



THE SOLAR SQUEEZE



Without a strategic plan for solar build-out, North Carolina faces a difficult road to a renewable future. Fortunately, there are lessons utilities can learn from others' experience in the Southeast.





North Carolina ranks second in the U.S. for solar energy added to its grid, behind only California. The sun's rays alone make up around 4.4 percent of the state's total generation, but developers aren't stopping there. According to the Solar Energy Industries Association, within the next five years North Carolina is expected to add more than 4,400 megawatts of solar energy to its energy portfolio.

But the drivers behind this massive growth are less about the market — North Carolina is geographically indistinct from its neighboring states — and more about the way the North Carolina Utilities Commission (NCUC) has been implementing a four-decades-old law. The results have left the state's utilities grappling with how to interconnect the enormous number of requested facilities with the grid, leaving others to wonder: How do we plan for solar build-out?

THE PURPA PREDICAMENT

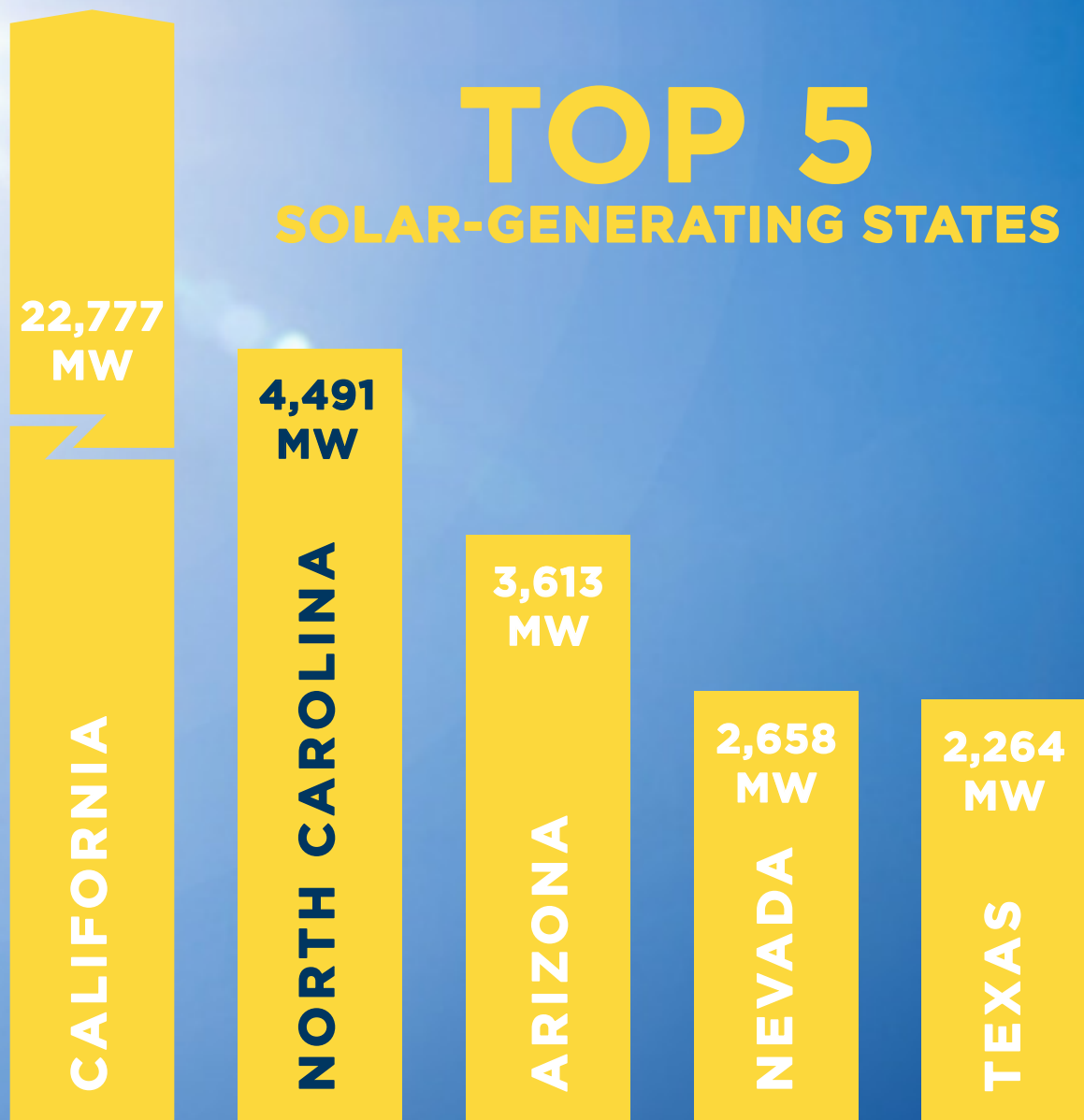
The law in question is the federal Public Utility Regulatory Policies Act (PURPA) of 1978. Designed to increase the supply of domestic and renewable energy and reduce overall demand, PURPA mandates that utilities purchase any power generated by qualifying renewable energy sources in their area. Under PURPA, the terms of facility qualification, prices and length of contract are predetermined at the state level, and regardless of market need.

These terms are still in effect throughout the southeastern United States, making the region desirable for solar developers; however, the fact that the NCUC offered a policy that was highly favorable to large-capacity facility developers made North Carolina even more enticing. Generous terms included the highest avoided-cost rates and the longest fixed-rate contracts for any state in the Southeast.

As a result, utilities throughout the state were inundated with applications, amounting to several gigawatts, from developers requesting to interconnect their solar facilities to the grid. »

TOP 5

SOLAR-GENERATING STATES



Source: SEIA/GTM Research Solar Market Insight Report
Cumulative amount installed through Q2 2018

THE SURGE REVERSAL

By June 2017, North Carolina was home to 60 percent of all PURPA projects in the entire U.S., overwhelming the ability of the state's utilities to successfully interconnect. Then, in July 2017, a new state law made it more difficult for solar developers to obtain PURPA contracts, effectively ending the surge in requests for interconnection.

Unfortunately, utilities are still dealing with the fallout created by the state's earlier handling of PURPA contracts.

"Each site takes approximately four weeks of engineering time, including going through the studies and developing a plan for interconnection," says Doug Houseman, a project manager at Burns & McDonnell. "With literally thousands of sites dropped on their heads and little to no staff with which to process them, the utilities in North Carolina are facing a backlog and seeking regulatory relief for deadlines."

But the law isn't designed to take existing projects out of the queue. What was originally intended to be a speedy 180-day interconnection process has extended to almost two years as utilities work their way through the backup these policies created.



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DOUG HOUSEMAN

THE PREPARATION FOR INTERCONNECTION

Despite the engineering and construction challenges that come with interconnection, incorporating a systematic interconnection plan as a standard process will prepare utilities for large amounts of solar build-out.

The first step is to understand the grid's overall hosting capacity. This isn't always a fast or cost-effective solution; such assessments involve multiple studies and the capital necessary to keep accurate and up-to-date models.

"Putting in solar is good, but putting it in without planning — without putting it in where it's needed — causes serious problems that take time to mitigate," Houseman says.

Knowing a grid's hosting capacity allows a utility to understand where and how much generation it can add. Then it can put out a request for proposals to develop on that location and at that capacity.

The entire process can be engineered from this point, as constructing sensors and communications — and performing studies, including harmonics and protection — will still be necessary to make a site suitable for interconnection.

If a utility wants to simply take applications for new generation development, then it will need to set up the appropriate planning tools. As applications come in, a similar cost will be incurred to determine the capacity of the circuit through various studies. The planning tool sets up a process for the utility to follow for interconnection.

LIGHTING THE WAY

North Carolina's experience — that of having to add an extensive amount of solar to its energy portfolio without a plan for interconnection because of poor state-level policy — offered good lessons for the industry. To deal with both the outstanding applications and the potential for new PURPA-driven contracts, utilities in the Southeast now have more engineers, with some creating entire divisions devoted to interconnection.

"This is a situation that most utilities can avoid by taking the time to put into place an interconnection process," Houseman says. "Understanding what it takes to do this and educating state regulators will be important in the future. It's far better to set up a process beforehand than it is to be surprised by a state regulatory change."

The example set by North Carolina will prove invaluable as the world moves toward a more renewable future. As utilities continue to find more intentional ways of installing the large amount of photovoltaic generation needed, North Carolina will continue to serve as a case study in how to better handle interconnection in the future. ●

Curious about how utilities are handling the changing landscape of residential solar? See how data is being used to determine peak demand impacts at burnsmcd.com/RenewableRescue. 