

THE IMPACT OF LOCAL PERMITTING ON THE COST OF SOLAR POWER

How a federal effort to simplify processes can
make solar affordable for 50% of American homes

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focus on the four to eight states that have successfully emerging solar markets and where installers are facing roadblocks.

There is **recent precedent** for federal government to lead reform of **local renewable energy permitting**. In November, 2010, Department of Interior launched the “Smart from the Start” initiative to streamline offshore wind permitting by coordinating with “local, state, and federal partners.”¹² Federal involvement will strengthen industry efforts to address permitting, such as SolarTech’s 2009 permitting challenge and countless other local efforts.¹³

Success will provide a positive feedback loop for the solar industry that will create even more value than today’s cost of permitting and inspection. German residential solar costs \$3.50 per watt because the residential market has scaled and simplified the design and installation process, leading to lower costs. Similarly, with limited local variation in the United States, installers can benefit from scale and the solar industry can drive down costs to reach grid parity sooner.

Standardizing local permitting will transform residential solar:

- Bring the cost of solar to grid parity by 2013 for **50% of American homes**¹⁴
- Close Germany’s **40% cost advantage**
- Deliver the equivalent of a new **\$1 billion solar subsidy** over five years¹⁵

This effort, as much as any subsidy, will translate into increasing solar investment by the solar industry, in addition to increased local economic activity.

LOCAL PERMITTING COSTS \$2,516 PER INSTALLATION

This report provides the most accurate estimates of permitting and inspection costs available. The cost averages \$2,516 for each residential installation, or \$0.50 per watt.¹⁶ Local permitting and inspection processes are the “bane” of the solar industry, and costs are falling at a “glacial” pace.¹⁷ Certain installers experience this cost rising, and some even refuse to sell in certain jurisdictions that have especially cumbersome processes. These costs are unnecessary and counterproductive, and streamlining will support safety through efficiency and repetition. The primary costs in the permitting process are listed below (see Appendix B for detailed discussion):

Complete permit application: \$505. Since each jurisdiction has different requirements, installers may have to research code, customize drawings, and apply for zoning approval every time they do an install. Many jurisdictions

12 <http://www.doi.gov/news/pressreleases/Salazar-Launches-Smart-from-the-Start-Initiative-to-Speed-Offshore-Wind-Energy-Development-off-the-Atlantic-Coast.cfm>.

13 http://www.solartech.org/index.php?option=com_st_document&view=documentdetail&id=15&Itemid=58.

14 Includes the federal Investment Tax Credit, which expires in 2016.

15 Assumes 500,000 new solar installations over the next five years, equivalent to 0.4% of all housing units.

16 Assume five kilowatt system. Previous studies underestimate this cost by not accounting for the full time, effort, and materials required in the process. For example, a 2010 Department of Energy study estimates \$0.25 per watt for local permit and field inspection. “Distributed PV Permitting and Inspection Processes: Case Studies from: Austin, Portland, Salt Lake City,” Department of Energy, August 2010.

17 Interviews with SunRun installation partners.

require review by an expensive professional engineer even if similar plans have been approved before.

Solution: adopt Solar ABCs standards across jurisdictions (longer term: provide national online application tool).

Submit permit application in person: \$149. Jurisdictions usually require installers to drop off the application. This wastes time and gasoline—one installer reported driving three hours to drop off a permit, only to have the jurisdiction, short on staff, outsource to an office just three blocks from the installer's office.

Solution: allow email submission of permit application (longer term: provide national online application tool).

Pay permit fee: \$431. Jurisdictions charge fees that vary widely, some higher than \$1,000. Many jurisdictions use solar permit fees to plug other holes in the budget. By comparison, the cost of issuing a permit for a local jurisdiction should be \$250 or less, as estimated by organizations like Vote Solar.¹⁸

Solution: reduce permit fees to \$250 or cost of issuance.

Variation in building requirements: \$726. Jurisdictions often have requirements beyond what state or national code requires, such as larger fire barriers, extra disconnects to turn off the system, expensive labeling, and excessive roof penetrations. These add significant cost to a system. Solar ABCs standards allow jurisdictions to follow code with a simple form, helping jurisdictions feel comfortable that they are ensuring safety.

Solution: adopt Solar ABCs standards across jurisdictions.

Field inspection: \$236. Typically inspectors provide a 4-8 hour arrival window, forcing a costly employee to wait on site for the inspector to arrive, even though inspections are often only 15 minutes. In addition, some jurisdictions require "in process" inspections during an installation, going beyond what is necessary to ensure code compliance, wasting the time of construction crews and extending installation time.

Solution: reduce inspection appointment arrival windows to two hours or less; eliminate "in-process" inspections.

Delay: 3.5 weeks. Installers report that local permitting causes an average delay of 3.5 weeks to build. The most significant delay is permit review, which ranges from 0-6 weeks. This delay frustrates customers, reducing satisfaction and referrals to friends and family, driving up cost.

Solution: adopt Solar ABCs standards across jurisdictions; provide decision on each permit application within three business days.

Sales and marketing cost: \$845. The cost, delay, and increased cancellation rate lower close rates, increasing acquisition cost. Customers usually assume the installer is at fault for delays, harming satisfaction. One east coast installer said: "this problem ripples through the entire customer process."

Solution: all of the above.

This report likely underestimates the true cost of solar permitting because it focuses on directly quantifiable data

¹⁸ <http://votesolar.org/permitting-toolkit>.

only. Additional hidden costs include management opportunity cost, poor customer experience from delays, constraints to planning and pursuing innovative cost reduction measures, and the inability for installers to realize economies of scale across jurisdictions. This is clear from our interviews. Often CEOs and COOs spend time dealing with processes to handle permitting, and operations managers struggle to plan installations when permits may or may not arrive when expected.

STREAMLINED PERMITTING WILL BENEFIT JURISDICTIONS

Standardization will save jurisdictions time and increase installation quality. Local officials reinvent the wheel by creating their own codes and requirements. They are short on budget, under-staffed, and over-extended, and solar is only one of many issues they face. A DOE release confirms: “Staff in local permitting offices is grappling with not only resource issues, but cumbersome, often antiquated permitting procedures.”¹⁹

Jurisdictions all intend to follow state or national electrical code, yet each jurisdiction interprets code in its own way and may add additional requirements without a clear safety benefit. Solar ABCs states on its website, “While jurisdictions everywhere share most of the same challenges in ensuring the safety of new PV systems, **inexperience with PV has led many to implement unnecessarily complex and inconsistent permitting procedures.** In these cases, barriers of time and expense brought about by requiring multiple departments to review the same application severely inhibit the timely and efficient construction of new PV systems.”²⁰

Adopting Solar ABCs standards will improve the quality of permit applications, reducing re-submission and failed inspection. One jurisdiction explained that about 90% of all plans submitted for permitting are essentially the same; however, solar installers still have to customize permit packets for each jurisdiction, leading to error. A 2010 SolarTech survey of building departments confirms that “incomplete applications” caused nearly 40% of permitting delays.²¹ Furthermore, the cost is greater for low-income families, since permitting costs are mostly fixed regardless of system size, penalizing smaller homes. Ultimately, the current requirements and processes harm local communities by making solar power less affordable and slowing adoption.

Several innovative permit offices, mostly in larger cities such as San Jose, Portland, and Philadelphia, are already streamlining their processes. For example, San Jose does not require plan review for systems that meet basic criteria, has simple guidelines, and generally has a fast process.²² As a result, San Jose’s cost of installation is significantly below other large cities in California, with several leading installers consistently able to price below \$6 per watt.²³ As another example, Philadelphia uses worksheets from the Solar ABCs standards to provide a combination electrical and building permit for smaller projects that meet certain criteria. Philadelphia has also made policy changes that have resulted in reduced permitting fees for smaller projects and has a fee cap for larger projects. This past summer, the city held a training session for electrical inspectors and is ensuring solar friendly language

19 http://solaramericacommunities.energy.gov/pdfs/Success_Snapshots_SanJose.pdf.

20 <http://www.solarabcs.org/permitting>.

21 “Solar PV Permitting Study: Study and recommendations for residential permitting,” SolarTech, June 2010.

22 <http://www.sanjoseca.gov/building/PDFHandouts/1-10Solar.pdf>.

23 Data from California Solar Initiative.