



# The Value of Transparency in Distributed Solar PV Markets

*Study Shows Lower Prices in Transparent Markets and Suggest Measures to Increase Access to Quotes May Help Reduce Prices*

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## Summary

Market transparency refers to the degree of customer awareness of product options and fair market prices for a given good. In *The Value of Transparency in Distributed Solar PV Markets*, we use residential solar photovoltaic (PV) quote data to study the value of transparency in distributed solar PV markets. We find that improved market transparency results in lower installation offer prices. Further, the results of this study suggest that PV customers benefit from gaining access to more PV quotes.

## Context

Prospective PV customers generally make an adoption decision based on a small number of installation quotes. As a result, PV markets are relatively non-transparent; customers are largely unaware of market prices and may not obtain the lowest available price. PV customers that use quote aggregators—third party companies that collect quotes on behalf of customers—receive

more quotes, on average, than customers that solicit quotes directly from installers (Figure 1). Hence, quote aggregation may be one means of improving PV market transparency. If so, what is the value of this market transparency? How would market transparency affect installer behavior and PV customer outcomes?

## Data and Methods

We use data from more than 70,000 residential PV quotes provided by the quote aggregator EnergySage to study the value of market transparency. First, we compare prices for quotes made through the quote aggregator with prices for quotes made directly to the same customers. Second, we use a linear regression to test how installers respond to the number of quotes received by customers.

## Results and Conclusions

In 2015, prices on the aggregator’s quote platform were \$0.32/W (8%) lower than prices for quotes made directly by installers to customers, on average (Figure 2, reverse). Further, through a paired differences approach we show that quotes were \$0.24 per watt (W) lower on the quote platform than quotes made directly to the *same* customers after controlling for other factors.

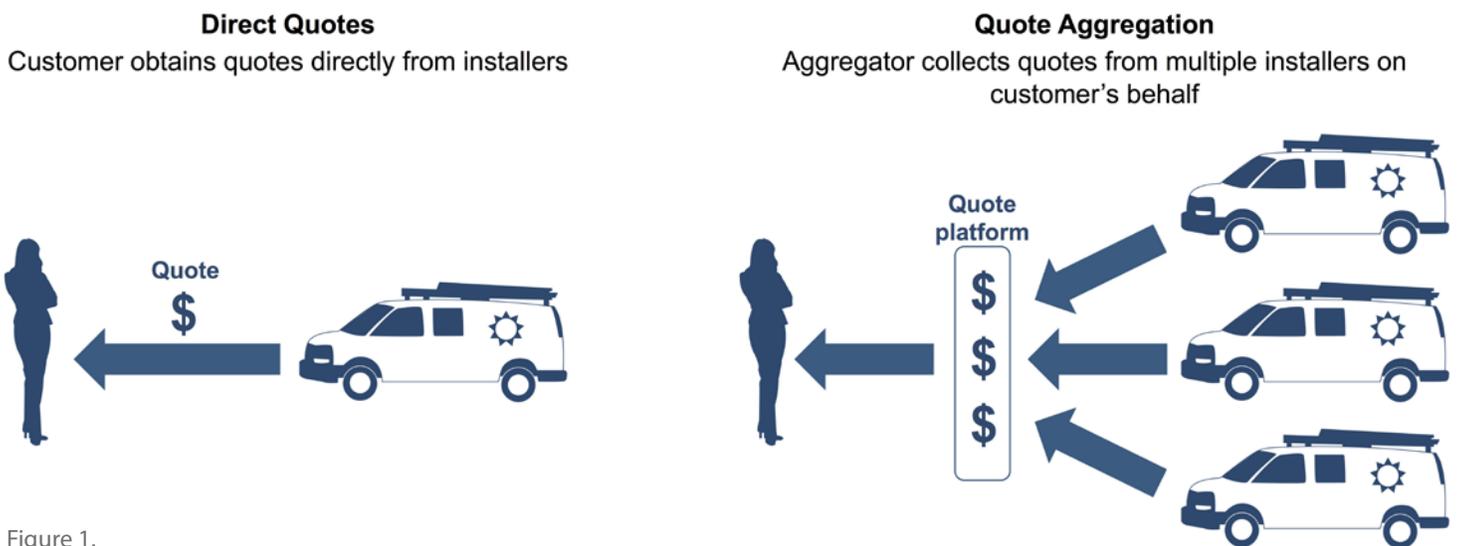


Figure 1.

In other words, lower prices on the quote platform are not attributable to differences in customer characteristics or system differences.

Further, we find evidence that installers offer lower prices when customers receive more quotes. Before submitting quotes on the platform, installers can see how many other installers have expressed interest in bidding to any given customer. The number of interested installers is highly correlated with the number of quotes that customers ultimately receive. Hence, a relationship between quote prices and the number of interested installers would suggest that installers alter their price behavior according to the number of quotes they expect their customers to receive. Through a linear regression, we show that installers tend to lower their offer prices as the number of expected quotes increases, after controlling for other factors. For instance, in the first quarter of 2016 in California, the average quote price falls about 15% from \$3.97/W for customers with a single expected bidder to \$3.37/W for customers with seven expected bidders (Figure 3).

The data suggest customers that receive seven quotes may save as much as \$0.48/W more than customers that receive a single quote. For a typical 5-kW system, this delta could translate into roughly \$2,500 in savings

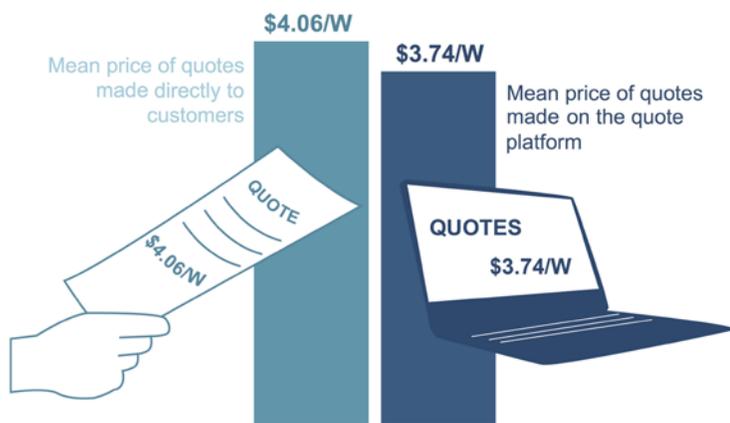
Our results suggest that customers obtain lower prices in more transparent markets. And, our study demonstrates that measures to increase PV market transparency by facilitating customer access to quotes may be an avenue for further PV price reductions.

## More Information

For more information, download the full technical report: O'Shaughnessy, Eric, and Robert Margolis. 2017. *The Value of Transparency in Distributed Solar PV Markets*. NREL/TP-6A20-70095. Golden, CO: National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy18osti/70095.pdf>.

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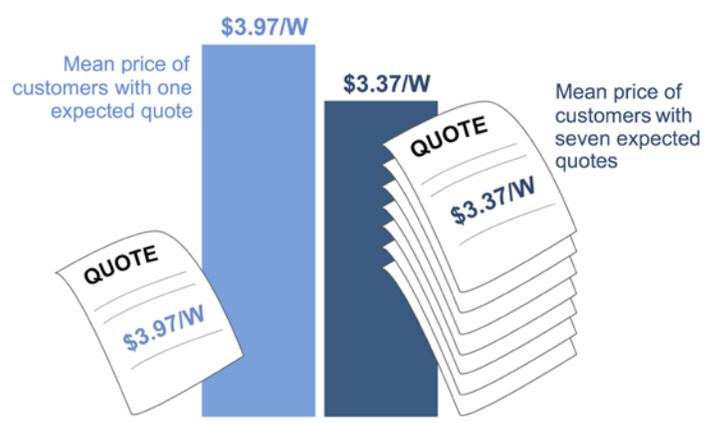
### Installers offer lower prices on the aggregator's quote platform.



\* Based on quotes made in 2015

Figure 2. Mean prices of quotes made directly to customers versus through the quote platform

### Installers offer lower prices when they expect customers to receive more quotes.



\* Based on quotes made in California in Q4 2016

Figure 3. Mean prices for customers with one expected quote versus seven expected quotes



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