

Berkeley Lab study finds that photovoltaic systems boost the sales price of California homes

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New research by the U.S. Department of Energy's Lawrence Berkeley National Laboratory finds strong evidence that homes with solar photovoltaic (PV) systems sell for a premium over homes without solar systems.

"We find compelling evidence that solar PV systems in California have boosted home sales prices," says the lead author Ben Hoen, a researcher at Berkeley Lab. "These average sales price premiums appear to be comparable with the average investment that homeowners have made to install PV systems in California, and of course homeowners also benefit from energy bill savings after PV system installation and prior to home sale."

The research finds that homes with PV in California have sold for a premium, expressed in dollars per watt of installed PV, of approximately \$3.90 to \$6.40/watt. This corresponds to an average home sales price premium of approximately \$17,000 for a relatively new 3,100 watt PV system (the average size of PV systems in the Berkeley Lab dataset), and compares to an average investment that homeowners have made to install PV systems in California of approximately \$5/W over the 2001-2009 period.

"This is a sizeable effect," says Ryan Wiser, a Berkeley Lab scientist and co-author. "This research might influence the decisions of homeowners

considering installing a PV system and of home buyers considering buying a home with PV already installed. Even new home builders that are contemplating PV as a component of their homes can benefit from this research."

Approximately 2,100 [megawatts](#) (MW) of grid-connected solar PV have been installed in the U.S. California has been and continues to be the country's largest market for PV, with nearly 1,000 MW of installed capacity. California is also approaching 100,000 individual PV systems installed, more than 90% of which are residential. Though an increasing number of homes with PV systems have sold, relatively little research has been performed to estimate the impacts of those PV systems on home sales prices.

The Berkeley Lab research is the first to empirically explore the existence and magnitude of residential PV sales price impacts across a large number of homes and over a wide geographic area. The research analyzed a dataset of more than 72,000 California homes that sold from 2000 through mid-2009, approximately 2,000 of which had a PV system at the time of sale. "This is the most comprehensive and data-rich analysis to date of the potential influence of PV systems on home sales prices," says co-author and San Diego State University Economics Department Chair Mark Thayer.

The research controlled for a large number of factors that might influence results, such as housing market fluctuations, neighborhood effects, the age of the home, and the size of the home and the parcel on which it was located. The resulting premiums associated with PV systems were consistent across a large number of model specifications and robustness tests.

The research also shows that, as PV systems age, the premium enjoyed at the time of home sale decreases. Additionally, existing homes with PV

systems are found to have commanded a larger sales price premium than new homes with similarly sized PV systems.

"One reason for the disparity between existing and new homes with PV might be that new home builders also gain value from PV as a market differentiator that speeds the home sales process, a factor not analyzed in the Berkeley Lab study," says Berkeley Lab researcher and co-author Peter Cappers. "More research is warranted to better understand these and related impacts."

More information: The report, "An Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California," can be downloaded from

eetd.lbl.gov/ea/emp/reports/lbnl-4476e.pdf

A 2-page summary of the report's key findings can be found at:

eetd.lbl.gov/ea/emp/reports/lbnl-4476e-rs.pdf

Provided by Lawrence Berkeley National Laboratory

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