
Left to right: inverter, off-on switch,
conduit, old and new boxes

Last summer, Berkeley's Center for Law, Energy and the Environment (CLEE) issued a report, at the request of Governor Jerry Brown, identifying barriers to the accelerated deployment of "distributed" renewable energy projects. This document was the result of a stakeholder conference hosted by the Governor, located on campus at UCLA, and substantively managed by Berkeley Law's CLEE. One of the key findings was that as the cost of solar photovoltaics continued to fall, it was the "soft costs" – those related to marketing, installation and local permitting – that would be harder to avoid. We reported on stakeholders' call for more uniform, lower-cost local permitting processes.

When the report was issued, several efforts were already underway to achieve that objective. The Governor's office was working to coordinate local attempts at permitting reform. Independently, some groups received permit-related funding from the U.S. Department of Energy's Sunshot program. One such group was the San Francisco Bay Area's East Bay Green Corridor Project, ably managed by Carla Din. Through the Green Corridor, nine East Bay cities are combining their efforts to produce green jobs in the region. UC Berkeley is a founding partner in the project.

David R. Baker in the San Francisco Chronicle reports that the East Bay Green Corridor cities have reached an agreement on permitting reforms. "The cities have developed an application process that, for the vast majority of homes, will eliminate the need for a structural engineering assessment, a step that can add hundreds if not thousands of dollars to the final bill. In six of the cities, permits will be handled over the counter, reviewed and approved the same day. The remaining three cities have agreed to process permits within three to seven days…Fees will still vary from one city to another. But none will be higher than the cost of paying for the city employees who must process permit applications. The average will be $236. A 2012 state law caps permit fees for most residential solar systems at $500."

For the solar industry, these will be welcome reforms that can help drive down some of those soft costs. Permitting costs, of course, come in two basic flavors: (1) the permitting fee itself, and (2) the parts and labor needed to come into compliance. There is only so much that the local governments can, or should do to bring those costs down. Much of the rest is in the hands of the manufacturers and installers.

My wife and I have been witnessing this problem first-hand, as we have undertaken the installation of rooftop photovoltaics on our home. The installation itself seemed to go smoothly. The permitting process has kept the project in limbo, and still does as we speak. The city inspector didn't like the wiring that would connect the solar output to the main service box. The equipment on our 1930s vintage home is old and small and inflexible. The installer had to jam several feet of stiff wire into a tiny space. Thank goodness the inspector caught the problem and insisted that it be fixed.

Now, there is a second box, as big as the first, and there are several new lengths of conduit. On his second visit, the inspector liked what he saw. However, he wants to see the new design reflected on a new set of drawings, and then he wants to visit our home again to make sure that the drawings reflect reality. And the side of our house is much busier now with the old box and meter, a large inverter to turn DC into AC, a separate switch box to turn the system on and off, and lots of pipes.

We have confidence that soon, the system will start giving us sweet, clean solar power. For us, it has just been a matter of waiting. For the solar company, it is expense on top of expense. Five men spent 12 hours each installing the system. Before that, a salesman spent an hour with us making the deal. Two workers spent two hours each at our home making measurements and taking pictures. Some anonymous engineer then spent some unannounced amount of time making drawings. Several customer service people have called us on various occasions to provide updates. One worker spent two hours at our house on the day of the first inspection waiting for the city to arrive. Two workers spent a full day crafting the "fix" on the side of our house. Another worker spent an hour onsite for the second inspection. The company will now pay an additional permit fee, after having produced new drawings. Someone will have to be at our house for the final inspection by the city. Then, someone will have to be there when a utility electrician visits a couple of weeks later for the final approval and meter switch-out.

This story embodies many of the soft cost challenges. Every house offers its own installation special concerns. Older homes, especially, are likely to offer unsatisfactory wires and boxes as a starting point. If consumers are careful in agreeing to terms, the solar firm remains at risk for unanticipated expenses. Reducing fees and making installation standards, well…..standardized would be a plus. But everyone else has to help out. Our inspector is providing a needed service, but perhaps he could have snapped a photo for the file rather than requiring more paperwork and a third inspection. It truly does seem possible to make some aspects

of the installation more predictable. Rather than using separate inverters, mini-inverters can be installed in the panels. On the other hand amorphous, thin-film arrays could reduce installation time and cost with systems that just roll out on the roof. Perhaps wiring packages could be prefabricated and contained in a box to install at older homes. Getting to the existing housing stock requires greater activity.

At the same time, it would be a crime to lose the chance to incorporate photovoltaics into new homes and commercial/industrial buildings. Make it part of the original wiring and roof design. Incorporate it into shingles. Think about solar when planning the building's orientation. Some California cities have begun to require builders to include solar. Sebastopol and Lancaster have led the way. In the meantime, California continues to pursue the dream of zero net energy buildings. No doubt, solar will have to play a part.