sizable and historic glass industry, as well as a long history of PV research and commercialization at the University of Toledo. The University has attracted a concentration of experts in the field and is recognized internationally as one of the top three centers in the U.S. for PV research, having won several significant grants in the past few years.



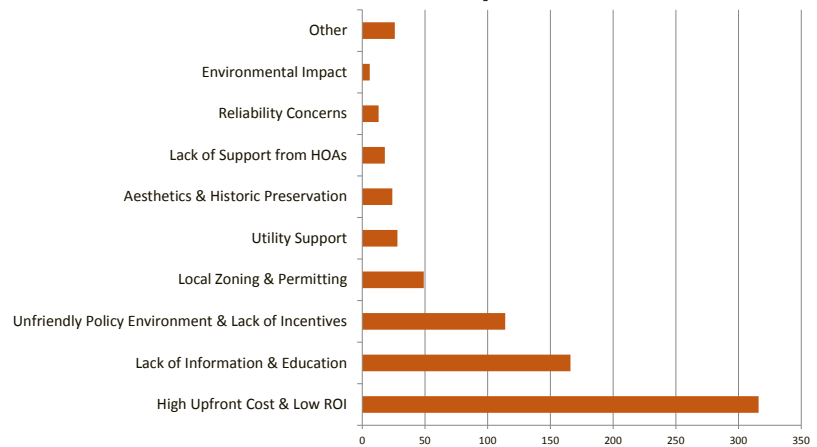
In support of its mission to “enhance awareness of the region’s assets and opportunities,” TMACOG engaged in a Meta-Planning process to identify core regional industry clusters in 2007, along with several academic and industry partners. Recognizing the industry and University’s assets, this planning effort supported the development of the solar panel manufacturing industry, highlighting transportation and infrastructure investments that would support the region’s unique economy. In addition, this led to the integration of solar in several regional projects, including the *Interstate 280 Veterans Glass City Skyway Bridge* and Toledo’s *Collins Park Water Treatment Facilities*.

The Toledo region now hosts several solar companies, including First Solar, Xunlight and Willard & Kelsey. In 2010, Ohio Governor Ted Strickland announced the *Northwest Ohio Solar Energy Innovation Hub* in the Toledo region, and, according to the Solar Energy Industries Association, in 2011, Ohio became second only to Oregon in solar output.

In today's policy context and economy, RPOs can play a vital role in bringing solar into their communities, including:

- Conducting regional-level surveys or research to understand current energy use and supply. See *MARC Highlight on page 17*.
- Developing regional energy plans that set regional goals for efficiency or the proportion of renewable energy generation.
- Integrating solar into regional economic development strategies, creating new jobs and providing a clean and reliable energy source for local businesses.
- Convening stakeholders to promote solar friendly policies, and increase awareness of solar energy solutions.

### **Barriers to Local Government Adoption to Solar**



760 solar stakeholders were asked about the perceived barriers their regions face. The answers were open-ended and have been categorized into topics that best represent the answer provided.

Chart credit: SolarOPs

This *Guide* provides detailed information on how RPOs can utilize creative regional solutions to break down barriers and build a strong regional solar economy.

### **Green River Area Development District**

Owensboro, Kentucky  
[www.GRADD.com](http://www.GRADD.com)



The Green River Area Development District (GRADD), seeking to be a regional leader in promoting sustainability and environmental stewardship, took the initiative to organize a one-day symposium on nurturing sustainability at the local level. The Green Living Symposium, held in the fall of 2011, attracted 115 participants from the Green River Area as well as the state of Kentucky. GRADD staff coordinated a committee of local advocates and stakeholders to help guide the day's agenda and select speakers. The event was held at a local convent and conference center, well-known for its dedication to sustainability, and was fully supported through attendee registrations, exhibitor registrations and sponsors.

Although not a solar-specific event, the Symposium gave key billing to a representative from the Kentucky Solar Partnership. By incorporating solar and other clean energies into an overall "sustainability" theme, GRADD was able to encourage participation without alienating local governments, which rely heavily on local coal-based economies. GRADD recognized the value in providing information without political agenda.

GRADD is considering organizing a second symposium in the future and has started work to establish an Energy and Environmental Stewardship Committee. In addition to all the outreach and education provided at the Symposium, there were several valuable connections made, leading to potential projects, including several solar energy systems on a high-profile downtown redevelopment project.

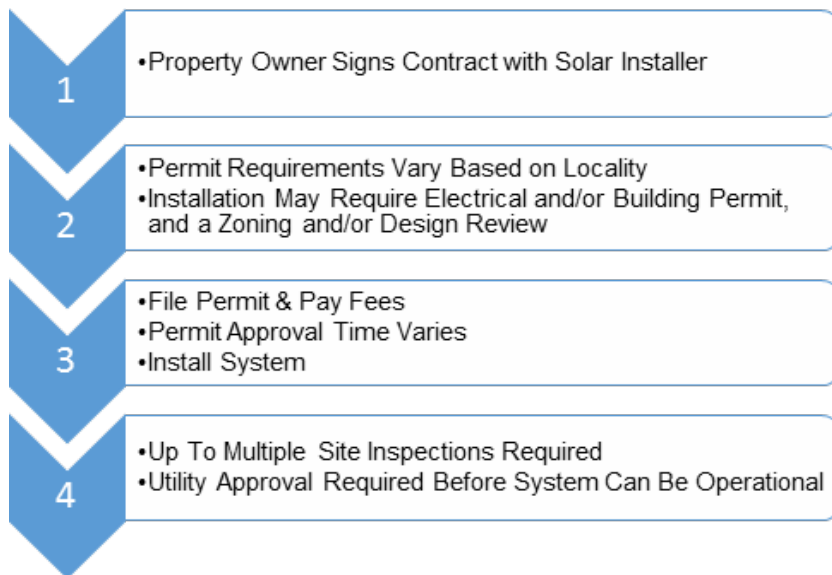


# Barriers to Solar

Despite the supportive policy context and advancements in technology, local governments still face barriers to deploying solar in their communities. This section outlines the primary regulatory and financial barriers that are most relevant to RPOs.

## Permitting and Inspection Processes

One of the biggest hurdles to installing solar is dealing with disjointed, confusing and costly permitting inspection processes. Each state requires different permitting and inspection processes. In addition, there are over 5,000 utilities with various interconnection standards and over 18,000 local jurisdictions with differing PV permitting requirements. The following is an example of what might be required in order to install a solar PV system:



## Solar Permitting Paperwork



This is an example of the amount of paperwork often required to install solar.

Photo credit: Forbes

## Mid-Ohio Regional Planning Commission

Columbus, Ohio  
[www.MORPC.org](http://www.MORPC.org)

The Mid-Ohio Regional Planning Commission (MORPC), recognizing the need to address energy issues, established a *Center for Energy and Environment* in 2007. Supported in part by the region's local utilities, the Center is unique to regional planning organizations, with 25 employees and six different project focus areas, including energy efficiency. Currently, the Center is focused primarily on weatherization and other energy efficiency efforts, but has been keeping a close eye on the pending PACE legislation. In addition, the *Center* has served as an energy resource for the region, serving to answer questions about solar-related financing options, such as third-party power purchase agreements. For more information about MORPC's *Center for Energy and Environment*, visit [www.morpc.org/energy/center/main.asp](http://www.morpc.org/energy/center/main.asp).



While these permitting and inspection processes are important, they can substantially increase the time and cost of installing a PV system. The time associated with installation can become a major obstacle in solar market development. Local permitting processes can add, on average, \$2,516 to the installation cost of residential PV.<sup>22</sup> In addition, the procedures and fees for obtaining these permits can vary drastically between jurisdictions, creating uncertainties and delays for installers.

Many communities have streamlined the solar permitting process with clear requirements, expedited processes for standard installations and online submissions. Most installers do not work exclusively within one jurisdiction, therefore, it is important for communities to work together to make significant changes in a region's solar market. Making permitting requirements and processes consistent across a region or state, provides installers with a standard set of operating procedures, reduces uncertainty and offers more accurate installation cost estimates. In turn, this can save customers time and bring down costs.

Standardization can also enable jurisdictions to pool resources and share planning and inspection staff. RPOs can play a key role in advocating for regionally consistent permitting and processes, while fostering a less expensive and more supportive environment for solar investment in their region. For more information on how your region can streamline permitting and inspection processes, see page 49.

### **Solar Limiting Regulations**

Most states have legislation protection for solar access or solar rights, and local governments often have the authority to adopt policies that support solar. Although there is growing support for solar energy at state and local levels, many consumers still encounter solar inhibiting regulations. These barriers include zoning or subdivision ordinances, development agreements or historic district restrictions. Many of the rules that prohibit or restrict solar are unintended deterrents, and were crafted for another purpose (e.g. aesthetics or building height) or are simply out of date. For example, a zoning or land development code might prohibit solar in certain residential or commercial zones because it is categorized incorrectly as an industrial use and grouped with power plants.

#### **Southwest Florida Regional Planning Commission**

Fort Myers, Florida  
[www.SWFRPC.org](http://www.SWFRPC.org)

The Southwest Florida Regional Planning Commission (SWFRPC) serves six counties along the southern Gulf Coast tip of Florida. The Commission has successfully been promoting solar in its review process for Developments of Regional Impact for almost forty years. By adding in requirements for solar, large-scale developments in the region are encouraged to incorporate it into their development designs. This includes stipulations for solar access, as well as PV lighting for streets, parking lots, recreation sites and other public areas. SWFRPC also requires developers to provide information and opportunities for installation of solar hot water heaters and PV to potential home buyers.



In addition, SWFRPC is working with ten other RPOs in Florida on the *State of Florida Statewide Energy Resiliency and Assurance Plan Project*. This project aims to develop strategies and implementation methods for energy assurance planning statewide. Many of these strategies focus on encouraging the growth of renewable energy statewide. The project released an Interim report, available here:

[http://www.swfrpc.org/content/Economic\\_Development/Energy/Energy\\_Assurance\\_031513\\_Final.pdf](http://www.swfrpc.org/content/Economic_Development/Energy/Energy_Assurance_031513_Final.pdf).

Protecting access to sunlight on a property or allowing for the installation of solar equipment can be done through solar access laws. These laws are in place in 40 states and the U.S. Virgin Islands, but consumers are often unaware of their rights.<sup>23</sup> The most common type of solar access law at the state level, is a solar easement, which states that sunlight on a site cannot be obstructed by landscaping or structures on a neighboring property. Solar easements can have flexible conditions, and are typically transferred with the property title. Easements can be voluntary or created automatically when a property owner receives a permit to install a system.

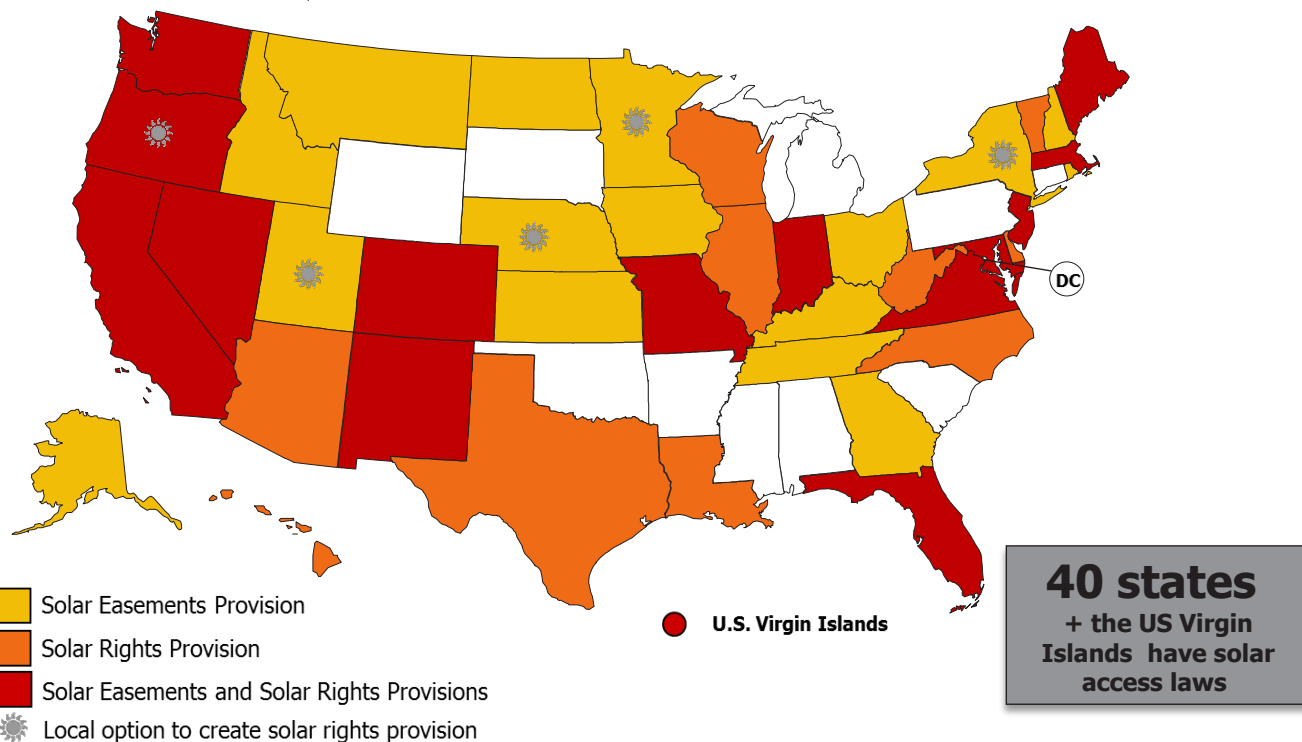
Solar rights laws limit or prohibit public and/or private restrictions (e.g. homeowner association covenants, local government ordinances or building codes) on solar installations. These laws increase the likelihood that properties will receive sunlight, protect the rights of property owners to install solar and reduce the risk that systems will be shaded after installation.

Promoting solar and energy efficiency at the onset can help make future installations or improvements easier and more cost effective. The following are actions local governments and regions can take to promote solar access and solar-ready buildings.

**Local Government & RPOs Actions:**

- Adopt ordinances to ensure solar access.
- Review zoning codes to promote solar installations.
- Encourage design and construction of solar-ready homes and buildings with design guidelines.
- Conduct outreach to educate residents, businesses and homeowner associations about solar access.
- Survey local governments to determine which ordinances might be creating unintended obstacles.
- Develop model “solar-friendly” ordinances, incorporating recommended statutes and language to promote solar access within local ordinances, zoning and building codes.

**State Solar Access Laws**



This map represents which states contain solar easement and solar rights provisions.

Source: Database of State Incentives for Renewables & Efficiency

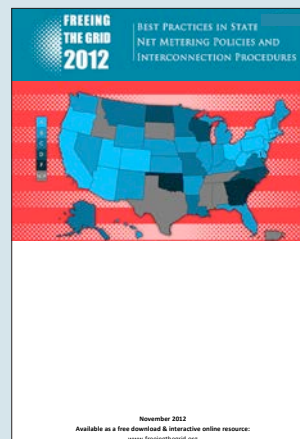
The American Planning Association (APA) has an extensive list of relevant resources on implementing solar energy, [www.planning.org/research/solar/resources.htm](http://www.planning.org/research/solar/resources.htm). The Solar Foundation created a guide for working with Homeowner Associations, [http://thesolarfoundation.org/sites/thesolarfoundation.org/files/HOA%20Guide\\_Final.pdf](http://thesolarfoundation.org/sites/thesolarfoundation.org/files/HOA%20Guide_Final.pdf). The Solar American Board of Codes and Standards (Solar ABCs) provides a comprehensive review of solar access laws in the U.S., as well as model statutes and ordinances, both of which serve to help local governments in drafting their own solar access laws, [www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf](http://www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf). Learn more about how RPOs are creating model ordinances on page 46.

### **Working with Utilities**

The fundamental role utilities play in facilitating customers' solar installations gives utilities the power to accelerate or impede solar adoption in a local community. By collaborating with the utility companies, regional planning organizations and local governments can influence many of the policies, rules and regulations that affect solar installation at the utility level, such as interconnection and net-metering.

Interconnection standards specify the technical, legal and procedural requirements by which customers and utilities must abide when connecting a PV system to the electric grid. Although most states set these standards, they may only be applicable to investor-owned utilities. Furthermore, some standards may have the same requirements and processes regardless of the size or scope of the PV system, making smaller systems prohibitively expensive. Like the permitting and inspection process required by the jurisdiction,

**Freeing The Grid** is a policy guide that grades states on their net metering and interconnection procedures. The report can be found online: <http://freeingthegrid.org/>.



### **Mid-America Regional Council**

Kansas City, Missouri  
[www.MARC.org](http://www.MARC.org)



The Mid-America Regional Council (MARC), the regional council for the bi-state Kansas City Metro area including nine counties and 120 cities, recognized the need for better understanding of the zoning and permitting climate for solar energy. Using funding from an Energy Efficiency and Conservation Block Grant, MARC conducted a survey of current zoning and permitting policies within the region. By developing a baseline understanding of the current zoning and permitting climate, MARC hopes to better address solar energy in the development of regional plans and policies.

MARC conducted the phone and email survey, asking local planning and building officials from each jurisdiction in the region a series of questions regarding planning, zoning and code policies. The information was documented in a spreadsheet and compiled into a report, which organizes the responses into restrictions based on panel coloring, visible placement, non-visible placement and other aesthetics. The report can be found online at: <http://www.marc.org/Environment/energy/solar.htm>.

The survey and subsequent report serve as a foundation for understanding the potential for solar energy initiatives in the region. Having this information helped MARC vie for additional funding and projects to continue its work on solar energy. In 2012, MARC received a U.S. DOE Rooftop Solar Challenge award for its *Solar Ready KC Initiative*. The initiative succeeded in reducing market barriers and soft costs at the local government level. For more information, see MARC's case study on page 38.



interconnection standards often add another layer of cost and time to a solar installation, sometimes duplicating the work of the building inspection.

Net-metering policies promote solar by making it more fiscally attractive to a consumer. Net-metering allows customers to export power to the grid during times of excess generation and receive credits that can be applied to later electricity usage.<sup>24</sup> Net-metering eliminates the need to incorporate expensive storage technology to account for fluctuations in energy production. Some states have expanded on net-metering regulations to allow credits from a single system to be applied to multiple meters and to meters located on other sites. This is known as virtual net-metering or community solar.

Utilities can benefit from net-metering, as customer-sited generation can allow the utility to avoid distribution and transmission-system upgrades. RPOs can play a key role in coordinating with utilities. By providing a collective voice for local governments, RPOs can influence utility and state policies, such as interconnection and net-metering. Furthermore, RPOs can work with stakeholders to adopt model policies like those outlined by the Interstate Renewable Energy Council's (IREC) *Connecting to the Grid* website.<sup>25</sup>

**Tri-County Regional  
Planning Commission**  
Harrisburg, Pennsylvania  
[www.TCRPC-PA.org](http://www.TCRPC-PA.org)



The Tri-County Regional Planning Commission (TCRPC) serves three counties and 103 municipalities in south central Pennsylvania and is home to Harrisburg, the state capital. Recently, the Tri-County Region has seen some commercial interest in alternative energy production. Because of this, in November of 2011, TCRPC released model energy ordinances for wind energy, outdoor fuel burning, pipeline safety and solar energy systems.

The process of creating the model solar energy ordinance was led by TCRPC with the assistance of Dauphin County Planning. It is based on the 2009 *Pennsylvania Governor's Solar Working Group Solar Municipal Guide*. TCRPC also evaluated ordinances passed by other municipalities in Pennsylvania as well as some from out of state. While helpful for understanding intent, the use of out of state ordinances as models was a challenge, as the Pennsylvania Municipalities Planning Code relegates more planning processes to the municipalities in Pennsylvania than in other states, by comparison.

The TCRPC model ordinance is all-inclusive and includes regulations for all aspects of solar energy systems, including principal solar installations that generate energy for off-site uses and accessory solar systems that supply power for on-site uses. It regulates the installation and operation of solar and thermal energy facilities and includes sections on easements for access and fire safety.

While advisory in nature, the solar energy systems model ordinance provides a framework that municipalities can adopt as a whole or in sections depending on their local situation and existing regulations. In some sections, the model ordinance includes multiple ways to regulate an aspect of a solar energy system and often provides a sample range of regulations commonly found in other ordinances.

TCRPC is looking to promote the solar energy systems model ordinance in the future as part of a broader toolkit of coming trends in economic development in their region. The model ordinance can be found on TCRPC's website: <http://www.tcrpc-pa.org/content/?/tri-county-regional/model-ordinances/>.



## Financing Hurdles

While solar can be a cost-effective investment for government, businesses and residents, these entities are often not accustomed to a large up-front expenditure for energy.<sup>26</sup> Financing incentives and mechanisms can reduce the up-front capital required and provide project owners with additional revenue streams. Developing these financing opportunities can bolster local market demand and attract solar investment and business, establishing a regional solar economy.

Financial incentives can either come in the form of investment incentives, which help to mitigate the up-front costs, or performance incentives, which provide additional revenue over the life of the project. Although there are several options to finance the installation of PV systems for residential, commercial or municipally owned structures, it can be difficult to understand all of these options and determine which is feasible, and which might work best.

RPOs can work to promote these financial incentives and provide education and outreach to help consumers navigate their choices. Having a regional resource that can answer consumer questions and provide consistent guidance can significantly boost solar adoption in a region, especially one with an active solar industry and high electricity prices. While RPOs cannot take advantage of tax incentives, some RPOs have chosen to administer regional financing programs to share costs among municipalities and create competitive regional solar markets. For more information, see Metropolitan Area Planning Council (MAPC) Case Study page 36.

### Types of Financial Mechanisms

- Cash incentives
- Tax incentives
- Third party residential financing models
- Property Assessed Clean Energy (PACE) programs
- Feed-in-tariffs (FITs)
- Low-interest loans
- Group purchasing and community solar

Further details about these financial tools can be found in Chapter 2 of the *Solar Powering Your Community Guidebook*.<sup>27</sup>

### Sonoma County Energy Independence Program

Sonoma County, California  
[www.SonomaCountyEnergy.org](http://www.SonomaCountyEnergy.org)

The *Sonoma County Energy Independence Program*, in partnership with Energy Upgrade California, offers property owners the opportunity to finance efficiency and solar energy improvements through the property tax system. Property owners apply for the program, describing the energy and/or water saving improvement(s) they wish to make. If approved, the county and the property owner enter into an assessment contract and implementation agreement, through which the county pays the final cost of the improvements. The county places an assessment lien on the property, and the property owner repays the county for the improvements as an assessment on his/her property tax bill over a ten or 20 year period. This is a typical Property Assessed Clean Energy (PACE) structure, which has been authorized in California as a financing tool, and has been very successful in implementing solar energy systems in Sonoma County. For more information, see the county's energy website at [www.SonomaCountyEnergy.org](http://www.SonomaCountyEnergy.org).



## Regional Solutions

There are practical ways that RPOs can play an important role in promoting and deploying solar in their regions. Although solar and renewable energy are not usually the main focus of RPOs, they are becoming more common as a regional priority, and innovative RPOs have been working to find creative solutions to these barriers in their regions. Examples of promising practices are outlined in the following case studies and highlights distributed throughout the *Guide*. Following the case studies, the Toolkit details proactive steps RPOs can take to promote solar installations and build a regional solar economy.

RPOs' skills and expertise in facilitating public feedback, solving multi-jurisdictional challenges and developing visions and long-term plans for their communities can be applied to the challenge of providing clean, safe, reliable energy to their citizens in many ways. The promising practices, tools and techniques compiled throughout this *Guide* provide a launching point for RPOs to engage with their local communities to promote solar adoption.

### Silicon Valley Collaboration Renewable Energy Procurement Project

San Jose, California  
[www.JointVenture.org](http://www.JointVenture.org)



The *Silicon Valley Collaboration Renewable Energy Procurement Project* (SV-REP) is the largest multi-agency collaborative procurements of renewable energy programs in the country. The *Project* was launched in 2008 by Joint Venture: Silicon Valley Network's Public Sector Climate Task Force in partnership with the County of Santa Clara, California. The County partnered with nine additional public agencies, and Optony, an energy research and consulting firm, provided technical advice on the project.

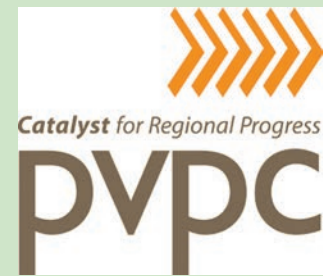
The *Project* resulted in solar installations on 43 publicly owned facilities ranging from carport, rooftop and ground-mounted solar PV systems. Installations were bundled based upon size, allowing the participating public agencies to benefit from site aggregation. In addition, SV-REP resulted in reduced electricity costs by 2 to 19 percent; reduced administrative costs by 75 to 90 percent; more favorable contract terms; the generation of \$70 million plus in local economic activity; the creation of more than 300 jobs; and, over \$30 million in federal tax benefits captured via power purchase agreements, leading to lower pricing.

The next phase entitled, the *Regional Renewable Energy Procurement Project*, focuses on expanding the project to public agencies within Alameda, Contra Costa, San Mateo and Santa Clara Counties. As of Summer 2013, this *Project* is projected to include 19-20 public agencies resulting in installations on 115 sites (deploying 20 MW in the region).

## Pioneer Valley Planning Commission

Springfield, Massachusetts

[www.PVPC.org](http://www.PVPC.org)



The Pioneer Valley Planning Commission (PVPC) has increasingly come across solar-related issues while developing solar bylaws as part of the technical assistance they provided for local governments throughout the region.

One of the major drivers for solar energy systems and their bylaws was the Massachusetts' Green Communities Act in 2008, which gave incentives to promote renewable energy and created the *Green Community* program for municipalities. One criterion for becoming a *Green Community* was modifying zoning ordinances to allow renewable energy installations by-right. PVPC helped several towns pursue this designation. This included not just crafting the appropriate land use regulations, but also working to educate and inform the public about their benefits and necessity, so that they could make an informed decision about the bylaw. In addition, PVPC has also provided land use regulation assistance to towns that are not pursuing the *Green Community* designation, but that have an interest in seeing solar development to promote community well-being in mind.

PVPC has worked on several aspects of developing proper regulations for solar installations, including streamlining permitting, establishing setbacks, and incorporating concerns of environmental impact such as land clearing and permeability, visual or aesthetic effects, and safety. In addition, PVPC is looking to include appropriate solar initiatives in its forthcoming Climate Action and Clean Energy plan in order to promote the use of clean, renewable energy across the region.

## San Diego Association of Governments

San Diego, California

[www.SANDAG.org](http://www.SANDAG.org)



The San Diego Association of Governments (SANDAG) has played an instrumental role in promoting solar growth in their region through numerous venues. They supported the formation of the *California Center for Sustainable Energy* ([www.energycenter.org](http://www.energycenter.org)), a “non-profit organization dedicated to creating change for a clean energy future.” SANDAG continues to support the Center by providing outreach to local governments and elected officials around solar, communicating with permitting offices and bolstering an awareness of regional solar leadership.

Solar is also included in SANDAG's *Regional Energy Strategy*. The Strategy addresses barriers to meeting the region's solar goals, including permitting, rates and financial issues. Through the *Regional Energy Strategy*, SANDAG supports rate structures that encourage the adoption of solar, helping PV system owners earn the full value of the electricity they generate. For more information about SANDAG's Regional Energy Strategy, visit [www.sandag.org/index.asp?projectid=332&fuseaction=projects.detail](http://www.sandag.org/index.asp?projectid=332&fuseaction=projects.detail).

Additionally, SANDAG's Regional Energy Working Group provides a regional forum to discuss solar among stakeholders. The Working Group, established in 2003, serves as a forum to build consensus and reduce conflict surrounding energy issues through addressing policy measures and educating local elected officials, including the SANDAG Board of Directors, on solar barriers and issues. The Working Group also serves to prepare local leadership to participate when California addresses the solar rate and subsidy issues at a statewide policy level. For more information about SANDAG's Regional Energy Working Group, visit [www.sandag.org/index.asp?committeeid=67&fuseaction=committees.detail](http://www.sandag.org/index.asp?committeeid=67&fuseaction=committees.detail).

# Case Studies

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# Suffolk County and Nassau County Planning Commissions: Long Island Unified Solar Permitting Initiative

Greater Long Island, NY region  
Population: 2.8 million  
Size: 2826 square miles  
[www.suffolkcountyny.gov](http://www.suffolkcountyny.gov)  
[www.nassaucountyny.gov](http://www.nassaucountyny.gov)

The *Long Island Unified Solar Permitting Initiative* (LIUSPI) was launched in 2009 by the Suffolk County Planning Commission and the Nassau County Planning Commission. Prior to this effort, Long Island's solar installation permitting process had a different set of regulations for each town and village, creating confusion, delays and extra costs. For example, some communities treated solar installations as a structure, as an add-on, or as related to plumbing or electrical installations.

As solar installations became more prevalent in the region, it became evident that a standardized and more efficient approach was needed. The Clean Energy Leadership Task Force run by the Sustainability Institute at Molloy College began asking local governments to identify the best set of rules that could be adopted region-wide to help facilitate solar installations. Under the direction of the Suffolk County Planning Commission Chair David Calone, a committee was formed, including representatives from the Suffolk County Planning Commission, the Nassau County Planning Commission, the Long Island Power Authority, industry experts and various municipalities. The Committee sought to create a permitting process that could be executed quickly, but retained safety and quality control. It was important that the application was not so easy that any solar installation could pass without the proper safety measures.

In October 2011, the committee proposed an expedited and standardized process for residential solar electric systems. The new Solar Energy System Fast Track Permit Application process allows municipalities to meet the regulatory requirements, while reducing the time and money associated with approving solar installation permits.

*The Long Island solar photovoltaic permitting situation was described as costly and inefficient, specifically, "inconsistent local permit requirements can add hundreds of dollars to the cost of installing a solar electric system."*

– Gordian Raache, Executive Director,  
Renewable Energy Long Island

Key components of the new standardized permitting process include:

- waived or minimal application fees;
- permit decisions provided within 14 days of completed application submissions;
- the creation of a central registry of solar installations;
- warning label requirement on the utility meter and any AC disconnect switch; and
- that the Solar Energy System Fast Track Permit Application be utilized as an alternative to existing building permits forms.

Another important aspect of the application includes waiving the need for a survey of the entire property or other information that is not relevant to the solar installation.

## Lessons Learned

To encourage municipalities to adopt LIUSPI, the Long Island Power Authority provided incentives of \$15,000 to each township and \$5,000 to each of the first ten villages in Nassau and Suffolk that adopted LIUSPI by December 2011. Currently all ten towns in Suffolk have adopted LIUSPI and the committee is continuing to reach out to the remaining municipalities.

- Research the details of the permitting process thoroughly prior to introducing an initiative. This information will help mitigate the amount of questions and uncertainty municipalities might have in regards to initiative adoption.
- Recognize the importance of standardizing solar installations to expedite the process and reduce costs, while maintaining safety and quality control.





# Western Riverside Council of Governments: Regional PACE Program

Western Riverside, CA  
Population: 1.7 million  
Size: 2,100 square miles  
[www.wrcog.cog.ca.us](http://www.wrcog.cog.ca.us)  
951.955.7985

The Western Riverside Council of Governments (WRCOG) is comprised of 17 cities in Western Riverside County, the County of Riverside, the Eastern Municipal Water District and the Western Riverside Water District. It is a subregion of the Southern California Association of Governments, stretching from Orange County in the west to the City of Banning on the eastern edge and City of Temecula on the southern edge. It is a fast-growing region, with a diverse mix of development. WRCOG is the joint powers agency that provides the region's collective voice on important regional issues.

## WRCOG's Property Assessed Clean Energy Program

In July of 2008, California passed Assembly Bill 811, allowing local governments the authority to enter into voluntary contractual assessment programs with property owners and to offer low-interest financing that would be repaid over time through annual property tax payments. This allows local governments the ability to finance the installation of renewable energy sources – like solar – and energy efficiency improvements to structures, making them more affordable. When used for clean energy improvements, these are commonly referred to as Property Assessed Clean Energy (PACE) programs.

WRCOG hosts a Technical Advisory Committee of city managers, county and water district executives from across the region. In the fall of 2009, the Committee expressed interest in pursuing this new legislation. They made a recommendation to WRCOG's Executive Committee to create a

regional-scale model PACE program for energy-efficiency and water conservation (similar legislation for water conservation improvements was passed a year after AB 811). Following direction from the Executive Committee, WRCOG solicited proposals for the development of a regional-scale program and hired Public Financial Management (PFM) as their consultant in 2010.

The original plan was to create a large municipal bond program to fund the loan program, but like many other programs across the country, this was sidelined by the concerns raised by Freddie Mac and Fannie Mae. Working with its consultants, WRCOG came up with an alternate solution, establishing partnerships with other finance and investment firms to raise private investment. WRCOG found that there was great interest in investing in clean energy in their region and a total of \$325 million in investment funds were acquired for the program. The investment partners, to date, for this project include Renovate America, which contributed \$100 million in asset-backed micro-bonds for residential projects; Samas Capital, which finances the \$200 million targeted for small and medium-sized commercial projects; and Structured Finance Associates, LLC,

which manages the \$25 million loan program for large commercial projects. In addition to these partners, the team has brought in specialists to help record and track the assessments, and a bond rating agency so all assessments are given credit ratings.

While the funding was being secured, WRCOG worked with its partners and its

*With the launch of the HERO Program, we are excited to offer residents and businesses in Western Riverside County this valuable financing opportunity. The Program offers a unique combination of economic and environmental benefits, as it will provide needed construction-related jobs, help property owners realize utility bill savings while improving their properties, and reduce greenhouse gas emissions associated with energy use.*

– The Honorable Robin Hastings, Former Councilmember of Moreno Valley, CA and Former Board Member, WRCOG

committee to develop the policies and procedures for the program. Using Sonoma County, California's program as a guide, the team worked out details such as which jurisdictions would participate, qualifications, terms, application processes, types of eligible improvements, penalties and marketing, among other details. Following the stipulations of AB 811, WRCOG submitted regular reports to its Executive Committee. The entire process took approximately two years, with about eight months dedicated to working on the complexities of the program and another year to secure credit ratings on the assessments.

WRCOG's *Energy Efficiency and Water Conservation Program* for Western Riverside County was launched in December 2011. It is the combination of three programs:

- *HERO\* Residential* – Managed and financed by Renovate America, this program has \$100 million available for financing to install eligible products for residential property owners.
- *HERO Commercial* – Utilizing over \$200 million in financing provided by Samas Capital, this program offers financing for 125 kW or smaller renewable energy projects, plus eligible energy efficiency and water conservation products, for all types of commercial properties.
- *HERO Large Commercial* – Managed and financed by Structured Finance, this program has \$25 million in financing to support financing for 125 kW or larger renewable energy projects, plus eligible energy efficiency and water conservation products, for all types of commercial properties.

With separate firms managing each of these programs, WRCOG works in coordination and has administrative capacity, maintaining a consistent marketing campaign and serving as the lien holder. When a loan is approved through one of these programs, WRCOG and the property owner enter into an assessment contract, through which WRCOG pays the up-front costs of the eligible improvements. Working with the County's Tax Collector, WRCOG

then places an assessment lien on the property, and the property owner repays the improvements as part of an annual assessment on the property tax bill over a specified period of time. WRCOG hopes to meet its goals of providing financing to over 13,000 residential and commercial property owners in the region, helping property owners save energy and significantly reduce energy use and utility costs, and creating an estimated 4,000 local jobs.

## Lessons Learned

With \$325 million available, WRCOG's *Program* is the largest PACE program of its kind in the United States; its approach is being emulated by others in Southern California and across the country. WRCOG's Executive Committee and Director view this program as an important benefit to its communities – both in terms of energy sustainability and economic development – and therefore, an important regional objective.

In addition to the projected benefits to the economy and environment, WRCOG has viewed this program as an excellent way to coordinate regionally and has identified several lessons learned:

- The high level of complexity in development and administration, made the program best suited for regional scale administration.
- Be flexible with the timeline. The biggest challenge during the process of developing and launching the program was giving it sufficient time. As WRCOG and its team responded to hurdles along the way, the time to project launch was delayed.
- Provide extra time for development of program policies and procedures, and receiving credit ratings.
- Require a small administrative fee to help cover costs in the absence of state, federal or additional outside funding.

\* *Home Energy Renovation Opportunity Financing Plan*



# Pima Association of Governments: Regional Solar Plan

Tucson, AZ

Population: 980,263

Size: 9,187 square miles

[www.pagnet.org](http://www.pagnet.org)

520.792.1093

Founded in 1972, the Pima Association of Governments (PAG) is a federally designated metropolitan planning organization, comprised of nine member jurisdictions in the greater Tucson region. PAG represents an environmentally and culturally diverse region, including the city of Tucson, surrounding towns and several Native American Reservations.

## PAG and Solar

In 2008, Tucson was designated a Solar America City by U.S. DOE. The region enjoys around 300 days of sunshine a year and is home to one of the largest solar power arrays in the nation. In early 2009, the City of Tucson approached PAG to assist with their Solar America Cities grant. The City was charged with hosting community outreach events to educate businesses and consumers on the benefits of solar. In an effort to assist the city and facilitate the development of solar in the region, PAG and the City of Tucson established the Solar Partnership. The Partnership is membership based and includes installers, manufacturers, end users, municipalities and government agencies based upon a flexible fee structure. During meetings, members focus on outreach and education to the community as well as working on solar energy legislation. Currently, the Solar Partnership has more than 40 members.

Shortly after the formation of the Solar Partnership, PAG and the City of Tucson developed the Greater Tucson Solar Development Plan, a component of PAG's

*Overall Work Plan*, to assist and accelerate solar deployment in Southern Arizona. Funded through the Solar Partnership, the *Plan* is comprised of twelve primary stages designed to establish a viable market for solar energy; help the region compete effectively with other western states; stimulate investment and workforce growth in the region; and secure the participation of key stakeholders.<sup>28</sup> For example, several of the stages include establishing rules and regulations to support healthy solar energy development and markets; establishing the financial incentives necessary to support renewable energy investments; and improving the ability of municipal governments to facilitate the solar energy development.<sup>29</sup> Several of the *Plan's* goals have been met or exceeded. The Solar Partnership meets monthly to discuss and update the Solar Plan to reflect these achievements and continue to develop the solar market in Southern Arizona.

PAG's efforts to develop the solar market in Southern Arizona have also benefited from a fairly generous state incentive program. However, these incentives, coupled with other market forces, assisted in an oversaturation of the region's solar installation market. As more installers flocked to the region, the quality of the installations began to suffer. The local utility, Tucson Electric Power (TEP), called upon PAG to work with local installers on the Southern Arizona Solar Standards Board (SASSB) for assistance in maintaining quality solar installations.

The SASSB, established originally by five local solar installers, works to inform consumers and



**Pima Association of Governments**

*Solar Partnership Vision is "to support a diverse and vibrant business, educational, and governmental community that is fully engaged in making southern Arizona one of the preeminent leaders in the world for the development and utilization of solar energy."*

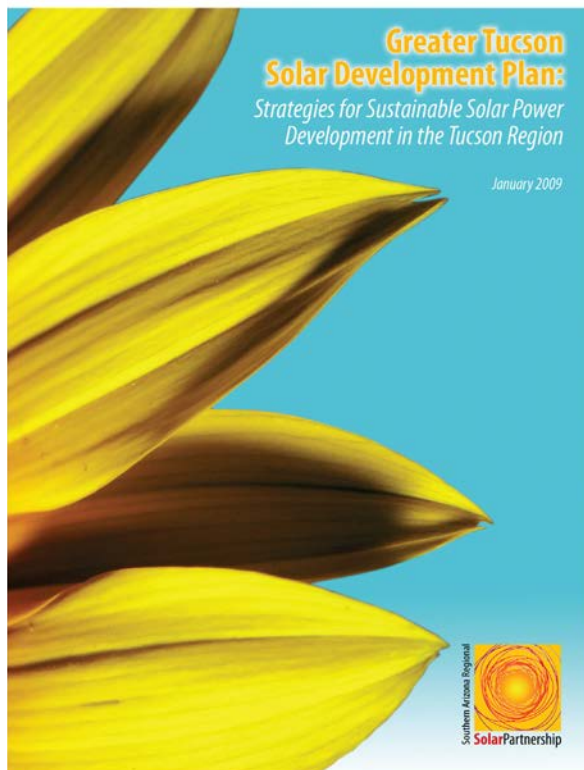
– Southern Arizona Regional Solar Partnerships Brochure

rank local installers based upon a system of best practices. The SASSB provides a set of goals to help installers attain accreditation. These goals refer specifically to established best practices associated with solar installation, such as having at least one NABCEP (North American Board of Certified Energy Practitioners) certified person on staff. Installers who successfully achieve the outlined goals receive the SASSB's stamp of approval and are listed on the SASSB's website as accredited installers. Companies that do not currently meet the outlined standards, but want to be included in SSB's database, are provided one year to meet these standards with the assistance of the SASSB.

### Lessons Learned

The SASSB works to enhance and improve the solar business climate in Southern Arizona by promoting best practices, educating the general public and assisting solar businesses looking to install long-lasting, quality installations. Because the Tucson region benefits from one of the largest solar power arrays in the nation, it has experienced success through its solar programs. The implementation of such programs has taught PAG that:

- It is important to maintain the quality of solar installation throughout the region, while still attracting projects through state incentives;
- A system of best practices is helpful to inform consumers and installers about the benefits of solar and how installers can attain accreditation; and
- Providing incentives to installers to follow best practices, leads to the installation of long-lasting, quality installations.



PAG's Greater Tucson Solar Development Plan.

Credit: PAG



# Denver Regional Council of Governments: Solar Map Project

Denver, CO

Population: 2.8 million

Size: 5,288 square miles

[www.drcog.org](http://www.drcog.org)

303.455.1000

Since 1955, the Denver Regional Council of Governments (DRCOG) has served as a voluntary association of local governments and a voice for regionalism in the nine-county Denver, Colorado region. DRCOG serves as the region's planning commission, metropolitan planning organization (MPO) and area agency on aging (AAA), and also fosters cooperation among local governments for other regional needs related to the environment, data, growth, development and many more issues that cross jurisdictional boundaries.

## DRCOG and Solar

In December 2009, DRCOG received a New Energy Economic Development grant from the Colorado Governor's Energy Office to develop a solar map that provides information on a given rooftop's solar capacity and simultaneously connects residents and businesses with installers who could help them capitalize on that capacity. Where detailed building data was available, the interactive solar map analyzed the roof space (without significant obstructions) and solar orientation of commercial and residential buildings in the 56 cities, towns and counties represented by DRCOG. This data was then translated into an easy-to-understand calculation, providing residents and business owners with an accurate assessment of their building's potential for solar photovoltaic (PV) installation. The project started out with a focus on commercial buildings, but expanded to include residential buildings.

The solar map, which supports the sustainability aspects of DRCOG's Metro Vision 2035 plan

and the achievement of Colorado's Renewable Portfolio Standard, was created with support from a public/private partnership with Woolpert Inc. (Dayton, Ohio) and the Colorado Solar Energy Industries Association (COSEIA) (Boulder, Colorado) in an effort to more easily link building owners with solar installers that would have the potential to create jobs, stimulate the economy and encourage broader solar energy adoption. Both partners were key in the project development and implementation process – Woolpert provided the technical knowledge that existing data could be used to create the map, and COSEIA provided rooftop solar potential information more specific and tailored to the Denver region than material publicly available from sources like the U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL).

The result is a user-friendly map with a simple interface that requires no training. When a user types in an address or zooms in to a building on the map, the first information displayed is a month-by-month estimate of the power generation capacity in kilowatts if a solar PV system were installed on all available roof area for that address. If a user clicks "Next," he or she will see estimated electric bill savings, as well as related information about the

estimated system sizes and available incentives. Clicking "Next" again leads the user to a contact form where the user can input his or her name, contact information and a few preferences so that an area solar installer may contact the user directly to provide a personalized estimate with detailed incentive opportunities. The information submitted is

*DRCOG is proud of the solar map project, and it really helps supplement our very successful ongoing regional data efforts. Residents, businesses, and other organizations now have access to this very useful tool, and we've received a lot of positive feedback. The project itself aligns perfectly with the goals set forth in our long-range Metro Vision plan, which emphasizes sustainability and more broadly making life better in the Denver region.*

– Jennifer Schaufele, Executive Director,  
Denver Regional Council of Governments

then passed on to regional solar installers who have access to the solar map and more detailed data provided by DRCOG and its partners.

For a map like DRCOG's, several key datasets are essential, including high-resolution digital orthophotography for feature and building identification, Light Detection and Ranging data (LiDAR) to quickly identify obstructions on rooftops that could inhibit PV panel placement, and building footprints and parcels (property ownership) for areas where LiDAR does not exist. DRCOG and its partners created the map using data from its ongoing *Denver Regional Aerial Photography Project* (DRAPP) and Denver Regional Data Consortium which fosters regional data development and is used for transportation, parcel, land use and zoning, among others. Using LiDAR, Woolpert built a web-based computer program that analyzes the roof space and solar orientation of commercial and residential buildings throughout the DRCOG region. In addition, some federally and locally funded LiDAR data created when Denver hosted the Democratic National Convention in 2008 was leveraged for this project. Finally, local governments coordinated with DRCOG and Woolpert to provide building footprints for areas without LiDAR data. This fit in well with DRCOG's on-going efforts to collect similar data from its members, as this information is used to support other long-range planning, transportation and land use modeling efforts.

After collecting the data and beginning to build the map, DRCOG worked closely with COSEIA to develop solar power generation estimates specifically for the Denver region. Beyond these estimates, the team also identified estimates of PV system size for given buildings and projected electric bill savings estimates.

The datasets from DRCOG's member governments and region-specific information from COSEIA were then loaded into DRCOG's enterprise Geographic

Information System (GIS) database. Each time a user accessed the Google Maps Application Programming Interface (API) or Solar Map interface to look up their address or click on a building, a query is sent to DRCOG's database and a custom calculation is performed on-the-fly and the information is sent back to the user via the Google Maps interface. After identifying a building of interest, users can access the information described above. In the map's first month of activity, there were nearly 8,000 unique visitors. Within the first two months of the map's release, 14 leads were generated for solar installers from the online form. Both measurements are important indicators of how the map is educating the public about solar information. DRCOG is currently working on measuring the data created by the site, specifically job creation numbers. DRCOG is developing partnerships to continue efforts to educate the public about how the site helps residents and business owners connect with local solar providers.

### Lessons Learned

DRCOG and its partners identified several areas where their experiences could help inform other regional planning organizations developing similar mapping projects:

- Partnerships are critical for success - both technical partnerships (LiDAR data processing, database, map design and maintenance) and with solar installers (provide accurate solar PV potential estimates);
- Effectively maximizing available data and tools, results in cost savings, a familiar user interface and an easy to update back-end system; and
- Recognize the need for continuing funding or partnerships that can market and maximize the number of end users, resulting in larger impacts on the growth of the solar PV industry within their region.



# Merrimack Valley Planning Commission: Clean Energy Action Plan Brings About Collaborative Regionalism

Haverhill, MA  
Population: 325,000  
Size: 270 square miles  
[www.mvpc.org](http://www.mvpc.org)  
978.374.0519

The Merrimack Valley Planning Commission (MVPC) is comprised of fifteen communities along the Merrimack River in the northeastern corner of Massachusetts. The region is bounded by New Hampshire, the sea and the Boston metropolitan area, and has a diverse mix of urban, coastal and rural development. MVPC is the region's federally designated metropolitan planning organization (MPO) and has served as the area's regional planning commission for over 50 years.



## Going Green Regionally

In 2008, The Merrimack Valley Planning Commission (MVPC) conducted an assessment of their regional challenges to economic growth in updating their Comprehensive Economic Development Strategy (CEDS). Based upon this assessment, MVPC identified the need to support the region's growth areas and energy needs by developing plans to reduce the region's carbon footprint, the creation of model ordinances to guide alternative energy development and assist municipalities pursuing renewable energy projects. In response to these needs, MVPC created the Merrimack Valley *Clean Energy Action Plan*. The Plan identifies energy challenges, resources, and strategies for each community in the region, and creates an action plan on how these communities can work together to reduce the region's carbon footprint.

## Energy Challenges

MVPC's first step was to establish a *Regional Energy Manager Program*. Through this program, MVPC brought on the expertise needed to assist the communities by recommending how they

could best conserve and generate energy. The Regional Energy Manager monitored each participating communities' energy use and expenses and then recommended corresponding changes to reduce their energy usage. To assist the *Program*, MVPC contracted with Peregrine Energy Group to provide strategic technical services and support. Peregrine learned that most communities were interested in identifying and implementing energy savings improvements in their older municipal buildings, and suggested considering using Energy Performance Contracting to address this need.

Energy Performance Contracting is a special procurement tool, allowing Massachusetts cities, towns, school districts, and other public agencies to purchase a bundle of energy management services from qualified energy vendors (ESCO). In such agreements, the selected energy vendor guarantees that implemented projects will result in specified, measurable savings, and the savings can then be used to finance the cost of a project. To date, six communities (Lawrence, Haverhill, Merrimac, Methuen, North Andover, and Salisbury) have entered into an Investment Grade Audit Agreement with Ameresco, the selected ESCO provider. Preliminary estimates suggest that Ameresco will undertake approximately \$15M in improvements, which will result in over \$1.3M of energy savings each year for the six communities participating.

In addition to energy savings improvements, communities wanted to explore their renewable energy options. MVPC conducted a "Fatal Flaws" analysis for nine communities that identified eleven landfills, which could potentially be developed



into solar farms. The analysis confirmed that five communities were candidates for installing solar on their landfills. Despite this analysis, the five communities still needed assistance in advancing these projects, developing Power Purchase Agreement (PPAs) RFPs and monitoring the project's implementation. MVPC procured the services of Meister Consultants Group to act as Regional Energy Managers and assist each of the five participating communities in developing these projects as well as identifying other solar development opportunities.

### Green Communities

In 2008, the Commonwealth passed the Green Communities Act, which encouraged communities to reduce energy consumption and costs. To encourage the development of solar energy, Massachusetts allows municipalities to purchase power from solar developers. Using the ESCO effort as a model, MVPC solicited proposals from solar developers to sell power to participating communities. Communities have various pricing options to choose from, but preliminary estimates indicate that the four participating communities will save over \$600,000 in the first year alone. This latest MVPC renewable energy initiative

will allow communities to buy power directly from power suppliers at rates lower than retail, producing savings at a minimum of 10 percent.

### Lessons Learned

Through its extensive efforts to create a truly “Green” region, MVPC learned that regionalization is not a government structure but more of an approach to how communities can work together to address common challenges.

- There were two key components to making the region's energy projects successful:
  1. Solid leadership from local elected officials, and
  2. Continuous, diligent effort to keep the projects moving.
- MVPC found that through offering various energy efficiency project options, each community can tailor the program to meet their needs, while collaborating with others on shared issues.
- MVPC continues to build off early successes, taking advantage of the momentum they have created.
- There is still a need to bring collective capacity, share experiences, solicit available resources, create efficiencies and maximize community benefits.



Credit: MVPC



# Delaware Valley Regional Planning Commission: Alternative Energy Ordinance Working Group

Greater Philadelphia, PA region  
Population: 5.6 million  
Size: 5,000 square miles  
[www.dvrpc.org](http://www.dvrpc.org)  
215.592.1800

For over 40 years, the Delaware Regional Planning Commission (DVRPC) has worked to foster regional cooperation in a nine-county, bi-state Greater Philadelphia region, which includes Bucks, Chester, Delaware, Montgomery and Philadelphia counties in Pennsylvania; and Burlington, Camden, Gloucester and Mercer in New Jersey. Through DVRPC, the region's 352 municipalities work together to address key issues, including transportation, land use, environmental protection and economic development. DVRPC provides comprehensive, coordinated planning for the orderly growth and development of the region.

## DVRPC and Solar

Municipalities in the DVRPC region are increasingly faced with the task of regulating the installation of small-scale renewable energy systems. As energy costs rise, and state and federal incentives reduce the initial cost of these systems, residents and businesses, some driven by environmental awareness, are becoming increasingly enabled to install renewable energy systems. In 2009, at the request of the region's nine counties, DVRPC established the Alternative Energy Ordinance Working Group (AEOWG) to bring together leadership from counties and municipalities in the DVRPC region to compile resources to support the safe and sound development of small-scale alternative energy systems, including solar photovoltaic (PV), small wind (<100 Kilowatt or kW) and geothermal.

Over the last three years, the AEOWG has drawn on the expertise and activity in the region to develop a series of Renewable Energy Ordinance Frameworks (REOF). These Renewable Energy Ordinance Frameworks are intended to serve as a resource for municipalities as they develop and update ordinances to govern the siting of small-scale renewable energy systems in their community.

The REOFs are available for download on DVRPC's website here:

<http://www.dvrpc.org/EnergyClimate/aeowg.htm>.

The function of the solar REOF is to provide the reader with a range of options for developing ordinances to regulate solar energy systems. The framework allows a municipality to build a customized ordinance that addresses their local issues by choosing the most appropriate language from among the options. The intent of this "menu" approach is to provide language choices and corresponding explanations that address the full breadth of barriers, benefits and cautions for municipalities to consider for solar energy systems. The document consists of the seven sections typical of an ordinance, containing language options with explanations as necessary of what language choices might be more permissive or restrictive.

To create the REOFs, the AEOWG first compiled zoning ordinances for solar, small-wind and geothermal energy systems from municipalities within the DVRPC region. Through AEOWG meetings hosted by DVRPC, municipal leaders and staff were engaged from the outset. Industry representatives were consulted to help frame the issues. The AEOWG examined relevant municipal ordinances to identify key issues to incorporate into the REOFs, including: legal restrictions within local and state laws (e.g. Home Rule) and regional consistency among local governments. The AEOWG was divided into subgroups for an in-depth examination of and language creation for the frameworks. This launched an iterative process of feedback and review among the AEOWG members for each framework. This multifaceted review process was a critical component to the REOFs and included three levels: industry, municipal and legal. These reviews assure the REOFs are consistent with best practices, ensure that language is compatible with evolving renewable energy

systems, meet the needs of the local governments and are consistent with the municipal planning codes in New Jersey and Pennsylvania.

This effort was conducted with limited staff resources from DVRPC and its member counties. Within DVRPC, this work is housed in the Office of Energy and Climate Change Initiatives' work program and is carried out with approximately five percent of a single staff member's time. Comprehensive planning funds support this initiative. Staff time from DVRPC and county governments support AEOGW facilitation, research and fact checking. Additionally, the City of Philadelphia provided funding through its Solar America Cities program to conduct a legal review of the REOFs.

DVRPC seeks to continually update the REOFs as technologies evolve and municipalities adopt ordinances. DVRPC is examining ways to expand the use of the REOFs beyond promotion within its member jurisdictions by incorporating the work into Connections, its long-range plan.



The City of Philadelphia was selected as a Solar America City, spurring interest in solar across the region. *Credit: DVRPC*

## Lessons Learned

DVRPC's work with its AEOGW identified several lessons learned:

- Create model ordinance frameworks that are regionally appropriate and inclusive;
- Include representation from municipalities and organizations that have land use authority;
- Engage diverse industry representation early;
- Determine legal liability, limitations and requirements;
- Conduct national research that can be made regionally specific;
- Establish an iterative, structured review and feedback process;
- Determine an appropriate, easily customizable, flexible and interactive presentation, for easy access and use of documents by the end-user;
- Identify integrated end goals for promotion of activities, such as a marketing and outreach strategy and audience(s);
- Allocate adequate staff time and resources with dedicated funding; and
- Integrate activities into broader initiatives of the regional planning organization.



# Metropolitan Washington Council of Governments, EPA and Optony: Metro DC Clean Energy Collaborative Procurement Initiative

Washington, DC

Population: 4.9 million

Size: 3,685 square miles

[www.mwcog.org](http://www.mwcog.org), 202.962.3200

[www.epa.gov](http://www.epa.gov), 202.272.0167

[www.optony.com](http://www.optony.com), 408.567.9216

The *Metro DC Clean Energy Collaborative Procurement Initiative* provides a collaborative platform for deploying clean energy technologies across multiple government and educational organizations for maximum impact on installed onsite solar energy capacity, local economic activity and the regional environment.<sup>30</sup> Created in 2010, this Initiative is supported by the U.S. Environmental Protection Agency's (EPA) Green Power Partnership, the Metropolitan Washington Council of Governments (MWCOCG) and Optony Inc.<sup>31</sup> The Initiative is located in the Washington, DC metropolitan region, which includes the District of Columbia and the surrounding counties and cities in Maryland and Virginia.

Based upon a successful Silicon Valley collaborative model, the Initiative aims to replicate the benefits of collaborative procurement in the Metro DC Region, including: reduced up-front and administrative costs, creation of local jobs, lower project risks, and lower electricity prices. Through collaborative procurement, communities can reduce the up-front costs of solar installations by working together as a group to evaluate project sites, procure solar systems and negotiate contracts, thus yielding much lower transaction costs for each individual participant.

*The solar collaborative provides a new opportunity to introduce solar energy at affordable prices to agencies in the National Capital Region. When enough agencies join the collaborative, the projects could generate nearly 40 megawatts of energy – enough to power 2,200 homes and avoid 26,700 metric tons of carbon dioxide.*

– The Honorable Penelope A. Gross, NARC Board of Directors President, Mason District Supervisor, Fairfax, VA County Board of Supervisors, and MWCOCG Board Member

Collaborative procurement also encourages bundling sites based upon scale. Scale refers to the size of the project: larger sites require significant scale whereas smaller sites are best suited for rooftops with limited space. Companies are then able to bid on site bundles that match their installation capabilities. For example, larger solar capital companies bid on the larger scale sites, while local or regional installers bid on the smaller sites. Linking companies with sites by scale provides scale group pricing, supports local vendors and assures that a vendor has the capacity to complete the task.

Detailed feasibility studies are produced for each participating site. These evaluations ensure that sites can support a solar installation (e.g. the site is structurally sound or the roof isn't blocked by tree coverage) and economic evaluations to determine realistic cost savings potential. Inspecting the sites, prior to issuing a request for proposals (RFP), saves time and money for both the site owner and the solar installer.

## Partners

Optony Inc., a solar energy consulting firm, provided solar expertise to agencies in the metro DC region. Hiring an outside, independent solar expert can significantly reduce the administrative costs associated with collaborative procurement. The addition of a solar expert can save a community the time and resources that it would need to dedicate to researching the solar collaborative procurement process, therefore significantly reducing administrative costs.

The *Initiative* is also supported by several of MWCOCG's committees including the Climate, Energy and Environment Policy Committee, the associated Energy Advisory Committee, and MWCOCG's Regional Environmental Fund. MWCOCG uses these committees and resources to reach out



and assist local governments and promote the project. MWCOG also hosts workshops and meetings in which the Initiative is publicized.

### Successes and Barriers

The *Initiative* aims to increase the total installed solar capacity in Maryland, Virginia and DC, create local jobs, drive down electricity prices, and reduce transaction and administrative costs by up to 75 percent for individual participants. As of January 2012, 20 organizations, including six higher education institutions, 13 public agencies and one hospital system, totaling over 176 sites and 42 megawatts in solar PV capacity have joined the Initiative. Only sites with the technical and economic capacity, as determined through the feasibility study, will progress to the next phase of the Initiative, issuing a collaborative RFP. Currently, 57 sites are entering the collaborative procurement stage.

The *Initiative* has faced several barriers to success, namely assessing how to make the project economically attractive to potential sites. Within the Northern Virginia region, electricity prices are low and there is a lack of comprehensive solar incentives. However, once several sites within the region signed onto the project and conducted their initial assessments and potential for energy savings, they have generated high visibility and interest in pursuing this *Initiative*.



Solar Panels at FedEx Field.

Photo Credit: MWCOG

### Lessons Learned

Through collaborative procurement, the *Metro DC Clean Energy Collaborative Procurement Initiative* has created a pathway for stakeholders that otherwise could not or would not pursue solar and is developing an effective and collaborative platform for developing clean energy in the metropolitan Washington, D.C. region. Collaborative procurement initiatives can be replicated in any region with interested stakeholders:

- Take time to develop your plan;
- Ensure an understanding of the different procurement procedures of local governments, educational institutions and the federal government before acquiring funding;
- Upfront costs will be more than offset by resulting increased economic performance of the solar solutions deployed; and
- Collaborative procurement requires low startup costs associated with conducting the detailed technical and economic analyses for each site under construction.



Metropolitan Washington  
Council of Governments



# Metropolitan Area Planning Council: Regional Solar Initiative

**Greater Boston, MA region**  
**Population: 3.15 million**  
**Size: 1,422 square miles**  
**[www.MAPC.org](http://www.MAPC.org)**

Celebrating its 50th anniversary in 2013, the Metropolitan Area Planning Council (MAPC) was created by the Massachusetts State Legislature to serve as the regional planning agency for the people who live and work in the 101 cities and towns of Metropolitan Boston. The region is grouped into eight subregions, whose communities span Greater Boston, coastal communities, older industrial centers, rural towns and modern cities. MAPC's mission is to promote smart growth principles and regional collaboration, while working toward sound municipal management, sustainable land use, protection of natural resources, efficient and affordable transportation, a diverse housing stock, public safety, economic development, an informed public, and equity and opportunity among people of all backgrounds. A critical component of MAPC's mission is to advance equity and cultural competency both internally and in work throughout the region.

## **MAPC and Solar**

Prompted by member interest and requests, MAPC's Clean Energy division provides a range of technical assistance services to its member cities and towns, including comprehensive energy planning as well as project-specific guidance, with the goal of advancing markets for clean technology while reducing greenhouse gas emissions and dependence on fossil fuel consumption in the Commonwealth. As part of this work, MAPC undertakes regional energy projects that help communities get lower pricing and better quality of service by bringing them together to obtain energy-related goods and services. One current project is the Regional Solar Initiative.

In 2008, the Massachusetts State Legislature enacted the "Green Communities Act," which boosts energy efficiency and encourages investment in renewable energy by providing for a statewide structure around clean energy technologies and activities. As part of the Renewable Portfolio Standard (RPS) requirements set in place by the Act, the State carved out a portion to specifically support distributed solar photovoltaic facilities, increasing incentives for these projects across the Commonwealth. MAPC has been involved with advising the regulatory implementation of the Act since the beginning, and continues to serve on a Green Communities Advisory Committee convened by the State.



*Credit: MAPC*

For MAPC, the *Regional Solar Initiative* began to germinate in 2011, when the organization brought together six communities to begin thinking about opportunities for renewable energy development and to secure a preliminary site assessment of renewable energy potential on their closed municipal landfills and underutilized lots. MAPC solicited quotes from vendors on a Massachusetts statewide contract, and contracted with Meridian Associates to conduct a Fatal Flaw analysis for potential commercial wind and ground-based solar photovoltaic (PV) on seven sites identified by the participating communities. The assessment determined that each community had the potential to develop PV projects on these sites.

In 2012, in order to help these and other communities move forward with potential local solar projects, MAPC created a Regional Solar Initiative that combines group procurement with peer learning opportunities. Seventeen cities and towns expressed interest in participating in this initiative to consider both rooftop and ground-based PV sites. MAPC hired the Cadmus Group to help develop a Request for Qualifications (RFQ) for qualified solar developers to provide solar energy management services (EMS) that could help each of the communities explore and advance local solar projects. The ability to procure these services through a streamlined path was established as part of the Green Communities Act, allowing communities to package design and construction into a single solicitation for energy project(s) with a performance guarantee.

Solar EMS contracts are long-term (up to 20 years) service agreements that include: PV system design, financing, and installation; operations, maintenance, and PV system removal; long-term lease of public space; electricity generated by a PV system; and, a system performance guarantee. A community entering into a solar EMS contract is responsible for hosting the PV system on a municipally-owned site, and purchasing all the electricity generated by the PV system. The benefit to the community is a long-term guarantee for solar energy production at a determinate price schedule without the risks of ownership. The developer owns the PV system and generates revenue by selling electricity to the community and monetizing the tax incentives and Solar Renewable Energy Credits (SRECs) associated with solar electricity generation.

In addition to managing the EMS RFQ process, which included convening a municipal Selection Committee of municipal representatives to evaluate proposals, and facilitating interviews for top-ranked developers, MAPC also held workshops and informational sessions to educate the participating communities on the developer contracting process for municipal solar projects before the solicitation process was completed.

MAPC received 14 responses to the RFQ for solar developers, and the municipal Selection Committee identified and selected a single company, Broadway Electrical, for the regional program. Upon selection, MAPC entered into a Memorandum of Understanding (MOU) with Broadway Electrical that spelled out expectations for the program and minimum requirements to enter into individual agreements with the municipalities. As each community proceeds with their individual solar EMS contract, MAPC is strongly recommending that each city or town additionally contract with an independent “Owner’s Agent”/consultant to represent their interests in technical and financial discussions and negotiations.

As the municipalities move forward with solar project development in 2013, MAPC will support solar EMS projects by providing contract development assistance for member municipalities, as well as education for vendors on how to develop more competitive responses to future RFQs. Examples of resources made available by MAPC include: Frequently Asked Questions on solar EMS Contracts and a PowerPoint on “Solar Contracting Basics”. MAPC continues to provide contract guidance, model contract documents and technical support, including possible roundtable legal discussions for the contracting phase.

## Lessons Learned

MAPC’s work identified several lessons learned:

- Neutral convening of interested stakeholders is critical for educational purposes and for broad-scale procurement activities;
- Leveraging economies of scale provides group purchasing power and makes for a more attractive solicitation for vendors;
- Establishing one point of contact through the regional planning organization allows for easy communication and feedback with the vendor, particularly for refining activities for future work;
- Streamlining solar RFQ requirements would help provide for a closer match up to vendor capabilities;
- Determining if the scope of work for a regional program would best be met through a single or multiple vendors is a key question to be addressed in the selection process, with no cookie-cutter answer;
- Engaging legal review early in EMS solar contracting would help determine risks, liabilities, roles and responsibilities;
- Pairing together education and outreach efforts with an implementation tool, such as group procurement, is a good model for advancing procurement activities;
- Connecting communities working on the same or similar projects helps promote solar throughout the region;
- Engaging the vendor community to learn about their processes and expertise is important to educating the communities and establishing trust;
- Determining if a single contract mechanism used by multiple municipalities to limit the legal activities and backend contracting required would be a worthwhile endeavor for both the communities and vendor;
- Ensuring the procurement vehicle is flexible to the market demands and capabilities; and
- Gearing the marketing of such opportunity to solar vendors is important to gain the correct exposure and interest (for example, MAPC marketed to the Northeast Sustainable Energy Association).



# Mid-America Regional Council: Solar Ready KC Initiative

Greater Kansas City, MO region  
Population: 1.9 million  
Size: 4,400 square miles  
[www.MARC.org](http://www.MARC.org)

Since 1971, the Mid-America Regional Council (MARC) has promoted regional cooperation and developed innovative solutions for the Kansas City bistate region. MARC's region encompasses nine counties and 119 cities, including Cass, Clay, Jackson, Platte, and Ray counties in Missouri, and Johnson, Leavenworth, Miami, and Wyandotte counties in Kansas. MARC is the metropolitan planning organization for the bistate region, providing cooperative purchasing, professional development training, research, emergency services, workforce development, environmental and energy programs, and additional services to their local governments.

## MARC and Solar

Local governments in the Kansas City region, like many other regions across the nation, have a wide variety of policies and processes related to solar energy usage. According to *Freeing the Grid: Best Practices in State Net Metering Policies and Interconnection Procedures*, inconsistency is the enemy of clean energy development. It creates customer confusion, undermines renewable energy development and increases costs.

In 2012, the U.S. Department of Energy (DOE) announced the *SunShot Initiative Rooftop Solar Challenge* project, which aimed to achieve measurable improvements in market conditions for rooftop photovoltaic (PV) nationwide. Based on the needs of the Kansas City (KC) region to reduce the inconsistencies in their permitting and planning processes, MARC formed a partnership with a consortium of city and county governments, Kansas City Power & Light (KCP&L) and solar industry experts to respond to the Rooftop Challenge project.

*Since 2009, MARC has taken the lead in planning for energy efficiency, conservation and renewable technologies in our region. Over these four years, the conversations have been rich in developing strategic alliances, identifying best practices and positioning the region for future advancements through regionally consistent codes, processes and policies. These solar market improvements are one of the most illustrative of how regional planning councils have an important role to play in assisting local governments in the implementation of innovative practices.*

– David Warm, Executive Director, MARC

MARC's project, formally called the *Solar Ready KC Initiative*, sought to establish best management practices (BMPs) to streamline permitting and planning processes, offer training sessions to broad and diverse audiences, conduct a financing options inventory and recruit additional jurisdictions to join the project. The *Solar Ready KC Initiative* also aimed to provide local government representatives with the latest information and best practices to prepare for policy and market changes and to position their communities and the region for this new renewable energy economy.

*Solar Ready KC* identified BMPs in two categories: permitting process improvements and planning improvements. Permitting process improvements (standardized permit fees, incorporating utility notification) are one of the fastest and most effective methods to facilitate solar installations. Planning improvements help organize and emphasize a jurisdiction's support of a building owner's right to use solar. Removing local ordinance barriers, adopting facilitating codes, encouraging solar readiness and incentivizing solar acceptance in new development fosters a community that supports individual choice.





*Solar Ready KC's* BMPs include:

- Streamline permitting - creates a permit checklist summarizing the necessary regulatory steps and develops critical permit outlining thresholds for standard installations and streamline permitting processes accordingly.
- Standardization of permit fees - recommends a fixed fee based on cost recovery for residential PV permit applications and provides the PV Permit Fee Calculator for commercial rooftop systems.
- Notification of utility - recommends a notification process when permit applications are received and electrical inspections are complete, and to conduct joint inspections with local utility and jurisdictions.
- Pre-qualify plans and installers - recommends the development of a process for pre-qualification of standard plans and a process for pre-qualification of installers.
- Improvement of solar access - recommends the incorporation of solar access priorities in comprehensive plans and the adoption of solar access ordinances.
- Improvement in solar readiness - recommends the development of a solar ready building checklist for new construction and adoption of new ordinances / building codes to promote solar ready construction.
- Engage developers and homeowners associations - create incentives for the adoption of BMPs.

Local governments can commit to different levels of the BMPs according to the immediate needs, timing of policy reviews, etc. Introducing a non-binding resolution that can be adopted by city councils or board of commissioners is a simple step that endorses the concept of the solar best practices, while also documenting support for the region-wide effort. Overtime, consistency will be achieved, as cities and counties implement the various permitting and planning practices.

### Successes & Lessons Learned

The following are a few lessons learned from the *Solar Ready KC Initiative*:

- Provide central information source for potential solar customers;
- Create a permit checklist summarizing the process to obtain all necessary permits;
- Incorporate solar access priorities in comprehensive plans;
- Provide tools for new developments;
- Provide homeowner associations with recommended strategies; and
- Create incentives for the adoption of best practices.

More information on MARC's Solar Ready KC Initiative can be found here: [http://marc.org/Environment/Energy/solar\\_ready\\_kc.html](http://marc.org/Environment/Energy/solar_ready_kc.html).



Tour of solar panels at Kauffman Stadium.

Credit: MARC



# Toolkit

The purpose of this section of the *Guide* is to provide brief, user-friendly descriptions of regionally-appropriate tools that a regional planning organization can utilize to promote solar energy deployment. The toolkit is meant to be used along with the rest of the publication, but is a one-stop-shop for those looking for regional approaches to solar implementation.

It is important to note that often the first step in employing any of these tools is garnering support. Therefore, the first tool included in this Toolkit section is a one-pager providing talking points about the benefits of solar as well as links to fact sheets and other resources. The purpose of “The Case for Solar” one-pager is to assist RPO’s to take the first step towards adding solar to their region’s priorities. It is designed to be replicated and distributed.

The subsequent tools are more specific and range in complexity. Each tool is briefly defined in the “What is it?” box. Step-by-step instructions or a list of possible implementation options are provided in the “How do you do it?” box. The “Who else is doing it?” box provides brief descriptions and links to examples of regional planning organizations or other groups that have used this tool, including the case studies from Section IV. Additional resources specific to the tool are included in the bottom box, “Where can I get more information?”

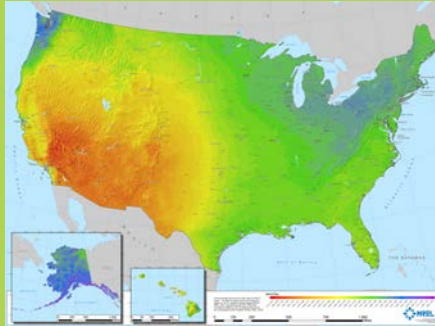
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# THE CASE FOR SOLAR

## Potential

All regions have the potential for solar development.


**The United States has 6X the solar capacity as Germany, world leader in solar.** Even cloudy regions like the Upper Northwest, have plenty of solar potential, as illustrated in the figure.



Solar Energy Industries Association, [www.seia.org](http://www.seia.org).

Map source: NREL

## Creates Jobs

- Solar is growing at nearly 10X faster than the overall economy and it one of the fastest growing job creation industries in America.
- As of September 2012, solar industry employed over 119,000 workers.
- 14,000 jobs were created in 2012,  86% of these jobs are new.
- 1 out of every 230 new jobs in the U.S. economy was created in the solar industry.
- On the current trajectory, the number of jobs in solar is expected to increase by nearly 300 percent by 2030.

## 300% INCREASE BY 2030

- While solar is expanding, the fossil fuel industry cut its employee base by almost 4% in 2012.
- Solar creates high-skilled, well-paying jobs, providing a unique opportunity for workforce development efforts to train and retrain local workforces.

## Improves Local Economies

- The increasing value of solar installations has injected life into the U.S. economy. In 2012, solar installations were valued at 11.5 billion, up from 8.6 billion in 2011.<sup>1</sup>
- Homes with solar sold 20% faster and for 17% more than equivalent non-solar homes in California.<sup>2</sup>
- Solar industry clusters serve as a valuable business development and recruitment tool for local economic development agencies.<sup>3</sup>
- Economic impact is created through industry job creation incentives, workforce training support, and manufacturing tax credits and exemptions.†
- Land leases and property taxes through large-scale solar installations increase the value of residential properties and revenue opportunities for landowners.‡
- Solar can decrease the amount of energy dollars outsourced to other states' and countries' by shifting energy investments to local sources.\*
- In Arizona, \$1 spent on solar produced \$1.67 in local economic activity. This totals a direct savings of \$2.8–\$4.5 million of economic activity for Arizona communities.<sup>°</sup>

<sup>1</sup> Solar Energy Industries Association, [www.seia.org](http://www.seia.org)

<sup>2</sup> National Renewable Energy Laboratory, "A New Market Paradigm for Zero-Energy Homes: The Comparative San Diego Case Study," <http://www.nrel.gov/docs/fy07osti/38304-01.pdf>

<sup>3</sup> The Solar Foundation's Solar Job Census, [www.thesolarfoundation.org](http://www.thesolarfoundation.org)

† The Solar Foundation, State of the Solar Industry, [http://thesolarfoundation.org/sites/thesolarfoundation.org/files/TSF\\_State%20of%20the%20Solar%20Industry\\_Final.pdf](http://thesolarfoundation.org/sites/thesolarfoundation.org/files/TSF_State%20of%20the%20Solar%20Industry_Final.pdf)

‡ The Solar Foundation's Solar Job Census, [www.thesolarfoundation.org](http://www.thesolarfoundation.org)

\* Solar Works for Minnesota, <http://www.solarmn.org/docs/SESHandout.pdf>

<sup>°</sup> Arizona Solar Center, [www.azsolarcenter.org/economics/economic-benefits-of-solar.html](http://www.azsolarcenter.org/economics/economic-benefits-of-solar.html)

8.6  
BILLION  
IN 2011  
—  
11.5  
BILLION  
IN 2012

## Flexible

- Solar does not need a lot of space; it can be placed on rooftops, integrated into buildings or mounted on the ground.<sup>1</sup>
- Solar can be placed on unused land like landfills and brownfields.<sup>2</sup>
- You don't have to tear up the street to install solar! It can be used to provide electric grid stability so you don't have to replace existing infrastructure.<sup>3</sup>

<sup>1</sup> Solar Energy Industries Association, [www.seia.org](http://www.seia.org)

<sup>2</sup> U.S. Environmental Protection Agency, Repowering America's Land Program, [www.epa.gov/renewableenergyland/](http://www.epa.gov/renewableenergyland/)

<sup>3</sup> Solar Energy Industries Association, [www.seia.org](http://www.seia.org)

## By the Numbers

- Nevada has enough solar energy to power every house in Carson City, the state capitol.
- There are more solar companies in New Jersey than tanning salons.
- Solar installations earned more revenue than ticket sales for the New England Patriots in 2012.
- In Maryland, the solar industry is bigger than its famous crab industry.
- If you stack all Colorado's solar panels together, it would reach 3 miles high.
- Texas has twice the solar potential of any other state.

## Achieve Energy/Environment Goals

- Climate Change Mitigation & Adaptation
- Improve Air Quality & Public Health
- Lower GHG Emissions

States Advancing Solar, "Overview of Benefits of Solar," [www.statesadvancingsolar.org/solar-101/benefits-of-solar](http://www.statesadvancingsolar.org/solar-101/benefits-of-solar)

## Solar Planning for a Better Tomorrow

Integrating solar into current local or regional planning activities affirms a community's commitment to solar, promotes strategic long-term thinking and can help secure resources and political will to accomplish solar goals.

# Tool #1: The Case for Solar

## Guides & Fact Sheets

### *Solar Powering Your Community: A Guide for Local Governments.*

*This guide is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan.*

[http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)

### *Solar Energy Industries Association.*

*This website provides an extensive collection of fact sheets and resources advocating for solar energy development.* [http://www.seia.org/cs/fact\\_sheets](http://www.seia.org/cs/fact_sheets)

### *States Advancing Solar.*

*This website provides a comprehensive overview of the benefits solar provides to local governments.*

<http://www.statesadvancingsolar.org/solar-101/benefits-of-solar>

### *The Solar Foundation.*

*The Solar Foundation produces an annual Solar Jobs Census, which provides an overview of the solar industry's labor market current conditions and its potential for growth.*

<http://thesolarfoundation.org/research/national-solar-jobs-census-2012>

### *A Comprehensive Review of Solar Access Law in the U.S.*

*This guide from Solar America Board of Codes and Standards provides a review of solar access laws in the U.S., as well as suggested standards for model statute and ordinances.*

<http://www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf>

### *Solar Energy Industries Association.*

*This website provides an extensive collection of fact sheets and resources advocating for solar energy development.* [http://www.seia.org/cs/fact\\_sheets](http://www.seia.org/cs/fact_sheets)

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<http://thesolarfoundation.org/research/national-solar-jobs-census-2012>

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<http://www.solarabcs.org/about/publications/reports/solar-access/pdfs/Solaraccess-full.pdf>

# Tool #1:

## The Case for Solar

### **Planning & Zoning**

Planning Advisory Service Essential Info Packet 30: Planning & Zoning for Solar Energy.

*This info packet provides planning fundamentals for public officials including sample ordinances of solar access, solar siting and solar energy systems.*

<http://www.planning.org/pas/infopackets/open/eip30.htm>

Solar Best Management Practices Planning Improvements.

*The Mid-America Regional Council created a list of planning improvements to help organize and emphasize a jurisdiction's support of a building owner's right to use solar.*

[http://www.marc.org/environment/energy/solar\\_ready\\_kc.html](http://www.marc.org/environment/energy/solar_ready_kc.html)

Renewable Energy Ordinance Frameworks.

*The Delaware Valley Regional Planning Commission developed frameworks to provide clear, consistent guidance on how to construct renewable energy ordinances.*

<http://www.dvrpc.org/energyclimate/ModelOrdinance/solar.htm>

### **Resource Centers & Technical Assistance**

SunShot Resource Center.

*This website maintains a comprehensive collection of resources on solar technologies and best practices to implement solar on the local level.* [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/](http://www4.eere.energy.gov/solar/sunshot/resource_center/)

State & Local Climate and Energy Program.

*This website provides technical assistance, analytical tools, and outreach support to state, local and tribal governments on issues related to energy.* <http://www.epa.gov/statelocalclimate/>

The Interstate Renewable Energy Council.

*This website provides detailed information on state and national energy policies and solar standards and best practices. IREC's numerous reports provide effective techniques and best practices on how to accelerate solar development.* <http://www.irecusa.org/>

Freeing the Grid.

*This website highlights best practices in state net metering policies and interconnection procedures and grades each state in detail based upon their respective policies.* <http://freeingthegrid.org/>

Database of State Incentives for Renewable & Efficiency (DSIRE).

*This resource is a comprehensive source of information on incentives and policies that support renewables and energy efficiency in the United States.* <http://www.dsireusa.org/>

SolarOPs Technical Assistance.

*SolarOps offers complementary technical assistance for local governments to help them overcome barriers and deploy solar in their regions.* <http://solaroutreach.org/ta/>



# Tool #2:

## Working with Stakeholders

### What is it?

Regional planning organizations are in the unique position to advance solar energy technology improvements by engaging regional stakeholders, including utilities, local municipalities, state government, local solar or renewable energy associations, and consumers. Regional planning organizations can engage stakeholders to promote solar “friendly” policies, increase awareness of solar energy solutions, and facilitate the design and implementation of strategic local solar plans.

By collaborating with a range of different stakeholders, regional planning organizations can make significant strides toward advancing solar adoption in a region.

### How do you do it?

- Work with utilities to promote policies, rules and regulations that affect solar installation, such as net metering and interconnection standards.
- Partner with state and local governments to adopt policies encouraging solar installations in your region.
- Collaborate with local Solar Energy Industry Association (SEIA) chapters to assist in removing market barriers, strengthen the solar industry and educate the public on the benefits of solar energy.
- Create relationships with State Energy Offices. The American Recovery and Reinvestment Act of 2009 allotted money to State Energy Offices to promote energy-related programs.
- Host a workshop to increase public awareness and interest in solar technology.
- Distribute materials created by U.S. DOE or other entities that are specifically crafted for different stakeholder groups.
- Create a working group or committee to identify the current regulatory, policy and incentive framework in order to accurately assess the changes necessary to advance solar energy in your region.

### Who else is doing it?

- The Green River Area Development District (GRADD) organized the Green Living Symposium, a one day workshop on nurturing sustainability on the local level. The event brought together local advocates and stakeholders to encourage discussion on local sustainability efforts. For more information, see the GRADD profile on page 13 of this *Guide*.
- The Delaware Valley Regional Planning Commission (DVRPC) established an Alternative Energy Ordinance Working Group, which convened local leadership to compile resources supporting the development of small scale alternative energy systems. For more information see the DVRPC case study on page 32 of this *Guide* or visit <http://www.dvrpc.org/energyclimate/aeowg.htm>.
- The Mid-Ohio Regional Planning Commission (MORPC) created the Center for Energy and Environment to bring together greenways, sustainable growth, energy efficiency and air quality programs, and stakeholders that serve the region’s needs and visions. For more information, see the MORPC profile on page 14 of this *Guide* or visit <http://www.morpc.org/energy/center/main.asp>.
- The San Diego Association of Governments (SANDAG) was instrumental in the creation of the California Center for Sustainable Energy (CCSE), an independent nonprofit organization that fosters public policies and provides programs, services and information that facilitates the adoption of clean and renewable energy technologies and practices in the San Diego region. For more information, see the SANDAG profile on page 21 of this *Guide* or visit <http://energycenter.org/index.php>.

### Where can I get more information?

- The Interstate Renewable Energy Council’s (IREC) *Connecting to the Grid* provides information on state level interconnection standards. For more information, visit <http://irecusa.org/wp-content/uploads/2009/11/Connecting-to-the-Grid-Guide-6th-edition.pdf>.
- IREC’s Model Net Metering Rules provides state level model net metering policies. For more information, visit [http://irecusa.org/wp-content/uploads/2010/08/IREC\\_NM\\_Model\\_October\\_2009-1-22.pdf](http://irecusa.org/wp-content/uploads/2010/08/IREC_NM_Model_October_2009-1-22.pdf).
- The U.S. Department of Energy’s (DOE) *Solar Powering Your Community: A Guide for Local Governments* is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on improving utility policies and processes on page 81-96. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)

# Tool #3:

## Integrating Solar into Existing Activities

### What is it?

Integrating solar energy within other regional plans (e.g., regional energy plan, emergency preparedness plan, long range transportation plan, economic development strategy, sustainability plans, or development of regional impacts checklist) can meet multiple goals.

By incorporating solar into a regional plan, planners can coordinate the community's efforts and reach common goals more easily. Including solar into your regional plans can also show your region's commitment to advancing renewable energy sources and help build the foundation to secure future resources and political will to accomplish solar goals.

### How do you do it?

- Identify solar as a key economic driver in your region by creating or supporting policy that bolsters regional solar investment.
- Establish rules and regulations facilitating solar energy development.
- Consider identifying public and private stakeholders willing to implement strategies outlined in your regional solar plan.
- Create the position of Regional Solar Energy Coordinator, designate a committee or coordinate with a public-private agency willing to implement solar policies and plans.
- Promote Solar in Development of Regional Impacts (DRI) by including solar roof access, photovoltaic (PV) street and recreational area lighting, among others. DRIs can also direct that developers must provide information on solar hot water heaters and PV to potential home buyers and allow them to select those options.
- Consider including solar within emergency or transportation planning. For example, solar can be used as backup for traffic controls and emergency radios.

### Who else is doing it?

- The Solar Roadmap, provides resources, best practices and guidance on incorporating solar into regional plans, including permitting, inspection planning, zoning, interconnection, financing and market development. For more information, visit <http://www.solarroadmap.com/>.
- The Southwest Florida Regional Planning Commission (SWFRPC) has successfully promoted solar within their Development of Regional Impacts review requirements for the past 37 years. For more information, visit <http://www.swfrpc.org/dri.html>.
- The Pima Association of Governments (PAG) in partnership with the City of Tucson and Clean Energy Corp developed the Greater Tucson Solar Development Plan which promotes the development of solar in their region. For more information, see the PAG case study on page 26 of this *Guide*. or visit <http://www.pagnet.org/documents/solar/SolarDevPlan2009-01.pdf>.
- The Metropolitan Washington Council of Governments (MWCOCG) incorporated solar into their Climate Action Plan to support the region's reduction of greenhouse gas emissions. For more information, visit <http://www.mwcog.org/environment>.
- Berkeley, CA includes solar provisions within their Climate Action Plan. For more information, visit [www.ci.berkeley.ca.us/ContentDisplay.aspx?id=19668](http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=19668).

### Where can I get more information?

- The American Planning Association's (APA) Planners Energy and Climate Database, provides examples of the incorporation of solar within regional and local plans. [www.planning.org/research/energy/database/](http://www.planning.org/research/energy/database/)
- The U.S. Department of Energy's (DOE) Solar Powering Your Community: A Guide for Local Governments is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on including solar in broader regional planning efforts on page 20-22. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)

# Tool #4:

## Model Ordinances

### What is it?

Model solar ordinances provide regions with a framework to facilitate the protection and promotion of solar energy resources in various municipalities.

Model solar ordinances can contain helpful implementation strategies, including but not limited to:

- laying out siting requirements for solar;
- outlining safety requirements for solar installations; and
- establishing provisions to maximize solar access.

### How do you do it?

- Survey your local governments to better understand their solar ordinance needs.
- Form a subcommittee or assign staff tasked with this project.
- Review model ordinances completed by other regional councils (see *Who else is doing it?* box below).
- Develop a model ordinance and make it specific to your region. Many model ordinances can be easily adapted to fit your regional requirements. Add guidance about how local communities can customize the model ordinance to fit their needs.
- Issue a public review and have the model ordinance reviewed by an attorney and your regional Board, if necessary.
- Edit and finalize the model ordinance.
- Market and disseminate information online, and through workshops and/or webinars.

### Who else is doing it?

- The Tri-County Regional Planning Commission (TCRPC) developed a model solar energy systems ordinance which includes multiple ways to regulate an aspect of a solar energy system, regulate the installation and operation of solar and thermal energy facilities, and can be adopted as a whole or in sections. For more information see the TCRPC profile on page 18 of this *Guide* or visit <http://www.tcrpc-pa.org/assets/adeptiv/upload/attach/Solar%20Energy%20Systems.pdf>.
- The Delaware Valley Regional Planning Commission (DVRPC) has developed a series of model Alternative Energy Ordinance Frameworks, which provide resources on citing, permitting and funding alternative energy systems for solar, geothermal and wind. For more information, see the DVRPC case study on page 32 of this *Guide* or visit [www.dvrpc.org/energyclimate/](http://www.dvrpc.org/energyclimate/).

### Where can I get more information?

- The American Planning Association has a Solar Energy Essential Info Packet and Inquiry Answer Service are both great resources to learn more about updating codes and ordinances. <http://www.planning.org/research/solar/>
- The Columbia Law School's Center for Climate Change Law has prepared a model small-scale solar ordinance. [https://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file\\_id=59609](https://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=59609)
- The APA compiled examples of solar access ordinances nationwide. <http://www.planning.org/pas/infopackets/open/pdf/30part3.pdf>
- The County of Santa Clara, California compiled examples of zoning ordinance standards for solar electric generating facilities. <http://www.sccgov.org/sites/planning/PlansPrograms/Solar/Documents/solar-power-and-land-use-in-SCC-final-for-Website.pdf>
- Massachusetts' Department of Energy Resources provides guidance for providing as-of-right siting in designated locations for renewable/alternative energy generation, research and development, or manufacturing facilities. <http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/gc-grant-program/criterion-1.html>

# Tool #5:

## Training and Certification

### What is it?

Installer certification indicates that your region is keeping pace with national standards developed by a large base of stakeholders. Certification can result in safer and higher performance installations as certified installers typically demonstrate a higher level of competency and a commitment to excellence than non-certified installers. Using nationally recognized programs relieves municipalities of the need to create their own certification standards.

A trained code official promotes safe solar installations and can expedite the inspection process saving money. An uneducated code official could potentially approve an improperly installed solar system, putting the safety of the building occupants, system owners, the public and others at risk.

### How do you do it?

- Coordinate with an organization providing solar training and education. These organizations can include local universities, colleges and training institutions. See below for some national examples.
- Collaborate with your region's solar industry representatives to identify what is needed to develop a safe installation process.
- Set up a training course for code officials or installers to collaborate with communities within your region.
- Work with state code and standards to determine whether continuing education credit can be offered for training. Offering credits provides an extra incentive to attend training.
- Educate the community about the value of using certified installers.
- Consider sharing a solar permitting and inspection department within the region.

### Who else is doing it?

- The Pima Association of Governments (PAG) hosts the Southern Arizona Solar Standards Board, which is designed to encourage quality solar installations in the region by providing a list of accredited solar installers, promoting best practices and educating the general public about solar installations. For more information see the PAG case study on page 26 of this *Guide* or visit <http://www.solarstandards.org/>.
- Dubuque is the first city in Iowa to implement a city-wide solar thermal installation ordinance, mandating that all installers must be either NABCEP (National American Board of Certified Energy Practitioners) certified or have successfully completed and passed the Solar Thermal Installation course and performed two installations. For more information, visit <http://www.ecia.org/pdf/publications/ECIA-E-Newsletter1-12.pdf>.

### Where can I get more information?

- The North American Board of Certified Energy Practitioners offers a national certification program for solar installers. <http://www.nabcep.org/>
- The Solar Instructor Training Network supports high-quality training through offering expert instruction and top training facilities within select educational institutions in their regions. [http://www1.eere.energy.gov/solar/sunshot/instructor\\_training\\_network.html](http://www1.eere.energy.gov/solar/sunshot/instructor_training_network.html)
- Electronics Technicians Association provides training and certification for alternative energy installers. <http://www.eta-i.org>
- The Interstate Renewable Energy Council's Best Practices & Recommended Guidelines for Renewable Energy Training document provides resources to assist in solar training. <http://irecusa.org/wp-content/uploads/2009/10/BestPracticesFormatted2010Final2410.pdf>
- The U.S. Department of Energy's *Solar Powering Your Community: A Guide for Local Governments* is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on code official training and installer licensing and certification on page 72-79. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)



# Tool #6:

## Solar Mapping

### What is it?

Solar mapping can be used as an effective tool to raise awareness and interest in solar energy in your region. Solar maps provide a portal for connecting residents and businesses with local solar installers as well as financing information. Depending upon the mapping software, maps can estimate the generating capacity and cost of a solar installation by neighborhood, by block or even on the rooftop of a particular building.

### How do you do it?

- Identify what type of mapping software would be required based upon the needs of your region and the preferred level of detail.
- Determine whether the map can be created in-house. If the map must be outsourced, find a vendor with solar mapping expertise.
- Create an inventory of any existing solar installations in your region.
- Create links on the map to solar financing information. If desired, provide site-specific financing information.
- Develop a database of recommended local installers and provide links to them on the map.
- Link web tracking software with the map to count the amount of people using the site.
- Link the map with the National Renewable Energy Laboratory's (NREL) Open PV Project, which tracks solar installations throughout the country.
- Consider using the map to publicly track progress towards a stated installation target.

### Who else is doing it?

- The Denver Regional Council of Governments developed a solar map that displays the solar capacity for an individual site and connects residents and businesses with local solar installers. For more information see the DRCOG case study on page 28 of this *Guide* or visit <http://solarmap.drcog.org/>.
- The City of Houston, TX developed an interactive solar map, which includes photos and case-study information on individual solar installations around the city. <http://www.solarhoustontx.org/LEEP/Experience/InteractiveMap/tabid/1164/Default.aspx>
- San Francisco, CA designed a web-based solar tool to assess a rooftop's solar potential and any related economic or environmental benefits that would result from installing solar on that site. For more information, visit <http://sf.energymap.org>.
- New York City's solar map shows the solar energy potential for every building within New York's five boroughs in addition to displaying the city's real-time solar production. For more information, visit <http://www.nycsolarmap.com>.
- Boston, MA developed an Interactive GIS Map indicating the active renewable energy installations within the city and also providing the ability to calculate the solar potential of building rooftops. For more information, visit <http://gis.cityofboston.gov/solarboston/#>.

### Where can I get more information?

- The National Renewable Energy Laboratory's (NREL) Open PV Project tracks solar installations throughout the country. <http://openpv.nrel.gov>
- NREL's In My Backyard tool estimates the PV array production based upon a site's system size, location and other variables. <http://maps.nrel.gov/imby>
- NREL created an analysis of web-based solar PV mapping tools. The report identifies and analyzes several web-based solar mapping tools based upon various criteria. [http://www.nrel.gov/analysis/analysis\\_tools\\_tech\\_sol.html](http://www.nrel.gov/analysis/analysis_tools_tech_sol.html)
- The U.S. Department of Energy's Solar Powering Your Community: A Guide for Local Governments is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on including solar mapping on page 120-122. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)

# Tool #7:

## Streamline Permitting and Inspection Processes

### What is it?

Streamlining a region's permitting and processes for solar installations can reduce costs and confusion by providing clearly defined requirements, expedited processing for solar installations and the option to submit paperwork online.

Standardizing permitting requirements within a region can help communities to pool resources by sharing permit inspection staff.

Implementing streamlined permitting also showcases the region's commitment to solar within their communities and creates opportunities for growth in the region's solar market.

### How do you do it?

- Understand each community's solar permitting and inspection process.
- Create an easy to understand outline of the solar permitting and inspection process in your region.
- Simplify permit application forms and the review process. Consider allowing for online submissions.
- Standardize permitting procedures in all communities in your region. Consider working with local utilities to provide incentives to encourage communities to adopt the permitting procedures.
- Consider allowing over-the-counter building permits for standard residential solar energy systems.
- Allow document exchanges to be conducted by company representatives. Some jurisdictions require licensed electricians pick up permits; this can place an unnecessary burden on installation firms.
- Host a workshop to educate building and electrical inspectors about solar technologies and installations.
- Publicize an easy to understand, step-by-step explanation of the permitting and inspection process.
- Establish a clear communications path between code enforcement offices and the local utility provider to expedite the interconnection and inspection processes.

### Who else is doing it?

- The Mid-America Regional Council's (MARC) Solar Ready KC Initiative identified best management practices for permitting process and planning improvements. For more information, see MARC's case study on page 38 or visit [www.marc.org/environment/energy/solar\\_ready\\_kc.html](http://www.marc.org/environment/energy/solar_ready_kc.html)
- Boston, MA recently released the *Solar Boston Permitting Guide* as a resource for business and residences interested in installing solar and describes the city's new streamlined permitting rules for solar PV installations. For more information, visit [http://www.cityofboston.gov/images\\_documents/Solar%20Boston%20Permitting%20Guide%20NEW%20Sept%202011\\_tcm3-27989.pdf](http://www.cityofboston.gov/images_documents/Solar%20Boston%20Permitting%20Guide%20NEW%20Sept%202011_tcm3-27989.pdf)
- The Long Island Unified Solar Permitting Initiative (LIUSPI) created standardized and expedited permitting for solar rooftop and solar hot water systems in Long Island. For more information, see the LIUSPI case study on page 23 of this *Guide*.

### Where can I get more information?

- The Solar America Board for Codes and Standards addresses solar codes and standards issues. <http://www.solarabcs.org>
- SolarTech released a revised electrical diagram and guidelines for residential PV to help expedite the solar permitting process. [http://irecusa.org/wp-content/uploads/2010/09/TUCC\\_Policy\\_11\\_Standardized\\_PV\\_guide\\_revised\\_070810-1.pdf](http://irecusa.org/wp-content/uploads/2010/09/TUCC_Policy_11_Standardized_PV_guide_revised_070810-1.pdf)
- SolarTech also released a "Top 10 List" for expedited permitting, available here <http://solartech.org/permitting/56-top-10>.
- The Vote Solar Initiative houses resources on solar permitting. <http://votesolar.org/city-initiatives/project-permit/>
- SunRun produced a report exploring how streamlined permitting can make solar more affordable. <http://www.sunrunhome.com/solar-lease/cost-of-solar/local-permitting/>
- Brook's Engineering's *The Expedited Permit Process for PV Systems: A Standardized Process for the Review of Small-Scale PV Systems* report provides a detailed overview of the standardization process for small-scale PV systems. <http://www.brooksolar.com/files/Expermitprocess.pdf>
- The U.S. Department of Energy's (DOE) Solar Powering Your Community: A Guide for Local Governments is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on streamlined permitting on page 67-71. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)
- The National Renewable Energy Laboratory released *Updating Interconnection Screens for PV System Integration*, which provides short and long-term solutions that allow for increasing solar deployment levels in a safe and reliable manner. <http://www.nrel.gov/docs/fy12osti/54063.pdf>

# Tool #8:

## Regional PACE Programs

### What is it?

The Property Assessed Clean Energy (PACE) program is a financial model used by municipalities to help make solar more affordable. PACE programs provide building owners and lenders the ability to finance the upfront costs of an energy investment such as solar panels through a property tax repayment method, which maintains the repayment with the property even if it changes hands. This allows property owners to receive low-interest finance options from their local municipality with long-term loan repayment periods. Because of the regulatory uncertainty surrounding PACE programs on the local level, regional planning organizations stand to play an important role in providing these energy investment incentives within their jurisdictions.

Benefits of the PACE program include: offering a loan attached to the property and not the individual (and thereby transferrable); the potential to deduct the loan interest from federal taxable income as part of the local property tax deduction; and savings to property owners on energy costs while paying for their solar energy system, usually resulting in a net gain.

### How do you do it?

1. Determine whether or not there is local authority to administer PACE in your region.
2. Consider issuing a Request for Proposals (RFP) to hire an outside consultant with expertise in PACE program financing.
3. Develop a financing structure that provides enough revenue to cover the principal and interest payments, administrative costs and a reserve fund to cover participant delinquencies. Look at existing bond authorities or establish partnerships with finance and investment firms to raise private investments.
4. Engage a committee to develop policies and procedures for the PACE program. Include such details as: which jurisdictions will participate, qualifications, terms, application processes, penalties and marketing.
5. Determine where the administration of the program should be housed and clearly delineate all stakeholders' roles. A regional planning organization is well positioned to serve as the main point of contact or lead convener for the project.
6. Educate local installers, applicable committees or workgroups, and consumers on the benefits of the program.
7. Market and disseminate information online and through workshops and/or webinars.

### Who else is doing it?

- Western Riverside Council of Governments (WRCOG) in California developed a regional-scale model PACE program for energy efficiency and water conservation. For more information see the WRCOG case study on page 24 of this *Guide* or visit <http://www.wrcog.cog.ca.us>.
- The Sonoma County Energy Independence Program in California provides local property owners to finance energy efficiency, water efficiency and renewable energy improvements through a voluntary assessment. For more information, see the Sonoma County on page 19 of this *Guide* or visit <http://www.sonomacountyenergy.org/>.

### Where can I get more information?

- The Database of State Incentives for Renewables & Efficiency (DSIRE) provides a list of state, local, utility and federal incentives and policies promoting renewable energy and energy efficiency, including PACE programs. <http://www.dsireusa.org/>
- The U.S. Department of Energy's (DOE) Weatherization and Intergovernmental Program provides information on the status of the Pilot PACE Financing Programs. <http://www1.eere.energy.gov/wip/pace.html>
- PACENow's mission is to promote the use of PACE programs to increase energy retrofits nationwide. The website provides a wealth of information about PACE programs. <http://pacenow.org/>
- The University of California, Berkeley's Guide to Energy Efficiency & Renewable Energy Financing Districts for Local Governments covers issues such as financing, marketing, legal issues, and program administration for PACE programs. <http://rael.berkeley.edu/sites/default/files/old-site-files/2009/FullerKunkelKammen-MunicipalEnergyFinancing2009.pdf>
- The U.S. Department of Energy's Solar Powering Your Community: A Guide for Local Governments is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on PACE programs on page 41-45. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)

# Tool #9:

## Collaborative Procurement

### What is it?

Collaborative procurement provides the opportunity for local governments, communities or regions to collaborate together to negotiate a reduced rate for solar installations. Collaborative procurement can result in reduced up-front costs of solar installations, overall savings due to site aggregation, administrative cost savings and favorable contract terms. Collaborative procurement can help regions reach their solar energy goals faster by accelerating solar purchases. Regional planning organizations can play the important role of convener or the main point of contact.

### How do you do it?

- Convene Interested Stakeholders through open calls for participation.
- Consider issuing a Request for Proposals (RFP) to hire an outside consultant with expertise in solar collaborative procurement.
- Conduct Feasibility Studies to evaluate the economic and technical capacity for a solar installation on each interested site.
- Facilitate Stakeholder Review and approval to proceed from any involved elected officials and agencies.
- Bundle Sites by Scale to facilitate the procurement of a lower price per watt.
- Utilize the Procurement Process to evaluate solar system installers, negotiate prices and contract terms, and receive Board approval.
- Contract to finalize the system design, construction, planning, project permitting and system commissioning.

### Who else is doing it?

- The U.S. Environmental Protection Agency's Green Power Partnership's Metro DC Clean Energy Collaborative Procurement Initiative facilitates the collaborative procurement of solar in the Metro DC region. For more information, see the collaborative procurement case study on page 34 of this *Guide* or visit, <http://www.epa.gov/greenpower/index.htm>.
- The Silicon Valley Collaborative Renewable Energy Procurement Project created a large-scale initiative intended to serve as a replicable regional example of collaborative procurement. For more information, see the Silicon Valley profile on page 20 of this *Guide* or visit [http://www.jointventure.org/index.php?option=com\\_content&view=article&id=189&Itemid=287](http://www.jointventure.org/index.php?option=com_content&view=article&id=189&Itemid=287).
- The Merrimack Valley Planning Commission (MVPC) is implementing a collaborative RFP process after administering feasibility studies on several sites throughout the region. For more information, see the MVPC case study on page 30 of this *Guide*.

### Where can I get more information?

- The World Resources Institute's Purchasing Power: Best Practices Guide to Collaborative Solar Procurement provides in-depth examples of commercial and government led collaborative procurement. [http://pdf.wri.org/purchasing\\_power.pdf](http://pdf.wri.org/purchasing_power.pdf)
- The Houston-Galveston Area Council created [www.HGACBuy.org](http://www.HGACBuy.org), an online resource for collaborative procurement within a number of programs. While the site does not contain information on solar, it can be used as a guide for the establishment of collaborative procurement programs by a regional council in general.
- The U.S. Department of Energy's Solar Powering Your Community: A Guide for Local Governments is a comprehensive resource created to assist local governments and stakeholders in designing and implementing a strategic local solar plan. The guidebook includes a section on group purchasing on page 49-50. [http://www4.eere.energy.gov/solar/sunshot/resource\\_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf](http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf)



# List of Acronyms

Below is a list of acronyms that have been referenced throughout this report.

AAA	Area Agency on Aging
AEOWG	Alternative Energy Ordinance Working Group
APA	American Planning Association
API	Application Programming Interface
BMPs	Best Management Practices
CCSE	California Center for Sustainable Energy
CEDS	Comprehensive Economic Development Strategy
COSEIA	Colorado Solar Energy Industries Association
CSP	Concentrating Solar Power
DOE	U.S. Department of Energy
DRAPP	Denver Regional Aerial Photography Project
DRCOG	Denver Regional Council of Governments
DRI	Development of Regional Impacts
DSIRE	Database of State Incentives for Renewables & Efficiency
DVRPC	Delaware Valley Regional Planning Commission
EMS	Energy Management Services
EPA	U.S. Environmental Protection Agency
ESCO	An Energy Service Company
FIT	Feed-in-tariffs
GIS	Geographic Information System
GRADD	Green River Area Development District
HERO	Home Energy Renovation Opportunity Financing Plan
ICC/IECC	International Energy Conservation Code
ICMA	International City/County Management Association
IREC	Interstate Renewable Energy Council
KC	Kansas City
KCP&L	Kansas City Power & Light
kW	Kilowatt
LiDAR	Light Detection and Ranging
LIUSPI	Long Island Unified Solar Permitting Initiative
MAPC	Metropolitan Area Planning Council
MARC	Mid-America Regional Council
MORPC	Mid-Ohio Regional Planning Commission
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MVMCC	Merrimack Valley Mayors and Managers Coalition
MVPC	Merrimack Valley Planning Commission
MW	Megawatt
MWCOG	Metropolitan Washington Council of Governments
NABCEP	North American Board of Certified Energy Practitioners
NARC	National Association of Regional Councils
NREL	National Renewable Energy Laboratory
PACE	Property Assessed Clean Energy
PAG	Pima Association of Governments
PFM	Public Financial Management
PPA	Power Purchase Agreement
PV	Photovoltaic
PVPC	Pioneer Valley Planning Commission
REOF	Renewable Energy Ordinance Frameworks
RFP	Request for Proposal
RFQ	Request for Qualifications
RPO	Regional Planning Organization
RPS	Renewable Portfolio Standard

SANDAG	San Diego Association of Governments
SASSB	Southern Arizona Solar Standards Board
SEIA	Solar Energy Industry Association
SRECs	Solar Renewable Energy Credits
SITN	Solar Instructor Training Network
Solar ABCs	Solar America Board for Codes and Standards
SolarOPs	Solar Outreach Partnership
SV-REP	Silicon Valley Collaboration Renewable Energy Procurement Project
SWFRPC	Southwest Florida Regional Planning Commission
TCRPC	Tri-County Regional Planning Commission
TEP	Tucson Electric Power
TMACOG	Toledo Metropolitan Area Council of Governments
WRCOG	Western Riverside Council of Governments

# End Notes

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3. <http://dsireusa.org/solar/solarpolicyguide>
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5. Solar Energy Industries Association, [www.seia.org](http://www.seia.org)
6. Galen Barbose, Naim Darghouth, and Ryan Wiser. "Tracking the Sun IV: An Historical Summary of the Installed Cost of Photovoltaics in the United States from 1998-2010." <http://emp.lbl.gov/publications/tracking-sun-iv-historical-summary-installed-cost-photovoltaics-unitedstates-1998-2010>
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# NOTES



### **About The National Association of Regional Councils**

The National Association of Regional Councils (NARC), representing local elected officials and their regional planning organizations, serves as a national voice for regionalism by advocating for regional cooperation as the most effective way to address a variety of topics including transportation, economic and community development, environment and homeland security. NARC's member organizations are composed of multiple local governments that work together to serve American communities - large and small, urban and rural. For additional information, please visit [www.NARC.org](http://www.NARC.org).

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