PV Value®: Developing the Market Value of Installed Photovoltaic Systems

Property owners install photovoltaic (PV) systems for lower utility bills, energy independence, and/or environmental benefits to society. As those properties with PV are bought and sold, the question arises, "what is a PV system worth?" Appraising a PV system was challenging because no standard appraisal practice existed. The PV Value® tool helps appraisal professionals develop the value of a PV system using an income-based approach.

In 2008, the U.S. Department of Energy recognized that solar photovoltaic (PV) systems were being installed at increasing rates across the U.S., providing benefits to property owners, including utility-bill savings and environmental benefits through reduced emissions. What was missing was an understanding of whether those benefits were being capitalized into the home's value, just as other property improvements, such as a new kitchen, furnace, or air conditioner can. Despite existing federal and local incentives, PV systems remain a significant investment for a homeowner, therefore being able to recognize the potential value of a PV system when the property is sold or refinanced would have important implications when determining the payback and return on investment (ROI) from such an investment.

To help do this, the DOE funded Sandia National Laboratories, starting in 2010, to use a bottom up, income-based approach to develop tools and educational materials needed by real property appraisers to ensure PV systems are valued properly under existing Uniform Standards of Professional Appraisal Practice and underwriter guidelines. This research has proven timely as the PV market has grown tremendously in the past five years and more properties are being bought and sold with PV systems. Before this effort was in place, the real estate and appraising/underwriting industry did not have any tools, market studies, or guidance to apply to properties with PV.

Sandia researcher Geoff Klise originally worked with Solar Power Electric™ (now Energy Sense Finance, LLC) to develop a tool that can be used to appraise photovoltaic installations on homes and businesses. (Photo by Randy Montoya)

Appraiser Tools for Determining Market Value

The market value is something that an appraiser develops, with knowledge of what that local market will bear, especially for new features or technologies, such as solar PV. Appraisers encountering PV systems lacked knowledge of how to use methods outside the traditional "sales comparison" approach, especially in the residential market. Addressing this need concurrently through both DOE-funded and independent efforts, Sandia worked closely with Jamie Johnson a mortgage, tax, and solar PV expert to develop the PV Value® tool as a way of using the income based approach to develop a discounted cash flow of the energy value provided by the PV system. Additionally, training programs led by the Appraisal Institute and Sandra Adomatis of Adomatis Appraisal Services were developed to educate appraisers about PV systems and how to apply standard appraisal practices, including cost, income, and sales comparison to develop a PV system's value.

Any system, be it large or small, adds value to a home. The questions are: "How much value?" and "What is fair for both the homeowner and the lender?" The PV Value® tool provides a systematic, standardized, unbiased method of answering these questions for all parties involved.

PV Value® is Launched

The PV Value® tool is now being used nationwide by appraisers, lenders, assessors, real estate agents, underwriters, government, solar sales professionals, and property owners to develop value for both residential and commercial PV systems.
Use of this tool by appraisers is helping homeowners add equity to their homes by recognizing a PV system's energy-generating capabilities, which is unique when compared to other items of real property that add value.

It is also used by solar installers to show the potential market value of the system upon installation. The PV Value® tool is introduced to participants in the Residential and Commercial Valuation of Solar course offered by the Appraisal Institute, along with additional tools appraisers and others can use to develop the value estimate of a PV system. Two recorded webinars also are currently available on the PV Value® tool.

PV Value® can be used to develop the value of systems installed in commercial settings as well as in residential areas.

Due to the tool's success, PV Value® is now expanding beyond a proof-of-concept into a web version, which is being developed by Energy Sense Finance, LLC. New features planned for the web application include more detailed solar resource calculations that consider different PV technologies. Additional research into different technology degradation rates will also help refine estimates of solar energy production for each year of analysis. This new version will make appraising properties with installed PV systems even quicker, as it will allow for analysis on most mobile platforms and will seamlessly integrate with the Appraisal Institute's Form 820.04 – Residential Green and Energy Efficient Addendum.

Industry Impacts

The Sandia work has resulted in a tool that has been downloaded over 4000 times and is used widely by appraisers across the U.S. PV Value® has been featured in multiple industry trade publications and newspaper articles. Sandia has published two reports along with a peer-reviewed journal article on PV valuation concepts.

Now that the PV Value® tool is available, appraisers are using it to develop local market studies on how much PV systems can add to a property, such as was done in Colorado in 2013. It is anticipated that the PV Value® tool will become a standard method for appraiser-led valuation of solar PV systems using an income-based approach.

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