Local market conditions and policies strongly influence solar PV pricing

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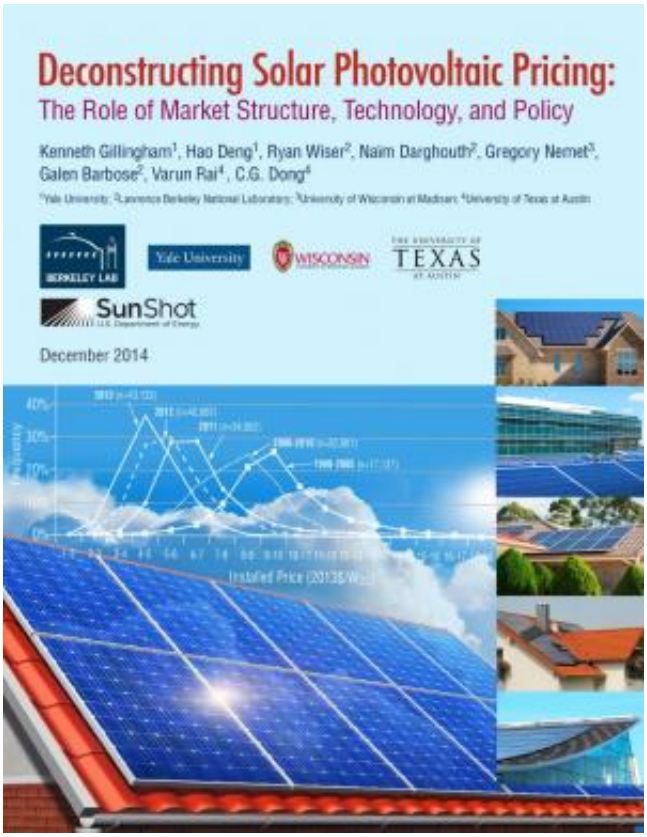

Differences in local market conditions and policies, and other factors, particularly the size of the system, can lead to wide disparities in what consumers across the United States pay to install solar energy systems on their homes or small businesses, according to a recent study published by

the Department of Energy's Lawrence Berkeley National Laboratory (Berkeley Lab). This translates into thousands of dollars difference in the price of comparable solar energy systems around the U.S.

Berkeley Lab's Ryan Wiser, a co-author of the study, explains its motivation, "Although average prices for solar PV have declined substantially over time, we continue to observe high levels of variability in pricing from one system to another, both within and across regions." For example, among residential and small commercial systems installed in the United States in 2013, roughly one in five was priced at less than $3.90/ W, while a similar portion was priced above $5.60/W.

Berkeley Lab and researchers at Yale University, the University of Wisconsin-Madison, and the University of Texas-Austin collaborated on the study. The work draws upon Berkeley Lab's Tracking the Sun annual report series, which monitors trends in the installed price of solar photovoltaic (PV) systems in the United States.

The new study seeks to explain observed differences in pricing, using statistical methods to estimate the effects of a large number of possible influences. These include factors related to system characteristics and household demographics, as well as installer competition, installer experience, demand for PV, and public policy. Understanding these issues can help inform policy and industry efforts aimed at making solar more affordable.

According to Kenneth Gillingham, of Yale University and the lead author of the report, "We found very strong effects associated with the density of installers operating within the local market, leading to differences in PV pricing of more than $0.49/W." The report suggests that the lower prices in markets with a greater number of active solar installation companies may be due to greater competition and lower information search costs for consumers. The report also found

significant price effects associated with installer experience, particularly at the local level.

The overall consumer value of PV – which reflects the size of financial incentives, solar insolation levels, and retail electricity rates – was also found to heavily influence pricing, leading to differences of more than $0.47/W across individual systems. The report offers two possible explanations for this relationship. One is that higher incentives may stimulate demand for PV, naturally leading to higher pricing, as can occur when demand for any good increases. The other is that installers in markets with high incentives and insufficient competition may be able to charge higher mark-ups, though the report does not conclude that this has occurred.

The study focuses on systems ranging in size from 1 to 10 kilowatts (kW). Even within this narrow range, differences in system size were the single largest source of price variability, leading to a $1.50/W price differential between the smallest and largest systems. Other differences in system characteristics, such as tracking equipment or batteries, and installations in residential new construction, also had substantial price impacts.

A wide variety of other explanatory factors for pricing variability were tested and in many cases found to have sizable impacts. The report notes, however, that even after accounting for these many underlying influences, a great deal of pricing variability remained unexplained – suggesting the potential importance of other unobserved contributors and the opportunity for further inquiry.

More information: "Deconstructing Solar Photovoltaic Pricing: The Role of Market Stucture, Technology and Policy," emp.lbl.gov/publications/decon … echnology-and-policy

Provided by Lawrence Berkeley National Laboratory