Here Comes the Sun: Barriers and Opportunities in Solar Power

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Local Power over Solar Energy: Its Use and Abuse

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Local governments in New York can take actions that facilitate the installation of solar energy systems or adopt land use and construction code requirements that hinder installation. The cooperation of local governments that enjoy nearly plenary authority to regulate private land uses is essential if solar power is to fulfill its potential to supply state energy needs and reduce greenhouse gas emissions. Increasing the current total of around 12 Megawatts of grid-connected solar power to over 2,000 Megawatts, roughly 5% of the state's power requirements, will remove annually about two million tons of CO2, 1,800 tons of NOx, and 5,300 tons of SO2.

New York City leads local governments in adopting sound solar energy policies. The Energy Plan in PlaNYC is designed to foster the market for renewable energy recognizing that solar energy has great potential to produce power needed in New York City.[1] Because solar energy is currently not as cost effective as gas-fired electricity, the plan includes incentives to encourage solar panel installation.

The specifics include property tax abatement for solar panel installations and facilitation of solar panel energy use on city-owned buildings by attracting private developers with long term contracts to build, own, operate, and maintain the solar panels. The city will provide incentives as high as 35% of installation costs for solar energy systems. A graduated structure will be used for the incentives that will provide early adopters greater benefits. "To further promote solar energy, the City will work with the State Legislature and the Public Service Commission to reduce two existing barriers: the amount of solar that can be connected to the grid, currently capped at 8.1 Megawatts, and the amount of excess power that can be sold back to the grid, currently limited to 10 Kilowatts of residential power." The Mayor's office of Long Term-Planning and

[1] City of New York, PlaNYC (2007), available at http://www.nyc.gov/html/planyc2030/downloads/pdf/report_energy.pdf (last visited July 17, 2008). PlaNYC is a plan for the future of New York City that responds to issues related to population growth, aging infrastructure, and an increasingly vulnerable environment.

Sustainability is working in conjunction with the City University of New York and the city's Economic Development Corporation to collaborate with the federal Energy Department's "Solar America Initiative" to make solar energy cost-competitive with other forms of electricity by 2015.[2] Key among the Solar America goals is the use of land use law to facilitate solar energy production or, at a minimum, not to obstruct it.

Local zoning, historic preservation, and aesthetic regulations may inadvertently discourage or prevent solar installations. Typically, Boards of Architectural Review (BAR) are given only advisory powers; however, in Scarsdale, the BAR's jurisdiction includes the power to approve and disapprove building permit applications.[3] Because the BAR is charged with ensuring the conservation of property values through the preservation of architectural character and appearance, the BAR will prefer aesthetically pleasing design qualities over designs that, while environmentally friendly, are deemed visually offensive.[4] This includes applications for solar panels. BAR approval power can have the unintended consequence of hindering the use of alternative energy sources like solar power.

Since state policy favors the production of alternative energy, it would be logical for the state legislature to prevent the restriction of solar panels for aesthetic purposes only, to adopt model legislation encouraging local zoning laws that further solar power, or some combination of the two. This article explores existing state land use and construction laws and local land use and code regulations that affect the installation of solar energy facilities.

Local Solar Energy Laws in New York

State law governs local land use power over solar facilities in two ways: through the delegation of power to regulate land uses--zoning--and through the adoption of building, electric, and energy codes that regulate the construction of permitted land uses. The New York State Zoning Enabling Act authorizes local governments to permit and regulate solar energy systems.[5] The National Electric Code, which is applicable in New York through the New York State Energy Code, governs and facilitates the installation of solar panels and limits the power of local governments to adopt more restrictive provisions.

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[2] Sewell Chan, Bloomberg Turns Attention to Solar Power, N.Y. Times, April 8, 2008, available at http://cityroom.blogs.nytimes.com/2008/04/08/bloomberg-turns-attention-to-solar-power/?scp=1&sq=Bloomberg%20Turns%20Attention%20to%20Solar%20Power&st=cse.

[3] Scarsdale Village Code §§ 18-11 to -15.

[4] Scarsdale Village Code §§ 18-1, -2, -13, -15.

[5] N.Y. Gen. City Law § 20(24) (McKinney 2008) (effective Apr. 1, 2001); N.Y. Town Law § 263 (McKinney 2008) (effective Mar. 1, 2004); N.Y. Village Law § 7-704 (McKinney 2008) (effective Jan. 1, 1981).

Local governments in New York have taken several approaches to encouraging or limiting the development of solar energy systems through zoning. These are found in various parts of local zoning codes, including the purposes, definitions, height and setback provisions; site plan and subdivision regulations; special permits or accessory uses standards; solar access requirements; the regulation of trees; exemptions and waivers; design and installation controls; favorable consideration in awarding variances; and architectural review requirements, such as Scarsdale's. In addition, local laws encourage solar energy provisions through exemptions from fees, provision of property tax rebates, and other techniques. This article proceeds and concludes by describing a variety of local law provisions that illustrate these approaches.

Purpose and Objectives Sections

Several communities have amended the purpose provision of their zoning laws to provide a policy basis for determining how to handle solar system. Village of Albion § 290-2; City of Auburn § 305-2; Town of Bedford § 125-1; Town of Bethlehem § 128-8; Town of Haverstraw § 167-1; Village of Massena § 300-1; Town of New Windsor § 300-2; Village of Nyack § 59-1; Town of Oyster Bay § 246-1.4; Town of Wawarsing § 112-2; Village of West Haverstraw § 250-1; Town of Whitestown § 200-2. **Others have made policy statements about solar access in the objectives sections of their zoning codes.** Town of Newstead § 450-4; Village of Perry § 490-2; Village of Tarrytown § 305-3.

Definitions Section

Some local zoning ordinances contain actual definitions of solar energy systems and related terms that are then used in later provisions of the code. Town of Albion § 103-13; Village of Albion § 290-12 ("Solar Access"); Town of Bedford § 125-3; Village of Briarcliff Manor § 220-2 ("Solar Energy Collector"); Town of Ithaca § 270-5 ("Solar Storage Battery"); Village of Massena § 300-4 ("Solar Energy System"); Town of Newstead § 450-5 ("Solar Skyspace"); Town of Niskayuna § 220-4 ("Solar Energy System, Active"); Village of Perry § 490-10; Town of Wawarsing § 112-5; Village of Westfield § 155-6 ("Solar Energy"). **As a way of imposing restrictions on the installation of solar equipment, other communities include "solar equipment" within word usage or definition sections.** City of Albany § 375-7 ("rooftop appurtenance"); Town of Albion § 103-13 ("alternative energy systems"); Village of Albion § 290-12 ("alternative energy systems"); Town of Ballston § 138-3 ("structure"); Town of Blooming Grove § 235-4 ("structure"); Village of Massena § 300-4 ("building, front line of").

Exceptions to Height Limitations

Several municipalities grant exceptions from height limitations with many conditions (e.g., screening, not covering a certain amount of area, not over

a certain height above roof). Town of Bedford § 125-20; Town of Carmel § 156-12; Town of Oyster Bay § 246-4.5; Village of Tarrytown § 305-15; Town of West Bloomfield § 140-117. **Municipalities may grant exceptions from height limitations with the single condition that it be only to the height necessary.** Town of Bedford § 125-20; Town of Carmel § 156-12; Town of Oyster Bay § 246-4.5; Village of Tarrytown § 305-15; Town of West Bloomfield § 140-117.**Others grant exceptions from height limitations with no conditions.** Town of Greenburgh § 285-40; Town of Newstead § 450-33; Village of Perry § 490-31.

Exceptions to Required Setbacks

In West Bloomfield, solar collectors may be located within any required setback subject to limitations contained in the relevant chapter. Town of West Bloomfield § 140-118.

Solar Equipment Permitted by Special Permit

Some communities govern solar energy systems and equipment by requiring a special permit, City of Albany §§ 375-61 to -83; Village of Ocean Beach § 164-32 (Business C District); Village of Westfield §§ 155-11 to -19 (nine zoning districts). **and other impose conditions on other specially permitted uses in order to ensure access to solar light.** Town of West Bloomfield § 140-114.

Solar Equipment Permitted As Accessory Use

Solar equipment may be defined as an accessory use allowed in conjunction with some principally permitted uses or in all zoning districts. Town of Bedford § 125-27 (all districts); Town of Brighton § 203-146 (planned residential development district); Village of Massena §§ 300-5 to -7 (Residential A, B, and C); Town of Niskayuna § 220-10 (designated districts including High-Density Residential, Neighborhood Commercial, and Research and Development); Village of Tarrytown § 305-17 (all districts); Town of Wawarsing 112-13 (all districts).

Site Plan and Approval Requirements

Site plan submission checklists can include the location of solar energy equipment and require submission of design and construction materials. City of Auburn § 305-13; Town of Ballston § 138-105; Town of Beekman § 155-59; Town of Chester § 98-30; Village of Garden City § 200-82.4; Town of Greenport § 101-3; Town of New Hartford § 118-15; Town of Newstead § 450-84; Town of New Windsor § 300-86 (“efforts shall be made to retain the existing aesthetic character of the neighborhood while providing the best possible location for such collector units”); Village of Perry § 490-17; Town of Whitestown § 200-24. **Site plan standards can include applicants to include protection**

of solar access on adjacent or neighboring properties and/or among buildings on the proposed development site. Some municipalities specifically consider protection of adequate sunlight for use by solar energy systems. Town of Albion § 103-87; Village of Albion § 290-90; Town of Bedford § 125-87; Town of Bethlehem § 128-71; Village of Briarcliff Manor § 220-14; Town of Chester § 98-30; Town of Colonie § 192-2; Town of East Fishkill § 194-26; Village of Massena § 300-31; Town of Oyster Bay § 246-6.10.2.7; Village of Tarrytown § 305-61; Village of Westburg § 248-255; Village of Westfield § 155-108.

Subdivision Design Requirements

Subdivision regulations may require east-west axis, where feasible, to maximize solar access; Town of Wawarsing § 95-23 (planning board considers arrangement of lots to promote energy conservation and maximization of solar access); Village of Westbury § 218-22 **require street design to "facilitate passive solar design;"** Town of Ballston § 104-14 **allow clustering of homes but providing sufficient separation between buildings to allow for solar access**; Town of Colonie § 166-32; **or require solar collectors to be required on homes in subdivisions.** Town of Ithaca § 234-34.

ZBA May Consider Solar Access When Hearing a Request for an Area Variance

The Zoning Board of Appeals in the Town of Batvia may consider and make provisions for the "accommodation of solar energy systems and equipment and access to sunlight necessary therefore when hearing a request for an area variance." Town of Batvia § 235-62.

Solar Access Requirements

Zoning codes can require that sunlight be available for rooftop solar equipment. Some laws require a specific amount of sunlight on November 1st of each year. Village of Massena provides that solar access should be "protected to the maximum extent practical." Village of Massena § 300-20; Town of Newstead § 450-32; Village of Perry § 490-30; Town of West Seneca § 120-35.1; Town of Whitestown § 200-32.

Regulation of Trees; Tree Removal Permits

In the Village of Briarcliff Manor the local authority deciding whether to grant or deny a tree removal permit or tree protection plan must consider the impact (positive or negative) on solar access of nearby properties. Village of Briarcliff Manor § 202-5; Town of Clarence § 131-10.

Exemption for Solar Equipment to Rooftop Mechanical Equipment Ban in Mixed-use Districts

In Amityville, local architectural design requirements in mixed-use districts ban rooftop mechanical equipment but make an exception for solar panels. Village of Amityville § 183-79.4; Town of Babylon § 213-144.17.

Regulations of Solar Energy Systems: Installation, Placement, Adjacent Property Control, Restrictions, Application Instructions

Municipalities have enacted solar energy system regulations to promote and protect their use, but also to address concerns regarding aesthetics, lighting, and possible depreciation of property values. Some are more protective of solar equipment and some more restrictive. These regulations address installation, placement, adjacent property control, restrictions, and application instructions. City of Albany § 375-93; Village of Briarcliff Manor § 220-9.1; Village of Garden City § 200-45.3; Town of Ithaca § 270-219.1; Village of Munsey Park § 200-42; Village of Westfield § 155-57.

Regulation of Solar Devices within Specific Zones

Provisions applicable to certain zoning districts can restrict the installation of solar devices to minimize visual impact or achieve architectural harmony. Town of New Hartford § 118-47; Town of Brighton § 203-168; Town of North Salem § 250-19.2.

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Architectural Review

In Briarcliff Manor the Architectural Review Advisory Committee reviews all applications for building permits for solar energy collectors referred by building inspector. Village of Briarcliff Manor § 5-6. **The Garden City Architectural Board, like Scarsdale's, must approve all solar energy systems and determine that they are "aesthetically appropriate for the intended location."** Village of Garden City, § 200-45.3. **In Spring Valley solar energy collectors require site development plan approval and architectural review by planning board.** Village of Spring Valley § 255-38.

Exemption from Fees

In the Town of Rotterdam, no building permit fee or site plan approval application fee for developments that have primary purpose to install green energy production, which includes solar power. Town of Rotterdam §§ 270-137.1 & 270-176.

Solar Electric System Rebate and Incentive Program

In Southhampton, an applicant is eligible for a $2,500 rebate if he/she installs a 5KW or greater solar electric system that complies with all state and local laws. The first twenty applicants to produce the required documentation will receive the rebate. Town of Southhampton § 176-2.

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New York State Unified Solar Permit

Expedited Solar Permit Process for Small-Scale Photovoltaic Systems

Requirements for Application Submittal – *STEP 1*

For use in all New York State counties with the exception of Nassau County and Suffolk County.

The expedited solar permitting process uses a unified permit across municipalities in New York State.

A combined building and electrical permit for a grid-tied photovoltaic (PV) system will be issued pending proper completion of forms, submission of approved plans and approval by municipality. All applicants must submit:

1. Unified Solar Permit for Small-Scale Photovoltaic Systems Eligibility Checklist – STEP 2

2. One (1) set of plans (number may vary by municipality) that include:

- Site Plan showing location of major components of solar system and other equipment on roof or legal accessory structure. This plan should represent relative location of components at site, including, but not limited to, location of array, existing electrical service location, utility meter, inverter location, system orientation and tilt angle. This plan should show access and pathways that are compliant with New York State Fire Code, if applicable.
- One-Line or 3-Line Electrical Diagram. The electrical diagram required by NYSERDA for an incentive application and/or utility for an interconnection agreement can be used here.
- Specification Sheets for all manufactured components. If these sheets are available electronically, a web address will be accepted in place of an attachment, at the discretion of the municipality.
- All diagrams and plans must include the following: (a) Project address, section, block and lot number of the property; (b) Owner's name, address and phone number; (c) Name, address and phone number of the person preparing the plans; and (d) System capacity in kW-DC.

3. Unified Solar Permit for Small-Scale Photovoltaic Systems Application – STEP 3

4. Permit Fee Amount

Permit Review and Inspection Timeline

Permit determinations will be issued within 14 days upon reciept of complete and accurate applications. The municipality will provide feedback within 7 days of receiving incomplete or inaccurate applications. If an inspection is required, a single inspection should be sufficient and will be provided within 7 days of inspection request.

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Eligibility Checklist – *STEP 2*

To determine if you are eligible for the expedited permitting process, answer the questions below.

❑ Yes ❑ No 1. Solar installation has a rated capacity of 12 kW or less.

❑ Yes ❑ No 2. Solar installation is not subject to review by an Architectural or Historical Review Board.

❑ Yes ❑ No 3. Solar installation does not need a zoning variance.

❑ Yes ❑ No 4. Solar installation is to be mounted on a permitted roof structure of a building, or on a legal accessory structure. If on a legal accessory structure, a diagram showing existing electrical connection to structure is attached.

❑ Yes ❑ No 5. Solar installation is compliant with all applicable electrical and building codes.

❑ Yes ❑ No 6. Solar installation is compliant with New York State Fire Code.

❑ Yes ❑ No 7. The Solar Installation Contractor complies with all licensing and other requirements of the jurisdiction and the state. [can be customized for jurisdictions]

❑ Yes ❑ No 8. The proposed equipment is permitted by code and equipment meets all relevant certification standards.

❑ Yes ❑ No 9. The PV system and all components will be installed per the manufacturer's specifications.

❑ Yes ❑ No 10. The project will comply with adopted National Electrical Code® requirements.

❑ Yes ❑ No 11. The roof has no more than a single layer of roof covering (in addition to the solar equipment).

❑ Yes ❑ No 12. The system is to be mounted parallel to the roof surface, or tilted with no more than an 18 inch gap between the module frame and the roof surface.

❑ Yes ❑ No 13. The system will have a distributed weight of less than 5 pounds per square foot and less than 45 pounds per attachment point to roof.

If you answered "No" to any of Questions 1-10, you are not eligible to participate in the expedited permitting process and must go through the standard permitting process dictated by the municipality. If you answered "No" to any of Questions 11-13, you must provide a letter from a Professional Engineer or Registered Architect certifying that the existing structure can support the additional weight and wind loads of the solar energy system. If you answered "Yes" to all of the above questions, please sign below to affirm that all answers are correct, and you have met all the conditions and requirements to participate in this expedited process.

Property Owner's Signature _____ Date _____

Solar Installation Contractor Signature _____ Date _____

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Application – *STEP 3*

1. Property Owner:

Property Owner's Name

Property Address

Section | Block | Lot Number

2. Existing Use:

❑ Single Family ❑ 2-4 Family ❑ Commercial ❑ Other

3. Provide the total system capacity rating (sum of all panels)

PV System: _____ kW-DC

4. Solar Installation Contractor:

Business Name

Business Address

Contact Name | Phone Number

License Number(s)

5. What is the existing roofing material?

6. Provide method and type of weatherproofing for roof penetrations (i.e., flashing, caulk).

7. Is the mounting structure an engineered product designed to mount PV modules? ❑ Yes ❑ No
If no, provide details of structural attachment in a letter certified by a design professional.

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Application – STEP 3 *(continued)*

8. For manufactured mounting systems, provide the following information about the mounting system:

a. Mounting System Manufacturer _____

b. Product Name and Model Number _____

c. Total Weight of PV Modules and Rails _____lbs.

d. Total Number of Attachment Points _____

e. Weight per Attachment Point (c ÷ d) _____lbs.

f. Maximum Spacing Between Attachment Points on a Rail _____inches
(see product manual for maximum spacing allowed based on maximum design wind speed)

g. Total Surface Area of PV Modules (square feet) _____ft^2

h. Distributed Weight of PV Module on Roof (c ÷ g) _____lbs./ft^2

9. Indicate quantity, brand, make and model of the:

Inverter(s):

_____	_____	_____
Quantity	Make	Model

Modules:

_____	_____	_____
Quantity	Make	Model

Please sign below to affirm that all answers are correct and that you have met all the conditions and requirements to participate in this expedited process.

_____ _____
Property Owner's Signature Date

_____ _____
Solar Installation Contractor Signature Date

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Simplifying the Solar Permitting Process
Residential Solar Permitting Best Practices Explained

To aid communities in designing effective and efficient solar permitting processes, the Interstate Renewable Energy Council, Inc. (IREC) and The Vote Solar Initiative have identified nine Residential Solar Permitting Best Practices. This document provides additional context for these Best Practices and relevant resources to help communities implement them. For more detail on the examples of where the Best Practices listed below have been implemented as well as additional resources see Sharing Success: Emerging Approaches to Efficient Rooftop Solar Permitting.

1. Post Requirements Online

What does this mean? The municipality should have a website that offers a one-stop location for residents, businesses and installers to get all necessary information on obtaining a solar permit in that municipality or region. In particular, the website should include a clear description of the requirements and process for getting a solar permit, including any necessary forms, and information on fees and inspections. The website could also contain checklists for the application and inspection requirements for solar.

Who is already doing it?

Solar One Stop (Pima County and City of Tucson, Arizona), solaronestopaz.org

San Jose, CA, www.sanjoseca.gov/index.aspx?nid=1505

Berkeley, CA, www.cityofberkeley.info/solarpvpermitguide

Why do it? Making these resources easily accessible to solar installers can reduce the number of questions that municipal staff have to answer and can improve the efficiency of the permitting process for all involved. In addition, it can help to increase the quality of applications submitted, which in turn decreases the time required for review. It also decreases the frustrating back-and-forth that installers and municipal staff may otherwise experience. Providing these resources can be particularly helpful for new installers or those that are new to that specific municipality. If a municipality has unique or unusual requirements, or has recently modified their process or requirements, the website is a good way for the municipality to identify these differences clearly to installers and residents.

Additional Resources

IREC Solar Permitting Checklists and Guidance Documents, www.irecusa.org/wp-content/uploads/permitting-hand-outv6-1.pdf

IREC Inspection Checklist (coming soon)

2. Implement an Expedited Permit Process

What does this mean? If they meet clearly defined review requirements, the majority of small residential PV systems can be processed quickly, ideally over-the-counter or electronically within one day. There are several ways to accomplish such expedited treatment, including through pre-qualification for certain systems, plans or installers. The Expedited Permit Process for PV Systems from the Solar America Board for Codes and Standards (Solar ABCs), which provides a framework for expedited review for typical residential systems, has proven especially popular and effective. Regardless of the method chosen, we recommend that the permitting requirements, including the permit form itself, should be made consistent regionally and, to the extent possible, statewide or nationally.

Who is already doing it?

New York State Unified Solar Permit, ny-sun.ny.gov/Local-Community-Tools (system pre-qualification, modeled on Solar ABCs)

Honolulu, HI, Materials and Methods Approval (pre-qualified plans), http://www.irecusa.org/wp-content/uploads/Sharing-Success-final-version.pdf (pp. 27-28)

San Diego, CA (pre-qualified templates), http://www.sandiego.gov/development-services/home-ownr/residentialsolar/index.shtml

Why do it? Expediting the process can save both installers and municipalities time and money. Installers receive their permit more quickly, and can move forward with installing the project and soliciting additional projects sooner. Municipalities do not have to waste valuable staff time reviewing projects that do not require more intensive review. While these procedural improvements are sometimes specific to solar, they are often implemented more broadly such that all permit applicants can benefit.

Additional Resource

Solar ABCs Expedited Permit Process for PV Systems (model process and forms, widely adopted), available at www.solarabcs.org/about/publications/reports/expedited-permit

The implementation of an expedited permit process could be part of the broader implementation of online permit processing (Best Practice #3). It could also result in the achievement of a fast turn-around time for permits (Best Practice #4).

3. Enable Online Permit Processing

What does this mean? Submittal, review and approval of solar permits should be possible via email or a website, with no trips to the municipal office required for most permits. Implementation of this Best Practice could range from a simple email-based solution to a fully online permitting system.

Why do it? An online permitting system can offer numerous streamlining benefits for both installers and municipalities, which vary depending on the sophistication of the system. Generally speaking, when an application and supporting materials are submitted online, municipal staff can immediately access them and do not need to enter the information manually, which saves staff time. Likewise, installers save time and money by not having to submit paper copies or take extra trips to the permitting department. In a more fully online system, once the application has entered the system, multiple personnel may work on reviewing the materials at the same time, and track the review progress and

comments made by different departments. If there is an online web portal that records the path of a permit application through the review process, installers can follow the status of their applications, reducing the number of phone calls and office visits made to obtain the same information. With some systems, applicants can also pay their permit fees online and the city can keep track of the revenue information automatically. While the more sophisticated online permitting systems can entail more significant upfront costs, their benefits can be similarly significant for municipalities and solar installers, as well as other types of permit applicants.

Enabling online permit processing could be part of the implementation of an expedited permit process (Best Practice #2). Similarly, online permit processing could facilitate a faster turn-around time for permits (Best Practice #4).

Who is already doing it?

Sacramento, CA, Sacramento Streamline Program (fully online permitting), www.cityofsacramento.org/dsd/customer-service/sacramento-streamline.cfm

Miami-Dade County, FL, ePermitting Application, http://bldgadmin.miamidade.gov/building/applications/e-permitting.asp

City and County of Honolulu, HI, Division of Planning and Permitting Online Building Permit, http://dppweb.honolulu.gov/DPPWeb/default.aspx?PossePresentationId=3000

Scottsdale, AZ, Digital Plan Submittal, https://eservices.scottsdaleaz.gov/eServices/PlanReview/default.aspx

4. Ensure a Fast Turn Around Time

What does this mean? Obtaining a PV permit should require no more than one visit to the building department for properly completed applications. In addition, we recommend allowing for over-the-counter permit review, which allows permits to be processed and approved on the same day the installer visits the permitting office with a completed permitting application. If this is not possible, we recommend a turn-around time of less than three days.

Why do it? Travel to and from the building department can be one of the most cost-intensive parts of the permitting process for installers. Reviewing permits is labor- and cost-intensive for municipalities, as well. Expediting the process in some way can save both installers and municipalities time and money. While no more than one trip to the permit office for applicants is the goal of this Best Practice, if an expedited permit process is implemented in tandem with online permit processing, it may be possible to avoid visiting the office entirely for some permits. While these procedural improvements are sometimes specific to solar, they are often implemented more broadly such that all permit applicants can benefit.

Who is already doing it?

Scottsdale, AZ, www.scottsdaleaz.gov/bldgresources/planreview/sfr_review

San Jose, CA, www.sanjoseca.gov/index.aspx?nid=1505

Santa Clara, CA, santaclaraca.gov/index.aspx?page=2447

A fast turn-around time for permits could be achieved through an expedited permit process (Best Practice #2) or by enabling online permit processing (Best Practice #3).

5. Collect Reasonable Permitting Fees

What does this mean? Fees should fairly reflect the time needed for city staff to review and issue a permit. They should remain relatively consistent regardless of system size and are often not proportional to the materials cost of a solar installation, in contrast to other types of projects. A flat fee of $400 or less is reasonable for a residential solar permit.

Who is already doing it?

Colorado (Fair Permit Act, 2011)

Arizona (House Bill 2615, 2008)

Why do it? A key way for municipalities to pay for the permitting services that they provide is to assess fees for the issuance of permits. Therefore, it is critical that permit fees cover the time it takes to review and issue permits so that municipalities have adequate staff and resources to meet the demands of permit applicants. At the same time, it is also important that municipalities make their permitting processes as efficient as possible, for example by adopting the other Best Practices, which in turn should keep fees reasonable. As far as calculation of the appropriate fee and fee cap, using a flat-fee method instead of a value-based method to assess permit fees streamlines the process and ensures that larger solar energy systems are not arbitrarily penalized. Because of the high cost of solar hardware, the typical value-based method often results in an inflated fee that does not reflect the actual staff time required. In the end, it is important to recognize that the municipality's role in permitting is valuable. Payment of a reasonable permit fee that compensates the municipality for its time and labor may actually aid in the long-term sustainability of the rooftop solar market.

Additional Resource

Sierra Club (Loma Prieta Chapter) Fee Calculator, lomaprieta.sierraclub.org/climate-action/solar_permit_fees

6. Do Not Require Community-Specific Licenses

What does this mean? If a municipality institutes a local-level permitting license or certification, it should accept the North American Board of Certified Energy Practitioners (NABCEP) PV installer and solar thermal certification in lieu of community-specific solar licenses. The goal of this Best Practice is statewide uniformity in any contractor licensing requirements, with no variation at the local level, either using NABCEP or possibly other statewide requirements. If a license is determined to be necessary, NABCEP is preferred in order to encourage national consistency, as well.

Who is already doing it?

Colorado (NABCEP or other nationally recognized organization), http://cdn.colorado.gov/cs/Satellite/DORA-Reg/CBON/DORA/1251614750513

California (statewide contractor licensing requirements), www.cslb.ca.gov

Why do it? Encouraging statewide uniformity in any contractor licensing requirements allows installers to operate in more than one municipality without spending time and money to understand and obtain multiple licenses for each municipality. Consistency in licensing requirements could be accomplished via statewide legislation or via voluntary implementation of NABCEP at the local level in place of a unique local license. Such consistency with respect to licensing as well as other requirements

is important to efficient permitting. In addition, developing a local licensing requirement is time and cost intensive for individual municipalities. Ultimately, however, IREC and Vote Solar recognize that it is critical for municipalities to ensure safe solar installations, and that contractor licensing can help to promote that. While specific licensing may not be necessary in all markets, where needed, the NABCEP standards are widely respected and they offer the only program in the country certified by the American National Standards Institute (ANSI).

Additional Resource

North American Board of Certified Energy Practitioners (NABCEP), www.nabcep.org

7. Offer a Narrow Inspection Appointment Window

What does this mean? Ideally, installers should be able to schedule an appointment for an inspection at a precise time. When this is not possible, inspection appointments should be kept at or below two hours. We also recommend that inspectors notify contractors as the inspector nears the site as an additional way of reducing waiting time for both installers and inspectors.

Why do it? Keeping the windows for inspection appointments at or below two hours can benefit both installers and inspectors. It reduces the amount of costly installer time spent waiting for inspectors to arrive. In addition, it lessens the chance that an inspector will arrive and find the installer unprepared to undergo the inspection. If the inspector provides a two-hour or shorter time window, and notifies the installer close to the time of arrival, it can help to ensure that the installer is there and ready for the inspection. In this way, it avoids wasting the inspector's time as well. Taking advantage of the ubiquity of cellphones and Internet access, jurisdictions have developed a variety of new methods for scheduling inspections and enabling shorter windows.

Who is already doing it?

Miami-Dade County, FL (as part of its ePermitting process), http://www.miamidade.gov/building/permits/contractor-e-permitting.asp

Livermore, CA (online scheduling, one-hour window), www.cityoflivermore.net/citygov/cd/permits/inspections.asp

8. Eliminate Excessive Inspections

What does this mean? We recommend requiring only one inspection by the local government for standard rooftop systems on existing homes or businesses.

Why do it? Numerous jurisdictions have found that they can safely permit solar systems without requiring more than one inspection, often by rolling inspection of electrical, structural and fire safety together. Eliminating reviews that do little to validate the safe and efficient operation of

Who is already doing it?

Boston, MA, www.cityofboston.gov/climate/solar.asp

Scottsdale, AZ, www.scottsdaleaz.gov/bldgresources

Santa Clara, CA, http://siliconvalleypower.com/index.aspx?page=1953

a proposed PV system—for example, plan checks with aesthetic criteria, or certain rough or in-process inspections—removes unnecessary costs and expedites permit issuance. For rough or in-process inspections in particular, the installer's work crew has to be put on hold while the inspection is scheduled and completed. This creates scheduling and staffing challenges for solar installers, who in certain cases might otherwise be able to complete installation in one day. For municipalities, requiring only one inspection can free-up inspectors to be more thorough on other job sites and possibly reduce the need to rely on third-party inspectors in overflow periods. Resources exist to train inspectors to do a thorough inspection without requiring an in-process inspection.

Additional Resources

Field Inspection Guidelines for PV Systems (model), www.irecusa.org/wp-content/uploads/2010/07/PV-Field-Inspection-Guide-June-2010-F-1.pdf

IREC Inspection Checklist (coming soon)

9. Train Permitting Staff in Solar

What does this mean? Municipalities should make full or half-day workshops available to relevant staff. Trainings should be available to building department plan check and review staff, and inspectors. Training should be kept up-to-date as solar technologies evolve.

Why do it? Training building department staff to review permits for compliance with electrical and building codes and to perform standard fire department checks reduces the time and resources spent by both the municipality and the applicant. Although it may entail an up-front investment in staff time, such training leads to a more educated staff that can more efficiently review solar permits, and save time and money in the long run. Proper training also ensures that municipal staff can apply technical standards consistently to ensure safe installations. Such training is especially critical in municipalities seeing or anticipating an influx of solar permit applications. From an installer's perspective, it is easier and more efficient to interact with a municipal staff familiar with solar and its requirements. Numerous sources offer training at low or no cost.

Additional Resources

Photovoltaic Online Training (PVOT) for Code Officials (free online training),http://www.pvonlinetraining.org/

Solar Instructor Training Network (SITN), www.irecusa.org/workforce-education/solar-instructor-training-network

IREC Training Directory (coming soon)

For more information on solar permitting best practices visit www.projectpermit.org or www.irecusa.org/regulatory-reform/permitting, or contact:
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Sharing Success

Emerging Approaches to Efficient Rooftop Solar Permitting

www.irecusa.org

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Interstate Renewable Energy Council, Inc.

Sharing Success

Emerging Approaches to Efficient Rooftop Solar Permitting

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Executive Summary

As the nation moves toward achieving the renewable energy goals set out by state and local governments, increasing attention is being paid to the role that the permitting process plays in the overall costs of rooftop solar energy systems. Over the last year the Interstate Renewable Energy Council, Inc. (IREC) interviewed installers, state and local government personnel, regional advocacy organizations and others in cities and counties across the United States regarding the permitting process. This report delves into this issue by examining obstacles to efficient and effective permitting of both solar photovoltaic (PV) and solar thermal rooftop systems, and highlights the steps that states, local governments and others are taking to remove these hurdles. The report is focused largely on the procedures that govern the rooftop permitting process. With limited exceptions, it does not address the technical standards that relate to permitting, such as electrical or structural requirements.

IREC intends this report to serve as both a vehicle for discussion of rooftop permitting challenges, and a source of inspiration for those looking for realistic and effective ways to improve solar permitting in their communities. Based on our researching in writing this report, two key principles have emerged as fundamental to enabling effective improvements to permitting processes:

- **The responsibility for change should be shared.** The delays and inefficiencies in the processing of solar permits are sometimes the result of cumbersome municipal policies and practices related to those permits. However, they are also due to the failure of solar installers to submit complete and accurate applications and to consistently comply with relevant codes and standards in the field. Streamlining the permitting process is going to take a commitment from both groups to be effective.

- **Changes to permitting policy should offer benefits to municipal governments, as well as solar installers and their customers.** Changes to permitting processes need to be designed with an understanding of the way that local governments operate and the value of the services they provide. At the same time, local governments need to understand the challenges faced by the solar industry in this fast-changing market. The economic conditions faced by both groups are critical, but the best solutions can offer efficiencies that can be shared throughout the broader community.

The report begins with three chapters that provide background and context for a discussion of the solar permitting process. Chapter I contains an introduction to the issues surrounding rooftop permitting and defines the reasons why reform is being sought. It also introduces the research and outreach that IREC has conducted over the past year to develop the report, and sets out the report's goals and contents. Chapter II provides an overview of how the rooftop permitting process is traditionally regulated and then focuses on the role that states may play in solar permitting reform. It includes a discussion of how states have chosen to get involved in permitting, and evaluates some of the pros and cons of state-led permitting reform. It provides examples of state efforts to improve the permitting process, including an examination of the mandatory requirements put in place by states such as Oregon, Vermont and Colorado, while also looking at guidance-driven approaches from Arizona and California. Chapter III examines regional approaches to solar permitting reform, including a discussion of the merits and drawbacks of regional efforts, and includes examples of regional permitting reform in action in places such as Long Island, New York, and the San Francisco Bay Area. Together these chapters provide information on the motivation for and goals of this report, along with the legal and regulatory considerations relevant to the solar permitting process.

Chapter IV contains an in-depth discussion of the typical local permitting process for rooftop solar found in the United States, and provides examples and analysis of efforts to reform it. This chapter is organized around the three steps IREC has identified as central to the permitting process:

1. **Pre-application**—In effect the permitting process actually begins before an application for a permit is submitted. The information that is made available about the permitting procedures, technical requirements and other expectations can make a meaningful difference in the efficiency and effectiveness of the process for both the applicant and the municipality. As demand grows for the installation of solar PV and solar thermal systems, municipalities have begun to develop written and electronic resources targeted towards solar customers and installers to provide them the information they need to submit applications for local permits. These resources include: permitting checklists, guidebooks, and websites and other electronic resources. This section explains the importance and benefits of providing these sorts of resources, and provides examples of each of them from cities such as Boulder, Tucson and Philadelphia.

2. **Application submittal and review**—This section covers the heart of the formal permit application process. The permitting process for solar systems often involves review for building, electrical, mechanical, plumbing and/or fire code compliance, depending on the system type and design, and a separate permit can be issued for each type of review. In some jurisdictions, a single application is submitted for the permitting process, but in others an application form must be submitted for a permit under each of the separate codes. In almost all jurisdictions, fees are associated with permit submittal and review. This section discusses: (1) application forms; (2) application submittal and review processes, including over-the-counter review, expedited review procedures and online permitting options; and (3) permitting fees. The section explains the benefits of improving these various components and reviews examples of how cities and counties such as Honolulu, Scottsdale, and San Jose have approached such reform.

3. **Inspection—**In most jurisdictions, the issuance of a permit by the local agency merely allows the contractor to begin installing the system. Final approval of the project does not occur until the installation has been completed and passed all inspections required by the jurisdiction. Though inspections are an important part of ensuring system safety, they can sometimes represent a time-consuming and costly part of the permitting process for both cities and installers. In particular, the manner in which the inspections are scheduled, the amount of time that they take to complete and the process of finalizing the jurisdiction's approval after the inspection all present opportunities for streamlining, which may reduce the permitting costs for solar projects. In addition, improved inspector training especially focused on solar installations would likely improve the inspection process. Finally, although difficult, jurisdictions have begun to consider the benefit of coordinating permitting inspections with the local utility's interconnection inspections. This section discusses the benefits of these potential changes to the solar inspection process and provides examples of various efforts intended to improve solar inspections from cities and counties such as San Diego, Santa Clara, and Miami-Dade.

Chapter V provides a conclusion that highlights some of the common elements of successful permitting reform efforts and offers some thoughts on solar permitting improvement moving forward. The common elements that IREC has identified suggest that a framework for efficient processing of rooftop solar permits is emerging. These elements are:

- **Technical and procedural requirements that are relatively consistent across regions, and possibly the country, can offer significant efficiency benefits for both municipal governments and the solar industry.** When requirements are relatively constant within a region, installers become familiar with those standards and learn efficient ways to comply with them. Installers benefit because they have to spend less time learning the particularities of each jurisdiction's technical and procedural requirements. Instead they can focus on designing safe and effective systems that can be installed at a low cost. Local governments benefit because the quality of the installations as a whole increases, and they have to spend fewer staff resources educating installers and ensuring compliance with procedures, codes and standards. Adoption of a consistent set of requirements can also be easier for municipalities because they can take advantage of other jurisdictions' knowledge and experience, rather than developing new standards.

- **Increased and readily available access to information about technical and procedural requirements reduces costs and increases safety across the board.** By providing clear and detailed information regarding the specific technical and procedural requirements associated with obtaining a solar permit, municipalities can help installers to efficiently comply with requirements. Specifically, providing this information can help installers plan ahead and incorporate the requirements into their design, and improve the accuracy and completeness of permit applications. Installers who take the time upfront to access the available information can reduce permitting and inspection failures, set clear expectations with their customers, and build trust with the local jurisdiction. Local governments benefit because they receive fewer requests for information, questions from installers, and incomplete permit applications, all of which can be a drain on limited local resources.

- **Using simplified standards and processes that focus only on the elements relevant and necessary for solar installations can increase installer compliance rates.** Levels of review can be tailored to match the complexity of a system. Projects that meet certain design criteria may be eligible for expedited review procedures. These expedited procedures can save time and money for both installers and local governments. At the same time, such simplified standards and processes should still ensure compliance with national codes and standards in order to protect health and safety.

- **Fee structures that are designed to fully compensate a jurisdiction for the time invested reviewing an application will help maintain necessary staffing levels and also promote economic growth in the community by keeping solar permitting costs to a minimum.** Local governments provide an important service in permitting solar installations and reasonable fees can help ensure they provide a high level of service. Traditional valuation-based fee structures often penalize solar installers because the hardware costs for solar installations are high and their price does not translate to the amount of staff time required to process an application. Adoption of a fee structure tied to the amount of time it takes a local government to process most applications can appropriately compensate the local government while also encouraging local installations by keeping fees relatively low.

Some of the changes identified in this report, such as the publication of an informational guide or the adoption of a solar-specific application, can be taken relatively quickly by a local jurisdiction. Others, such as moving to an online permitting system, will require more of an up-front and ongoing financial investment and time to roll out. Since it is expected that the rooftop solar market will continue to grow rapidly and will expand to new markets in the coming years, it makes sense for states, counties, cities and other entities to be proactive in addressing solar permitting in the near term. IREC hopes this report can help to inspire and guide communities toward approaches that make sense for them.

I. Introduction

Municipalities in the United States have been hard-hit in recent years with severe budget shortfalls and reduced staffing. Amidst these troubles, many cities and counties are seeing a dramatic increase in the number of applications filed for rooftop solar systems in their jurisdictions. These applications represent a bright spot in local economies, providing an opportunity for local job growth, reduced energy costs for constituents, and improved environmental conditions. In light of these benefits municipalities are looking for ways to support and encourage solar development in their communities but they must do so while balancing increasing demands on their time and shrinking budgets. This report examines the process for permitting rooftop systems in the United States and provides examples of methods state, regions and local governments are taking to improve the efficiency of solar permitting to benefit solar customers and developers as well as the local permitting authority.

Increased attention is being paid to the permitting of rooftop solar systems due to the costs associated with the permit process. The U.S. Department of Energy (DOE) recently launched an effort known as the SunShot Initiative, the goal of which is to "make solar energy cost competitive with other forms of energy by the end of the decade."[1] The DOE believes that "reducing the installed cost of solar energy systems by about 75% will drive widespread, large-scale adoption of this renewable energy technology and restore U.S. leadership in the global clean energy race."[2] In order to achieve this goal, DOE has broken down the different aspects of the solar industry that affect installation prices. While progress is being made to bring down the cost of panels and other hardware, DOE reports that "soft costs" associated with solar installations, including permitting-related costs, have remained relatively fixed.

A report prepared in 2011 by SunRun, a leading solar services provider, found that "local permitting and inspection add $0.50 per watt, or $2,516 per residential install."[3] The report breaks those costs down into various components, including the time it takes to learn local variations in permit requirements, to complete and submit a permit application, to undergo the necessary inspections, and to wait for the application to be reviewed, in addition to the permit fees themselves.[4] In sum, improvements in these various steps could play a significant role in making solar affordable for more Americans and also help with economic growth in our communities.

Over the last year the Interstate Renewable Energy Council, Inc. (IREC) interviewed installers, state and local government personnel, regional advocacy organizations and others in cities and counties across the United States regarding the challenges facing the solar industry, specifically in reducing the costs of permitting rooftop solar installations. Through these conversations and supporting research, IREC has gained an understanding of the complex nature of the permitting process and the diversity of approaches used. In addition, it has been evident that there is a commitment across a wide range of stakeholders to develop innovative approaches to permitting that enable wide-scale adoption of renewable energy in our communities.

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[1] http://www1.eere.energy.gov/solar/sunshot.
[2] *Id.*
[3] SunRun, The Impact of Local Permitting on the Cost of Solar Power 6-7 (2011), *available at* http://www.sunrunhome.com/solar-lease/cost-of-solar/local-permitting.
[4] *Id.*

While decreasing permitting-related costs is critical to helping achieve the nation's renewable energy goals, IREC has found that there are other compelling reasons to improve the efficiency of the local permitting process that often go unmentioned. Specifically, the dramatic growth of the solar industry over the last decade has resulted in a flood of new applications coming through city and county building departments. For example, the number of solar photovoltaic (PV) installations doubled in 2010 compared with installations in 2009, and the capacity installed in 2010 was over eight times what was installed in 2006.[5] Furthermore, over 50,000 systems were installed in 2010, a 46-percent increase over the number installed the previous year, and roughly a third of those new systems were residential installations.[6] The rate of increase has been so rapid that many local governments have not had the option of gradually adapting over time and are instead stuck trying to manage the influx of new solar applications while also continuing to serve all other, more traditional permit requests. In addition, this growth has come at a time when local governments are dealing with the effects of a severe economic downturn and have had to drastically reduce staffing to balance budgets. Thus, finding efficient ways of managing solar permit applications is important to local governments as well solar developers and advocates.

IREC has compiled this report to examine the specific permitting obstacles that presently exist for rooftop solar, and to highlight the steps that state and local governments and other entities are taking to address these hurdles. This report aims to serve as both a vehicle for discussion of these challenges, and as a source of inspiration for those looking for realistic and effective ways to improve solar permitting while continuing to ensure safe and responsible solar installations. The efforts highlighted in this report will not be applicable in every community due to the varied jurisdictional, political, demographic and economic conditions that exist in this country. However, these examples demonstrate a range of different techniques that can be utilized to improve permit processes, many of which can be modified to suit an individual community's circumstances. In the end, this report aims to help local governments and the solar industry to identify practical, feasible approaches to efficiently manage the flow of solar applications, so that state and local governments can achieve their renewable energy goals while also spurring local economic growth.

Through IREC's research and conversations, two key principles have emerged as fundamental to enabling effective improvements to permitting processes:

1. **The responsibility for change should be shared.** The delays and inefficiencies in the processing of solar permits are sometimes the result of cumbersome municipal policies and practices related to those permits. However, they are also due to the failure of solar installers to submit complete and accurate applications, and to consistently comply with relevant codes and standards in the field. Streamlining the permitting process is going to take a commitment from both groups to be effective.

2. **Changes to permitting policy should offer benefits to municipal governments, as well as solar installers and their customers.** Changes to permitting processes need to be designed with an understanding of the way that local governments operate and the value of the services they provide. At the same time, local governments need to understand the challenges faced by the solar industry in this fast-changing market. The economic conditions faced by both groups are critical, but the best solutions can offer efficiencies that can be shared by both groups as well as throughout the broader community.

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[5] IREC, *2011 Updates and Trends* 17-18 (Oct. 17, 2011), *available at* http://irecusa.org/wp-content/uploads/2009/10/IREC-Annual-Trends-Report-Final-10-11-11_december-webR.pdf.
[6] *Id.*

Working from these two principles, this report first looks at big-picture legal and policy issues, and then analyzes the details of the permitting process. It addresses both solar PV and solar thermal rooftop permitting, only referring specifically to one or the other when appropriate. In addition, this report is focused on the procedures that apply to rooftop solar permitting and is not centrally focused on the technical standards that are applied through these procedures.

Chapter II addresses the essential issue of local authority over the permitting process, and the potential role for states in permitting reform. It discusses the variations in mandatory state policies related to permitting, including state codes, solar rights acts and other laws, as well as non-mandatory state permitting guidance, and how these approaches affect local control over the permitting process. This chapter also evaluates the pros and cons of a state-led approach to permitting reform. Finally, it looks at specific examples of state policies that have been designed to impact the local permitting process.

Chapter III looks at regional efforts to improve the permitting process. It discusses the value of sharing knowledge across a region and some of the inherent coordination challenges therein. The chapter highlights a few leading examples of regional efforts underway in different parts of the United States. These examples demonstrate the potential for regional efforts to achieve many of the benefits of consistent statewide approaches without undermining local control.

Chapter IV looks at the diverse local permitting policies and procedures in place in the United States. The sections in this chapter are organized to recognize the three basic layers of the permitting process: pre-application information; permit application and review, including the application form, application submittal and review, and associated fees; and inspections. This chapter also describes the typical components of each of these layers and provides numerous examples of communities that have implemented changes to improve one or more of these components.

Chapter V provides conclusions drawn from the many examples highlighted in the report. It makes recommendations for jurisdictions and installers looking to make improvements to the solar permitting process in their own communities.

Finally, attached to this report is an Annotated Bibliography that is a compendium of background information and the examples that are references in this report, which may serve as models going forward, including: reports and related resources; legislation, codes and ordinances; guidebooks; websites; and checklists and applications.

II. State Role in Solar Permitting Reform

The permitting process acts as a mechanism to notice and inform appropriate authorities about a planned project so that these entities can ensure that the project complies with public health, safety and design standards. For rooftop solar installations, the relevant technical standards are typically found in the applicable building, electrical, mechanical, plumbing, and fire codes. Additional location, design, and procedural requirements are generally found in local ordinances and sometimes in state statutes. In most states, the local city or county building department controls the review and issuance of permits for rooftop solar installations in its jurisdiction; however other local departments, such as fire districts, sometimes have a role in permitting as well. States also have varying degrees of control and involvement in the permitting process, but local control by the city or county government is the norm.

At a high level, the basic process that applies for obtaining a permit is relatively similar across jurisdictions. While the steps are comparable, however, local variations have resulted in a patchwork of different permitting requirements and processes nationwide. Chapter III discusses in detail the different practices that exist at a local level, but first it is helpful to consider the role that state governments may play in the regulation of solar permitting, and the pros and cons of state involvement in permitting reform. This chapter provides a discussion of the potential role for state government in solar permitting reform, discusses the benefits and drawbacks of such an approach, and provides examples of states that have influenced the permitting process, either via legislative or similar mandatory efforts, or via non-mandatory guidance.

A. Paths for State Influence on Permitting

The role of states in solar permitting varies across the country depending upon the level of authority the state government has and the extent to which it has chosen to exercise that authority. In some cases, due to the legal structure of state and local law, states exercise complete control and have assumed the bulk of responsibility for permitting themselves, as is the case in Vermont. In other cases, the state government has placed specific parameters around how local entities process permits, as in Oregon, California, Wisconsin, Colorado and Arizona, although in most of these cases primary authority is still retained by the local jurisdiction. Finally, some states, such as California and Arizona, have also chosen to use non-mandatory guidance and recommendations to influence permitting processes at the local level. Due to variations in state laws, policies and political climates, states have different degrees of ability and willingness to undertake any given approach, although their experiences may be instructive for other states and localities considering similar approaches.

States such as Oregon have exercised influence over the permitting process through their building or other codes, which contain the technical standards for a solar installation. Most states have statewide, mandatory codes based on national or international standards,[7] as is the case in eight of the top ten solar states.[8] In most cases where there are statewide codes, however, local jurisdictions can modify the requirements of the statewide code, so long as their changes are more stringent than the state code. For example, California has a statewide,

[7] For some detail on the status of state building codes, see DOE's Energy Efficiency and Renewable Energy Web Site: Status of State Energy Code, *available at* http://www.energycodes.gov/states, and Building Codes Assistance Project (BCAP) and Online Code Environment & Advocacy Network (OCEAN), *available at* http://bcap-ocean.org/code-status.

[8] *See* Larry Sherwood, U.S. Solar Market Trends 2010, at 9 (June 2011), *available at* http://www.irecusa.org/wp-content/uploads/2011/07/IREC-Solar-Market-Trends-Report-revised070811.pdf.

mandatory building code based on the International Code Council's (ICC) Uniform Codes[9] but local jurisdictions may amend the state building code to make it more stringent due to unique, local climatic, geological or geographical conditions.[10]

There are two broad exceptions to this typical structure. First, some states, such as Arizona and Colorado, have no statewide codes. Instead, local jurisdictions establish their own local codes, which are often based on the same national or international standards a state would adopt. However, in these cases, the state has no formal control over local code requirements and therefore consistency is not guaranteed. The second exception arises in states such as Oregon, where the state has completely or partially circumscribed local code authority, allowing no local variation in the code requirements. It is in the case of Oregon where the state has taken some of the broadest steps to mandate reforms to the solar permitting process from both a technical as well as a procedural standpoint. Oregon has developed the Solar Installation Specialty Code, discussed in more detail below, which covers all the building code requirements for solar installations and applies uniformly statewide.

In addition to their authority over building codes, states have also chosen to exert some control over local solar permitting through solar rights acts.[11] Solar rights acts limit the ability of private and/or government entities to prohibit or place conditions on the installation of solar through restrictive covenants, ordinances, and building codes. [12] It is common for these acts to prohibit local jurisdictions from imposing "unreasonable" restrictions that significantly increase the cost or decrease the efficiency of a solar energy system. This limiting language is common throughout states with solar rights acts, and the reasonableness of a restriction is typically tied to the impact it has on system cost or on the ability of the system to perform as designed. Some of the states that have solar rights acts with reasonableness restrictions are California and Wisconsin, both discussed in more detail below.[13] Other states, such as Illinois, reference the allowable restrictions on solar projects more obliquely, and forbid restrictions which "prohibit or have the effect of prohibiting" the installation of solar energy systems.[14] States may choose to expand the scope of their acts over time to try to reduce the restrictions imposed by local jurisdictions or to exercise other control over the permitting process. For example, Wisconsin has included a provision in its Solar Rights Act to regulate the timing of permit review.[15]

Beyond modifying their codes or implementing solar rights acts, states may implement other laws to require local jurisdictions to change certain aspects of their permitting processes. For example, both Colorado and Arizona have implemented statutes requiring local jurisdictions to set fees for solar permits at certain levels, as described in more detail below. Finally, states may influence the local permitting process by playing an advisory role, rather than imposing mandatory restrictions or obligations related to permitting on local jurisdictions. Some states, such as Arizona and California, have provided non-binding guidance to aid localities in improving their permitting processes and to try to increase the consistency of the process across the state.

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[9] Cal. Code Regs. Tit. 24, *available at* http://www.bsc.ca.gov/codes/adoptcycle/2010Cycle/Appstndrds2010.aspx.
[10] Cal. Health & Safety Code § 18941.5(b).
[11] Colleen McCann Kettles, A Comprehensive Review of Solar Access Law in the United States: Suggested Standards for a Model Statute and Ordinance (Solar Access Report), at 1 (2008).
[12] Solar Access Report, *supra* note 11.
[13] *See,* Cal. Gov't Code § 65850.5; Wis. Stat. § 66.0401(1m); *see also* Colo. Rev. Stat. § 38-30-168(2)(a) (similar reasonableness language); Nev. Rev. Stat. § 111.239(2)(a) (similar reasonableness language).
[14] Homeowners' Energy Policy Statement Act, 765 Ill. Comp. Stat. 165/15; *see also* Utah Code § 10-9a-610.
[15] Wis. Stat. § 66.0401.

Vermont Streamlined Review for Small Net-Metered Systems

The permitting process for solar facilities in Vermont is highly streamlined, largely because the State Public Service Board has complete authority over the permitting process in Vermont. Specifically, to obtain a "certificate of public good" from the Vermont Public Service Board for net-metered systems 150 kilowatts (kW) or smaller, the applicant is only required to self certify that they comply with interconnection requirements and certain siting requirements. If any entity, including the utility, the municipality, and adjacent landowners, has an objection related to the facility not meeting these requirements, that entity can comment or request a hearing within ten days for facilities on existing structures and 30 days for other systems. Otherwise the Public Service Board grants a certificate, no further actions or inspections are required, and construction may begin.

The Vermont Energy Act of 2011 (H.56) expanded this process by modifying Vermont's permitting procedure to allow net-metered solar facilities up to five kW to achieve even faster approval. Under the Act, these small facilities simply register at the Public Service Board and declare that they comply with certain limited interconnection requirements. Utilities (and no other entities) have ten days to object to the facility, but only if the interconnection raises concerns. If no objections are made, a certificate of public good "shall be deemed issued" on the eleventh day, with no paper permit required unless requested. At this point, system construction may begin. No inspections are required.

Based on conversations with Vermont renewable energy stakeholders, the formal objection process in the standard permitting process was not frequently used and did not typically cause delays. Rather, the new streamlined permitting process in the Energy Act of 2011 addressed the rapidly increasing number of renewable energy applications at the Public Service Board, some of which were incomplete or otherwise faulty, and were holding up the permitting review process. Stakeholders appear to view the faster process for facilities five kW or smaller as a positive development. However, some noted that the five kW system size limit is too low. In fact, the Vermont legislature is currently considering H.475, which expands the faster permitting review to systems 10 kW or smaller.

For more information on the streamlined process for net-metered systems smaller than five kW, see Vermont Energy Act of 2011, Act No. 47 (H.56), 30 V.S.A. § 219a(c) (May 5, 2011), available at http://www.leg.state.vt.us/docs/2012/Acts/ACT047.pdf. For more information on Vermont's permitting process for systems up to 150 kW, see 30 V.S.A § 248, and Vermont Public Service Board rule 5.100. For additional detail and forms for both types of systems, see the Vermont Public Service Board's Net Metering Web Page at http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/netmetering. Finally, for more detail on H.475, see http://www.leg.state.vt.us/database/status/summary.cfm?Bill=H.0475&Session=2012.

B. Potential Benefits and Challenges of State-Led Permitting Reform

Because permitting is typically executed at the local level, states have experienced varying degrees of success in their efforts to improve the permitting process, often due to the receptivity or opposition to the state effort by local governments. When states attempt to influence the permitting process via legislation or other mandatory regulations, without local buy-in, they run the risk of encountering opposition during the legislative process and backlash after passage. For example, as discussed below, Colorado experienced a negative response when it implemented statewide permitting fee limits in the face of local opposition. At the same time, a statutory approach allows states to make sweeping, uniform and mandatory changes to local permitting processes, which can take effect immediately. This can allow states to make important improvements in permitting policy quickly, without engaging in the same consensus-building process that might otherwise be necessary to instigate regional or statewide change at the local level. State legislative action is likely the most efficient way to achieve true statewide consistency on a permitting issue.

Even when states are able to implement mandatory permitting-related policy, however, local jurisdictions generally still retain control over the permitting process and may find ways to protest the top-down imposition of authority. In the Colorado example mentioned above, it appears that some jurisdictions may be raising fees and taxes on other aspects of a solar installation in order to make up for the loss of permitting fees under the state statute. Given this potential for local backlash in some circumstances, a state might consider other ways to influence the permitting process that are not mandatory, such as providing guidance or recommendations to jurisdictions. Alternately, the state can require review of permitting standards through mandatory language, without placing strict limitations on what changes must be made with the hope that simply by initiating the review process the jurisdiction will then take reasonable steps. Likewise, states might consider facilitating regional efforts, such as those described in Chapter III. Such non-mandatory approaches allow states to provide advice and guidance to jurisdictions without impinging on their authority and possibly incurring opposition or backlash. In the long run, these approaches may prove equally effective from a state's perspective because they promote consistency and define best practices. They are not a top-down imposition of state authority, however, and so local officials may be more receptive to them.

C. Examples of Mandatory State Policy Related to Permitting

1. Oregon's Solar Installation Specialty Code

Oregon's building and electrical codes apply uniformly across the state and local jurisdictions cannot make any changes to their requirements.[16] Nonetheless, local jurisdictions are responsible for implementing the code and for reviewing and issuing solar permits.[17] Using its complete control over code requirements, Oregon has been able to implement statewide changes to its solar permitting process by establishing a Solar Installation Specialty Code that not only covers technical requirements, but also imposes parameters on how municipalities process applications.[18] Although the Solar Installation Specialty Code does not cover the

[16] *See* Or. Rev. Stat. §§ 455.040, 479.525, 479.854. *but see* Or. Rev. Stat. § 479.854 (limited exception for the electrical code related to certifying electricians that allows some local variation).
[17] *See* Or. Rev. Stat. §§ 455.020(4); 479.820(4); *see also* Or. Rev. Stat. § 215.130(1) (local jurisdictions also retain control over land use and zoning).
[18] http://www.cbs.state.or.us/bcd/programs/solar.html (the relevant Oregon statutory sections for the Solar Code are in Chapter 455 regarding the state building code, Or. Rev. Stat. §§ 455.010–455.895).

electrical code provisions that govern solar installations, it has been able to substantially standardize the technical requirements that apply to building permits for solar projects.

The Oregon Solar Installation Specialty Code was implemented in October 2010 in an effort to provide more transparency and consistency to the structural requirements and permitting process for solar PV installations. It includes:

- A "Prescriptive Path," which is a fast-track compliance process for rooftop installations on conventional light-frame construction;
- Standard permit requirements for other solar installations, with some mandatory requirements and some local discretion for additional requirements;
- Permit submittal requirements, addressing the contents for permit submittal;
- A provision constraining the building permit fee to reasonable cost recovery and basing permit fees on the costs of the structural elements of the solar PV system and not the panels themselves (racking, mounting elements, rails and the cost of labor);
- Permit review within a "reasonable" timeframe and the issuance of the permit "as soon as practicable"; and
- Certain inspection elements for a structural inspection.

The Solar Code goes beyond the typical state code structure by prescribing technical requirements as well as requirements about the manner in which localities process permits and the fees they can charge, items not usually found in a state's codes. The requirements for "reasonable" timeframes still leave most of the process up to local discretion.

2. California's Solar Rights Act

California's Solar Rights Act provides an illustrative example of how solar rights laws can be used to impact the permitting process. The Act provides strong protections against local restrictions on solar installations and strictly limits the circumstances under which a burdensome condition of approval may be imposed.[19] The law declares that the review of a permit is purely a ministerial act, and that the only time a limitation can be placed on solar energy is when an official determines that a mitigation measure is necessary to protect public health and safety.[20] The law also prohibits purely aesthetic conditions of approval.[21] If a local authority imposes a condition of approval to protect public health and safety, it must make that determination in writing and it must be supported by substantial evidence. In addition, the law requires that the condition be "feasible."[22] In California this reasonableness restriction defines a significant cost as one that raises the price of a system by $2,000, or that diminishes the efficiency of a system by more than 20 percent.[23]

3. Wisconsin's Solar Rights Act

Among other issues, Wisconsin has addressed the timeline for permit application review via its Solar Rights Act. Specifically, Wisconsin has a statewide statute that requires, among other things, that local governments approve or disapprove applications for solar systems within 90 days of determining the application is complete.[24] If the local government fails to act, then the

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[19] Cal. Gov't Code § 65850.5, *et seq.*
[20] Cal. Gov't Code § 65850.5(b).
[21] Cal. Gov't Code § 65850.5(a).
[22] Cal. Gov't Code § 65850.5(c).
[23] Cal. Civ. Code § 714(d)(1)(A) & (B).
[24] Wis. Stat. § 66.0401(d)

permit is considered approved.[25] However, the local government may extend the approval period in writing for up to 90 additional days in certain circumstances—when additional information is needed (45 days), when the applicant makes a material modification (90 days) or for other "good cause" (90 days).[26] While 90 days is by no means a quick timeframe for permitting review, this is an example of how a state might exercise its authority over the permitting process to set a "ceiling" on permitting timelines, in a similar manner to Colorado's "cap" on permitting fees, discussed below.

4. Colorado's Fair Permit Act

In June 2011, Colorado enacted the Fair Permit Act (HB 11-1199),[27] which extended and modified the solar permitting fee limitations put in place in 2008 by SB 08-177.[28] The Fair Permit Act is a state statute that limits the authority of local jurisdictions in setting permitting fees for solar customers. It caps the fees a local jurisdiction can charge systems two megawatts (MW) and under. For larger systems, it prohibits state entities, counties and municipalities from charging fees that, in aggregate, exceed the county's or municipality's actual costs in issuing the permit. In addition, the county, municipality or state entity must identify all fees and taxes assessed on an application. Thus, while localities are still responsible for setting the appropriate fee, the state has put a numeric cap in place and prescribed the considerations that must go into setting the fee. The legislation passed with overwhelming bipartisan support because supporters argued that a balanced approach was needed to eliminate vast disparities in fees. The intent was to allow communities to recover their costs while not stifling the economic development that solar deployment brings. Some have expressed concern that setting a specific numeric cap has caused jurisdictions to simply set the fee at that cap rather than adhering more closely to the requirement that they determine their actual costs in issuing the permit.

5. Arizona's House Bill 2615 regarding Streamlined Permitting

Despite not having statewide building codes in place, Arizona nonetheless took significant steps to make the solar permitting process more uniform across the state with House Bill (HB) 2615 (2008). First, HB 2615 removed the requirement that permit applications should include an engineering stamp, unless the local jurisdiction provides a written explanation for why one is needed. In some instances, obtaining these stamps can cost as much as $700–800 per application.[29] Second, it requires local permitting fees to be "attributable to and defray" the actual costs the local agency incurs in processing a permit. In some cities, such as Phoenix, this requirement departed from the City's fee schedules, which were based on system costs or value at the time of installation.[30] Finally, under HB 2615, applicants are required to submit standardized information, such as the location of panels, one-line and three-line electrical diagrams, and cut sheet and listings for inverters. These mandatory changes have made a substantial difference in standardizing permitting processes across the state.

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[25] *Id.*
[26] Wis. Stat. § 66.0401(e).
[27] SB 08-0177 (2008), *available at* http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/1109D26989FEC52B872573D000791515?Open&file=117_enr.pdf.
[28] SB 08-0177 (2008), *available at* http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/1109D26989FEC52B872573D000791515?Open&file=117_enr.pdf.
[29] Public comments of Thomas Alston of the Solar Alliance before the Senate Government Committee in the Arizona Legislature on April 7, 2008.
[30] Based on conversation with Dwayne Dover, Electrical Plans Examiner for City of Phoenix.

D. Examples of State Guidance and Recommendations Related to Permitting

1. Arizona's Solar Energy Task Force

In addition to HB 2615, which caps permit fees as discussed above, the Arizona Governor's Energy Office has implemented a special Solar Energy Task Force, comprised of a wide range of stakeholders, including local jurisdictions. The Task Force recently issued a number of recommendations, including several related to solar permitting.[31] These recommendations included: instituting "flat fair fees", implementing over-the-counter permitting for residential systems, standardized permitting requirements, reduced inspection appointment windows, inspector trainings, and the provision of a local solar expert.[32] Although the Task Force recommendations are not binding on local jurisdictions or the Governor, they nonetheless help these actors prioritize improvements to solar permitting and other aspects of solar market development.

2. California's Solar Permitting Guidebook

In California the Governor's Office of Planning and Research (OPR) has convened a "Solar Permitting Work Group", which is working on a Guidebook, expedited code changes and training programs related to permitting.[33] OPR's Guidebook will address the efficient local permitting of solar energy facilities to help local governments and contractors improve the permit approval processes.[34] The Guidebook has four specific goals: (1) to outline requirements for solar PV projects and explain important aspects of permitting these projects; (2) to recommend a uniform building code interpretation for the installation of solar PV systems; (3) to help local enforcement agencies streamline their solar PV permitting process; and (4) to enable standardized project approval by local enforcing agencies across the state. OPR has sought input from cities and counties, solar developers, solar advocates, and others in drafting the guide in order to ensure that it is as responsive as possible to these entities' various concerns. The intent of the Guidebook is not to introduce requirements in excess of state code standards, but rather to specify and clarify requirements for solar installations to minimize locally unique interpretations of state standards. While the procedures and interpretations recommended by the guide will not be binding on localities in California, it may have the effect of setting the bar for what is a "reasonable" restriction under the state's Solar Rights Act,[35] discussed above. A final version of this Guidebook is expected in the spring of 2012.

In addition to the Guidebook, OPR is developing a set of expedited changes to the state's residential, building and electric codes that will clarify requirements related to solar systems that are either not addressed in current codes or need to be modified to allow for efficient and safe permitting without imposing unnecessary restrictions. Normally making changes to the codes can take a number of years; however, the state is looking to expedite these changes to help meet its renewable energy goals. Finally, OPR is also working with stakeholders to develop trainings to help local governments streamline and standardize their permitting practices. These trainings will be provided for building inspectors and other local government employees, as well as solar contractors.

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[31] Arizona Governor's Solar Energy Task Force 2011 Recommendations, Executive Summary (Arizona Solar Task Force) (2011), available at: www.azenergy.gov/doclib/2011%20GSETF%20Recommendations.pdf.
[32] *Id.*
[33] http://www.opr.ca.gov/s_renewableenergy.php;
[34] Details regarding the Guidebook and related efforts were provided via phone and e-mail communication with Wade Crowfoot, Deputy Director, California Governor's Office of Planning and Research.
[35] Cal. Gov't Code § 65850.5, *et seq.*

For some of the same reasons that apply to state-level reforms, there is a logic and appeal to taking a regional approach to solar permitting reform. Regional efforts can identify scalable processes that can apply beyond the particular region, or in other areas of the state or country. In fact, most of the regional efforts discussed in this chapter attempt to identify a streamlined process that can be "exported" or adopted by other regions. For example, the groups behind regional streamlining efforts currently underway in the San Francisco Bay Area and on New York's Long Island intend that the streamlined processes they develop could be models for use in other parts of the country. Standardization across a geographically significant region is desirable because it reduces the need for installers in the area to master many different processes. This can also be achieved through statewide efforts, but regional approaches may have other advantages, particularly in states with a strong tradition of local control or home-rule. This report identifies some of the potential benefits and challenges of taking a region-wide approach to permitting reform, and briefly discusses some of the significant early efforts to achieve regional standardization.

A. Potential Benefits and Challenges of a Regional Approach

There are various benefits to taking a regional approach to permit reform, but a compelling consideration from the viewpoint of participating municipalities, governmental departments and stakeholders is economic development. Regional standardization of the permitting process for solar energy systems can create efficiencies for installers who learn to competently navigate a single process, in contrast to a segmented approach where an installer may need to master dozens of local jurisdictions' processes. This may result in a lowering of installed costs of solar and a boost to the local market for solar products and related services in that region. This is also true for state level reforms, but regional approaches may offer a more collaborative and locally based approach to achieving a similar goal.

Administratively, a regional, cooperative approach may lower the cost of streamlining for individual jurisdictions by creating administrative economies of scale and by encouraging a division of labor that allows all jurisdictions to benefit from the expertise of other nearby jurisdictions. Regional approaches can build on and leverage existing cooperative relationships between departments and benefit from familiarity with each other's processes. Moreover, for installers and small-scale solar businesses, the cost of participating in individual proceedings in each jurisdiction to achieve permit streamlining could be time-intensive and cost-prohibitive. In contrast, a regional approach that brings together stakeholders from across the region can lower the cost of participation and ensure that participants devote the necessary resources to make the process valuable and worthwhile.

Another benefit of a regional approach that involves local officials, utilities, solar developers and other interested entities is that it might create a more even playing field to foster cooperation. A cooperative, consensus-building regional work group may help navigate the potentially delicate political waters of impinging on local autonomy over land use and planning decisions. Indeed, the strength of the regional approach lies in its consensus-building, bottom-up process, which stands in contrast to some of the top-down, state-led approaches described above in Chapter II. In the end, local jurisdictions must voluntarily adopt a regional group's end product, and they are more likely to do so if they have had a voice in creating it.

While a benefit, this lack of mandatory authority to require implementation of regional standardization in solar permitting can also be seen as a weakness when compared to a statewide approach. The strong tradition of local control over land-use decisions in most states

underscores the importance of a cooperative process by which local jurisdictions would voluntarily adopt the standard procedures. But there is no guarantee that all or most localities will agree to adopt the region-wide approach. Indeed, as some of the following examples show, political unanimity and incentives to adopt standardized procedures may be required to overcome inertia and induce local jurisdictions to act consistently with a regional plan.

Another challenge of creating regional standardization is the recognition that local jurisdictions may have specific requirements built into their respective codes that make it difficult to adopt the regional model in full. In this respect, harmonizing local requirements can require action by the local elected body. This underlines the importance of broad participation in a regional working group that develops standards, so that problems with implementation may be anticipated and addressed in the developmental phase.

B. Examples of Regional Efforts to Streamline Solar Permitting

1. Long Island Unified Solar Permitting Initiative

A recent effort by the Long Island Power Authority (LIPA) provides a first-of-its-kind effort by a municipal utility, along with local governments and other industry stakeholders, to achieve regional standardization of residential solar permit review.[36] Long Island is made up of approximately one hundred towns and villages, with widely varying permitting requirements in each jurisdiction. The population of this region is nearly as large as some states in the country and industry participants indicated that the lack of consistency among the jurisdictions on Long Island created unnecessary expense in preparing and submitting solar energy system applications in different municipalities.

LIPA has a successful solar rebate program that has led to the largest concentration of solar energy facilities in New York.[37] Recognizing the inefficiencies created by each jurisdiction having its own distinct requirements for residential solar permits, LIPA and the Planning Commissions of Nassau and Suffolk Counties took a leadership role in unifying the solar permit process for Long Island. The resulting Long Island Unified Solar Permitting Initiative sought to create a process for "standard" residential solar energy systems that would apply to 90 percent of all residential systems.[38] The Initiative represented the first joint effort between the Nassau and Suffolk County Planning Commissions, and the first time that local jurisdictions and these departments have worked together to develop any type of public policy.[39]

Given New York's strong tradition of local independence, LIPA took a collaborative and voluntary approach to achieving this goal. First, in developing the criteria and format of a unified application, LIPA worked closely and openly with industry stakeholders and the planning commissions of Suffolk and Nassau Counties.[40] In addition, since uniform permitting for solar energy systems could not be accomplished by fiat, LIPA took a creative approach to encouraging

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[36] Long Island Power Authority, Nassau County and Suffolk County Planning Commissions and LIPA Launch New Unified Solar Permit Initiative (LIPA Press Release) (September 23, 2011), available at: http://www.lipower.org/newscenter/pr/2011/092311-solar.html.
[37] *Id.*
[38] *See* Long Island Unified Solar Permitting Initiative Program Packet (Unified Packet) at 1 (Sept. 9, 2011), available at http://www.suffolkcountyny.gov/Portals/0/planning/publications/SCPCLIPAEnergy.pdf (document was sent to all local jurisdictions in Nassau and Suffolk counties).
[39] Video of LIPA Press Conference, David Calone, Suffolk County Planning Commissioner and LIPA Board Member, speaking at minute 3:55, *available at* http://www.youtube.com/watch?v=qRd9uWivzTE.
[40] *See* LIPA Press Conference, *supra* note 36.

local jurisdictions: it provided cash grants of $15,000 to towns and $5,000 to villages that adopted the unified process early to help defer the costs of the transition.[41]

The Long Island "Solar Energy System Fast Track Permit Application" process has three primary components that will be uniform across the adopting jurisdictions in Long Island.[42] First, for systems that meet fast track eligibility, the application fee must be waived or must not exceed $50. Second, the local jurisdictions must complete review and provide a determination within 14 days of submittal of the application. Lastly, and perhaps most importantly, the fast track application itself is uniform.

LIPA's approach of offering grants to local jurisdictions to assist in the implementation of the unified permitting process is a proven success. As of this article, all ten towns in Suffolk County and one town in Nassau County have adopted the unified permit process through code revisions, entitling them to the full $15,000 cash grant for implementation. LIPA has indicated that it will extend this offer, at a reduced grant amount, to encourage the remaining jurisdictions to move quickly to adopt the procedures.[43] While fewer villages have taken advantage of the grant available to them, the success of the incentive means that a significant portion of Long Island's population will be covered by the unified permit, a fact that could represent a critical mass that encourages other local jurisdictions to follow suit going forward.

LIPA's role as a municipal utility helped to motivate its interest in permitting reform. LIPA's charter includes the economic development of Long Island as one of its organizational objectives. As LIPA states, permit reform furthers the goal of wider customer adoption of rooftop solar, which is consistent with LIPA's mission and charter. For this reason, LIPA funded the cash grants to local jurisdictions out of its general fund using ratepayer dollars.

2. East Bay Green Corridor: Solar Permitting Initiative

The East Bay Green Corridor (Green Corridor) is a partnership of nine mayors and academic institutions in the San Francisco Bay Area. Its mission is to create a thriving region of clean energy innovation, commercialization and local economic development, leveraging the assets of UC Berkeley and the Lawrence Berkeley National Laboratory.[44] The Green Corridor's Principals identified development of a regional standardized solar permitting process as its top policy priority.[45] As a result, the Green Corridor is driving standardized permitting across nine jurisdictions as part of two DOE SunShot Initiative consortium grants focusing on permitting, inspection, interconnection and financial models.[46]

Green Corridor hopes to establish a regional standardized permitting process, and to create a model that addresses a variety of city processes, recommends policy guidelines and develops transition and implementation plans that are scalable enough to apply to other jurisdictions throughout the state and nation. It intends to streamline both process details, including submittal checklists, turnaround times, fees, and application requirements, as well as technical

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[41] *Id.*
[42] Unified Packet at 4, supra note 38.
[43] Based on conversation with Michael Deering, LIPA Vice President of Environmental Affairs and Todd Stebbins of LIPA.
[44] *See* East Bay Green Corridor Profile, *available at* http://www.ebgreencorridor.org/corridor_profile.php.
[45] All information regarding the East Bay Green Corridor, unless otherwise cited, is based on conversations with Carla Din, Director of the East Bay Green Corridor.
[46] *See* East Bay Green Corridor: Regional Solar Policy Initiative, *available at* http://www.ebgreencorridor.org/solar_policy.php.

guidelines, including fire access, roof framing, slope, and aspects of the inspection process. The effort will likely also include trainings with the contractor community in the hopes of getting buy-in and cooperation, and may culminate in a "pre-qualified" list of contractors eligible for an expedited process. The goal is to unveil the proposed guidelines in the fall of 2012, with implementation beginning during the winter of 2012.

3. County Standardization Efforts

With some exceptions, county governmental agencies generally do not possess authority to mandate requirements that cities within the county must adopt. But like the regional efforts above, county government institutions may be an effective conduit to encourage regional standardization of solar permitting. This subsection reviews two recent examples where local partnerships with county-level departments have facilitated standardization of solar permitting processes: Pima County, Arizona and Sonoma County, California. While the permit standardization initiatives are just getting underway at the time of writing this report, the use of regional standards from these counties could be instructive to other regions looking to adopt a model of standardization.

Pima County, Arizona, which contains Arizona's second largest city, Tucson, has recently developed a standard solar permitting process that should soon be adopted by all jurisdictions within the County.[47] Through its U.S. DOE Solar America Cities work, Tucson partnered with officials from Pima County to lay the groundwork for regional standardization.[48] Representatives from the cities, Pima County, and industry stakeholders all worked in collaboration with the common goal of removing barriers to greater solar adoption in the region. Significantly, the Pima County standards are based closely on the Solar ABCs *Expedited Permit Process*,[49] which is discussed in more detail in Section IV.B.1. While the standards for permitting will be mostly uniform, there will be some variation as not all jurisdictions have online permit processing capability. However, as part of the move toward standardization, Tucson and other jurisdictions are interested in moving toward adopting similar technologies to make the process as efficient and similar as possible.[50] The implementation of standardized permitting in Pima County is just getting underway, so the respective city and town forms and websites do not yet reflect the agreed-upon changes.

Sonoma County, California has taken a leadership role in supporting standardization of the permitting processes through the "Solar Sonoma County" organization. Solar Sonoma County is a consortium of local businesses, elected officials, city governments and individuals, which got its start as a partnership between the City of Santa Rosa and the group's founders. With the City of Santa Rosa's assistance, Solar Sonoma County received a Solar America Cities grant to "create a countywide solar implementation plan"[51] to "streamline and standardize solar policies for all local governments."[52] Specifically, the Solar Sonoma effort aims to create a countywide

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[47] All information regarding the City of Tucson, unless otherwise cited, is based on a conversation with Bruce Plenk, Solar Coordinator, City of Tucson.
[48] *See* Tucson, Arizona: Solar in Action: Challenges and Successes on the Path toward a Solar-Powered Community, DOE/GO-102011-3221 (2011), *available at* http://www.nrel.gov/docs/fy12osti/50204.pdf.
[49] Bill Brooks, Solar America Board for Codes and Standards, Expedited Permit Process for PV Systems (Oct. 2011), *available at* http://www.SolarABCs.org/about/publications/reports/expedited-permit/.
[50] Based on conversation with Bruce Plenk, Solar Energy Coordinator, City of Tucson.
[51] http://solarsonomacounty.org/aboutus3.aspx (history of Solar Sonoma County).
[52] http://solarsonomacounty.org/uploads/documents/PressKitforWebsite.pdf (*See* Solar Sonoma County Press Kit).

permit application, an ongoing training mechanism to keep stakeholders up-to-date on new technology, and a central database of permitting submittal requirements by jurisdiction.[53]

As a result of the U.S. Department of Energy's Rooftop Solar Challenge, which awarded funds to 22 regional collaborations, it is apparent that regional efforts will continue to be a popular forum for addressing the challenges of solar permitting going forward.[54] These efforts have great promise to increase the consistency of requirements region-wide, if not nationwide, and appear to be one of the more efficient methods for encouraging change across a number of different municipalities.

Regional Coordination for Climate-Specific Conditions

Southern Florida is a region blessed with ample solar resources but it is also exposed to hazardous wind and water conditions during its annual hurricane season. Indeed the Florida Building Code contains specific provisions regarding this area, known as the "High-Velocity Hurricane Zone", that provide additional requirements for roofing and other materials to increase their chance of withstanding hurricane conditions. Because the region is subject to these unique building code requirements, the Miami-Dade County Board of Rules and Appeals established a working committee to develop minimum code requirements with regard to renewable energy installations. Broward County joined in the effort to enable uniform requirements in the region.

As a result of these efforts, in May 2009, the two counties implemented "Uniform Permit Submittal Guidelines for Solar Thermal and Solar Electric Installations in the High Velocity Hurricane Zone" and accompanying "Solar Thermal/Electric Instructions and Recommendations." These documents specify requirements that solar installations must comply with to meet wind loads and other requirements in accordance with the Florida Building Code. They also set out some suggestions on implementation of these requirements through the permitting process that are intended to help streamline the permit review. These suggestions include the development of a master permit for solar thermal and solar electric installations and a procedure that enables inspections to be completed within a two-hour timeframe.

This multi-county effort provides a good example of an action taken to deal with unique code requirements and climactic conditions that could have otherwise acted as a hurdle to solar installations. In addition, the effort was done on a regional basis, thereby providing consistency to installers operating in the region.

For information on these requirements see: Florida Building Code, 2007, section 4401-4413. "Uniform Permit Submittal Guidelines for Solar Thermal and Solar Electric Installations in the High Velocity Hurricane Zone" and accompanying "Solar Thermal/Electric Instructions and Recommendations." Available at *www.broward.org/CodeAppeals/Documents/SolarThermalElectric.pdf* (visited Mar. 14, 2012).

[53] Based on email correspondence with Alison Healy, Executive Director of Solar Sonoma County.
[54] *See* U.S. DOE Rooftop Solar Challenge Web Page, http://www.eere.energy.gov/solarchallenge (link to "Team Activity Matrix" has detail on award recipients).

IV. The Local Permitting Process

As Chapter II discusses, in most states, city and county governments have control over the process governing the issuance of solar permits, leading to a patchwork of solar permitting requirements across the United States. While underlying code requirements and legal structures vary, nevertheless the basic steps for obtaining those permits takes on a familiar form across the country. This chapter outlines the key procedural steps that commonly make up the local permitting process for rooftop solar. This chapter also identifies reforms taken by jurisdictions across the country to increase the speed, efficiency and clarity of the different components of the permitting process. The examples given will not be applicable in every jurisdiction, but can illustrate the variety of solutions available to improve the process, often in a manner that benefits solar applicants, the local government, and sometimes other non-solar permit applicants, as well.

A. Pre-Application: Access to Information on Solar Permit Requirements and Procedure

In effect, the permitting process actually begins before an application for a permit is submitted. The information that is made available about the permitting procedures, technical requirements and other expectations can make a meaningful difference in the efficiency and effectiveness of the process for both the applicant and the municipality. As demand grows for the installation of solar PV and solar thermal systems, municipalities have begun to develop written and electronic resources targeted towards solar customers and installers to provide them the information they need to submit applications for local permits.

Providing these resources to solar installers can be useful to municipalities in a number of ways. If available in readily accessible locations, such as on a solar-focused municipal website or in paper form in the permit office, these resources can reduce the number of questions that a municipal staff has to answer. They can also increase the quality of applications submitted, thereby decreasing the time required for review and lessening the frustrating back-and-forth that installers and city staff may otherwise experience. These resources can be particularly helpful for new installers or those that are new to that specific jurisdiction. If a jurisdiction has requirements that may be unique or unusual for the area, it is particularly valuable for the jurisdiction to identify them clearly. This can ensure that system installers are aware of technical requirements when they are in the system design stage or of process requirements when they submit their application.

1. Permitting Checklists

Numerous municipalities have developed permitting checklists that provide one document enumerating all the items and information that an applicant needs to prepare for the permitting process. An applicant sometimes submits the checklist with the permit application to indicate that all of the items on the list are included in the submittal; in other cases, the municipality merely provides the checklist to the applicant for informational purposes. Certain municipalities have created multiple checklists depending upon the technology (solar PV or solar thermal), system type (residential or commercial) or system size, where different requirements apply. In some cases a checklist is merely a simple list of required information for use by the reviewing body, but it is also possible to use checklists and other informational documents as an opportunity to educate installers about common errors and considerations.

Some of the jurisdictions that have prepared Permitting Checklists include:

- **Boulder County, Colorado** has prepared a Solar Photovoltaic Systems Checklist[55] and a Solar Thermal Systems Checklist,[56]
- **Miami-Dade County, Florida** has a Solar Systems Permit Document Guideline,[57] which acts as a checklist for both solar PV and solar thermal systems.
- **Tucson, Arizona** provides a Residential Photovoltaic Template,[58] which contains a checklist for both the Electrical and Structural Elements of a permit application.
- **San Jose, California** has a Solar Photovoltaic System 2010 CEC Residential Inspection Checklist,[59] which provides a detailed list of technical requirements for a system.
- **Berkeley, California** has an Applicant Checklist for Solar PV Panel Installations, which is currently being updated,[60] and a similar Applicant Checklist for Solar Thermal Hot Water Installations, which provide a list of the application requirements for both system types.[61]
- **The State of Oregon**'s Building Code Division has a Checklist for Prescriptive Photovoltaic Installations in accordance with Section 305.4,[62] which it provides for the use of local jurisdictions implementing the statewide Oregon Solar Installation Specialty Code, described in more detail in Section II.C.1.
- **Maui County, Hawaii** has a "Permit Requirements for Photovoltaic Systems, Wind Turbines and Windmills" [63] document, which serves as an educational document intended to answer questions that may commonly arise. It provides a narrative description of the relevant procedures that apply to the permitting of certain renewable energy systems, including the type of contractor's license that is required, when a building permit is necessary, and the enclosures that must accompany an application form.

2. Other Guidance Documents

A number of jurisdictions have gone beyond the checklist and have put together comprehensive guides or documents that cover the technical requirements, process and other elements in greater detail.

Portland, Oregon has a set of resources available on their website that provide some of the simplest and most comprehensive explanations of the permit process available in the United States. The city has developed two sets of guides, one for commercial and one for residential installations.[64] The guides explain what constitutes a complete permit application, where the application should be submitted, and how the review process proceeds. They also contain information on the technical requirements that will apply along with sample drawings. In addition, Portland has prepared a simple step-by-step slideshow that walks an installer through

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[55] http://www.bouldercounty.org/find/library/build/b46solarphotovoltaicchecklist.pdf (Jan. 21, 2011).
[56] http://www.bouldercounty.org/find/library/build/b48solarthermalchecklist.pdf (Dec. 17, 2010).
[57] http://www.miamidade.gov/building/library/guidelines/solar-systems-permit.pdf.
[58] http://cms3.tucsonaz.gov/sites/default/files/dsd/Permit-review/residentialphotovoltaicelectrical_ii.pdf.
[59] www.sanjoseca.gov/building/PDFHandouts/SolarChecklistIII.pdf.
[60] http://www.cityofberkeley.info/uploadedFiles/Online_Service_Center/Planning/ApplicantCheckListforSolarPanelInstallations.pdf (Jan. 2009).
[61] http://www.cityofberkeley.info/uploadedFiles/Online_Service_Center/Planning/Applicant%20Checklist%20for%20Solar%20Thermal%20Hot%20Water.pdf (Mar. 2009).
[62] http://www.cbs.state.or.us/bcd/programs/solar/state_solar_checklist_100710.pdf.
[63] County of Maui, Permit Requirements for Photovoltaic Systems, Wind Turbines and Windmills, Procedure No. DSA 18.0, Dec. 2, 2009.
[64] http://www.portlandonline.com/bds/index.cfm?c=36814&a=195360 (residential guide) (Dec. 1, 2010); http://www.portlandonline.com/bds/index.cfm?c=36814&a=193776 (commercial guide) (Dec. 1, 2010)

the process they will go through at the city's permitting office.[65] Together these resources provide a clear explanation of Portland's procedures and requirements.

Philadelphia, Pennsylvania has also prepared comprehensive guides that are available on their website providing details on the entire solar installation process.[66] The guides provide an introduction to solar technologies, detail on system design, incentives, and step-by-step instructions for proceeding through the permitting process. The PV guidebook contains "checklists, process flow diagrams and worksheets summarizing the requirements for electrical, building and zoning permits."[67]

San Diego, California has developed an Information Bulletin entitled "How to Obtain a Permit for Installation of Solar Photovoltaic Systems" that "is published to guide you through the permit process for renewable energy projects."[68] The document outlines when a permit is required, what the submittal requirements are, information on special circumstances such as historical buildings, references to special procedures that may apply, the fee schedule for PV systems, and information on the plan check process and inspections. It also contains a link to other relevant documents including PV plan templates developed by San Diego, inspection guidelines, and other relevant information bulletins. The city has also prepared a number of publicly available slide decks that provide overviews of the permitting and inspection process that can help lead installers through what to expect and prepare for in the process.[69]

Boston, Massachusetts provides a "Solar Boston Permitting Guide,"[70] developed as part of the city's involvement in the U.S. DOE's Solar America Cities program. The Guide serves as a resource for Boston residents, businesses and solar installers to help them navigate the solar development process. It includes information related to different solar technologies; the evaluation of whether solar makes sense at a particular location and, related to that, Boston's Solar Boston map; state and federal financial incentives for solar; how to find a solar installer; and, finally, the permitting and interconnection processes for systems built in Boston.

San Jose, California passed an ordinance in 2008 that made modifications to its Municipal (Zoning) Code in order to provide for a simplified permit process for solar systems.[71] As part of these modifications, San Jose published an Informational Handout that provides an overview of permitting requirements for PV Systems. The "Photovoltaic Systems Plan Review and Permitting Requirements" document explains which systems need to go through electrical or building plan review and other details about the permitting process.

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[65] City of Portland, Solar Permitting Process, *available at* http://www.portlandonline.com/shared/cfm/image.cfm?id=193279.
[66] The City of Philadelphia, Guidebook for Solar Photovoltaic Projects (Philadelphia Solar Guidebook) (March 2011) and the Guidebook for Solar Hot Water Heating Projects (December 2011) are both *available at* http://www.phila.gov/green/solarGuidebook.html.
[67] Philadelphia Solar Guidebook, *supra* note 66 at 4-8.
[68] City of San Diego, How to Obtain a Permit for Installation of Solar Photovoltaic Systems, Information Bulletin 301 (June 2010), *available at* http://www.sandiego.gov/development-services/industry/pdf/infobulletin/ib301.pdf.
[69] City of San Diego, Residential Solar Photovoltaic Systems, http://www.sandiego.gov/development-services/news/residentialsolar.shtml.
[70] City of Boston, Solar Boston Permitting Guide (rev. Sept. 2011), *available at* http://www.cityofboston.gov/Images_Documents/Solar%20Boston%20Permitting%20Guide%20NEW%20Sept%202011_tcm3-27989.pdf.
[71] City of San Jose, Ordinance No. 28320 (June 6, 2008), *available at* http://www.sanjoseca.gov/planning/pdf/Ord28320.pdf.

Scottsdale, Arizona also made some revisions to its local ordinances to assist with solar permitting, discussed in more detail in Section IV.B.2.b and has put together a "Residential Solar Plan Review Quality Submittal Guidelines" [72] document. The Guidelines provide information on submittal requirements for solar systems, including application checklists, interpretations of the applicable codes and regulations, and specific placement design guidelines.

3. Websites and Electronic Resources

In addition to specific checklists and guides, a municipal solar-specific webpage is an effective way to share information with installers and improve the efficiency of the permitting process. As part of the jurisdiction's larger website, the webpage may contain links to all of the solar-related forms, resources and information that an applicant may need, all in one place. If part of a regional effort, a website containing all relevant information for participating jurisdictions could be useful. While this does not sound revolutionary, IREC has found that it is relatively uncommon for jurisdictions to have comprehensive websites that truly provide a one-stop location for residents, businesses and installers to get information on installing solar systems.

Some of the cities that have prepared websites targeted specifically at solar or other renewable power include: **Berkeley, California**,[73] **Denver, Colorado**,[74] **San Jose, California**,[75] **Philadelphia, Pennsylvania**[76] and **Portland, Oregon**.[77] Many of these cities participated in the U.S. DOE's Solar America Cities program and were able to channel resources from that effort towards development of these websites. Categories of information that might be of use on a jurisdiction's solar specific website and/or in one of the guide's mentioned above include:

- **The jurisdiction's permitting requirements that apply to solar systems**, including: application requirements and forms, checklists, informational bulletins, inspection requirements, special provisions, Solar Access Laws, Frequently Asked Questions and more. The most user friendly websites have this information on one page rather than referencing documents located on other parts of a jurisdictions website.
- **Links to other regulatory or private entities that may be involved in the permitting process**, including: the municipal or public utility responsible for interconnecting the solar system and possibly providing incentive programs and state regulatory bodies, such as the Public Utilities Commission, which may have information on solar incentives and requirements, and other related information and resources.
- **Links to additional informational resources**, such as information related to determining solar irradiance, how to find and evaluate a solar service provider, and available incentives and financing options.

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[72] City of Scottsdale, Residential Solar Plan Review Quality Submittal Guidelines (Sept. 2010), *available at* www.scottsdaleaz.gov/Assets/Public+Website/bldgresources/Residential+Solar+Plan+Review+Quality+Submittal+Guidelines.pdf.
[73] City of Berkeley, Energy & Sustainable Development, Solar & Renewables, *available at* http://www.cityofberkeley.info/ContentDisplay.aspx?id=37808.
[74] City of Denver, Solar Panel Building Permit Requirements, *available at* http://www.denvergov.org/tabid/436502/Default.aspx.
[75] City of San Jose, Go Solar in San José!, *available at* http://energy.sanjoseca.gov/solar/default.asp.
[76] City of Philadelphia, Solar City Partnership, *available at* http://www.phila.gov/green/solar.html.
[77] City of Portland, Welcome to the City of Portland's Solar Energy Program, *available at* http://www.portlandonline.com/bps/index.cfm?c=43478.

Entities other than cities have also provided solar-permitting-related web sites. For example, the Solar One Stop is a multi-agency, collaborative effort led by **Pima County, Arizona** and the City of **Tucson, Arizona,** which has a website that provides information on permitting, incentives, utilities, local installers and other information.[78] The website includes a "Regional Permitting Requirements Table" that provides basic information and links for permitting for multiple cities, tribes and the county.[79]

B. Solar Permit Application Submittal and Review Process

The formal process of obtaining approval for a rooftop solar system begins with the submission of an application for a solar permit. Depending upon the jurisdiction, the actual name of the permit can vary; some refer generally to a solar permit, while others generically refer to building or electrical permits. In reality, the permitting process for solar systems often involves review for building, electrical, mechanical, plumbing and/or fire code compliance depending on the system design, and a separate permit can be issued for each type of review. In some jurisdictions, a single application is submitted for the permitting process, but in others an application form must be submitted for a permit under each of the separate codes. In almost all jurisdictions, fees are associated with permit submittal and review.

The following sections discuss (1) the application form, and the creation of a solar-specific application form; (2) the application submittal and review processes, and improvements made to expedite these processes; and (3) the fees associated with application submittal and review.

Portland, Oregon Field Issuance Remodel (FIR) Program

Portland's FIR program was originally developed for residential remodelers but it is now available to solar contractors. The goal of the FIR program is to facilitate rapid plan review and inspection processes. First, the contractor registers with the program and pays the associated fee. Then, in exchange for fees for services, a designated FIR inspector works with the contractor in the field to issue all necessary permits and advise the contractor of any planning or zoning issues with the project. All aspects of the project are covered by FIR, including: plan reviews; partner bureau or agency reviews, such as planning and zoning and structural engineering reviews; permit processing; pre-job meetings; consultations and follow-ups; and field inspection. As of July 1, 2011, the fees for the FIR program included a one-time registration fee of $233 per contractor and a fee for services of $172 per hour or fraction of an hour. Use of a model similar to FIR might provide an option to expedite review, either alone, or conjunction with other methods discussed herein.

For additional information on Portland's FIR program generally, see Portland Bureau of Development Services' Field Issuance Remodel Program Guide *(May 13, 2009), available at* http://www.portlandonline.com/bds/index.cfm?a=138766&c=36814, *and* Building and Other Permits Fee Schedule *(July 1, 2011), available at* http://www.portlandonline.com/bds/index.cfm?a=102792&c=34184.

For additional detail on the FIR program as applied to solar permitting, see Portland Bureau of Development Services' presentation City of Portland Solar Permitting Process *(April 17, 2008), available at* http://www.portlandonline.com/shared/cfm/image.cfm?id=193279.

[78] Solar One Stop, *available at* http://solaronestopaz.org/.
[79] Solar One Stop, Regional Permitting Requirements, *available at* http://solaronestopaz.org/Portals/0/documents/Regional-Permitting-Requirements.pdf.

1. Solar-Specific Permit Application Form

In addition to, or sometimes combined with, the permitting checklists described above in Section IV.A.1, some municipalities have developed solar-specific permit applications that identify the precise information that is needed to process a permit for a solar installation. These solar-specific permit application forms can act as a single application for permits necessary under all codes. Like the checklist and guidance documents, a solar-specific permit application form has a number of benefits for both installers and municipalities, including increasing the quality of applications and installations and reducing the number of questions from installers and the associated drain on municipal resources. In particular, the exercise of developing a solar-specific permit application can aid a jurisdiction in evaluating the information that is relevant to solar permits, which in turn helps to ensure that installers include all the information needed for a solar-specific permit review. By contrast, a more general application form may not be precise enough and may result in repeated back-and-forth between installers and municipal staff. There could also be certain informational requirements in the general application that may not be necessary for the review of a solar application, which can be eliminated and save time for both installers and municipal staff.

As discussed more in Section IV.B.2.c, when a solar-specific application is launched in conjunction with an online-submittal system, it may be possible for a city to bar submittals that lack key information or at least flag those entries for the installer to show missing information. An online system may also provide a link to the jurisdiction's review requirements next to a request for information to aid the installer in understanding how to provide the necessary information and why it is needed.

The following communities have developed solar-specific applications:

- **Miami-Dade County, Florida** has a Solar Systems Roof Permit Form[80] designed specifically to obtain appropriate information for roof permits necessary in the High Velocity Hurricane Zone.
- **Phoenix, Arizona**'s Solar Water Heating System application distills the required information down to one page.[81]
- The **Vermont Public Service Board** has prepared solar specific applications for Certificates for Public Good for projects from 5 kW to 150 kW and a "registration" document for projects under 5 kW.[82]

In addition, the Solar America Board for Codes and Standards (Solar ABCs) *Expedited Permit Process for PV Systems*[83] provides a model application form and associated information requirements that jurisdictions can use to develop a permit application for most residential systems. As discussed in the Introduction to this report, achieving relative consistency in permitting requirements around the country may be one of the most significant ways to help to lower the transactional costs overall. Thus a number of jurisdictions have relied upon the Solar ABCs *Expedited Permit Process* to guide in the development of their application forms and requirements. The Solar ABCs model does not address every aspect of a local jurisdiction's rules but covers most key components. Cities using a standardized form may find that the applications they receive have greater accuracy, as the installers will be familiar with the information requested.

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[80] http://www.miamidade.gov/building/library/permits/solar-roof.pdf.
[81] http://phoenix.gov/webcms/groups/internet/@inter/@dept/@dsd/@trt/documents/web_content/dsd_trt_pdf_00464.pdf.
[82] http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/netmetering.
[83] Brooks, *supra* note 49.

2. Application Submittal and Review Process

The process for submitting a permit application and obtaining review varies significantly from jurisdiction to jurisdiction, due in part to the level of technology utilized and the manner in which the jurisdiction manages staff time. Permit submittal processes generally fall into three different categories, though it is common for jurisdictions to include multiple options or to have a process that includes different aspects from each category. Each process is discussed in more detail in the following subsections:

- **In-Person Submittal with Later Review**: The applicant delivers the application and supporting documentation to the building department in person, and may meet with a plan-checker to go over the plans, but full review does not happen until a later date. Often the applicant needs to return to the building department to obtain the approval documentation. In IREC's experience, this is the most common submittal and review process. Jurisdictions have improved this process by expediting review in various ways, as discussed below.
- **Over-the-Counter Submittal and Review**: The applicant submits the application and any supporting documentation in person at the building department office and plan review occurs at that time, allowing the applicant to leave with the permit if approved. Over-the-counter submittal reflects an improvement in the permit submittal and review process where it can be reliably done without long wait times. However, it is typically available only for certain projects, and only in a limited number of jurisdictions.
- **Online or Electronic Submittal and Review**: In its most complete form, the application is filled in online, plans are submitted electronically, comments from the staff are provided and tracked electronically, and notification of permit approval is provided online or via e-mail. A full online process is still relatively uncommon, though some jurisdictions have implemented a partial-online or electronic process.

The permit application submittal process has become a crucial point of concern for solar installers because it can require significant company time to comply with the traditional submittal process with later review or to wait in line for over-the-counter review. An applicant must prepare the application materials, physically deliver them to the building permit office, wait in line for plan review, and return to the building permit office when review is complete to pick up the signed permit and plans.[84] With the exception of jurisdictions that have modified their processes to respond specifically to the needs of solar customers and installers, the procedures that govern the submittal and approval of a solar permit are typically the same as those that apply to all other municipal customers seeking a building permit. The process can be similarly burdensome for those applicants, but the competitive nature of the solar market presents a special challenge. Along with pricing competition from other solar installers, the companies also need to keep costs lower than what the customer would otherwise be paying to purchase power from their utility. That upper limit on pricing, often combined with the renewable energy goals of a state, enhances the need to make improvements to the permitting process for solar projects. Nonetheless, many of the improvements discussed herein could be made to benefit more than just solar applicants. IREC has heard from a number of communities that solar is acting as the "tail that wags the dog" in creating momentum for the transition to electronic permitting that benefits all applicant types.

In order to reduce the costs associated with the permitting process, solar installers are seeking reductions in the amount of time their staff must spend shepherding each individual application through the local process. Cities and counties across the United States have responded with a

[84] *See* SunRun, *supra* note 3.

variety of different techniques to help improve the efficiency of their procedures. At times these procedural improvements are specific to solar, but often they are implemented more broadly and all permit applicants are eligible for their benefits. The following discussion highlights four different methods of improving the permit submittal and review process that are being implemented across the country.

a. Expedited Review for Pre-Qualified Projects, Plans or Installers

In evaluating when it may be possible to expedite an application for a solar project, municipalities often identify two key factors: (1) the experience and qualifications of the installer and (2) the complexity of the installation. Taking into account these factors, municipalities have developed review processes that enable certain pre-screened applicants and/or projects to proceed more quickly through the review process. These fall into three rough categories: simple system pre-qualification; plan templates or pre-approvals; and installer pre-qualification.

i. Simple System Pre-Qualification

A number of jurisdictions have implemented an expedited permitting process for projects that meet certain technical criteria, generally focused on smaller residential systems using a common design format. The prerequisites for these expedited processes often overlap with the recommendations made in the Solar ABCs *Expedited Permit Process for PV Systems*,[85] but jurisdictions have integrated their own unique criteria. Some of the most common qualifications include:

- Rooftop installations on residential structures;
- A maximum weight per square foot, generally five pounds per square-foot;
- Minimum clearance range around the equipment;
- Maximum height above the roof surface; and
- Panels and inverters installed per manufacturer's specifications.

Along with variations in the criteria, jurisdictions have different methods of providing expedited review to the qualified projects, though the most common is to provide over-the-counter review and/or to allow the project to skip the building plan review process.

San Jose, California and **Philadelphia, Pennsylvania** have exempted systems that meet certain criteria from the building plan review process that would otherwise apply to all solar systems. It is expected that most residential installations will be able to meet the criteria, which are as follows:

- Equipment weight is not greater than five pounds per square-foot (both);
- Maximum concentrated load at each point of support is not greater than 40 pounds (San Jose) or 45 pounds (Philadelphia);
- Maximum height above the roof surface does not exceed 18 inches (both);
- PV panels are installed on the rooftop (both);
- PV panels are not ballasted (San Jose), or are pre-engineered ballasted or on a mounting structure with attachments both designed for a wind load of 90 mph (Philadelphia); and
- Project is under 10 kW (Philadelphia only).[86]

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[85] Brooks, *supra* note 49 at 1.
[86] City of San Jose, Photovoltaic Systems Plan Review and Permitting Requirements, *available at* http://www.sanjoseca.gov/building/PDFHandouts/1-10Solar.pdf; City of Philadelphia, Streamlined Standard

In both cases, qualification enables a system to skip the building plan review process, but each expedited procedure has slightly different process components. In San Jose, the Building Division also does not require electrical plan review prior to obtaining a permit, though during inspection the plan will be reviewed at the job site. In Philadelphia, an applicant can obtain the streamlined combined permit at the electrical permits counter without needing to go to the building permit counter. Philadelphia also provides an alternate option for a streamlined permit for projects that still require a building permit. To qualify for this process "the system must be 10kW or less, be composed of four or less series strings, and have a total inverter capacity of less than 13.44kW, with all materials, devices and equipment labeled and listed by a certified testing agency."[87] This streamlined permit can be granted within 1 to 3 business days, whereas a standard permit requires a full plan review and takes 20 to 25 business days to be completed.[88]

The **Long Island Unified Solar Permitting Initiative**, discussed in detail in Section III.B.1, also includes a fast-track process. The fast track application consists of a checklist that determines whether a solar energy system is considered "standard," and thus eligible, a list of submittal requirements, and a standard information form.[89] The plan submittal requirements are designed to require no more detail than is necessary to determine if a project meets standard criteria.[90] The requirements are similar to those in San Jose and Philadelphia, but are a bit more detailed.[91] Perhaps the most rigorous requirement in the fast track process is that the applicant must provide "a letter from a Professional Engineer or Registered Architect certifying that the existing structure can support the additional gravity and wind loads of the solar energy system."[92] Other jurisdictions have also been moving away from the need for engineering or architect stamps for simple systems.

ii. Plan Templates or Pre-Approvals

In addition to or in lieu of allowing projects to skip the structural review stage, other jurisdictions have developed an expedited procedure that enables faster review for projects following pre-approved plans or using defined templates.

Honolulu, Hawaii has pre-screening process that recognizes the similarities in many solar installations and offers special treatment for standardized plans. This process, known as Materials and Methods Approval (MMA), enables an installer to submit a plan template, to the City via a letter, for a system design or designs that the installer commonly uses.[93] The City will then review the template for compliance with the relevant codes and, if approved, issue a unique MMA number to the installer for that design. Depending upon the design, the City will sometimes also allow for a limited number of pre-approved variations to be included in the

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for 1 & 2 Family Dwellings Solar PV System Installations (Philadelphia Streamlined Standard), *available at* http://business.phila.gov/Documents/Permits/Solar_PV_install_guide.pdf.

[87] Philadelphia Streamlined Standard, *supra* note 86.

[88] *Id.* at 4-10.

[89] *See* Town of Riverhead, Solar Energy Fast Track Permit Application (Riverhead Application), *available at* www.riverheadli.com/Solar.Permit.pdf.

[90] *See* Video of LIPA Press Conference, *supra* note 39 at minute 4:30 (David Calone speaking).

[91] *See* Riverhead Application, *supra* note 89 at 2.

[92] *See, e.g., id.* at 3.

[93] Information regarding the MMA process was gathered via e-mails and phone calls with Honolulu's Department of Planning and Permitting staff, including Timothy Hiu, Acting Building Division Chief and Glenn Yokomichi, Chief of the Electrical Code Branch.

design to provide flexibility for application to different customer sites. For example, the pre-approved template may allow up to a specified number of panels, or may include a list of five different inverter types that can be used with the design. Upon receipt of the MMA number, the next time the installer has a project using a design that matches the MMA parameters, the installer can submit an application for the necessary permits using the City's online system. If the MMA number is valid, the applicant can then skip the plan check process, avoid traveling to the City's offices and proceed directly to the inspection process.

At the time of inspection, the installer is required to present a copy of the site plan showing the equipment location and panels on the roof layout, and a copy of the approved one- or three-line diagram annotated with the inverter and number of PV panels. If the inspection is passed, the diagram and site plan are scanned into the system as a record of what was installed under the permit. Using this record, the inspection process proceeds normally. If the installer fails to follow the pre-approved design template associated with the MMA number, however, the installer will fail the inspection and have to re-submit their application utilizing the traditional plan check process. Occasionally developers attempt to take advantage of this process by using designs that are not pre-approved, but the consequences of having to repeat the review should act as an effective deterrent. It is also possible that a jurisdiction using a similar approach could consider other fines or penalties if abuse becomes common.

The MMA process has proven to be popular in Honolulu. It saves installers significant time by reducing the number of design documents that must be developed for each installation, and eliminating the need to travel to the City offices to go through the plan check process. For the period from January 1 to February 14, 2012, there were 268 PV permits obtained online using MMA numbers, as compared to 609 permits obtained using the normal walk-in method.[94] In addition, the City believes it is likely that a significant number of those processed using the walk-in method could also qualify for the MMA process.

San Diego, California uses an expedited plan review for solar projects that is similar to the Honolulu MMA process but also incorporates elements of the simple system pre-qualification processes in San Jose and Philadelphia. San Diego developed a "Residential PV Plan Template" that enables it to provide fast, over-the-counter review by appointment for projects using the template.[95] The template is available for use by residential PV projects that are installed on a sloped roof with a panel weight of five pounds per square-foot or less. The template consists of three PV plan sheets that are to be modified to reflect the actual project-specific details.[96] When the plan sheets are submitted along with the manufacturer's specifications for the proposed PV panels and inverters, the project qualifies for over-the-counter review as well as slightly reduced permitting fees.[97] Commercial projects, and residential projects that do not meet the criteria above, are required to comply with more significant submittal requirements and are not always eligible for over-the-counter review.

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[94] Information provided via email correspondence with Glenn Yokomichi.
[95] City of San Diego, How to Obtain a Permit for Installation of Solar Photovoltaic Systems, Information Bulletin 301 (San Diego Bulletin 301) (June 2010), *available at* http://www.sandiego.gov/development-services/industry/pdf/infobulletin/ib301.pdf.
[96] City of San Diego, Development Services Department Residential Photovoltaic (PV) Plan Template, *available at* http://www.sandiego.gov/development-services/news/residentialsolar.shtml.
[97] San Diego Bulletin 301, *supra* note 95.

Vermont also has a streamlined pre-approval process that essentially pre-approves net-metered systems less than five kW in capacity.[98] Applicants file notice of their system and utilities have up to ten days to object to approval of these systems, once they have submitted a registration form. If no objections are made, the systems may proceed with construction and interconnection. Vermont's solar project review process is discussed in more detail in the text box above.

iii. Installer Pre-Qualification

In addition to the simple system pre-qualification and plan template and pre-approval processes described above, a number of jurisdictions have expressed interest in a process where projects proposed by pre-qualified installers could be expedited. City officials often note that in practice they have learned which installers can be trusted to submit complete and accurate applications, and subsequently properly install systems. Given this experience, a more formal system of installer pre-qualification may be possible.

The **Long Island Unified Solar Permitting Initiative**, discussed above and in detail in Section III.B.1, includes a requirement that an installer comply with all licensing requirements and "be named on the pre-screened installer list on LIPA's website."[99] Other jurisdictions have similar lists of qualified installers.

Portland, Oregon allows contractors to use its e-submittal process, described in Section IV.B.2.c, if the contractors have demonstrated familiarity with the Oregon Solar Installation Specialty Code and have successfully applied for PV permits via the traditional in-person submittal process.

Further-reaching approaches could include allowing installers with the necessary qualifications who install systems within a defined set of parameters to proceed directly to the inspection process. The qualifications could be based upon certification from a nationally recognized body such as the North American Board of Certified Energy Practitioners (NABCEP). Alternately, it could be based upon a record developed by the installer operating in that jurisdiction or region. For example, a jurisdiction could pre-qualify installers that have successfully installed five systems that passed the plan review and inspection without necessitating any major modifications.

b. Over-The-Counter Review

In many jurisdictions, building departments have instituted a policy of issuing over-the-counter solar permits. Applicants submitting permits over-the-counter must provide complete and accurate applications, so that the staff can expedite processing by minimally verifying that all the necessary information is provided and is compliant with codes and review standards. Due to the expedited character of this review, the types of permits that are available for over-the-counter review are usually limited to residential permits, and sometimes limited to only certain types of residential permits. If an application is complete and in compliance, agencies will often issue a permit to the applicant on the same day, while the applicant waits. The relative speed with which an over-the-counter permit can be issued will vary according to the level of staffing,

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[98] *See,e.g.,*Vt. Stat. tit. 30, § 219a(c)(1); VT PSB, Registration Form for Net-Metered Photovoltaic Systems with Capacities of 5 kW or Less, *available at* http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/netmetering.

[99] Riverhead Application, *supra* note 89.

the comprehensiveness of counter staff training, their ability to complete the full review process without requiring multiple reviewers, and the variation in workflow of the office that waxes and wanes with construction activity.[100]

Over-the-counter permit issuance has several advantages over traditional submission and review processes. For example, an over-the-counter process allows the applicant to wait while the application is reviewed, meaning that the applicant is there to clarify any questions from the reviewers or make last minute modifications to the application to ensure it can be processed. In this way, an applicant may avoid a second trip to the permit office, saving miles travelled and employee time. This also saves time for the municipality. However, this advantage also carries an inherent risk. If the permit office happens to be busy on a given day, the applicant may have to wait a considerable time just to have the plans accepted for review, since the most common practice with over-the-counter permitting is to serve customers on a first-come, first-serve basis. Thus, the over-the-counter option may fit the needs of applicants that are willing to wait and need the permit issued as soon as possible, but it also may not be the most efficient way to process, in terms of the time that an applicant must commit to waiting for review.[101]

The best over-the-counter processes have figured out how to managed staff time and demand in a way that avoids long wait times. Some methods include allowing applicants to make appointments in advance and/or providing certain days or windows of time when the qualified staff will be on-hand for review. It is often the case that an installer may have multiple applications that they would like to process at one time, this may create congestion for other contractors seeking permits that day. Rather than simply limiting the number of plans that can be reviewed at one time, municipalities using an appointment system could plan ahead to have sufficient staff on hand. This could create an immense savings for solar installers who otherwise have to make multiple trips to a permitting office when the task could be accomplished in a single visit.

Scottsdale, Arizona has one of the most successful over-the-counter permit processes that IREC has encountered and it reported some of the fastest plan review times. According to building department officials in Scottsdale, counter reviewers are typically able to review standard residential plans—including solar and non-solar projects where the applications are complete—between twenty and forty minutes from beginning of review to issuance of permit. As a way to ease the backlog of reviews, which was delaying the review of more complex commercial plans, the department decided in 2006 to streamline residential plan review by creating an expedited over-the-counter process.[102] At this time, Scottsdale typically has three qualified plan reviewers available to assist in plan review, with one person assigned to the counter at any given time. Additionally, two of the three reviewers are qualified to complete both structural and electrical review, adding to the ability to quickly review and issue permits.

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[100] As the authors found almost uniformly across jurisdictions, the economic downturn in 2008 significantly reduced construction activity and the number of permits being sought. Many departments had to reduce staffing over this time.

[101] SunRun, *supra* note 3 at 6.

[102] All information regarding Scottsdale, not otherwise cited, is based on conversations and email correspondence with Dustin Schroff, Senior Plans Examiner, and Michael Clack, Chief Development Officer, City of Scottsdale.

In other jurisdictions structural and electrical review are not always combined, and may add extra steps to the process. For example:

- **Philadelphia, Pennsylvania** allows streamlined review through the electrical permit counter, but may require an applicant to secure a building permit—at a different counter—prior to seeking the electrical permit if the installation does not meet the streamlined structural standards.[103]
- **Irvine, California** offers a separate electrical review, but it may not be required, unless the department determines that the installation is too complex for expedited over-the-counter review.[104]

It is important to note that Scottsdale's over-the-counter process is designed to facilitate residential applications broadly, and is not geared toward or modified to benefit solely solar applicants. The efficiency and structure of Scottsdale's over-the-counter process does benefit solar permit applicants, but it is also limited to residential systems that meet standard submittal criteria. That said, a majority of solar permit applications are suitable for processing over-the-counter. Scottsdale reported the installation of roughly 320 PV systems and 180 solar hot water systems in 2011.[105] Coupled with a flat fee for residential applications, Scottsdale's over-the-counter review process is a good model for lowering the time and expense of obtaining a permit and it has accommodated a significant number of rooftop systems.

Much of the credit to Scottsdale's efficiency appears to be due to the department's emphasis on customer service, and not necessarily on the clarity or simplicity of requirements to solar applicants. According to building officials, the department has a policy of returning calls and e-mails on all inquiries within a twenty-four hour period. While what would constitute adequate staffing will vary according to department size and the level of business coming through the door, Scottsdale's model of two plan reviewers "floating" and able to meet rising demand at the counter is noteworthy. Scottsdale provides for online submissions as well, which enables the plan reviewers who are not assigned to the counter to process online submissions when times are slow at the counter. Through this level of staffing in the plan review phase, Scottsdale is also able to accommodate plan review of most online submissions by the next business day after submittal.

Unlike Scottsdale, some jurisdictions offer over-the-counter reviews, but do not always encourage applicants to use that option. For example:

- **Phoenix, Arizona** processes a fair number of its residential solar applications over-the-counter, but has instituted a limit of two applications per applicant, per day in that process.[106] Alternately, an applicant may drop off as many applications as they like, and most will be reviewed within three business days.
- **Tucson, Arizona** encourages permit applicants to drop off submittals, to take pressure off of the staff to accommodate the fluctuations in activity levels. As officials in several Arizona jurisdictions indicated, many developers are pleased to either submit applications online or

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[103] *See* Philadelphia Solar Guidebook, *supra* note 66.
[104] City of Irvine, Counter Review for Residential Solar Photovoltaic Systems, *available at* http://www.cityofirvine.org/cityhall/cd/buildingsafety/permit_processing_center/residential_photovoltaic_systems/default.asp.
[105] Based on data collected for Scottsdale's Green Building Coordinator. Shared with the authors via email correspondence from Dustin Schroff.
[106] All information on Phoenix, unless otherwise cited, is based on conversations and email correspondence with Phoenix's Residential Building & Permits Department.

to drop off multiple applications at one time and wait several days for permits to issue.[107] Presumably, this is because a developer or installer with lots of projects in the queue will have plenty of work to do in the meantime and is not held up waiting for a permit review that takes three additional business days.

Over-the-counter processes can provide additional benefit when its requirements are simple and clear. In this way, over-the-counter processes can reduce the up-front cost of preparing an application as well as the cost of submitting and waiting for approval. For example:

- **San Jose, California** can accommodate most single-family residential solar permits through a simple, one-page application.[108]
- **Sacramento, California** allows applicants that satisfy a solar checklist to proceed over-the-counter.[109]

Berkeley, California provides a final example of a successful strategy for helping more projects obtain approval over-the-counter. The City has prepared a special document entitled "Conditions of Building Permit Approval for Solar PV Panel Installations" that it uses in lieu of a correction letter during the plan review process for easily correctable, common deficiencies.[110] City staff circle particular corrections on the list that need to be made and if the applicant then self-certifies that she or he will correct the problem, the City will approve the permit over the counter with the Conditions of Approval form attached. The circled item will then be verified during the inspection process. This enables more projects to proceed through over-the-counter review but still ensures safe installations.

c. Online or Electronic Permitting

Advocates for improved solar permitting efficiency have increasingly focused on the potential of online permit submittal and review processes. As the Internet becomes a common part of most transactions in the United States, it is unsurprising that its benefits may prove useful in this area as well. However, the initial costs associated with purchasing, implementing, training and maintaining software and accompanying hardware can be significant and may be difficult for jurisdictions to justify without a clear path to economic recovery for those investments. An online permitting system has the potential to offer numerous streamlining benefits for both customers/installers and jurisdictions. The specific features of each system will vary but the features that offer the most promise are described below along with some examples of how jurisdictions are starting to use them.

When an application and supporting materials are submitted online, municipal staff can immediately access them and do not need to enter the information manually. As discussed above in Section IV.B.1, by creating an online application form a jurisdiction can require that specific fields be filled in depending upon the answers provided to other questions. In addition, the form can contain links to informational boxes that provide more detail on the type of information being sought or the reasons why the information is necessary, which may improve the accuracy of responses. In essence, the computer can serve some of the "verification"

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[107] Based on conversations with building department officials in Phoenix, Scottsdale, and Tucson.
[108] *See* City of San Jose, Environmental Services Department Web Site: Solar Permits, *available at* http://energy.sanjoseca.gov/solar/solar-permits.asp.
[109] Solar PV Permit Packet 81611: City of Sacramento Guide to Solar Energy Permits, *available at* www.cityofsacramento.org/dsd/documents/Solar_PV_Permit_Packet_81611.pdf.
[110] City of Berkeley, Conditions of Building Permit Approval for Solar PV Panel Installations, available upon request from the City.

functions that a staff member reviewing an application for errors or omissions may otherwise have to do.

Once the application has entered the system, multiple personnel may work on reviewing the materials at the same time, and track the review progress and comments made by different departments. Some communities find the improved recordkeeping and archiving of permitting decisions to be valuable as well. Advanced systems provide automatic notification to relevant personnel and can include deadlines for review or other reminder functions. Comments can be entered online, enabling easy communication with other staff members as well as the applicant.

Indeed, online permit submittal systems can be an important way for a jurisdiction to communicate with an applicant about their permit application. If there is an online web portal that records the path of a permit application through the review process, installers can follow the status of their applications, reducing the number of phone calls and office visits made to obtain the same information. Through a web portal or e-mail communication, the jurisdiction can automatically notify an applicant of the status of their application, the need for additional information, and the approval or denial of a permit. This increases the ability of applicants to make revisions quickly without having to travel back to the municipal offices. Applicants can also pay their permit fees online and the city can keep track of the revenue information automatically.

The electronic submission of plans is one of the more significant hurdles that jurisdictions have to overcome in adopting a fully online permit system. It may require the jurisdiction to obtain special software and/or hardware to enable review of plans in a satisfactory manner. One temporary option that may avoid some of these issues is to allow applicants to submit plans via email or on a CD. As for the acceptance of electronic signatures, however, a federal law passed in 2000 made electronic signatures legally acceptable and most if not all states have since adopted the law or a similar version thereof.[111]

The benefits described highlight some of the capabilities of permitting software, though not every jurisdiction implements each of these components, or at least all at one time, as the examples below demonstrate. Online permitting is still a new concept for most cities and full implementation of all the potential features may take time.

i. Florida's ePermitting Tools

The Permitting and Environmental Regulation (PERA) Department of Miami-Dade County, Florida was an early-adopter of electronic permitting, beginning as early as 2002.[112] Though PV solar installations are increasing in this area, a flood of solar applications did not drive the County's adoption of this process; instead it came about because the Building Department wanted to create innovative "web based" ePermitting tools to expedite and improve the permitting process. The value, ease of use, and convenience of the various ePermitting systems and tools was

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[111] *See* Uniform Electronic Transaction Act (UETA), developed by the National Conference of Commissioners on Uniform State Laws, *available at* http://www.ncsl.org/issues-research/telecom/uniform-electronic-transactions-acts.aspx; *see also* Electronic Signatures in Global and National Commerce Act, Pub. L. No. 106-229, 114 Stat. 464 (2000) (codified at 15 U.S.C. § 7001 *et seq*.) (applies to the three states that have not adopted the UETA).

[112] Information provided via phone and e-mail communication with Boris Sursky, Roofing Plans Processor, Department of Permitting, Environment & Regulatory Affairs, Miami-Dade County. *See also* http://www.miamidade.gov/development/.

demonstrated by providing a solution to the extremely high demand for roofing permits following a major hurricane.[113]

There are currently two ways to submit permit materials electronically within the unincorporated portions of Miami-Dade County: (1) the Concurrent Plans Processing System (CPP), where permit documents are provided as PDF files saved to a CD that are hand-delivered to the Building Department office; or (2) completely online through the Department's ePermitting website.[114]

When an application is submitted via a CD, the application is assigned a process number, which enables the applicant to go online to track the status of the permit applications as it moves through the system. Permit applications, plans, and document submitted and downloaded into the CPP system are available electronically on plan reviewer's desktops in multiple departments for simultaneous review, thus expediting the permitting process. The permit documents are reviewed, marked up, and either denied or approved electronically. After the application is submitted no further trips to the Building Department are required, as long as no permit corrections are necessary. The applicant can pay the required fees, track the status of their permit review, and see any comments on their permit application (and thereby make corrections and modifications more quickly) on the website. After the permit application materials have been received, it generally takes 24 to 48 hours to complete the review process. The applicant is notified by e-mail when the permit review is complete, or if any permit document corrections are required. Once the permit has been issued, an applicant can pay the requisite fees online, print a permit card, schedule an inspection, and even track the progress of the assigned inspector online.[115] Although the County has developed a solar-specific permit application, at this time PV Solar permit application can only be submitted by dropping the materials off at the office for review through the CPP system. However, the Department hopes to allow the submittal of all permit documents into the CPP system through Electronic File Transfer sometime in the future.

The ePermitting Application system is an automated permitting process that is available to properly licensed and insured contractors through a secure website. These applications can be submitted directly online for subsidiary and stand-alone permits for roofing, electrical, mechanical, plumbing, and gas trades. The ePermitting system links together and verifies addresses, licenses, material approvals, and permit forms, to provide up-to-date information and documents. If the required standard forms that are part of this system are completed correctly, the permit can be reviewed, approved, paid for, and available for printing online.

ii. Sacramento Streamline Program

The City of Sacramento, California[116] is poised to launch one of the most comprehensive online-permitting systems in the country as a part of their "Sacramento Streamline Program."[117] The City is adopting a process that will enable most permit applications submitted to the Community

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[113] Boris Sursky, Making it easier: Miami-Dade County Uses Technology to Meet Exceptional Permitting Demands, Professional Roofing (June 2007), *available at* http://docserver.nrca.net:8080/technical/9055.pdf.
[114] Miami-Dade County, E-Permitting Application Website, *available at* http://www.miamidade.gov/building/applications/e-permitting.asp.
[115] Sursky, *supra* note 113.
[116] All information regarding Sacramento, unless otherwise cited, was gathered via phone calls and e-mails with Erik de Kok, Senior Planner, Community Development Department, City of Sacramento.
[117] City of Sacramento, Sacramento Streamline, *available at* http://www.cityofsacramento.org/dsd/customer-service/sacramento-streamline.cfm.

Development Department, including PV and solar thermal systems, to be processed via this service. This provides a good example of how innovation driven by solar customers may benefit the broader construction community.

Using the new system, installers in Sacramento will be able to submit applications online via the City's website. If the solar project field is selected, the form will include specific questions relevant to those projects. Using a geo-locational function, the system will be able to identify any special issues associated with the exact site in question, such as location in a historic district. The applicants will be able to begin filling out the form at any time, and can save it prior to submitting if they need to gather more information or do additional due diligence.

After submitting an application, the applicant can upload plan materials, if prepared in a file format that meets system requirements. If not, the applicant can deliver the plans by hand.[118] If submitted electronically, the City will then be able to review the application and associated plans, enter comments or corrections, and notify the applicant of any need for additional information or modifications, all electronically. As with Sacramento's current review process, the City hopes to be able to complete review within one or two business days for most smaller-scaled residential solar systems.

Once the review is complete, the applicant will then be able to print the permit without coming to the office and will eventually be able to schedule an inspection online as well. Applicants will also have the ability to track the process of their applications online. The City will continue to offer a telephone "help-line" to assist with questions regarding the online system. The City has noted that some of the program implementation may occur in stages (e.g. E-Plan Check is already available), but when fully implemented this system is likely to be a leading example across the country.

iii. Portland's Email Submittal Process

The City of Portland, Oregon now offers e-mail permit submittal for PV projects that meet the Oregon Solar Installation Specialty Code requirements for Prescriptive Installations, described in more detail in Section II.C.1. E-mail submittal is available for contractors who have demonstrated familiarity with the Code and have successfully applied for PV permits via the traditional in-person submittal.[119] Once approved, contractors can submit the required electrical and building permit applications and plans via e-mail, saving a trip to the City offices. The City staff then enters the permit information into their system and routes the information for review by appropriate personnel. Review is generally completed within three business days, after which the applicant is notified via e-mail that they can come to the City offices to pick up and pay for the permit. [120] Applicants can then schedule inspections by phone via an automated inspection request system.

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[118] *Id.* (the city already is allowing commercial building plans to be "submitted electronically, reducing the need to submit hard copy building plans. Plans can be placed on disk or thumb drive and submitted at the public counter.").

[119] Information regarding Portland's permitting process was provided by Jaimes Valdez, Renewable Energy Specialist for the City of Portland.

[120] City of Portland, Solar Permitting in Portland, *available at* http://www.portlandonline.com/bps/index.cfm?c=47394&.

iv. City of Honolulu Online Application

The City of Honolulu, Hawaii has implemented a partial-online permitting system, whereby installers file their applications online via the website and are given a permit tracking number. Except when using the MMA process discussed above, however, the applicant is still required to visit the Department of Planning and Permitting offices to have their application materials reviewed by a plan checker. It is possible to schedule an appointment via the Department's website,[121] and an applicant can have up to two plans checked per appointment, and can schedule up to two appointments per day. The appointments are each 45 minutes long. After in-person review, the Department then processes the permit and the applicant can check the website to see when it has been approved. Review takes between two and three weeks. Once the plan check process is complete, the applicant returns to the office to pick up the plans and permit and can then schedule the inspection over the phone. The City is hoping to allow submittal of plan drawings and supporting documents later in 2012.

3. Solar Permit Fees

One of the ways that cities and counties pay for the permitting services that they provide is to assess fees for the issuance of permits, whether for a solar installation or any other project requiring a permit. Particularly in tougher economic times, these fees can be an important source of revenue and can enable a jurisdiction to have sufficient staff on hand to review and process applications. Fee calculation methods can vary widely across jurisdictions. A recent survey of fees assessed in California for typically sized residential and commercial systems shows the effects of different fee calculation methods. For example, for a 131-kW commercial system, the survey found numerous jurisdictions charging upwards of $30,000, while the average fee was $5,465.[122] For 3 kW residential systems, the survey found fees up to $1,400, with an average fee of $343.[123] Many of the fees are merely a result of application of general building permit fee tables rather than a specific accounting of the costs of providing permits to solar systems.

Although a variety of methods are used for setting permitting fees, one common method has been to assess fees based upon the overall costs or size of the project for which the permit is sought. This method, however, has been criticized when it comes to solar permits, as neither system costs nor size are necessarily reflective of the amount of time it takes a jurisdiction to process the permit application. As a result, there is a growing movement to seek to reduce or waive the permit fees that apply to solar systems, both to reflect the actual amount of work required, and also to help encourage solar installations in accordance with a state's renewable energy goals. Solar permitting fees have been a frequent target for discussions on soft-cost reduction for solar installations, perhaps because they represent an obvious way to reduce dollars spent.

While permitting fees may be viewed as a hindrance to attaining price reductions in the solar market, the services that a jurisdiction provides in reviewing solar permits serve a vital health and safety function. Without sufficient safeguards to ensure systems are installed in compliance with relevant codes and standards, there is a risk that faulty installations could cause fires,

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[121] http://www3.honolulu.gov/DPPApptCalendar/default.aspx.

[122] Loma Prieta Chapter, Sierra Club, PV Permit Fees 131 kW Commercial Systems for 19 Surveyed California Counties (Sierra Club 131 kW Survey), *available at* http://www.solarpermitfees.org/PVFeesCaliforniaCommercial.pdf.

[123] Loma Prieta Chapter, Sierra Club, PV Permit Fees for 3 kW Residential Systems for 25 California Counties, *available at* http://www.solarpermitfees.org/PVFeesCaliforniaResidential.pdf.

damage to the nearby electrical grid, roof leakage or impairments in structural integrity, among other potential problems. Along with the harm to solar customers associated with such failures, the industry runs a risk of obtaining a questionable safety reputation that could hinder the expansion of the market, as happened in the early days of the solar hot water heating industry.[124] For this reason, it is worth recognizing that the jurisdiction's role is valuable and payment of a reasonable permit fee that compensates the jurisdiction for their labor may actually aid in the long-term sustainability of the rooftop solar market.

a. Determining Appropriate Fees

Either as a result of efforts by the solar community, or sometimes on their own initiative, jurisdictions across the United States have begun to evaluate whether their standard permitting fees are appropriate for solar installations. The Loma Prieta Chapter of the Sierra Club (Sierra Club) has been conducting a campaign in Northern California to encourage reasonable assessment of fees for solar installations, and thanks to its success, is now broadening that effort to include Southern California.[125] Their effort is illustrative of how improvements to permitting fees can be approached.

City of Sacramento Permit Fees

The City of Sacramento has directly implemented the Sierra Club approach to fees. "Permit fees for solar projects are determined by an hourly review rate, based on a pre-determined number of review hours for each system size level. Additional fees will apply for reviews that exceed the indicated number of hours due to project complexity or for multiple rounds of plan revisions." Residential solar projects over 10 kW that do not qualify for the standardized solar submission checklist will result in additional fees.

For more information see page 2 of City of Sacramento Guide to Solar Energy Permits: www.cityofsacramento.org/dsd/documents/Solar_PV_Permit_Packet_81611.pdf

The Sierra Club has pointed out that use of a valuation- or system-size-based fee structure is inappropriate when there is no evidence that an increase in size or value actually results in a proportionally greater expenditure of city or county resources to conduct the system review.[126] Rather, the Sierra Club recommends setting the fee based upon the amount of staff time it will take to process an application 80 percent of the time "assuming a well trained staff and a professional permit submittal/installation."[127] As the Sierra Club explains, "average plan review time should allow for one 2nd cycle minor correction review, but should be based on only the number of required inspections. Additional plan reviews or additional inspections should be assessed additional fees based on actual incurred costs. This fee methodology rewards

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[124] *See* Colleen Kettles and Tim Merrigan, Florida Solar Energy Center, Field Performance of Solar Water Heating Systems (Jul. 1994) at 1 (providing background on the reputation of solar hot water systems for reliability in the United States over time).

[125] Loma Prieta Chapter, Sierra Club, Reducing Local Barriers to the Installation of Solar Loma Prieta Chapter, Sierra Club, Reducing Local Barriers to the Installation of Solar Power Systems in California, *available at* http://lomaprietaglobalwarming.sierraclub.org/solar.php.

[126] Carl Mills and Kurt Newick, Loma Prieta Chapter, Sierra Club, Solar Electric Permit Fees in Northern California: A Comparative Study, at 3-4 (July 29, 2011) *available at* http://www.solarpermitfees.org/NorCalPVFeeReport.pdf; *see also* Arizona Solar Task Force, *supra* note 31 ("A flat-fee fee structure in lieu of a value-based method to assess permit fees provides transparency, streamlines process and ensures that larger systems are not arbitrarily penalized. Fees should adequately cover AHJ's time and costs associated with providing these services, inclusive of staff/consultant time needed for plan review.").

[127] Mills and Newick, *supra* note 126 at 3-4.

proficient customers with fees that reflect actual costs and does not subsidize the less competent."[128] In order to aid communities in determining a reasonable fee, the Sierra Club has developed a sample fee calculator that can be used to assess the amount of time that a jurisdiction spends on processing most permits.[129] The calculator can be modified based upon the specific review requirements, hourly staff rates, and other factors to help determine a rate that will allow the jurisdiction to reasonably cover costs without over-charging solar applicants. As described in the text box on page 39, Sacramento, California has used the Sierra Club's method to re-structure its permitting fees.

The efforts of the Sierra Club have brought wide attention to the solar fee issue in California, with a majority of jurisdictions adjusting their fees for residential systems in the areas in which the campaign has focused, and progress is being made on commercial fees as well.[130] Outside of California there is also growing attention to this issue. The Vote Solar Initiative's Project: Permit presents one example of a solar community-led, fee-reduction campaign that looks at fees across the country. As part of Project: Permit, The Vote Solar Initiative has launched a website that contains an interactive solar permit fee map that provides information on solar permitting fees in jurisdictions across the United States.[131]

In addition, some states have decided to take legislative action to mandate reasonable fees for solar systems.

- **Colorado** passed a Fair Permit Act[132] that states that if a PV system produces fewer than 2 MW of electricity or an equivalent-sized thermal solar system, state entities, counties, and municipalities may not charge permit, plan/application review or other fees that, in aggregate, exceed the lesser of: 1) the county's or municipality's actual costs in issuing the permit; or 2) $500 for a residential system or $1000 for a non-residential system. If a system is 2 MW or larger, state entities, counties and municipalities are prohibited from charging fees that, in aggregate, exceed the county or municipality's actual costs in issuing the permit. In addition, the county, municipality or state entity must identify all fees and taxes assed on an application.
- **Arizona** passed House Bill 2615 (2008), which among other things, implemented the principle that any permit fee assessed on a solar PV or solar hot water system must be "attributable to and defray or cover the expense of the service for which the fee or charge is assessed."[133] In some cities, such as Phoenix, this requirement was a departure from fee schedules based on system costs or value at the time of installation. The Phoenix Building Department's new flat fee of $300 represents the cost of servicing applications that meet all standard, over-the-counter criteria and only require one site visit by a residential inspector.[134]

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[128] *Id.*
[129] Kurt Newick and Scott Troyer, Loma Prieta Chapter, Sierra Club, PV Permit Fee Calculator for Commercial Rooftop Systems (Nov. 8, 2011), *available at* http://www.solarpermitfees.org/PVFeeCalcCommercial.xls.
[130] Sierra Club 131 kW Survey, *supra* note 122.
[131] Vote Solar Initiative, Solar Permit Map: Local Permitting Information for Small-scale PV Systems, *available at* http://votesolar.org/solar-map/.
[132] Fair Permit Act, HB 11-1199, *available at* http://www.leg.state.co.us/CLICS/CLICS2011A/csl.nsf/fsbillcont3/F3B0ACABC05F4CEA8725781D0073A2EB?Open&file=1199_enr.pdf; *see also* SB 08-0177 (2008), *available at* http://www.leg.state.co.us/CLICS/CLICS2008A/csl.nsf/fsbillcont3/1109D26989FEC52B872573D000791515?Open&file=117_enr.pdf.
[133] *See* Ariz. Rev. Stat. § 9-468.
[134] Based on conversation with Dwane Dover, Electrical Plans Reviewer, City of Phoenix.

- **California** has included a provision in its Solar Rights Act that says that fees "may not exceed the estimated reasonable cost of providing the service for which the fee is charged…"[135]

Such state legislation has the ability to create immediate permitting fee reductions across the entire state, but this approach has downsides. Section II.C discusses some of the possible drawbacks that may result from a state-led approach. Due to these drawbacks, there is an argument to be made for a more local, bottom-up approach to permitting fee reductions, or for an approach that allows municipalities to justify higher fees if necessary.

b. Fee Waivers

Certain jurisdictions that are particularly interested in promoting solar in their communities have chosen to waive permitting fees for solar systems altogether. Fee waivers can result in a meaningful reduction in system cost for residents and businesses in the city, and thereby spur the creation of jobs and help lower the energy costs in the community. However, jurisdictions considering a fee waiver should also evaluate whether they can continue to process the solar permits in an expeditious manner if they eliminate the revenue source.

The **City and County of Honolulu** passed an ordinance in 2008 that provides an exemption from plan review and building permit fees for the installation of solar PV systems.[136] However, as the number of solar installations in Honolulu has grown dramatically, it is becoming apparent that requests for improvements to the efficiency of the permitting process for solar are difficult to make when review of the systems consumes staff time that would otherwise be spent reviewing other permits where fees are assessed.

While solar installers and their customers may welcome the cost savings from the elimination of a fee, it may ultimately lengthen the time for processing the permit. If the processing time can be shortened through the payment of a reasonable fee, the solar industry may prefer to pay a fee in exchange for efficient permit review. Alternately, the jurisdiction may consider whether general funds or resources held in reserve for environmental initiatives could help in easing this concern.

C. Inspections

In most jurisdictions, the issuance of a permit by the local agency merely allows the contractor to begin installing the system. Final approval of the project does not occur until the installation has been completed and passed all inspections required by the jurisdiction. As stated in the Solar ABCs *Expedited Permit Process for PV Systems*, discussed above in Section IV.B.1, "[i]ncreasingly, local jurisdictions across the U.S. are placing less emphasis on the permit process and more emphasis on the field inspection process. This is a positive trend for the PV industry, as even the best permit package may do little to reduce challenges during a field inspection. Ultimately, the field inspection will illustrate how well a contractor is able to install a code-compliant PV system."[137]

Though inspections are an important part of ensuring system safety, they can sometimes represent a time-consuming and costly part of the permitting process for both cities and installers. In particular, the manner in which the inspections are scheduled, the amount of time

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[135] Cal. Gov't Code §66014.
[136] HONOLULU, HI., ORDINANCE 08-1 (2008) (amending REV. ORDINANCES § 18-6.5(f)).
[137] Brooks, *supra* note 49 at 2.

that they take to complete, the method for correcting errors and the process of finalizing the jurisdiction's approval after the inspection all present opportunities for streamlining, which may reduce the permitting costs for solar projects. In addition, inspector training especially focused on solar installations would likely improve the inspection process. Finally, although somewhat more difficult, jurisdictions have begun to consider the benefit of coordinating permitting inspections with the local utility's interconnection inspections.

1. Scheduling an Inspection and Inspection Timing

After receiving the necessary permits, applicants are required to schedule one or more inspections, either in person at the department, over the telephone or online. Most jurisdictions are able to schedule inspections within a day or two of request. The frequency and timing of the inspections is a critical cost component of solar installations for a number of reasons.

First, some jurisdictions require a rough or in-progress inspection, which is conducted after a certain portion of the electrical work has been done, but prior to completed installation of the PV panels or other work that would conceal the wiring.[138] In such cases, the work crew has to be put on hold while the inspection is scheduled and completed. This creates scheduling and staffing challenges for solar installers, who in certain cases might otherwise be able to complete installation in one day. The Solar ABCs Expedited Permit Process and the IREC Inspection Guidelines[139] provide information on how a jurisdiction can safely require only one inspection.

Second, most jurisdictions require that someone be onsite for the inspection, often an electrical contractor, but sometimes a certified engineer. The time spent traveling to the site and waiting for the inspector to arrive can add considerable cost to the project, particularly if an engineer is required.

Finally, and perhaps most importantly, jurisdictions vary in their ability to schedule an inspection within a reasonably precise window of time, and rarely schedule inspectors for a specific time. This may be due to variability in workload, staffing constraints and simple unpredictability of the time necessary for other inspections that may be scheduled in a day. Jurisdictions normally schedule inspections in blocks of time, sometime as short as a two-hour window, but sometimes as long as an entire day. Often the work onsite will be completed by this point, so this can be dead-time for a contractor who is required to wait onsite for an inspector.

Jurisdictions have begun to improve inspection scheduling in a number of ways. First, they are increasingly enabling contractors to schedule inspections online, and to pick time windows and dates that work well for them. Second, they are instituting methods of tracking the progress of an inspector that can reduce the amount of time someone is stuck waiting onsite. Some jurisdictions simply require the inspector to call 30 minutes prior to arrival. Other jurisdictions allow the applicant to physically track the progress of the inspector online to determine when they are likely to arrive at the customer's site.

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[138] *See, e.g.,* Boulder County, Solar Photovoltaic Systems Checklist, at 2 (The county requires a rough inspection "be scheduled after the installation of the solar PV racking system, grounding, and no more than 50% of the PV modules. Roof mounted junction boxes or DC combiner boxes shall also be installed and wires terminated.").

[139] Brooks*, supra* note 49 at 2; *see also* Brooks Engineering and Interstate Renewable Energy Council (IREC), Field Inspection Guidelines for PV Systems (IREC Field Inspection Guidelines) (2010), *available at* http://irecusa.org/wp-content/uploads/2010/07/PV-Field-Inspection-Guide-June-2010-F-1.pdf.

Third-Party Permit Reviews and Inspections

In some cases, a reviewing agency may allow independent, third-party review of permits, sometimes including solar permits. In these cases, a third-party entity is usually pre-certified in some way, at which point it is able to perform some or all of the permitting process—from permit and/or plan review to the inspection. The third-party typically is retained and paid for by the solar installer or property owner. For example, the Honolulu, Hawaii Department of Planning and Permitting (DPP) has allowed third-party review of building and electrical permits by certified third-party reviewers since 2005. Besides Honolulu, there are numerous jurisdictions around the United States that allow for third-party permit review to some extent, although not always for solar permits or for all of the elements of the permitting process.

Third-party review can speed up the permitting process, since it shifts some of the permitting burden from the governmental entity onto a third-party. It can be particularly helpful in managing the fluctuating rate of solar applications that sometimes occurs in conjunction with incentive cycles. In addition, it may give the solar installer and property owner increased certainty regarding the time and cost of permitting review. Some downsides of third-party review including potentially leaving the governments open to liability if problems with the third-party reviewer arise. Even if the government is not liable, if the third-party reviewer is not effective, the same issues with the permitting process discussed throughout this report may continue despite the third-party's involvement.

Jurisdictions with variable application flow may find that third-party review is worth considering. Another option may be to allow third-party review where an additional fee is paid, assuming this guarantees quicker review.

For more information see: Honolulu DPP Rules Related to Admin. Codes §§ 20-1-1; 20-2-9; 20-7-1–8 , available at http://www.honoluludpp.org/WhatsNew/3PRAdminRules.pdf; see also Honolulu DPP Third-Party Review Certification Form, available at http://honoluludpp.org/WhatsNew/ThirdPartyReviewCertification.pdf; Crystal Kua, Third Parties Can Now Expedite Building Permits, Honolulu Star Bulletin (Oct. 13, 2004), available at http://archives.starbulletin.com/2004/10/13/news/story9.html.

Miami-Dade County, Florida allows permit holders to request any of their required permit inspections online as part of its ePermitting process, discussed in detail in Section IV.B.2.c Scheduled inspections can also be canceled on the day of the requested inspection as long as it is done prior to 8 am. By using the Routes and Results link found on the web page[140] and entering the permit number, a permit holder can access their inspector's scheduled route for the day, and where their site falls in the inspector's order. On the Route and Results Page, the Inspector's phone numbers and photo are available. This enables anyone to contact them in the mornings for questions and to typically obtain a two-hour window of time when the inspection will occur. Using the Routes link allows the tracking of the inspector's location via a GPS system that is installed in the inspector's vehicle. At each stop on the inspector's route, the page is updated automatically showing the inspector's location and inspection number. Once the inspection has been finished the inspector enters the results prior to leaving the jobsite via a laptop computer and these "real time" inspection results are then available on the Department's website. An applicant can obtain these inspection results online.

[140] http://www.miamidade.gov/development/building-inspections.asp.

2. Inspector Training and Inspection Guidelines

A key tool to enabling jurisdictions to reduce the number of inspections is the provision of appropriate training and resources for the inspectors that enable them to know what to look for in a solar inspection. To aid with this process, and to continue to ensure that safe and reliable solar systems are the norm in the United States, IREC has developed *Field Inspection Guidelines for PV Systems*.[141] These guidelines aim to provide inspectors with a basic knowledge of how to inspect a PV system. The Inspection Guidelines "consolidate the most import aspects of a field inspection into a simple process that can be performed in as short as 15 minutes."[142]

In addition, IREC is developing a Photovoltaic Online Training (PVOT) platform as a method of instructing code officials nationwide in the key issues involved in granting permits and performing field inspections for residential PV installations.[143] The PVOT includes seven online training modules. The six basic learning modules encompass the major topics of concern for field inspection and expedited permitting, including: Roof Mounted Arrays and Wire Management, Electrical for Roof and Ground Mounted Arrays, Specifics of Ground Mounted Arrays, Appropriate Signage, Equipment Ratings, and Expedited Permitting. The seventh module is an immersive activity imbedded in an open-source, game-based framework with its own assessment. These trainings can be accessed, at no cost, by any jurisdiction. Moreover, all content developed is open source, and may be modified and repackaged by users to suit their specific training needs.

In addition, a number of jurisdictions have begun to develop resources that outline what will be required in their inspection processes to aid both inspectors and installers. Such guidelines can help to increase the consistency of the inspection process and ensure that all the important safety checks are made. For installers, this information can enable them to run through an inspection themselves to check for and resolve any potential problem areas prior to the arrival of an inspector. This improves the quality of the systems installed and also helps to reduce the costs associated with re-inspection.

Some examples of inspection guidelines can be found in:

- **San Diego, California**—Residential Photovoltaic Systems Inspection Guidelines[144]
- **San Jose, California**—Solar Photovoltaic System: 2010 CEC Residential Inspection Checklist[145]
- **Sacramento, California**—Photovoltaic Inspection Guidelines for Residential Interactive Systems[146]

3. Coordination with the Interconnection Process

Along with the permitting process governed by the local city or county, applicants are required to apply for interconnection with the local utility. The procedures that govern interconnection across the United States have improved significantly in the last few years. One area where little

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[141] IREC Field Inspection Guidelines, *supra* note 141.
[142] *Id.* at 3.
[143] http://www.irecusa.org/
[144] http://www.sandiego.gov/development-services/pdf/pvinspectionguidelines.pdf.
[145] www.sanjoseca.gov/building/PDFHandouts/SolarChecklistIII.pdf.
[146] http://www.cityofsacramento.org/dsd/customer-service/documents/Complete_Solar_GuidePacket_revised_121911.pdf.

progress has been made, however, is in improving the coordination and communication between the city or county and the utility regarding permit approval and interconnection. In addition to the permit-related inspection process, many utilities also conduct an inspection prior to allowing interconnection. Often utilities will not begin their interconnection review of a project until they have been notified that the local jurisdiction has issued the final, signed permit for the customer's facility. [147] Certain utilities and local jurisdictions have started to improve coordination between permitting and interconnection, but it has proven challenging, especially when a large utility serves many jurisdictions.

San Diego Gas & Electric, California's third largest investor-owned utility, has 22 cities and counties within its service territory. The utility has developed an efficient online net energy metering application and interconnection process for projects that are 30 kW or less, which allows utility review of the application, in most cases, within 24 hours. The utility requires that the building inspection have been completed prior to the utility inspection; however, rather than requiring that the customer forward on the signed copy of their building permit, SDG&E requires that the jurisdictional inspector "notify SDG&E's New Service Department directly."[148] This is accomplished through the city or county inspector emailing, calling, or faxing the solar release directly to the New Service Department. This is the same process as if a new electric meter was being released. SDG&E has been using this process for the last ten years. It is likely that in other parts of the country municipalities are also familiar with a similar notification process for new electric meters.

Santa Clara, California has been widely touted as having one of the most efficient permitting processes for PV systems in the United States because it is able to conduct both the building permit and interconnection review over-the-counter at the Building Department.[149] Santa Clara has a municipal utility, Silicon Valley Power, which has enabled the City to consolidate these review processes into one transaction. For jurisdictions with municipal utilities there are a number of compelling reasons why combining these review procedures can be more efficient and effective. With proper training, it is possible that the amount of staff required to review applications can be reduced if one individual can complete the intake for both the city and the utility.

Through its Rooftop Solar Challenge, the U.S. DOE has made several awards to groups proposing as one of their goals to facilitate coordination between permitting and interconnection.[150] In the coming years, it is possible that these groups will develop improved and novel ways to coordinate these two processes, and in particular, their inspection components.

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[147] *See, e.g.,* Pacific Gas & Electric Co., Application and Interconnection Agreement for Customers with Solar and/or Wind Electric Generating Facilities of 30 Kilowatts or Less, at 5 of 8, available at: http://www.pge.com/tariffs/tm2/pdf/ELEC_FORMS_79-1101.pdf (visited on Mar. 17, 2012).

[148] San Diego Gas & Electric, Net Energy Metering Application and Interconnection Agreement for Customers with Solar and/or Wind Electric Generating Facilities of 30 Kilowatts or Less, at 5 of 8, *available at* http://sdge.com/sites/default/files/documents/nem-30kw-interconnection_appl_0.pdf.

[149] City of Santa Clara, Building & Utility Permit in One-Stop Process for Solar Projects Innovative Service Allows Immediate Installation (Apr. 21, 2010), *available at* http://santaclaraca.gov/index.aspx?recordid=558&page=50.

[150] http://www.eere.energy.gov/solarchallenge (link to "Team Activity Matrix" has detail on award recipients).

V. Conclusion

The number of commercial and residential solar systems installed annually in the United States has grown from fewer than 2,000 to more than 50,000 in the past decade, placing intense pressure on local jurisdictions to develop consistent technical requirements for solar permitting and to process permit applications more rapidly.[151] As can be seen through the examples highlighted above, numerous states, regions, cities and counties have already taken steps to reduce fees, clarify technical requirements and increase the efficiency of their permitting procedures. These efforts demonstrate that a wide variety of different options are available to improve the process for both solar customers and local jurisdictions. The market for rooftop solar does not appear to be slowing down, however, and thus the need for innovative solutions remains high. IREC intends for this report to give states, counties, cities and other entities a sense of the number and variety of opportunities that exist for improving the efficiency of the permitting process in a manner that benefits everyone, including both local governments and the solar industry.

So, where to begin?

The first step may be to sit down and map out the path that a solar installer would take to obtain a rooftop solar permit in your community, using the steps in Chapter IV as a guide. Then, it may make sense to consider whether there are parts to the process that are unclear, or frequently the source of questions and delays. Such problems might be addressed quickly through providing clearer and more accessible information, for example on a one-stop solar permitting web page.

To help with the development of informational resources regarding local rules and procedures, IREC has prepared an annotated bibliography, which accompanies this report and is also available on our website.[152] The bibliography compiles useful examples of websites, guidebooks, checklists, applications and other documents discussed in this report, in addition to other background materials. By providing these various examples, IREC hopes to help local governments and others to identify the key components to include in their informational resources and to begin to think of ways to streamline procedures in a universally beneficial manner.

When it comes to reforming the actual technical requirements and procedures, this report looks at a variety of different techniques that communities have developed to improve standard permitting procedures. IREC also urges local governments and other stakeholders to look to what is going on in neighboring jurisdictions. Consistency in the permitting process across a region is helpful not only to solar installers but also local jurisdictions because it means that each jurisdiction does not need to "reinvent the wheel."

Finally, while IREC had chosen not to define specific best practices in rooftop permitting in this report, the following four common elements have arisen from the examples we have identified, suggesting that a framework for the efficient processing of rooftop solar permits is emerging. State governments, local governments and other entities may find it helpful to keep these four elements in mind when tackling the reform of permitting procedures.

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[151] IREC, 2011 Updates and Trends, *supra* note 5, at 17-18.
[152] http://www.irecusa.org/irec-programs/publications-reports.

- **Technical and procedural requirements that are relatively consistent across regions, and possibly the country, can offer significant efficiency benefits for both municipal governments and the solar industry.** When requirements are relatively consistent within a region, installers become familiar with those standards and learn efficient ways to comply with them. Installers benefit because they have to spend less time learning the particularities of each jurisdiction's technical and procedural requirements. Instead they can focus on designing safe and effective systems that can be installed at a low cost. Local governments benefit because the quality of the installations as a whole increases, and they have to spend fewer staff resources educating installers and enforcing compliance with procedures, codes and standards. Adoption of a consistent set of requirements can also be easier for municipalities because they can take advantage of other jurisdictions' knowledge and experience, and do not need to develop new standards.

- **Increased and readily available access to information about technical and procedural requirements reduces costs and increases safety across the board.** By providing clear and detailed information regarding the specific technical and procedural requirements associated with obtaining a solar permit, municipalities can help installers efficiently comply with requirements. Specifically, providing this information can help installers to plan ahead and incorporate the requirements into their design, and improve the accuracy and completeness of permit applications. Installers who take the time upfront to access the available information can reduce permitting and inspection failures, set clear expectations with their customers, and build trust with the local jurisdiction. Local governments benefit because they receive fewer requests for information and questions from installers, and fewer incomplete permit applications, all of which can be a drain on limited local resources.

- **Using simplified standards and processes that focus only on the elements relevant and necessary for solar installations can increase installer compliance rates.** Levels of review can be tailored to match the complexity of a system. Those that meet certain design criteria may be eligible for expedited review procedures. These expedited procedures can save time and money for both installers and local governments. At the same time, such simplified standards and processes should still ensure compliance with national codes and standards in order to protect health and safety.

- **Fees structures that are designed to fully compensate a jurisdiction for the time invested in reviewing an application will help maintain necessary staffing levels and also promote economic growth in the community by keeping solar permitting costs to a minimum.** Local governments provide an important service in permitting solar installations and reasonable fees can help ensure they provide a high level of service. Traditional valuation-based fee structures often penalize solar installers because the hardware costs for solar installations are high and their price does not translate to the amount of staff time required to process an application. Adoption of a fee structure tied to the amount of time it takes a local government to process most applications can compensate the local government while also encouraging local installations by keeping fees relatively low.

Some of the changes identified in this report, such as the publication of an informational guide or adopting a solar-specific application, can be adopted relatively quickly by a local jurisdiction. Others, such as moving to an online permitting system, will require more of an up-front financial investment and time to roll out. Since it is expected that the rooftop solar market will continue to grow rapidly and expand to new markets in the coming years, it makes sense for states, counties, cities and other entities to be proactive in addressing solar permitting in the near term. IREC hopes this report can help to inspire and guide communities towards approaches that make sense for them.

Annotated Bibliography

This annotated bibliography is intended to serve as a quick reference document. The ***reports and related resources*** *provide background and additional information regarding solar permitting and permitting reform. The remaining resources listed—the* ***legislation, codes and ordinances****;* ***guidebooks****;* ***websites****; and* ***checklists and applications****—consist of state and local examples intended to provide additional information, and possibly to serve as models for future efforts.*

REPORTS AND RELATED RESOURCES

Alexander Quinn et al., AECOM, *Economic and Fiscal Impact Analysis of Residential Solar Permitting Reform* (2011) http://www.sunrunhome.com/solar-lease/cost-of-solar/local-permitting.
In this report, AECOM evaluates the economic and fiscal implications of a streamlined local government permitting system for installing solar PV systems on residences in California between 2012 and 2020. The report aims to estimate the incremental growth in the solar industry, the increased revenues to cities and counties, the number of additional jobs created and other beneficial impacts that could result from permitting reform.

Bill Brooks, Brooks Engineering, Solar ABCs, *Expedited Permitting Process for PV Systems* (1st rev. 2011) http://www.solarabcs.org/about/publications/reports/expedited-permit.
This report presents an expedited permit process for small-scale PV systems. This process is intended to simplify the requirements for the contractor submitting a permit request and reduce the time needed for the local jurisdiction to provide structural and electrical review of the permit application.

Brooks Engineering, Interstate Renewable Energy Council (IREC), *Field Inspection Guidelines for PV Systems* (2010) http://irecusa.org/wp-content/uploads/2010/07/PV-Field-Inspection-Guide-June-2010-F-1.pdf.
This report provides the basics of a PV system inspection so that a field inspector can take this framework and develop the experience necessary to perform these inspections quickly and thoroughly. The report clarifies several important issues of concern and provides a detailed checklist for the field inspector, so that fewer poorly designed and installed systems will be approved.

California Solar Initiative, Go Solar California, *A Step by Step Tool Kit for Local Governments to Go Solar* (2009) http://www.energy.ca.gov/2009publications/CEC-180-2009-005/CEC-180-2009-005.PDF.
This Tool Kit provides an array of strategies and options that local governments can implement to help encourage solar developments in their region, which can be tailored to meet the individual circumstances of each municipality. Some of these suggested strategies include: amending general plans, incentivizing energy efficiency measures and solar installations, and educating local homebuilders about existing solar incentives.

Damian Pitt, Network for New Energy Choices, *Taking the Red Tape Out of Green Power* (2008) http://www.newenergychoices.org/uploads/redTape-rep.pdf.
This report focuses on municipal-level planning and permitting obstacles to solar PV and small wind energy systems, and discusses ways to overcome these hurdles. The report also identifies policies from states and municipalities that have successfully streamlined certification and permitting guidelines, and provides recommendations to overcome permitting hurdles.

Energy Efficiency and Renewable Energy, U.S. Dep't of Energy (DOE), *Solar Powering Your Community: A Guide for Local Governments* (2d ed. 2011) http://solaramericacommunities.energy.gov/pdfs/Solar-Powering-Your-Community-Guide-for-Local-Governments.pdf.
This guide is a comprehensive resource created by the U.S. DOE to assist local governments and stakeholders in designing and implementing a strategic local solar plan. This guide includes examples and models that have been field-tested in cities and counties around the country, many of which have resulted from the DOE's Solar America Communities program.

Kurt Newick & Scott Troyer, Loma Prieta Chapter, Sierra Club, *PV Permit Fee Calculator for Commercial Rooftop Systems* (2011) http://www.solarpermitfees.org/PVFeeCalcCommercial.xls.
Sierra Club developed a Microsoft Excel tool to help local jurisdictions calculate a reasonable solar PV permitting fee that enables cost recovery. The calculator considers the types of reviews and review-hours needed to conduct a comprehensive permit review for different sized systems.

Loma Prieta Chapter, Sierra Club, *Reducing Local Barriers to the Installation of Solar Power Systems in California*, http://lomaprietaglobalwarming.sierraclub.org/solar.php.
This website compiles Sierra Club reports that analyze and compare solar permitting fees in various California counties. The studies publicized major disparities in the fees charged by different cities and led to actions by 24 cities (in Silicon Valley) to significantly reduce their fees, and a total of 52 cities (in the greater Bay Area region), removing this small but important barrier to the installation of solar PV.

SunRun, *The Impact of Local Permitting on the Cost of Solar Power* (2011) http://www.sunrunhome.com/solar-lease/cost-of-solar/local-permitting.
This report provides recommendations for steps the U.S. DOE should take to launch a residential solar permitting initiative. The report also illustrates that the average costs of local permitting and inspection add $0.50 per watt, or $2,516 per residential install, due to variations in processes, excessive fees and other cumbersome practices.

The Vote Solar Initiative, *Project: Permit*, http://votesolar.org/permitting-toolkit.
This website provides a compilation of data and an interactive map of current permitting practices around the country. The online toolkit contains a model ordinance, best practices guidelines, solar permitting petition and other useful resources.

U.S. DOE, *Solar America Communities*, http://solaramericacommunities.energy.gov/.
This website provides information and resources coming out of the DOE's Solar America Communities program that was launched in 2007. A number of the Solar America cities focused on reforms to their permitting processes and the website contains information on these efforts and general information on how to improve permit processes more generally. The Solar Powering Your Community: A Guide for Local Governments report can be found on this website.

U.S. DOE, *SunShot Rooftop Challenge*,
http://www.eere.energy.gov/solarchallenge.
This website provides information and updates about the U.S. DOE's Rooftop Challenge, a program of the SunShot Initiative. Twenty-two regional teams from across the country were awarded grants under the Rooftop Solar Challenge, with a goal of making rooftop solar PV installations easier, faster, and cheaper for homeowners and businesses. These collaborative teams are working toward implementing streamlined and standardized processes that will dramatically improve local market conditions. In addition to details on these efforts, the website provides a range of useful permitting-related resources.

LEGISLATION, CODES AND ORDINANCES

Arizona House Bill 2615, 48th Leg. (2d Reg. Sess. 2008)
http://www.azleg.gov/legtext/48leg/2r/bills/hb2615s.pdf.
House Bill 2615, signed in May 2008, represented an effort to make the solar permitting process more uniform across Arizona. First, HB 2615 removed the requirement that permit applications should include an engineering stamp, unless the local jurisdiction provides a written explanation for why one is needed. Second, it required local permitting fees to be "attributable to and defray" the actual costs the local agency incurs in processing a permit. Finally, under HB 2615, applicants are required to submit standardized information, such as the location of panels, one-line and three-line electrical diagrams, and cut sheet and listings for inverters.

Colorado Fair Permitting Act, H.B. 11-1199, 68th Leg. (1st Reg. Sess. 2011)
http://www.leg.state.co.us/clics/clics2011a/csl.nsf/billcontainers/F3B0ACABC05F4CEA8725781D0073A2EB/$FILE/1199_enr.pdf.
Colorado's Fair Permitting Act, signed in 2011, extended and modified the solar permitting fee limitations put in place in 2008 by S.B. 08-117. The Fair Permit Act limits the authority of local jurisdictions in deciding what permitting fee they will charge to solar customer. Specifically, it caps the fees a local jurisdiction can charge systems two MW or smaller at the lesser of (1) the county's or municipality's actual costs in issuing the permit or (2) $500 for a residential system or $1000 for a non-residential system. If a system is two MW or larger, state entities, counties and municipalities shall not charge fees that, in aggregate, exceed the county's or municipality's actual costs in issuing the permit. In addition, the county, municipality or state entity must identify all fees and taxes assed on an application.

Vermont Energy Act of 2011, H.56 (Leg. Sess. 2011-2012)
http://www.leg.state.vt.us/docs/2012/Acts/ACT047.pdf.
The Vermont Energy Act of 2011 provides, in § 219a(c)(1), that net-metered solar facilities five kW or smaller must simply register at the State Public Service Board and declare that they comply with certain limited interconnection requirements. Utilities (and no other entities) have ten days to object to the facility, but only if its interconnection raises concerns. If no objections are made, a certificate of public good—essentially a permit—"shall be deemed issued" on the eleventh day, with no paper permit required unless requested. At this point, system construction may begin.

Oregon Solar Installation Specialty Code (Oct. 2010)
http://www.cbs.state.or.us/bcd/programs/solar.html.
The Oregon Building Codes Division has a webpage devoted to the Oregon Solar Installation Specialty Code (OSISC). The OSISC includes structural standards, requires reasonable fees for the issuance of building permits and similar documents, and describes the inspection and plan review services by the Department of Consumer and Business Services. This website includes links to the:

- **Oregon Solar Installation Specialty Code,**
  http://www.cbs.state.or.us/bcd/programs/solar/solar_code/100110_OSISC.pdf;
- **OSISC Commentary (guide),**
  http://www.cbs.state.or.us/bcd/programs/solar/OSISC_commentary.pdf; and
- **Checklist for Prescriptive PV Installations,**
  http://www.cbs.state.or.us/bcd/programs/solar/state_solar_checklist_100710.pdf.

San Jose, Cal., Ordinance No. 28320 (June 6, 2008)
http://www.sanjoseca.gov/planning/pdf/Ord28320.pdf.
This ordinance amends the City of San Jose's municipal code to include solar PV systems, provide a PV height exception on certain types of buildings and facilitate the permitting of these facilities.

GUIDEBOOKS

City of Boston, *Solar Boston Permitting Guide: A Resource for Building Owners and Solar Installers* (2010)
http://www.cityofboston.gov/Images_Documents/Solar%20Boston%20Permitting%20Guide%20NEW%20Sept%202011_tcm3-27989.pdf.
The Solar Boston Permitting Guide was developed as a resource for residents, businesses and solar installers to help navigate the solar project development process. It aims to provide information to help property owners evaluate whether solar makes sense for their buildings, how to use the Solar Boston map, and how the permitting and interconnection process works for systems built in Boston, among other things.

City of Philadelphia, *Guidebook for Solar Photovoltaic Projects* (2d ed. 2010)
http://www.phila.gov/green/PDFs/PhillySolarGuidebookFinal.pdf.

City of Philadelphia, *Guidebook for Solar Water Heating Projects* (2011)
http://www.phila.gov/green/PDFs/Guidebook%20for%20Solar%20Water%20Heating%20Projects%20First%20Edition.pdf.
With support from the U.S. DOE Solar America Cities Program, the City of Philadelphia designed these Guidebooks for developers of residential and commercial solar PV and solar thermal systems to address procedures related to solar installations, including (as applicable) planning, siting, permitting, interconnecting, metering, and installing these systems.

City of Sacramento, *Guide to Solar Energy Permits* (rev. Aug. 2011)
http://www.cityofsacramento.org/dsd/customer-service/documents/Complete_Solar_GuidePacket_revised_121911.pdf.
This solar permitting guide was developed by the City of Sacramento primarily as an overview of the city's streamlined permit requirements and process. The goal of this guide is to provide information on when planning reviews are needed, permit fees and inspection guidelines, among other things.

WEBSITES

City of Berkeley, Energy & Sustainable Development, Solar & Renewables,
http://www.cityofberkeley.info/ContentDisplay.aspx?id=37808.
The City of Berkeley has launched a program called SmartSolar, to encourage residents to install more solar PV. The SmartSolar program offers free information and technical assistance to any Berkeley property owner. It also provides an online mapping tool to assess solar potential in the area, a tool to help residents calculate solar savings and a solar permit guide.

City of Denver, Solar Panel Building Permit Requirements,
http://www.denvergov.org/tabid/436502/Default.aspx.
This website provides a checklist of requirements, links to forms and applications and other necessary information needed to obtain a permit for a Solar PV system within the City and County of Denver.

City of Philadelphia, Solar City Partnership, http://www.phila.gov/green/solar.html.
This website provides information on Philadelphia's solar initiatives and its partnership with the U.S. DOE's Solar America Cities program. The site provides references and information regarding site assessments, solar financing, installation resources, and other types of information that may be useful to residents.

City of Portland, Solar Energy Program,
http://www.portlandonline.com/bps/index.cfm?c=43478.
This website provides resources for solar permitting, requirements for historic preservation areas and other installation information for Portland residents.

City of San Jose, Go Solar in San José!, http://energy.sanjoseca.gov/solar/default.asp.
This website has been designed to provide resources and information about solar technologies and how residents can "go solar" in San José. The website contains information on solar basics, incentives, workshops and events.

East Bay Green Corridor, http://www.ebgreencorridor.org/solar_policy.php.
This website provides information and resources for the Green Corridor, which aims to develop a regional standardized solar permitting process throughout its eight cities in the San Francisco Bay Area.

Solar One Stop AZ, http://solaronestopaz.org.
Solar One Stop AZ provides information about solar energy and how to take advantage of solar in southern Arizona. The website provides an interactive map of solar installations, a solar calculator, information on incentives and rebates and solar news and events.

Solar Sonoma County, http://solarsonomacounty.org.
Solar Sonoma County is an organization that supports solar power and energy efficiency-related policy issues, educates and trains community members in these fields about solar power and solar energy, advocates for a rapidly growing industry, and acts as a clearinghouse for clean energy activity in Sonoma County.

Vermont Public Service Board, Net Metering Web Page,
http://psb.vermont.gov/utilityindustries/electric/backgroundinfo/netmetering.
The Vermont PSB has provided a web page with resources for net-metered systems, a registration form for systems smaller than five kW and a guide to the registration procedure for these systems.

CHECKLISTS AND APPLICATIONS

Boulder County, *Solar Photovoltaic Systems Checklist* (rev. Jan. 2011)
http://www.bouldercounty.org/find/library/build/b46solarphotovoltaicchecklist.pdf.

Boulder County, *Solar Thermal Systems Checklist* (rev. Dec. 2010)
http://www.bouldercounty.org/find/library/build/b48solarthermalchecklist.pdf.
Boulder County's Solar Photovoltaic and Solar Thermal checklists are provided by the County Land Use Department, and must be submitted with each solar PV or thermal permit application. The aim of the checklist is to provide a thorough understanding of what is required of solar PV and thermal applications so that they may be processed efficiently.

City of Berkeley, *Applicant Checklist for Solar PV Panel Installations* (Jan. 2009)
http://www.cityofberkeley.info/uploadedFiles/Online_Service_Center/Planning/ApplicantCheckListforSolarPanelInstallations.pdf.
This checklist, provided by the Building and Safety Division of the City of Berkeley Planning Department, explains the necessary requirements for a residential solar PV permit application.

City of Berkeley, *Applicant Checklist for Solar Thermal Hot Water Installations* (Mar. 2009)
http://www.cityofberkeley.info/uploadedFiles/Online_Service_Center/Planning/Applicant%20Checklist%20for%20Solar%20Thermal%20Hot%20Water.pdf.
This checklist, provided by the Building and Safety Division of the City of Berkeley Planning Department, explains the necessary requirements for a residential solar thermal permit application.

City of San Jose, *Solar Photovoltaic System 2010 CEC Residential Inspection Checklist* (Rev. Mar. 2011) www.sanjoseca.gov/building/PDFHandouts/SolarChecklistIII.pdf.
This checklist, provided by the City of San Jose, serves as a general guide for residential PV system developers, to help ensure that they will pass city inspections.

City of Tucson, *Residential Photovoltaic Template*
http://cms3.tucsonaz.gov/sites/default/files/dsd/Permit-review/residential_photovoltaic.pdf.
This set of guidelines, provided by the City of Tucson, provides the relevant information and requirements needed to complete a residential solar PV application.

Miami-Dade County, *Solar Systems Permit Document Guideline*
http://www.miamidade.gov/building/library/guidelines/solar-systems-permit.pdf.
This document, provided by Miami-Dade County's Building & Neighborhood Compliance Department, provides guidelines for submitting a solar PV or thermal application. These guidelines provide information for developers who must comply with building regulations in a High Velocity Hurricane Zone.

CLEAN ENERGY
FINANCE AND INVESTMENT AUTHORITY

SmartPower
Let's Get Energy Smart.

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Report: Innovative Program "Cracks The Code" For Residential Solar Power

Unique Program Reduces Costs for Customers by About $7500 Each, Making Solar Power More Affordable and Attractive To Homeowners

Rocky Hill, CT & Washington, DC – September 25, 2013 –The Clean Energy Finance and Investment Authority (CEFIA) and SmartPower released today a report that reveals a proven model for dramatically reducing the cost barrier that has stood in the way of wide-scale adoption of residential solar power in the United States. In recent years, the cost of the hardware required for residential solar power has declined significantly; it's the "soft" costs of customer acquisition that have been the primary obstacle. This report reveals a way to reduce those soft costs and make residential solar power attractive not just to those who are naturally inclined to alternative energy sources but also to those who simply want to stabilize their energy costs. ***About 20% of those choosing solar under this model had never thought about acquiring solar power before***.

The report details the results of Phase 1 of Solarize Connecticut[sm] – a partnership between CEFIA and SmartPower is part of the Energize Connecticut initiative, which helps consumers and businesses save money and access clean energy. The results cover a 20-week four-town initiative to advance the adoption of residential solar photovoltaic systems by lowering acquisition costs and making solar more affordable to residents using the Solarize model. The results, which are impressive and highlight the extraordinary potential of residential solar power as acquisition costs decline, include the following:

- In only 20 weeks – and in every Solarize community -- the rate of adoption for residential solar installations was between 24 and 64 times greater than the previous seven years. In one town, during this same 20 weeks, installed capacity more than quintupled.
- The average Solarize customer saved approximately $7500 on their system when compared to current market averages.
- More than 2 Megawatts of new solar photovoltaic capacity was deployed across the four communities, close to triple what was installed in those towns during the preceding seven years.
- Compelling drops were realized in customer acquisition costs – with "all in" costs of approximately $135 per kilowatt (kW), which is significantly less than both the industry average of $670/kW (per U.S. Department of Energy analyses and local installers' estimates of $250-$500/kW).

"These are very exciting results," said Bryan Garcia, president and CEO of CEFIA. "Working with SmartPower, it's clear that Solarize Connecticut is making solar power affordable to more and more Connecticut homeowners. We expect that the introduction of CEFIA's innovative financing tools will only further enhance this terrific program.

"We think we've cracked the code for residential solar power," said Brian F. Keane, President of SmartPower. "It shows that the costs of acquiring solar power systems can be reduced to a level where public demand increases significantly and even includes those who had not expected to be interested. And keep in mind, this was all done during a 20 week campaign."

The Solarize model consists of the following key components:

- Tiered group buying discounts, resulting in a continuous drop in pricing as more customers sign up;
- Outreach provided by participating towns and volunteers;
- Competitively-selected solar installers, using pre-approved equipment;
- An end date for the offer, motivating customers to take action.

A full report on Phase 1 of Solarize Connecticut is available at http://solarizect.com/wp-content/uploads/2013/09/TheFinalReportSept172013.pdf. The four Connecticut communities participating were Durham, Fairfield, Portland, and Westport.

A second phase in five additional communities has recently been completed, and official results are still being analyzed. Preliminary results reveal that approximately 175 contracts were executed, with each town seeing more than twice as many residential solar installations as they had in the last seven years.

Phase 3 has just begun in another set of communities. Town volunteers from those communities are now working with CEFIA, SmartPower, and the community's pre-selected solar installer to plan outreach events and workshops – providing homeowners an opportunity to meet their installer, learn about new financing options, and determine if their home is right for solar.

With the Solarize model, as more homeowners sign up to install solar, the price for everyone goes down, including those who install systems earlier in the program. Solarize customers can expect to receive discounts of between 15% and 20% on the base cost of solar systems through the program. Options to purchase, finance or lease make solar more accessible to homeowners participating in the program.

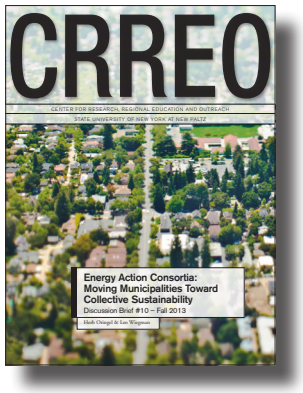
About the Clean Energy Finance and Investment Authority

CEFIA was established by Connecticut's General Assembly on July 1, 2011 as a part of Public Act 11-80. This new quasi-public agency supersedes the former Connecticut Clean Energy Fund. CEFIA's mission is to help ensure Connecticut's energy security and community prosperity by realizing its environmental and economic opportunities through clean energy finance and investments. As the nation's first full-scale clean energy finance authority, CEFIA leverages public and private funds to drive investment and scale-up clean energy deployment in Connecticut. For more information about CEFIA, please visit www.ctcleanenergy.com.

About SmartPower

SmartPower is the nation's leading non-profit organization that creates community campaigns for energy efficiency and clean energy. By engaging local partners from the municipal, business, private and non-profit sectors we promote behavior change and measurable energy actions. SmartPower's COR approach using Community outreach, On-line tools, and Rewards and Incentives is a tested formula that promotes engagement and delivers results. SmartPower is leading the New England Solar Challenge effort, which is intended to accelerate the adoption of Solar PV throughout the region. For more information, please visit www.smartpower.org.

# # #



Excerpts from

Energy Action Consortia: Scaling up for Regional Success[1]

On NWEAC and SWEAC...

"The two sibling consortia collaborate more frequently than not with each other on numerous programs, from promoting backyard leaf mulching to streamlining solar permitting. The total population of the **twenty-nine collaborating municipalities to date is 635,000**, almost two-thirds of the entire county.

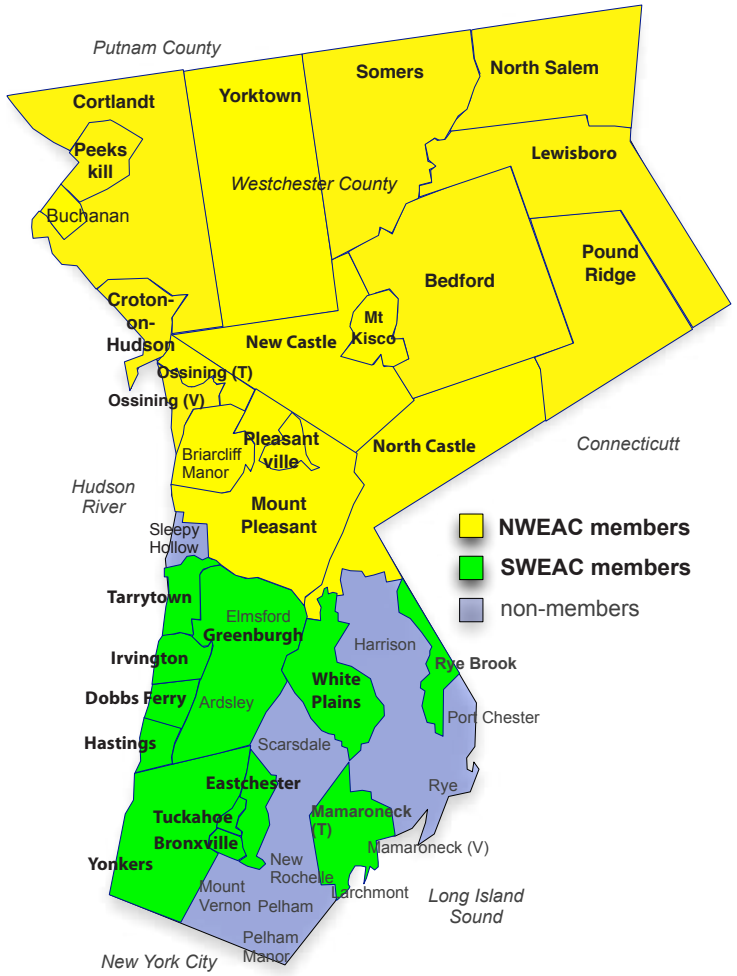
The consortia story shows how—with strong leadership and consistent local commitment—a collaborative intergovernmental infrastructure created for a particular purpose may develop into an important regional resource. These collaborations continue to develop as their initial incubation evolves and leads to additional opportunities."

(See map on left and chronology on page 2, both from the above source.)

[1] Oringel, Herb and Leo Wiegman (2013), Energy Action Consortia: Scaling Up for Regional Success (CRREO Discussion Brief 10, 2013). New Paltz, NY: State University of New York at New Paltz Center for Research, Regional Education and Outreach, www.newpaltz.edu/crreo/discussion_briefs.html

Westchester's Energy Action Consortium Members

(as of October 2013)



NWEAC

Northern Westchester Energy Action Consortium

Northern Westchester
Energy Action Consortium
Member Municipalities
www.nweac.org

Bedford
Briarcliff Manor*
Buchanan*
Cortlandt
Croton-on-Hudson
Lewisboro
Mt. Kisco
Mt. Pleasant
New Castle
North Castle
North Salem
Ossining (T)
Ossining (V)
Peekskill
Pleasantville
Pound Ridge
Somers
Yorktown
*Observer status

SWEAC

Southern Westchester
Energy Action Consortium
Member Municipalities
www.sweac.org

Eastchester
Bronxville
Dobbs Ferry
Greenburgh
Hastings-on-Hudson
Mamaroneck (T)
Rye Brook
Irvington-on-Hudson
Tarrytown
Tuckahoe
White Plains
Yonkers

2009

Bedford 2020 Environmental Summit (January)

Recovery Act (ARRA) Stimulus Fund Kick-off (April)

Coalition formed, twelve municipalities with a combined population of over 188,000 sign support letters joining together under the Town of Bedford as lead applicant in the Energize application for Recovery Act EECBG funding (Fall)

EECBG Better Buildings Recovery Act grant application submitted (December)

2010

NYSERDA awards $100,000 to Town of Bedford for energy management personnel to help staff the Energize Program (March)

NYSERDA awards $297,800 to Village of Croton-on-Hudson on behalf of seven NWEAC member municipalities to conduct greenhouse gas inventories and construct Climate Action Plans (March)

"Declaration of Energy Interdependence Day," consortium is officially formed with signing of the NWEAC IMA by twelve founding municipalities (April)

DOE/NYSERDA awards $2.6 million under Recovery Act EECBG for Energize New York (April-June)

SWEAC launches with six municipalities with a combined population of over 99,000 (June)

1st Annual NWEAC Strategy Conference (October)

Energize New York Program launches, beginning the year one pilot phase in the Town of Bedford (November)

NWEAC registers with New York State as a not-for-profit corporation (December)

NWEAC membership grows to sixteen municipalities with a combined population of over 240,000 (December)

2011

Seven NWEAC municipalities begin greenhouse gas inventories and Climate Action Plans under NYSERDA grant funding (January)

NWEAC receives the US EPA Environmental Quality Award (April)

Energy Improvement Corporation established as New York non-profit by Town of Bedford (July)

Energize New York roll out continues in year two expansion to other NWEAC municipalities (November)

SWEAC membership grows to ten municipalities with a combined population of over 364,000 (December)

NWEAC membership stable at sixteen municipalities with a combined population of over 240,000 (December)

2012

SWEAC hosts a Sustainability Forum at Sarah Lawrence College (January)

NWEAC sponsors Regional Sustainability Conference in Ossining (March)

Seven NWEAC municipalities publish greenhouse gas inventories and Climate Action Plans under NYSERDA grant funding (April)

NWEAC & SWEAC participate in the Pace Law School Land Use Learning Alliance Classes (April-June)

NWEAC & SWEAC participate in the Mid-Hudson Region Sustainability Plan process (May-December)

NWEAC establishes Municipal Solar Buyers Group partnership (August)

Energize New York roll out continues in year three expansion to all other NWEAC municipalities (November)

NWEAC membership grows to eighteen municipalities with a combined population of over 247,000 (December)

2013

Municipal Solar Buyers Group expands to Schools/Residential Housing

Petition submitted to NYS Public Service Commission to enable NYPA customers to participate in state incentive programs for solar installation (March)

NWEAC obtains 501(c)(3) designation from IRS (April)

Energy Improvement Corporation (EIS) membership expands to nine local governments with a combined population of over 520,000 (May)

SWEAC & NWEAC cosponsor a Solar Permitting Workshop with assistance from ICLEI-Local Governments for Sustainability and IREC at Pace Law School (May)

NWEAC membership stable at eighteen municipalities with a combined population of over 274,000 (June)

SWEAC & NWEAC constitute an alliance of local governments with a total combined population of over 639,000 in twenty-nine municipalities (June)

Source: Discussion Brief #10, page 11: www.newpaltz.edu/crreo/discussion_briefs.html