

Abundant Sunshine Not Enough to Power Texas Residential Solar Energy

By Benjamin Meier and Jesse Thompson

The Texas electricity market doesn't shine in residential solar energy despite plentiful sunlight. While Texas is No. 1 in wind power, its residential solar capacity per capita was less than one-third that of the U.S. average in 2017 (*Chart 1*).

One advantage of solar electricity generation is a reduction in greenhouse gas emissions, which have been tied to climate change.

Hot Texas summers and population growth continue to drive record electricity demand. Converting sunlight that would otherwise heat attics into power would seem to hold promise for homeowners.¹ However, compared with other states with similar sunlight penetration, Texas has been slow to adopt residential solar.

Solar energy, while experiencing robust growth in recent years, still only provides 0.5 percent of Texas' total electricity generation, with residential solar supplying a meager 0.1 percent of total generation. Small-scale residential solar capacity accounted for 15.6 percent of the more than 13,500 megawatts of new net generation capacity added in 2017.

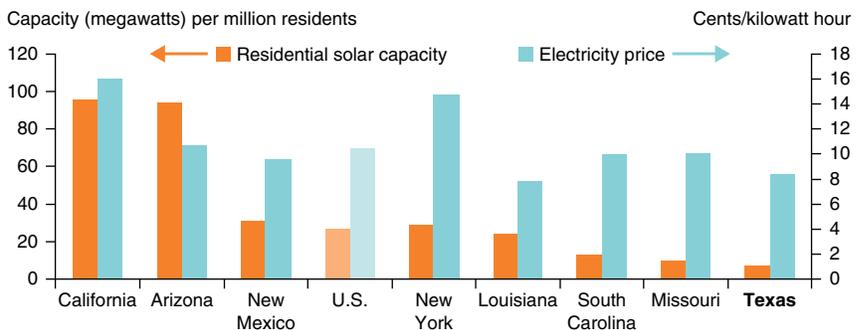
Variety of Factors

Texas is one of only two states in the nation that do not require utility companies to purchase excess energy from residential solar panels, a process called net metering. It allows homeowners to pay only for the net energy they consume or receive a credit if they generate a surplus.

Low electricity prices is another reason Texas homeowners haven't installed solar panels. In fact, even with net metering, the rate at which utilities buy back electricity from homeowners is below the national average. Texas' average price for electricity is 8.38 cents per kilowatt hour, 20 percent less than the

CHART
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Texas Trails Many States in Residential Solar Capacity



NOTES: Data shown are 2017 average small-scale net metered installed capacity and average retail electric price by state. U.S. capacity is calculated from sum of states.

SOURCES: Energy Information Administration, U.S. Census Bureau.

U.S. average. The comparatively inexpensive electricity translates into a relatively longer repayment period to recoup an initial residential solar investment, which nationally averages \$17,000.²

Renewable Energy Targets

Texas' low renewable energy generation requirements may also have hindered adoption. States that lead in residential solar capacity, such as Arizona and California, have adopted renewable energy production targets of 15 percent or more of total power sold, as well as established solar-specific minimum generation targets to reduce carbon emissions.

A high target increases demand among electricity companies for renewable energy that they may be unable to generate on their own. In those cases, companies can often turn to a market mechanism called renewable energy credits (RECs), electronic credits that can be bought and sold among producers and homeowners to meet renewable energy requirements.

Texas set its first renewable energy target to reduce emissions in 1999 and has since increased its goal three times,

most recently in 2006. However, even Texas' highest renewable energy target, at 10,000 megawatts by 2025, amounted to only 9.1 percent of total generation (relative to 2006 capacity). It also did not include a solar-specific requirement.

Additionally, when Texas created its REC market in 1999, homeowners with solar systems couldn't participate, precluding a revenue stream that could encourage home solar panel investment.

Meanwhile, homeowners in states with more residential solar installations often can benefit from an array of government incentives, including direct subsidies, income tax credits and cash rebates. Texas only excludes solar installations from property tax assessments.

Notes

¹ "Citywide Impacts of Cool Roof and Rooftop Solar Photovoltaic Deployment on Near-Surface Air Temperature and Cooling Energy Demand," by Francisco Salamanca, Matei Georgescu, Alex Mahalov, *Boundary-Layer Meteorology*, vol. 161, no. 1, 2016, pp. 203–221.

² "Solar Industry Research Data." Solar Energy Industries Association, accessed Feb. 15, 2019, www.seia.org/solar-industry-research-data.