PROFILES IN REGIONAL SOLAR PLANNING: A HANDBOOK AND RESOURCE GUIDE

NARC
Building Regional Communities
National Association of Regional Councils

Powered by SunShot
U.S. Department of Energy

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Forward

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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-USA Local Governments for Sustainability, 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 http://www1.eere.energy.gov/solar/sunshot/solarops.html.

The *Profiles in Regional Solar Planning: A Handbook and Resource Guide* (*Guide*) is intended to provide guidance specifically 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 taken on 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 in their regions.

The main focus of this *Guide* has been the compiling of the case studies and toolkit. NARC understands that regional planning organizations look to their peers for unique ideas and promising practices, as well as lessons learned. In this way, 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*.[1] 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 Initiative and the SunShot Solar Outreach Partnership

The U.S. Department of Energy (DOE) SunShot Initiative is a collaborative national effort to dramatically reduce the cost of solar energy before the end of the decade. To aggressively drive innovation and make subsidy-free solar energy systems cost-competitive with other forms of energy, DOE is supporting efforts by private companies, academia, and national laboratories to reduce the cost of solar electricity to about $0.06 per kilowatt-hour. Part of DOE's larger effort to make solar energy more accessible and affordable, the SunShot Initiative will enable solar-generated power to account for roughly 14 percent of America's electricity generation by 2030. For more information, visit the SunShot Initiative webpage.[2]

The SunShot Solar Outreach Partnership (SolarOPs) is a DOE program designed to increase the use and integration of solar energy in communities across the United States. The International City/County Management Association (ICMA), American Planning Association (APA), and National Association of Regional Councils (NARC), along with ICLEI-Local Governments for Sustainability and its partners, were competitively selected by DOE to conduct outreach to local governments across the United States, enabling them to replicate successful solar practices and quickly expand local adoption of solar energy. For more information visit the SolarOPs [http://www1.eere.energy.gov/solar/sunshot/solarops.html] webpage.

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Introduction

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

Regional planning organizations often step into the role of organizing and moving such efforts forward. However, energy planning, and specifically the role of renewable energy sources like solar energy, is still a relatively new area of practice for the majority of regional planning organizations. 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.[3] 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 solar is something that a regional planning organization should consider and sheds light on some of the main misconceptions about solar energy implementation. This is followed by Section II: *Barriers to Solar*, which identifies the most regionally-relevant real barriers to solar, both regulatory and financial. Section III: *Regional Solutions*, is an overview of how regional planning organizations can play a unique and significant role in overcoming these barriers, and introduces the following Section IV: *Case Studies*. The 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. These tools range in sophistication, but each one includes suggestions for implementation, as well as multiple links to examples and additional resources. Finally, a list of acronyms is included for clarification, as Section VI: *List of Acronyms*."

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.[4] 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.[5]

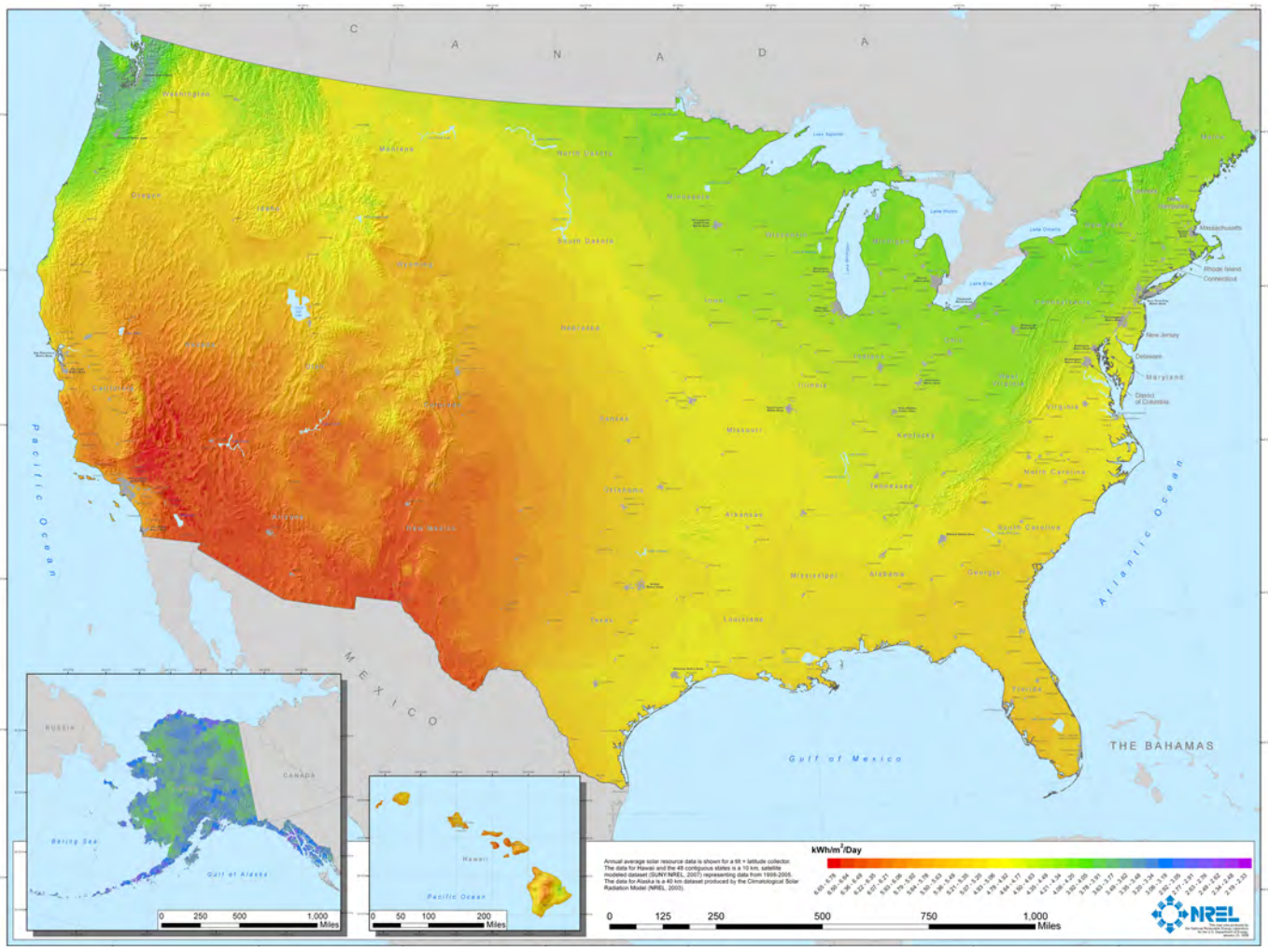
Making the Case for Solar

Every hour, enough solar energy strikes the Earth to power human activities for over a year.[6] 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.

- *Location and Weather*. Communities and regions often do not recognize that they are geographically located in a climate or latitude that is amenable to solar energy generation. Solar can be successful in all 50 states, even in areas with high precipitation, perceived cloudiness and extreme weather. Germany has more installed capacity than any other country in the world and receives roughly the same amount of sunshine as Alaska. In the U.S., solar isn't just for the southwestern states or "sunny" California. New Jersey has been one of the solar installation leaders over the last several years and Boston, Massachusetts has 90 percent as much solar potential as Miami, Florida.[7]

United States Photovoltaic Solar Resource: Flat Plate Tilted at Latitude



Map credit: National Renewable Energy Laboratory.

- *High Cost*. 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. [8] Since early 2010, the price of solar modules has dropped by over 50 percent.[9] Solar can often be developed on rooftops, or landfills or other underutilized lands. In addition, there are new financing options for homeowners and businesses to reduce or eliminate the upfront cost of solar and allow for a quicker return on investment. However, the costs associated with solar often remain high. This can be a true barrier to deployment, and is discussed further in this *Guide*, along with promising practices for how regional planning organizations can overcome this challenge.

- *Immature Industry and Technology*. There is a misconception that solar technology is inefficient and the industry is still immature. Like most technologies, solar energy systems are constantly improving. But current systems are built to last 25-30 years, reliably providing affordable, clean energy. A typical residential rooftop system is currently able to cover a home's needs. While incremental improvements in efficiency and reliability are being made, today's panels will still be producing electricity at a high rate down the road. In addition, the solar industry has matured. There are currently national certifications for both the equipment and installers, and a multitude of solar installer training opportunities that ensure panels are safely and effectively fitted. In addition, some states have equipment certification requirements and/or installer licensing requirements. Some regional planning organizations have played 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.

- *Subsidies and Support*. 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 and 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.[10] In addition, solar should not be viewed as part of an "environmentalist" agenda; according to an independent poll, 9 out of 10 Americans want to see more solar.[11] The U.S. Military is one of the largest purchasers of solar power and 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.

Today's Context for Solar

In early 2011, President Barack Obama 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. The SunShot Initiative aims to reduce the cost of solar energy systems by investing in improvements in solar technologies and manufacturing, bringing down the "hard" costs of solar panels and other PV system hardware. Equally important, SunShot also supports efforts to reduce "soft" costs, such as financing and permitting.[12] Through the SunShot Initiative, there are opportunities and resources for regional planning organizations that reduce these "soft" costs, which can constitute up to 40 percent of the cost of a solar installation.

The SunShot Initiative underlines the significant investment and support the federal government has put into solar and other renewable energies in recent years. Prior to the SunShot Initiative, the State Energy Program (SEP), authorized by Congress and funded by the U.S. DOE, saw a 96-fold budget increase from $33 million in 2008 to over $3.1 billion in 2009. The plans developed by the SEPs throughout the country are still being implemented, but initial reviews estimate that approximately $1 billion is heading toward end-use renewable energy projects, such as solar.[13] With such an increase in funding, the SEPs have been creating great opportunities for regional planning organizations and local governments to implement solar and other renewable energy projects.

Concurrent to the surge in state and federal support, the solar industry has seen explosive growth in the past few years. The U.S. solar energy industry installed a record 1,855 megawatts of photovoltaic capacity in 2011.[14] As of August 2011, there are more than 100,000 solar jobs in the U.S., a 6.8 percent increase in the solar workforce since 2010. This is even more significant considering the economic downturn, and that

Toledo Metropolitan Area Council of Governments
Toledo, Ohio
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.

the rest of the economy saw less than a 1 percent growth in jobs during the same timeframe.[15] The growth in the industry indicates that the economy is ripe for new investments in solar. Companies will be looking to expand and regions with streamlined permitting practices and "solar-friendly" development and building codes will be more attractive for development.

Furthermore, this growth in the solar industry is projected to continue with positions opening in installation, manufacturing, sales and distribution. Often these new 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. Departments of Labor and Education to form the Solar Instructor Training Network (SITN) in October 2009.[16] The 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. The U.S. DOE also finances accreditation of solar trainers and training programs, certification of installers and installation instructors, and distribution of best practices for training programs.

Along with the industry growth and government support for solar, there are thousands of jurisdictions working on solar at the regional and local levels. A recent survey of local governments, administered by the International City/County Management Association (ICMA), aimed to gather information on what local governments are doing related to the adoption of solar energy.[17] The results highlighted many of the barriers faced by local governments such as high costs, aesthetic concerns and lack of awareness. The survey also confirmed, however, 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. Perhaps the biggest opportunity, from the regional perspective, is that just 18 percent of the respondents who are working on solar issues reported working with their neighboring jurisdictions.

With recent technological improvements and subsequent reductions in prices, as well as federal, state, and local policy changes, solar has been brought into the mainstream. Consequently, the industry is

Green River Area Development District
Owensboro, Kentucky
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 2012 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.

experiencing high levels of growth. In today's policy context and economy, regional planning organizations can play a vital role in bringing solar into their communities. Many regional planning organizations have done regional-level surveys or research seeking to understand current energy use and supply. Others have developed regional energy plans that set regional goals for efficiency or the proportion of renewable energy generation. Solar can be neatly incorporated into these efforts. Additionally, solar can be integrated into regional economic development strategies, creating new jobs and providing a clean and reliable energy source for local businesses.

Furthermore, because solar is a relatively new field, there is often a lack of regional networks of local solar experts and local solar installers. Convening stakeholders to work on common problems is a unique strength of regional planning organizations. In many cases, there are existing committees or working groups staffed by regional planning organizations, already addressing issues in which solar may be included (e.g., environment committees, energy committees or economic development committees). There may be opportunities for a regional planning organization to host an event to bring regional solar stakeholders together, whether as a stand-alone occurrence or part of a larger topic area or series of events.

As with many cross-cutting issues, solar is an area in which regional planning organizations can look to get involved. It fits into the goals of many regional planning efforts, and the timing is ripe. That is not to say that there are no barriers to implementing solar. However, this *Guide* seeks to demonstrate that there are creative regional solutions to break down these barriers and build a strong regional solar economy.

Mid-Ohio Regional Planning Commission
Columbus, Ohio
www.MORPC.org

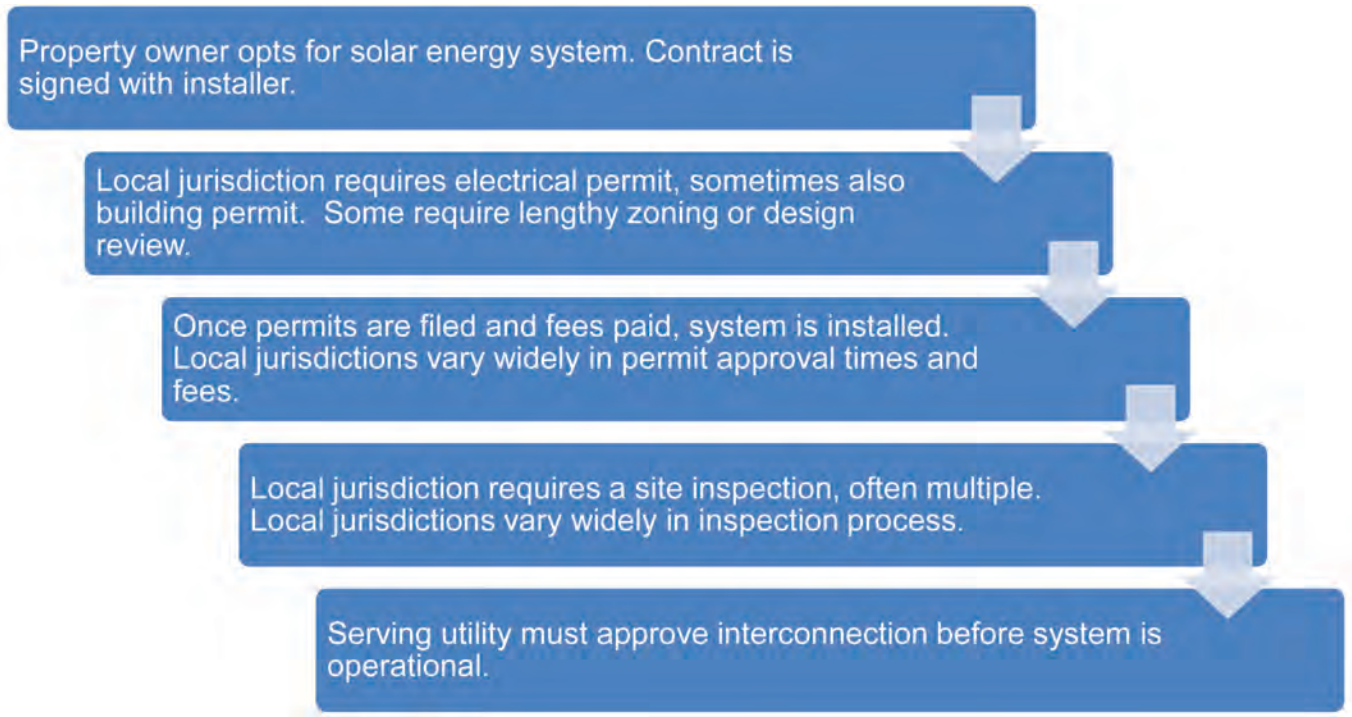
The Mid-Ohio Regional Planning Commission (MORPC), recognizing the need to address energy issues, established a Center for Energy and Environment in 2007. Supported in part by the region's local utilities, the Center is unique to regional planning organizations, with 25 employees and six different project 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.

Barriers to Solar

Despite the supportive policy context and the advancements in technology and the industry growth, there are still significant barriers to deploying solar on a wide scale throughout the country. These are primarily regulatory and financial barriers; those that are most relevant at the regional level are outlined below.

Permitting and Inspection Processes

Arguably the single biggest hurdle to installing solar is dealing with what are often disjointed and costly permitting and inspection processes. A typical permitting and inspection process to install a PV system could very well include the following pieces:



Southwest Florida Regional Planning Commission
Fort Myers, Florida
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, the SWFRPC created a Solar Hot Water Heating Task Force which proposed a Solar Thermal Heating Plan for the region. Recommendations from the plan are available on their website at: http://www.scopexcel.org/data/solar_hot_water_task_force_board_report_4.14.09.pdf.

These processes are necessary and important; however, they can substantially increase the time and cost of installing a PV system, which can unintentionally become a major obstacle in solar market development. In addition, the procedures and fees for obtaining these permits can vary dramatically between jurisdictions, creating uncertainties and delays for installers.

Many communities have streamlined the solar permitting process with clear requirements, expedited processing for standard installations and online submissions (e.g., Portland, Oregon and San Jose, California – both considered best practice communities according to the Solar America Board for Codes and Standards).[18] However, installers don't usually work within a single jurisdiction. Therefore, in order to make significant changes in a region's solar market, it is important for communities to work together. If the permitting requirements and process are made consistent across jurisdictions in a region, or even the state, installers have a standard set of operating procedures, reducing uncertainty and allowing them to create more accurate installation cost estimates. This, in turn, can save their customers time and bring down costs. Standardization can also enable jurisdictions to pool resources and share planning and inspection staff. Regional planning organizations 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.

Pioneer Valley Planning Commission
Springfield, Massachusetts
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.

Regulations that Limit Solar

Most states have legislation protecting 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 regulations that inhibit solar energy system installation. These regulations could be part of the zoning or subdivision ordinance, development agreement or historic district restrictions, for example. Many of the rules that prohibit or restrict solar, however, are unintended deterrents, and were crafted for another purpose (e.g., aesthetics or building height) or are simply out of date. A zoning or land development code might even prohibit solar in certain residential or commercial zones because it is categorized incorrectly as an industrial use, grouped along with power plants.

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 39 states and the U.S. Virgin Islands, but people are often unaware of their rights.[19] The most common type of solar access law at the state level is the solar easement, which is a legal agreement that states that sunlight on a site cannot be obstructed by landscaping or structures on a neighboring property. These easements can have flexible conditions, and are typically transferred with the property title. They are often voluntary, but can also be created automatically when a property owner receives a permit to install a system. A solar rights law, on the other hand, limits or prohibits public and/or private restrictions (e.g., homeowner's association covenants or local government ordinances or building codes) on solar installations.

Local governments may have the authority to adopt ordinances to ensure solar access. In addition, a review of a zoning code with solar in mind might reveal several opportunities to make updates that would transform the code from an obstacle to an opportunity to promote solar installations. Furthermore, communities can encourage the design and construction of solar-ready homes and buildings with design guidelines. The National Renewable Energy Laboratory (NREL) provides an overview of solar-ready implementation practices in its 2012 technical report, *Solar Ready: An Overview of Implementation Practices*, which is available at http://www.nrel.gov/docs/fy12osti/51296.pdf. Promoting solar and energy efficiency at the outset can help make future installations or improvements easier and more cost effective.

Regional planning organizations can work in several capacities to help with efforts to promote solar access and solar-ready buildings. One simple but effective solution is conducting outreach to make information available to educate residents, businesses and homeowners' associations about solar access. The APA has an extensive list of relevant resources on implementing solar energy, available on their website: http://www.planning.org/research/solar/resources.htm. Regional planning organizations can also survey their local governments, determining which might have ordinances that create unintended obstacles.

Taking more of a leadership role, regional planning organizations can also work with their committees and member communities to craft model ordinances that are "solar-friendly" – incorporating recommended

Mid-America Regional Council
Kansas City, Missouri
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, which will provide funding to work to standardize permitting region-wide.

statutes and language to promote solar access within local ordinances, zoning codes and building codes. Many communities are looking for guidance on how to regulate solar, as it is oftentimes a new use that is not yet covered in existing land use regulations.

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 process regardless of the size or scope of the PV system, making smaller systems prohibitively expensive. Like the permitting and inspection processes required by the jurisdiction, interconnection standards often add another layer of cost and time to a solar installation, sometimes duplicating the work of the building inspection.

Tri-County Regional Planning Commission
Harrisburg, Pennsylvania
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.

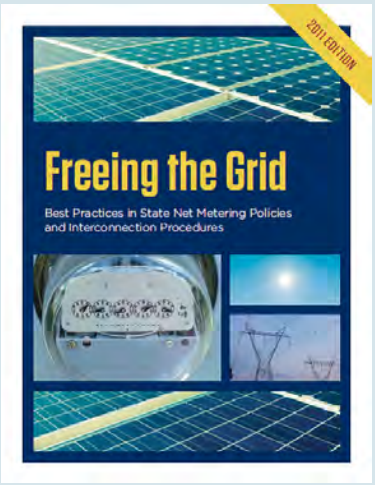
While advisory in nature, the solar energy systems model ordinance provides a framework that municipalities can adopt as a whole or in sections depending on their local situation and existing regulations. In some sections, the model ordinance includes multiple ways to regulate an aspect of a solar energy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

Net-metering policies can help promote solar by making it more fiscally attractive to a consumer. Net-metering is a billing method that credits PV system owners for electricity generated in excess of the electricity consumed that is exported onto the grid. These credits can then be applied to the owner's electric bill at a time when the PV system may not be covering the site's demand. 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 for credits from a single system to be applied to multiple meters and to meters that are not located at the same site (i.e., virtual net-metering or community solar). Utilities can benefit from net-metering as well. Customer-sited generation can allow the utility to avoid distribution and transmission-system upgrades.

Freeing the Grid is the Interstate Renewable Energy Council's annually updated policy guide that grades states on their net metering and interconnection procedures. Copies are available for download at: http://www.newenergychoices.org/index.php?page=nm07_WhatIsNM&sd=nm.



Regional planning organizations can play a key role in coordinating with a regional utility or utilities. By providing a collective voice for local governments working together, a regional planning organization can have a better opportunity to influence utility and state policies, such as interconnection and net-metering. Furthermore, regional planning organizations can work with stakeholders to adopt model policies like those crafted by the Interstate Renewable Energy Council (IREC), available on the IREC "Connecting to the Grid" website.[20]

Financing Hurdles

While solar can be a cost-effective investment for governments, businesses and residents, these entities are often not accustomed to a large upfront expenditure for energy.[21] Financing incentives and mechanisms can reduce upfront capital required and provide project owners with additional revenue streams. Developing these financing opportunities can bolster local market demand and help attract solar investment and business, establishing a regional solar economy.

Sonoma County Energy Independence Program
Sonoma County, California
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 10 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.

Financial incentives can either come in the form of investment incentives, which help to mitigate the upfront costs, or performance incentives, which provide additional revenue over the life of the project. Some types of financial mechanisms include: 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. Details about these financial tools can be found in Chapter 2 of the *Solar Powering Your Community Guidebook*.[22]

Although there are several options to finance the installation of PV systems for residential, commercial or municipally owned structures, it can be a difficult endeavor to sort through and understand all of these options and determine which is feasible, and which might work best. Regional planning organizations can work to promote these financial incentives, and can provide education and outreach to help consumers navigate them. Simply having a regional resource that can answer consumer questions and provide consistent guidance and information can significantly boost solar adoption in a region, especially one with an active solar industry and high electricity prices.

However, local governments and other non-profits, like regional planning organizations, cannot themselves take advantage of the tax incentives that make solar a financially viable option. This is particularly problematic for a community if third-party purchase agreements are not a possibility.

In some cases, regional planning organizations have found it makes the most sense to administer some complex financing programs regionally in order to share costs amongst municipalities and create a competitive regional solar market.

Silicon Valley Collaboration Renewable Energy Procurement Project
San Jose, California
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 February 2012, this project is projected to include between 20 to 30 public agencies resulting in installations on 150 to 200 sites (deploying 20 to 40 Megawatts).

Regional Solutions

As touched on with each of the barriers previously described, there are practical ways that regional planning organizations can play an important role in promoting and deploying solar in their regions. Although solar and renewable energy are often not a main focus of a regional planning organization, they are becoming more common as a regional priority, and innovative regional planning organizations have been working to find creative solutions to these barriers in their regions. Examples of these promising practices are outlined in Section IV as a series of case studies and examples.

Following the case studies, there is a toolkit, in Section V, which further details proactive steps regional planning organizations can take to promote solar installations and build a regional solar economy.

Regional planning organizations' 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 regional planning organizations to engage with their local communities to promote solar adoption.

San Diego Association of Governments
San Diego, California
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), 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.

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.

Case Studies

i. Regional PACE Program: Western Riverside Council of Governments, California
ii. Regional Solar Plan: Pima Association of Governments, Arizona
iii. Solar Map Project: Denver Regional Council of Governments, Colorado
iv. Collaborative RFP Process for Solar Installations: Merrimack Valley Regional Commission, Massachusetts
v. Alternative Energy Ordinance Working Group: Delaware Valley Regional Planning Commission, New Jersey and Pennsylvania
vi. Metro DC Clean Energy Collaborative Procurement Initiative: Metropolitan Washington Council of Governments, the U.S. Environmental Protection Agency and Optony Inc., Maryland, Virginia and Washington, DC
vii. Long Island Unified Solar Permitting Initiative: Suffolk County Planning Commission and Nassau County Planning Commission, New York

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
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.

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,
Councilmember of Moreno Valley, CA and
Chair of WRCOG's Executive Committee

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

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

In addition to the projected benefits to the economy and environment, WRCOG has viewed this program as an excellent way to coordinate regionally. Due to the high level of complexity in developing and administering the program, it makes most sense to administer it at a regional scale. 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.

The biggest challenge during the process of developing and launching WRCOG's regional PACE program has been giving it sufficient time. As WRCOG and its team responded to several hurdles along the way, the time to project launch had to be pushed back. The two most time-consuming hurdles were the development of the program policies and procedures, and awaiting credit ratings (which has taken over a year in some cases). WRCOG recognized, however, that both of these steps are critical to the project's success. After diligently working on the project for over two years, WRCOG had a successful launch at the end of 2011. Like the firms financing the three difference programs, WRCOG has not received any state or federal funding for this effort. However, once the program is underway, a small administrative fee will help WRCOG cover costs. 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.

Pima Association of Governments: Regional Solar Plan

Tucson, AZ
Population: 980,263
Size: 9,187 square miles
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 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.[23] 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.[24] 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 (SSB) for assistance in maintaining quality solar installations.

The SSB, established originally by five local solar installers, works to

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

inform consumers and rank local installers based upon a system of best practices. The SSB 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 SSB's stamp of approval and are listed on the SSB'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 SSB.

In addition, the SSB 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. The SSB is currently housed as part of PAG's Energy Programs, in order to maintain neutrality.

PAG's Greater Tucson Solar Development Plan.

Denver Regional Council of Governments: Solar Map Project

Denver, CO
Population: 2.8 million
Size: 5,288 square miles
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 Shaufele, Executive Director, DRCOG

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. The organization found that their partnerships were critical for success – both with the technical partnership for LiDAR data processing, database and map design and maintenance, as well as with the solar installers who had a stake in providing accurate solar PV potential estimates, while creating a system that informs and connects them with potential customers. DRCOG's team effectively maximized available data and tools, resulting in not only cost savings for the project, but also in a familiar user interface and easy to update back-end system. Finally, DRCOG has recognized the need for continuing funding or partnerships that could market and maximize the number of end users, resulting in an even larger impact on the growth of the solar PV industry within their region.

DRCOG
DENVER REGIONAL COUNCIL OF GOVERNMENTS
We make life better!

Merrimack Valley Planning Commission: Regional "Brightfields" Project - Collaborative RFP Process for Solar Installations

Haverhill, MA
Population: 325,000
Size: 270 square miles
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.

Merrimack Valley and Solar

In 2007, one of the region's mayors initiated the formation of the Merrimack Valley Mayors and Managers Coalition (MVMMC), with MVPC serving as the group's administrative agent. Mayors from each of the five cities and managers from the three largest towns in the region all joined the Coalition to discuss their common concerns. Energy repeatedly came up as a topic in which there was great interest, but insufficient expertise or capacity. From this realization, the MVMMC requested that MVPC initiate a request for proposal (RFP) process to acquire the services of a Regional Energy Manager which would work to identify and implement potential energy projects. MVPC procured a consulting firm, and administered a contract agreement which allowed the municipalities to pay MVPC directly for the firm's services. Eleven communities and two school districts participated in the energy services program, taking advantage of the economies of scale of the regional approach.

The funding for this work was initiated originally through a request from the state's Clean Energy Choice program (which allows citizens to pay a premium on their utility bills to promote alternative or renewable energy), but supplemented through local funds, Energy Efficiency and Conservation Block Grant (EECBG) funds and MVPC's District Local Technical Assistance funds.

Following the success of the initial energy audit program, MVPC continued to advance the communities' energy agenda, and introduced the Coalition to an example "Brownfields to Brightfields" project in which a large solar farm had been developed atop a capped landfill in a nearby community. This led to the MVMMC's decision to pursue a similar regional approach for "Brightfields" projects in the Merrimack Valley region. Nine communities came forward with eleven potential sites; the next step was to assess each for solar viability. Using its District Local Technical Assistance funds, MVPC hired the services of an engineering firm to do a "fatal flaw" analysis of the sites, assessing the sites for feasibility to install solar panels. The analysis showed that five sites had potential.

MVPC convened the five communities and once again offered its services to initiate an RFP process in order to acquire a technical expert to evaluate and organize these sites and manage the projects. The communities plan to work with the newly-contracted firm and MVPC to determine the best course of action for moving forward, and whether or not to develop one regional bid, or separate projects. Either way, the communities saw the value in MVPC administering one contract for the group and plan to pay the firm through an agreement with MVPC, or potentially through revenue-sharing at the successful completion of the solar installations.

Riding on this momentum, MVPC won a grant from the U.S. Department of Commerce Economic Development Administration to develop a Regional Clean Energy Plan. The focus of the plan will be to identify opportunities for the region to work together to accomplish other targeted regional strategies such as collective purchasing of energy, deregulation, and expansion of other renewables like wind, hydropower, geothermal, biomass and more.

Lessons Learned

There were two key components to making these energy projects successful: (1) solid leadership from local elected officials, and (2) continuous, diligent effort to keep the projects moving. Because the "Brightfields" project was initiated by the communities themselves, specifically by those leaders within the communities with sufficient influence and access to resources, the project had immediate buy-in and support. However, it is the task of the MVPC to keep the wheels turning, and by persistently following up on leads, seeking out creative funding options and pushing the agenda, the project remains focused. MVPC continues to build off early successes, taking advantage of the momentum they have created.

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
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

As technologies for alternative energy production advance, municipalities in the DVRPC region increasingly have been faced with questions about how to regulate them at the municipal level. In 2009, at the request of the City of Philadelphia and Montgomery County, 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 model Alternative Energy Ordinance Frameworks (AEOF) that provide resources on zoning for solar, geothermal and wind energy systems. These frameworks will be accessible in 2012 via an online portal. The goal of the AEOFs is to help municipalities develop appropriate zoning for alternative energy systems.

The function of the solar AEOF 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 AEOFs, 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 AEOFs, 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 AEOFs and included three levels: industry, municipal and legal. These reviews assure the AEOFs are consistent with best practices, 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 AEOWG 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 AEOFs.

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

With the ordinances set for public release later in 2012, DVRPC is examining ways to expand the use of the AEOFs beyond promotion within its member jurisdictions by incorporating the work into Connections, its long-range plan. Connections has a goal of supporting and promoting the growth of emerging green industries. Additionally, there is interest in integrating the AEOFs into the Smart Energy Initiative of Southeastern Pennsylvania, a subsidiary of the Chester County Economic Development Council (CCEDC), a private, not-for-profit economic development organization charged with supporting the growth of the new energy economy by partnering with businesses, public organizations and individuals in southeastern Pennsylvania.

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

MONTGOMERY COUNTY 1784

Lessons Learned

DVRPC's work with its AEOWG 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.
- Integrate activities into broader initiatives of the regional planning organization.

Metropolitan Washington Council of Governments, the U.S. Environmental Protection Agency and Optony Inc.: Metro DC Clean Energy Collaborative Procurement Initiative

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.[25] 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 (MWCOG) and Optony Inc.[26] 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.[27]

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 MWCOG's committees including the Climate, Energy and Environment Policy Committee; the associated Energy Advisory Committee; and MWCOG's Regional Environmental Fund. MWCOG uses these

> *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 Penny Gross, Mason District Supervisor, Fairfax, VA County Board of Supervisors, MWCOG Board Member, NARC Board Senior Vice President

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.

Solar Panels at FedEx Field.

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 that 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.

Lessons Learned

Collaborative procurement initiatives can be replicated in any region with interested stakeholders. While the U.S. EPA funding is not currently available to promote additional collaborative procurement initiatives, collaborative procurement requires low startup costs associated with conducting the detailed technical and economic analyses for each site under construction. These upfront costs will be more than offset by the resulting increased economic performance of the solar solutions deployed.

It is recommended that all interested communities take time to develop their plan and understand the different procurement procedures of local governments, educational institutions and the federal government before acquiring funding. 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, DC region.

Metropolitan Washington Council of Governments

OPTONY

EPA GREEN POWER PARTNERSHIP®

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

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.

Gordian Raache, Executive Director of Renewable Energy Long Island, described the Long Island solar photovoltaic permitting situation as costly and inefficient, stating, "inconsistent local permit requirements can add hundreds of dollars to the cost of installing a solar electric system."

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. Key components of the new standardized permitting process include:

- waived or minimal application fees;
- permit decisions are provided within 14 days of submittal of a completed application;
- the creation of a central registry of solar installations;
- warning labels are required 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.

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. The committee found that researching the details of the permitting process thoroughly prior to introducing LIUSPI was very beneficial, as it helped mitigate the amount of questions and uncertainty municipalities had in regards to adopting LIUSPI.

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 this "Making the Case for Solar" one-pager is to assist a regional planning organization on taking that 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?"

Tool 1: Making the Case for Solar
Tool 2: Working with Stakeholders
Tool 3: Integrating Solar
Tool 4: Model Ordinances
Tool 5: Training and Certification
Tool 6: Solar Mapping
Tool 7: Streamline Permitting and Inspection Processes
Tool 8: Regional PACE Program
Tool 9: Collaborative Procurement Program

Tool #1:
Making the Case for Solar

Talking Points

CREATES JOBS:
- Solar is growing at a rate nearly ten times faster than the overall economy. (Solar Foundation)
- As of August 2011, there are over 100,000 solar jobs; of those, almost 7,000 were created last year. (Solar Foundation)

IMPROVES LOCAL ECONOMIES:
- Solar increases revenue opportunities for landowners through land leases and property taxes from ground mounted solar arrays or "solar farms." (Solar Foundation)
- Solar has the potential to improve regional economic competitiveness by:
    - Inducing private capital investment. (SEIA)
    - Stabilizing long-term energy prices. (Commission for Environmental Cooperation)
    - Decreasing reliance on energy imports, saving ratepayers' money. (Scientific American)
    - Serving as a catalyst for other clean-tech companies and investments and enabling the region to avoid additional costly environmental controls of other industries. (Union of Concerned Scientists)
    - Increasing the value and resale opportunities of residential homes. (Lawrence Berkeley National Laboratory)

HELPS ACHIEVE ENVIRONMENT & ENERGY GOALS:
- Solar can lower greenhouse gas emissions, improve air quality and public health, and mitigate the harmful impacts associated with climate change. (States Advancing Solar)

MITIGATES LAND USE ISSUES:
- Solar is a modular and flexible technology that can be placed on rooftops, integrated into buildings or mounted on the ground. (SEIA) In particular, solar can be placed on capped landfills and unused brownfield sites. (EPA Repowering America's Land)
- Solar can provide electric grid stability without having to replace existing infrastructure. In other words, you don't have to tear up streets to upgrade the grid. (SEIA)
- Solar can also be a part of a sustainable and green redevelopment strategy. (EPA)

CAN INTEGRATE WITH CURRENT PLANNING ACTIVITIES:
- Integrating a solar plan into broader local or regional planning efforts affirms a community's commitment to solar energy, promotes strategic long-term thinking, and can help secure resources and political will to accomplish solar goals. (Solar Powering Your Community Guidebook)

YIELDS POSITIVE INVESTMENT RETURNS:
- A study conducted in Arizona demonstrated that for $1.00 spent on solar within a community produces about $1.67 of local economic activity. This totals a direct savings of $2.8 – $4.5 million of economic activity for Arizona communities. (Arizona Solar Center)

Fact Sheets and Other Resources

The Solar Foundation's 2011 Solar Jobs Census provides an overview of the solar industry's labor market current conditions and its potential for growth.
http://thesolarfoundation.org/sites/thesolarfoundation.org/files/TSF_JobsCensus2011_Final_Compressed.pdf

Solar Energy Industries Association (SEIA) provides multiple fact sheets advocating for solar.
http://www.seia.org/cs/fact_sheets; http://www.seia.org/cs/solar_policies/1603_treasury_program;
http://www.seia.org/galleries/FactSheets/Factsheet_BIPV_residential.pdf

The Commission for Environmental Cooperation produced the Renewable Energy as a Hedge Against Fuel Price Fluctuation report. http://www.cec.org/Storage/62/5461_QA06.11-RE%20Hedge_en.pdf

Scientific American's article, By 2050 Solar Power Could End U.S. Dependence on Foreign Oil and Slash Greenhouse Gas Emissions.
http://www.solarplan.org/Research/Z-M-F_A%20Solar%20Grand%20Plan_Scientific%20American_January%202008.pdf

Union of Concerned Scientists overviews the benefits of renewable energy use.
http://www.ucsusa.org/clean_energy/technology_and_impacts/impacts/public-benefits-of-renewable.html

Lawrence Berkeley National Laboratory's research report, An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California.
http://eetd.lbl.gov/ea/emp/reports/lbnl-4476e-rs.pdf

States Advancing Solar overviews the benefits of solar.
http://www.statesadvancingsolar.org/solar-101/benefits-of-solar

The U.S. Environmental Protection Agency (EPA) Repowering America's Land program.
http://www.epa.gov/renewableenergyland/

The U.S. Environmental Protection Agency (EPA) report on Green Remediation and Utility-Scale Solar Development. http://www.epa.gov/superfund/programs/recycle/pdf/aerojet.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.
http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

The Arizona Solar Center provides key economic benefits of solar installations.
http://www.azsolarcenter.org/economics/economic-benefits-of-solar.html

The U.S. Department of Energy's Solar Energy Resource Center maintains a 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/

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 towards 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 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 12 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 30 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, 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, 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/fileadmin/user_upload/ConnectDocs/IREC_NM_Model_October_2009-1.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 improving utility policies and processes on page 81-96. http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

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 Southwest Solar Transformation Initiative as part of DOE's Rooftop Solar Challenge is calculating the solar potential for each participating region and providing detailed information on how to incorporate solar recommendations into their regional plan. For more information, visit http://www.seiinc.org/index.php/about-us/news-a-press/item/545-southwest-solar-transformation-initiative.
- 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 24 of this *Guide*. or visit http://www.pagnet.org/documents/solar/SolarDevPlan2009-01.pdf.
- Boston, MA incorporated solar into their transportation and emergency planning in addition to creating a Climate Action Plan highlighting solar in the region. For more information, visit http://www.cityofboston.gov/doit/initiatives/environment.asp and http://www.cityofboston.gov/Images_Documents/A%20Climate%20of%20Progress%20-%20CAP%20Update%202011_tcm3-25020.pdf.
- Berkeley, CA includes solar provisions within their Climate Action Plan. For more information, visit www.ci.berkeley.ca.us/ContentDisplay.aspx?id=19668.

Where can I get more information?

- The American Planning Association's *Planners Energy and Climate Database*, provides examples of the incorporation of solar within regional and local plans. www.planning.org/research/energy/database/
- 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 in broader regional planning efforts on page 20-22. http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

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 examples 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 17 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 30 of this *Guide.*

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
- The American Planning Association 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/keyboard/attachments/Committee%20Agenda/2010/May%2013,%202010/202934788/TMPKeyboard203054870.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 25 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 (NABCEP) offers a national certification program for solar installers. http://www.nabcep.org/
- The U.S. Department of Energy's Solar Instructor Training Network supports high-quality training through offering expert instruction and top training facilities within select educational institutions in their regions. SITN will be offering free online code official training. http://www1.eere.energy.gov/solar/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 (IREC) 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/resources/solar_powering_your_community_guide_local_governments

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 (DRCOG) 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 26 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. www.solarhoustontx.org/Experience/ASESAnnualHoustonSolarTour/Tour2010/tabid/1805/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.solarmap.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. www.nrel.gov/eis/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://solaramericacommunities.energy.gov/PDFs/Analysis_of_Web_Based_Solar_PV_Mapping_Tools.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 including solar mapping on page 120-122. http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

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?

- Portland, OR's Bureau of Development Services developed an electronic permit submittal process for solar installers. For more information, visit http://www.portlandonline.com/OSD/index.cfm?c=47394&.
- San Jose, CA streamlined their permitting and inspection process so that permits for PV systems can be obtained over the counter. In addition, if an installation meets a certain criteria, a building permit can be waived. For more information, visit http://www.sanjoseca.gov/building.
- 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.
- 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 34 of this *Guide*.

Where can I get more information?

- The Solar America Board for Codes and Standards (Solar ABCs) 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.
- 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 *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/resources/solar_powering_your_community_guide_local_governments
- The U.S. Department of Energy, EPRI, Sandia and 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 22 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, 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 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/blog/
- 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/resources/solar_powering_your_community_guide_local_governments

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 an 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 32 of this *Guide* or visit, http://www.epa.gov/greenpower/cecp/washington.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 19 of this *Guide* or visit 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 28 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
- The Houston-Galveston Area Council created 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/resources/solar_powering_your_community_guide_local_governments

List of Acronyms

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

AAA	Area Agency on Aging
AEOF	Alternative Energy Ordinance Frameworks
AEOWG	Alternative Energy Ordinance Working Group
APA	American Planning Association
API	Application Programming Interface
ARRA	American Recovery and Reinvestment Act
CCEDC	Chester County Economic Development Council
CCSE	California Center for Sustainable Energy
CERA	Commercial Energy Retrofit Application Financing Plan
COSEIA	Colorado Solar Energy Industries Association
CPEP	Commercial Energy PACE Program Financing Plan
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
EECBG	Energy Efficiency and Conservation Block Grant
EPA	U.S. Environmental Protection Agency
FIT	Feed-in-tariffs
GIS	Geographic Information System
GRADD	Green River Area Development District
HERO	Home Energy Renovation Opportunity Financing Plan
ICMA	International City/County Management Association
IREC	Interstate Renewable Energy Council
kW	Kilowatt
LiDAR	Light Detection and Ranging
LIUSPI	Long Island Unified Solar Permitting Initiative
MARC	Mid-America Regional Council
MORPC	Mid-Ohio Regional Planning Commission
MPO	Metropolitan Planning Organization
MVMMC	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
PV	Photovoltaic
PVPC	Pioneer Valley Planning Commission
RFP	Request for Proposal
SANDAG	San Diego Association of Governments
SEIA	Solar Energy Industry Association
SEP	State Energy Program
SITN	Solar Instructor Training Network
Solar ABCs	Solar America Board for Codes and Standards
SolarOPs	Solar Outreach Partnership
SSB	Southern Arizona Solar Standards Board
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

1. Solar Powering Your Community Guidebook is available online at: http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments
2. SunShot Initiative webpage: http://www1.eere.energy.gov/solar/sunshot/index.html
3. http://www.eere.energy.gov/basics/renewable_energy/solar.html
4. http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments
5. http://dsireusa.org/solar/solarpolicyguide
6. U.S. Department of Energy Solar Energy Technologies Program, www1.eere.energy.gov/solar
7. Solar Energy Industries Association, www.seia.org
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19. Database of State Incentives for Renewables – Solar Access Laws, February 2012, http://www.dsireusa.org/solar/solarpolicyguide/?id=19
20. http://www.irecusa.org/irec-programs/connecting-to-the-grid/
21. See R. Perez, K. Zweibel, T. Hoff. Solar Power Generation in the U.S.: Too expensive, or a bargain? Energy Policy 39 (2011), pp. 7290-7297.
22. http://solaramericacommunities.energy.gov/resources/guide_for_local_governments/2/
23. Greater Tucson Solar Development Plan, 5.
24. Greater Tucson Solar Development Plan, 3.
25. "The Initiative" http://www.epa.gov/greenpower/cecp/documents/EPAGPP-CECP-MWDC-FactSheet.pdf
26. The EPA's Green Power Partnership is a voluntary program supporting the organizational procurement of green power by offering expert advice, technical support, tools and resources.
27. Solar Powering Your Community: A Guide for Local Governments http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

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.

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