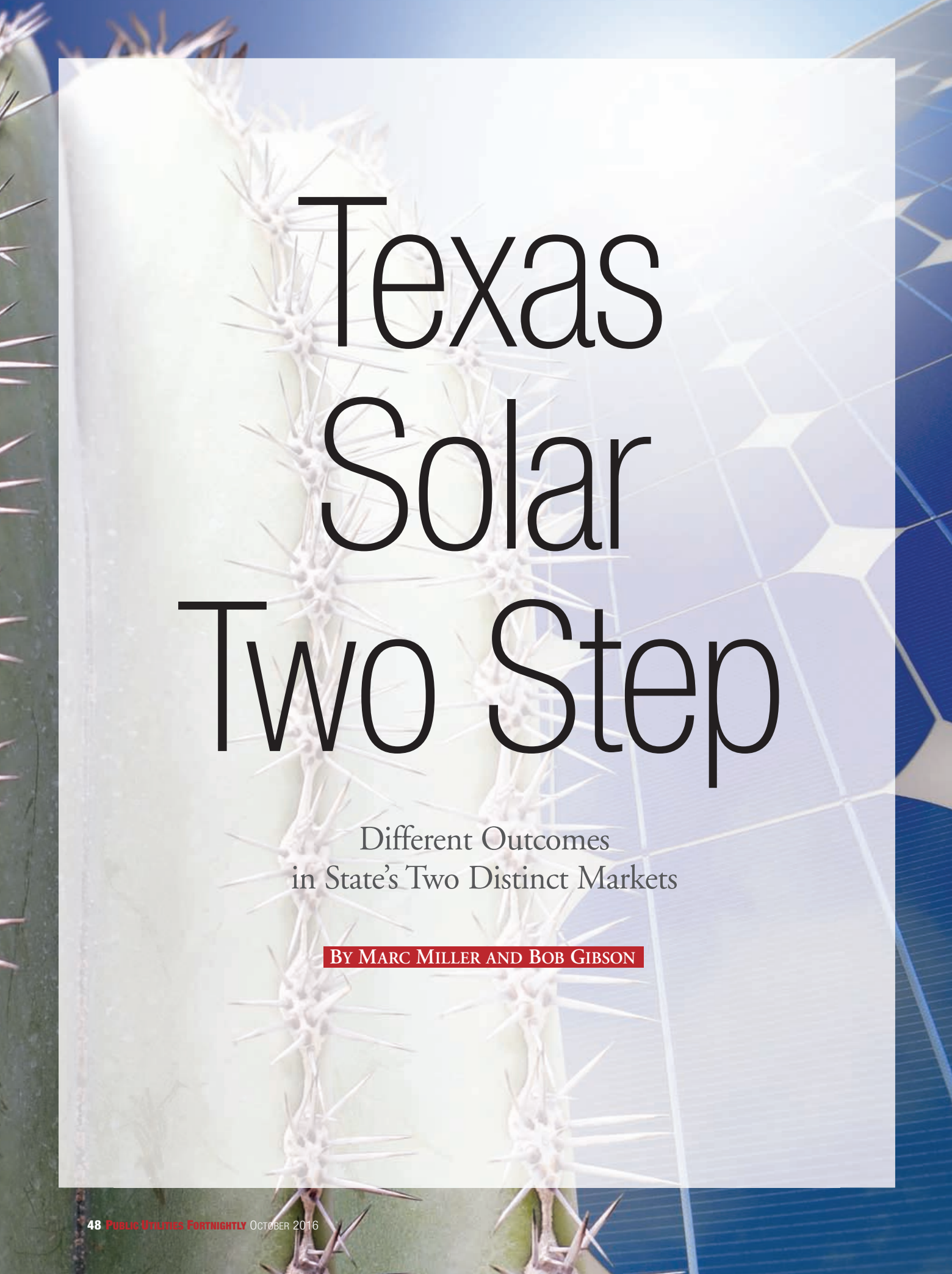

Texas Solar Two Step

Different Outcomes in State's Two Distinct Markets

By Marc Miller and Bob Gibson

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In Texas, the vast majority of solar growth has occurred in the service territories of municipal and cooperative utilities. However, the larger competitive wholesale market with retail choice has only seen modest growth.

In November 2015, we joined with the Smart Electric Power Alliance in hosting senior energy executives on a fact-finding mission to Texas. The objective of the trip was to understand the role of solar in a state with such unique market dynamics.

What the group found is municipal and cooperative utilities innovating to develop distributed and utility solar offerings.

Solar has been limited in competitive markets, though retailers are finding creative ways to offer solar products. Customers in all Texas markets will benefit from the expected boom of utility solar in the Texas oil patch.

Two Distinct Solar Market Structures

In 1995, Texas passed legislation requiring wholesale market deregulation. The reform required electric utilities to provide unbundled transmission service on a non-discriminatory basis. It resulted in the Electric Reliability Council of Texas becoming the country's first independent system operator.

Several years later in 2002, Texas implemented retail market deregulation. While municipal and cooperative utilities were only included if they opted in, this development required investor-owned utilities to divest generation assets and become poles and wires companies.

With retail deregulation, registered retail electric providers began to compete to serve customers. One is designated by the Public Utility Commission of Texas to be the provider of last resort service for each customer class in each electric utility service area that is open to competition.

The last resort service is relatively high-priced. It thereby encourages customers to select a service from a provider that meets their needs.

The deregulation design in the wholesale and retail markets makes Texas distinctly unique. But it also produces two distinct markets for solar growth.

The market that has driven the vast majority of solar to date is in the territories of municipal and cooperative utilities. They are overwhelmingly exempt from retail deregulation.

The market that has driven the vast majority of solar to date is in the territories of municipal and cooperative utilities, exempt from retail deregulation.

These utilities account for twenty-five percent of total load. They may source or own generation while providing full retail service to electric customers in their service areas.

See Figure 1.

In addition, these utilities may be influenced to pursue solar generation by local directives from local boards of directors or from city councils setting municipal renewable energy targets.

The second market is a competitive wholesale market with retail choice. Here, solar has been slow to appear.

In the competitive wholesale market, the system operator is responsible for scheduling power on an electric grid. This grid consists of forty-three thousand miles of transmission and five hundred fifty generation units.

The system operator also performs financial settlements for the competitive wholesale bulk-power market. It administers retail switching for competitive retail customers.

Wholesale energy prices are closely correlated with the cost of natural gas. This is the primary fuel for the majority of generation in Texas.

The competitive retail market accounts for seventy-five percent of total load. One hundred and ten retail electric providers serve customers who are able to choose their electric rate plan.

Since the inception of retail choice, ninety percent of retail customers have switched providers at least once as of September 2014. This indicates retail choice is functioning as intended to create choices and competition.

Municipal, Co-op Utilities Leading the Way

During the fact-finding mission, executives on the ground observed that a large and growing percentage of municipal and

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cooperative customers want options, and not simply low-cost, reliable power from any source.

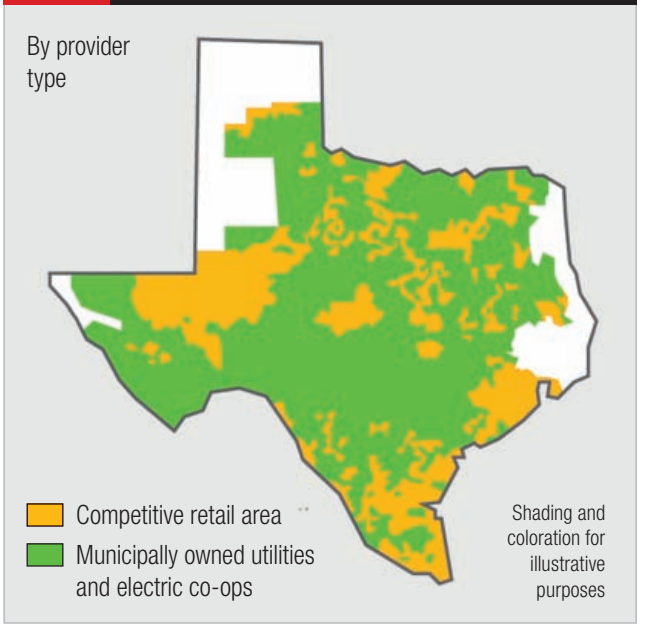
This sentiment matches the broader industry trend toward greater customer capability to choose energy sources and control energy consumption. For example, a national survey conducted in 2014 found homeowners maintain a favorable view of their utility. However, a large majority (sixty-nine percent) would like more choices when it comes to purchasing electricity for their home.

Municipal and cooperative utilities provide full retail service to their customers or member-owners, and can take a holistic view. Consequently, municipal and cooperative utilities have overwhelmingly led development of utility-scale and distributed solar in Texas so far.

These utilities accounted for eighty-six percent of cumulative solar capacity installed at the end of 2015. However, this success in solar has not come just because of the market construct. Rather, it has come because municipals and cooperatives are combining a lasting strong connection to their customers with the technical and operational capabilities to deliver the services that those customers want.

See Figure 2.

Fig. 1 Electric Territories in ERCOT



Key Driver of Solar in Competitive Markets

Consumers and retail electric providers are subject to long-term price uncertainty in the competitive wholesale markets. In addition, retail net metering is not available to customers in these markets.

In this setting, utility-scale and distributed solar deployment has historically been limited, unable to compete against low natural gas prices and competitive wind resources. This dynamic is changing for utility-scale solar with the continued cost declines of solar technology and recent extension of the thirty percent federal investment tax credit.

The best economics for solar are in the western portion of Texas, where less cloud cover allows a thirty to fifty percent increase in solar production relative to the eastern portion of the state. Transmission infrastructure constraints notwithstanding, expect utility-scale solar development to continue to expand in west Texas.

The near-term economics, which have a greater influence in the competitive retail market, are not there yet for distributed solar. Rooftop solar has been slow to develop in most parts of Texas in absence of retail net energy metering. However, municipal utilities like CPS Energy, with solar rebates, and Austin Energy, with a value of solar rate, have created islands of rooftop growth.

Nevertheless, retail providers such as TXU Energy and MP2 Energy have recently created retail offerings that are partially or fully-sourced with solar.

Maura Yates, MP2 Energy's vice president of sustainable solutions, characterizes solar as a risk mitigation tool in both the retail and the wholesale side of her company's business. "Finding value in solar on the risk side leads to innovation on the product side," she says. Most of MP2 Energy's retail products are a hundred percent renewable energy.

Two community solar rates offer renewable energy certificates directly from local solar assets. MP2 Energy purchases excess rooftop solar generation and, under unique ERCOT rules, leverages its high value during the peak-demand period at mid-afternoon.

Meanwhile, in 2016, TXU Energy opened its all-solar rate. It leverages renewable energy credits from a large solar project.

(Cont. on page 56)

of 2000-01 caused a utility to go bankrupt and another one to nearly go bankrupt, unlike her assertion that two went bankrupt.

Unfortunately, a book which began on a promising note, takes its reader on a journey that abounds in sweeping generalizations, unsupported statements, conjecture and speculation.

The narrative is marred by invective. "[B]y the 1970s the utilities had ceased to live and function in the real world. … Their power had grown absolute, plodding, and blind…[T]he most risk averse and least facile minds were running the game."

These statements bring into question the objectivity of the author. By the time I finished reading the book, the grid had become the grind. PUF

Endnotes:

1. Gretchen Bakke, *The Grid: The Fraying Wires Between Americans and Our Energy Future,* Bloomsbury Publishing, 2016.
2. Such as, that today's rate designs will have to yield to more sophisticated, three-part rates which charge for capacity through kilowatt charges and for energy through kilowatt-hour charges.
3. The surprising omission is the lack of any references to the extensive reports published on various facets of the grid by the Electric Power Research Institute.
4. Indeed, there have been places where parallel distribution lines ran down streets and for which different companies sold power from each of them. Eventually, only one company remained in business. This is similar to the experience of New York's original subway systems, where parallel tracks in Manhattan owned by different companies eventually went bankrupt.

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This follows the launch of "TXU Solar with SunPower," a rooftop solar installation service offered in partnership with the national solar company SunPower in an area of north Texas.

The long-term potential is evident in recent market forecasts. Driven largely by utility-scale solar, GTM Research forecasts cumulative solar capacity in Texas will increase from around five hundred megawatts to over seven thousand megawatts by 2021. See Figure 3.

A separate ERCOT analysis corroborates the finding that solar is poised for rapid growth.

In October 2015, the system operator released a report evaluating the potential implications of compliance with the Clean Power Plan final rule on resource mix and grid reliability.

The report, which did not distinguish between utility-scale and distributed resources, included thirteen thousand megawatts of new solar by 2030 in the baseline scenario. Meeting the Clean Power Plan and other environmental regulations could result in an additional eleven hundred megawatts of solar.

Outlook

The fact-finding mission to Texas highlights the importance of market structures and economics in the growth of solar deployment. Driven by customer interest and policy objectives, distributed and utility-scale solar has thrived in municipal and cooperative service territories.

The same has not been true in the competitive wholesale market with retail choice. However, this market is likely to see rapid growth of utility-scale solar, driven by improving and competitive project economics. PUF

Interesting Quotes from January 22, 1931 Issue of *Public Utilities Fortnightly*

"Neither in spite of nor because of its bigness, the electric utility industry, and, therefore, to a large degree, the whole electrical industry, is fundamentally local."
– Samuel Insull, Jr.,
President, Midland United Company

"I am not so much concerned over possible duplication of jurisdiction (of state and Federal public service commissions) as I am over filling possible gaps in jurisdiction. There should be no 'No Man's Land.' "
– George Otis Smith,
Chairman of the Federal Power Comm.

"I am satisfied there is a large element in the country that wants to try out government ownership. If we are going to try it out, there is no better place than in Muscle Shoals."
– Bertrand H. Snell,
Representative from New York State