Utility DIVE

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A new study uses side-by-side home comparisons to put a more accurate number on the value of solar systems

By Herman K. Trabish | December 17, 2015

Rooftop solar panels owned by their users can significantly increase the value of homes, recent research from the Lawrence Berkeley National Lab (LBNL) suggests.

LBNL's appraisal-based analysis, released last month, supports conclusions from previous studies with different methodologies that adding a rooftop photovoltaic (PV) solar array returns real value when the home is sold.

A “first-of-its-kind analysis compares in-depth PV home valuation by local appraisers to statistically derived PV premiums for the same homes,” reported the study, "Appraising into the Sun: Six-State Solar Home Paired-Sales Analysis."

“Both approaches produced similar premium results, providing additional strong evidence that PV adds value to homes in a variety of markets,” the study said.

A new kind of solar home study

Earlier studies showed that PV adds value to homes, but often were done by academics using complex statistical methods that mean little to appraisers working in the marketplace. This paired-sales analysis, a collaboration of Lawrence Berkeley National Laboratory researcher Ben Hoen and Adomatis Appraisal Service Head Sandra Adomatis, uses the familiar real estate exercise of comparing similar properties.

“The results provide strong, appraisal-based evidence of PV premiums in all states,” the paper concluded.

The authors started with 208 sales of homes with PV owned by the homeowner, but only 43 were found suitable after rigorous comparability criteria were applied.

“Solar [systems] are not typically installed on average homes, and each had to be paired with a very similar non-solar home,” Hoen explained.

The pairing also had to be in transactions of similar homes in similar neighborhoods at rough-

ly the same time. That, Hoen said, is why it is "so difficult for appraisers in general, and why they need options other than the paired sales analysis.”

Lending appraisal guidelines should recognize these challenges “and allow other forms of premium estimates (such as income and cost) when sales are not available,” the paper said.

“Auto-population of PV system characteristics into multiple listing servicesshould also be available,” Hoen added. Searchable fields should show whether a home has PV, whether the PV is directly owned or third-party financed, and the size and age of the installation.

The conclusions in the study apply to rooftop solar arrays directly owned by the homeowner. When the panels are leased or owned by the solar company appraisal efforts become more difficult.

The premium

The researchers compared homes in six states and concluded that a PV system on a home provided a premium of $2.68-$4.31/watt.

The paper offers a national average premium of $3.78/watt, but the value of that measure is limited because the premium is specific to the PV system and property. Market characteristics like retail electricity rates and local incentives are also factors.

“Value is determined by the market, and the market it a moving target,” Hoen said.

Most importantly, he added, it is inaccurate to simply describe the premium as a percent of the home value. “Most PV homes have a premium, but it takes some hard work to determine what that number is.”

The premium is also not a profit on the solar installation. The homeowner gets solar-generated electricity in return for the solar investment. But when a house with PV is sold, it goes for a higher price than a comparable house without PV.

It is like a homeowner getting a higher price for a house with state-of-the-art appliances after getting the benefits of using the appliances, Hoen said.

“The premium equates to an amount a PV home received over and above what would have been expected for the home to have received based on its non-PV characteristics, like its size, age, location, condition, and the size of the lot,” he said. “The definition of that non-PV value is defined through the selection of the comparable [house]."

The $2.68-$4.31/watt premium derived by the paired analyses are also not predictions of what a homeowner will get by adding PV, Hoen stressed. These are numbers derived from actual transactions.

Additionally, the LBNL analysis showed no consistent difference in how long it takes to sell PV homes compared to those without solar panels, contradicting media reports that such systems can complicate sales.

Incentive impacts: Gross vs. net cost

The premium for PV is similar to net PV cost estimates, but very different from gross cost estimates, the paper reports. And this is a crucial distinction that appraisers might not understand, Hoen said.

Appraisers readily understand that renovated kitchens and newly painted houses are good investments for home sellers and produce consistent returns based on their cost, while pools and hot tubs might not, he explained.

But solar is unique because of the 30% federal investment tax credit and other state and utility incentives that can make the net cost significantly lower than the gross cost, Hoen said. “The valuation of the solar premium should use the net cost, which can be 70% or less of the gross cost.”

A homeowner gets those discounts by the end of the first year after the purchase of the array. Data on the tax credit and other incentives can be obtained from local installers, but appraisers might not think about those factors.

If the appropriate value is to be placed on the system, it is crucial the appraiser and others in the real estate community take these incentives into account, Hoen said.

Getting accurate appraisals

Not enough of today’s residential appraisers have the skills to accurately determine a PV home’s premium, Hoen said. It requires an understanding of the paired sales technique as well as income and cost methods not usually common in residential real estate.

Whatever the outcome of any appraisal done before the home sells, the bank will want its own appraisal once a transaction price is agreed upon. At that point, the buyer has the right to require an appraiser with “the education and understanding to produce a credible estimate of the value of the PV,” Hoen said.

The bank would use that appraised value to calculate a loan to value ratio.

“Given a fixed ratio, the higher the appraisal is, the higher the amount of the loan will be, and that will hopefully cover the cost of the solar premium,” Hoen said. “If everything works right, the buyer is willing to pay more and the PV home is valued for more and the loan is higher.”

Third party and utility solar

The third party owned (TPO) financing plans for rooftop solar accounted for 72% of new customer-sited systems in 2014. They, report co-author Sandra Adomatis told the Washington Post, can "add another layer" to real estate transactions. Like a leased car, the solar is not a real asset.

Fannie Mae, the leading U.S. residential mortgage broker, has specific rulesgoverning TPO financed solar for Federal Housing Authority loans. Washington Post described those rules as

“cumbersome and confusing.”

LBNL survey data on TPO-financed solar will offer a better understanding of those transactions when it is published later this year, Hoen said.

“Based on my understanding, many solar homes with leased systems transact without problems, but, because of the complicated nature of a lease, they can produce unique problems,” he added. “It is important to look at the fine print.”

Utility-owned rooftop solar is similar to TPO-financed solar. Though Hoen was not yet ready to provide specific insights from his work on TPO financing, he offered some guiding thoughts that could be important to utilities starting rooftop solar programs.

“Real estate revolves around being able to transfer homeowner-owned assets,” he observed. Utilities might want to consider contractual stipulations that eliminate any complexity utility-owned solar could bring for homeowners.

“They could say ‘if you don’t want it anymore when you sell your house, we will take it off,’” Hoen suggested. That would remove barriers to the real estate transfer if the utility is unable to work things out with the buyer.

“The more the utility or leasing company can lessen the restriction on the transfer of the home, the better it would be for the prospective home buyer and therefore the better it would be for the seller of the home.”

San Antonio’s CPS Energy has one of the most advanced utility-owned rooftop solar programs and structured it to allow for the easy transference of rooftop solar panels from one homeowner to the next.

“The panels can be transferred to the new owner when the house is sold and the new owner then gets the bill credits,” said spokesperson Christine Patmon said. “If the new owner does not want the panels, there is an opt-out clause in the contract that can be negotiated between the buyer and seller.”

Utilities should be interested in the rooftop solar home values, Hoen concluded, because consumer sentiment suggests they will grow in the future.

A 2014 National Association of Realtors survey found 12% of prospective home buyers considered solar either “important” or “very important” and that “is well above the supply of homes with PV,” Hoen said.

“It is becoming something people care about, in part because of the dollar proposition and in part because people want to be green.”