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# Solar power gets cheaper as cost of panels drops

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Robert Hafkesbring is proud of the way Designs in Nature, the plant nursery he and his wife operate, has grown since he started it in 1987, but there's one bit of growth that hasn't been so welcome.

"I never dreamed my electricity bill would be over $1,000" a month, he says. And with three wells keeping 8 acres of plants and trees watered, along with power for his offices, those bills now can hit as much as $2,200 in a hot Texas summer.

So when he was recuperating last year after back surgery, he put pencil to paper to see what it would cost to install solar power. What he found surprised him.

"The prices have dropped dramatically," he said as he stood with his wife, Noelle, by one of two large solar arrays recently erected at his business at the southwest tip of Lake Arlington. Together the arrays can produce 40 kilowatts of power, and he figures that he'll get back his cost in less than three years after including utility incentives and tax credits.

"And you can park underneath it for shade in the summer," the New Orleans transplant laughs.

In the past five years, prices for solar panels -- the now-familiar glassy sheets containing electricity-producing photovoltaic cells -- have fallen at least 80 percent, bringing down the overall price of solar installations. At the same time, Texas, a solar power laggard in the past despite its vast open spaces and bright sunshine, has been moving up in the business, although it's still a distant also-ran compared to leaders like California, Arizona and New Jersey.

According to the Solar Energy Industries Association, Texas ranked No. 13 nationally in total PV solar capacity as of 2011, but has been climbing. It was No. 9 by capacity installed during 2011 alone, adding 44 megawatts, and it was No. 7 in new capacity installed in the first nine months of 2012, according to the trade group.Hafkesbring is paying about $90,000 to his installer, Air Wind & Solar, a Stephenville company, for his array. That's barely $2 per watt, an unusually low price that Paul Graff, director of operations for Air Wind & Solar, said is because of its size, Hafkesbring's installation of additional solar panels at his home in Mansfield and some signage agreements the installer is making to take advantage of the array's visibility from nearby Interstate 20.

But Graff said his company's price for a rooftop residential installation of at least 4 kilowatts is $2.50 a watt, still well below average.

According to the U.S. Solar Energy Industries Association, the average residential photovoltaic (PV) installation in the third quarter of 2012 cost $5.21 per watt nationally, while commercial installations averaged $4.18 a watt. Residential installations generally are smaller than 10 kilowatts.

Those prices are down from a median of $6.10 a watt in 2011 for all U.S. residential and small commercial installations, according to the U.S. Department of Energy

Other local installers said a price around $5 a watt, depending on the type of equipment used, is a common rate for residential jobs. All of those prices are before an incentive of $1.28 per watt from Oncor Electric Delivery, North Texas' dominant electricity distribution utility, and before the benefit of a 30 percent federal tax credit, which cut the cost further.

Jeamy Molina, an Oncor spokeswoman, said the utility has opened its 2013 residential solar incentive program with "more than $7 million available." This year, the program pays on a maximum of 8,300 watts, or about $12,900 for residential installations.

If Oncor pays out all of its incentive money, it will be the utility's biggest year for residential solar since it started the program in 2009. The previous high was $4.7 million in 2010.

It should also serve by far the most customers, since the incentive in 2010 was $2.35 per watt. As a rule, utilities with solar incentive programs peg their payment to the cost of a job. With the market price of solar installations coming down, the incentives also come down.

Oncor also has a commercial PV incentive program, but it is only about $4 million this year and is nearly all taken already, Molina said. The commercial incentive is $1.09 per watt.

The decline in solar panel pricing was particularly sharp in 2011, when it fell about 50 percent. That trend, while favorable for consumers, has slammed U.S. solar panel makers, including Solyndra, the politically-infamous California company that received $528 million in federal loan guarantees.

The slide in prices has produced charges of unfair dumping against Chinese panel makers, by far the world's biggest. But observers don't expect solar panel prices to rise even with U.S. duties imposed on Chinese imports.

"There may be a plateau for a while. There has been a lot of consolidation among manufacturers, and production is shifting to other countries outside of China," said Russel Smith, executive director of the Texas Renewable Energy Industries Association in Austin. While there could be a small price rise, Smith said, "a resumption in cost-wringing" seems more likely.

"Five years ago, we dreamed of $1 a watt wholesale cost" for solar panels, said Scott Bourgeois at the Energy Shop in Carrollton. "Now, that's fairly common" for medium-grade panels, he said.

But even with the lower prices, incentives by Oncor and other utilities are what make homeowners act, Bourgeois said.

The state has moderate electricity prices, making solar a tougher financial sell. And in most markets those prices don't vary by time or day or season, methods employed by some states to spur conservation, he said. Finally, nearly all the state's renewable energy mandate has been filled by wind power, meaning there are no special state incentives for solar.

"That's what makes Texas a mediocre market," Bourgeois said.

Hafkesbring joined the ranks on Nov. 14, when he turned on a six-kilowatt array at his home. Last week, he jumped on his computer at work and logged into an online site where he could track the output of each panel and of the array overall.

That installation, like the one at his business, uses a piece of equipment on each panel, called a microinverter, that takes the direct current (DC) power from the panel and converts it to alternating (AC) current. Most residential installations have one large inverter, typically mounted near the home's electric meter, but microinverters are gaining ground because they are generally more efficient.

This sunny Thursday afternoon at 3 p.m., the array had produced 35 kilowatt-hours so far that day, bringing its output for the month of February to 342 kilowatt-hours. Since it was switched on, it has produced 2.28 megawatt-hours, worth about $230 at 10 cents per kilowatt-hour, a fairly typical residential rate.

When the system produces more power than Hafkesbring uses at home or at work, the excess electricity moves onto the grid. His retail electric provider, TXU Energy, buys that power for 7.5 cents per kilowatt-hour, said TXU spokesman Juan Elizondo.

"I think we're just beginning" to realize the prospects solar power offers, he says. "We're organic, we're green. This was just another element of it."

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