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Renewables Trends and Regulatory Updates

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For the first time, total wind generation outpaced coal as a source of power in Texas during the first half of 2019 according to an ERCOT Demand and Energy Report Working Paper, while solar projects and production in Texas have seen significant growth over the last few years. In Q1 and Q2 combined, wind and solar accounted for approximately 22% and 1% of total generation in ERCOT, respectively. This growth can be attributed in part to tax incentives, including the Production Tax Credit (PTC) and Investment Tax Credit (ITC), and corporate initiatives to procure renewable energy through power purchase agreements (PPAs). Although uncertainty surrounding renewables incentives and the pace of development has also increased with the nearing expiration of the PTC and phase down of the ITC, costs of installing solar and wind capacity have decreased, making these resources more competitive. At the same time, Texas has faced unique issues this summer with wholesale power price volatility during peak periods, exacerbated in part by reliance on intermittent wind resources and the reduced supply of dispatchable resources. However, complementarity between wind and solar resources may soon alleviate these pricing issues in light of the accelerating pace of solar development in particular and the higher generation of solar power during peak demand periods.

Renewables Growth and Incentives

The Production Tax Credit (PTC) has been one major driver of wind project construction. The U.S. Energy Information Administration currently projects that U.S. wind capacity additions in 2019 will total 12.7 gigawatts (GW), exceeding annual capacity additions in each of the previous six years but falling short of the 13.3 GW of wind capacity added in 2012 (when the PTC was initially set to expire). While wind facilities commencing construction in recent years have been subject to a yearly phase-down of the PTC, wind facilities commencing construction after 2019 are not be able to claim the PTC. After 2019, solar will continue to qualify for the 26 percent Investment Tax Credit (“ITC”) for projects that begin construction in 2020. Additional details of the PTC and ITC are shown in Table 1.

In addition to the PTC and ITC, corporate renewable procurement initiatives have been a significant driver of renewables development. According to a Wood Mackenzie study, corporate buyers accounted for 22% of all wind and solar PPAs in 2018, for a total of 5.8 gigawatts of renewable power. In particular, the materials, financial, consumer discretionary, and industrial sectors have led renewables procurement and consumption efforts, with numerous companies and municipalities committing to 100% renewables.

The decline in costs of wind and solar installation spurred on by corporate procurement efforts may help continue the trend in renewables growth despite increased regulatory uncertainty both for the federal incentives discussed above and state renewable portfolio standards (RPS). Recently, some states have reconsidered or made downward revisions to their RPS targets. In Ohio, after initial legislative attempts to cancel the state RPS, the Ohio governor eventually signed a bill that instead truncated and decreased the Ohio RPS requirement, reducing the state’s RPS target from 12.5 percent by 2027 to 8.5 percent by 2026, the amount that would have been required by 2022 under the previous RPS. In contrast, other states, including California, Connecticut, Massachusetts, and New Jersey increased their RPS targets (respectively to 60%, 44%, 35% and 50% renewables by 2030). However, many states, including Texas, have retained their RPS targets. The Texas RPS target of 10,000 MW by 2025 was reached in 2010.

Price Problems and Solutions

Growth in renewables development has unsurprisingly coincided with a significant decrease in power prices, including for wind and solar hedges and corporate PPAs. Yet, in contrast to decreasing PPA and hedge prices, wholesale power prices hit the $9,000 ERCOT price cap in the month of August 2019, with reserves at one point hovering lower than three percent of demand. The price peaks have sparked debate over the source of the problem as well as potential solutions. Unlike PJM, ERCOT does not have a capacity market to incentivize development and ensure sufficient capacity during peak demand times. The "Energy only" market structure relies on scarcity pricing to provide incentives for new generation, yet financial markets are proving resistant to financing baseload power projects in light of uncertain and highly volatile pricing. The absence of capacity payments has been cited by several generators as a significant barrier to construction of dispatchable generation, especially unsubsidized conventional sources. Even prolonged scarcity pricing signals in 2011 produced only a limited number of new entrants from conventional sources, and many of those projects have faced bankruptcy or other financial distress. However, as demonstrated in PJM where the August 2019 capacity auction was recently cancelled until a further order is issued by the FERC revising the PJM market, capacity markets themselves may not always be reliable and are subject to a degree of regulatory uncertainty.

The variability of certain renewable power sources aggravates this issue, particularly in an energy-only market like ERCOT. While energy storage could theoretically provide a solution, the high costs associated with battery storage and insufficient incentives present obstacles to this solution. Battery installation has accordingly not kept pace with the rapid growth of wind and solar, and as of January 2019, only 89 MW of utility-scale battery resources were registered with ERCOT. Battery installation may eventually present a longer-term solution and is expected to increase due to declining battery technology costs. Approximately 2,300 MW of new battery capacity was under study in ERCOT as of December 2018. Yet phasedown of the ITC may also impact battery storage development as the ITC has been used for battery systems that are charged primarily by solar generation.

Installation of natural gas plant capacity could also address reserve issues, but generally prevailing power prices remain low enough despite temporary spikes that added gas capacity seems unlikely to be significant enough to resolve the issue.

In the current regulatory and price environment, a more viable solution may be found in wind and solar complementarity. Wind resources are most productive during the evening and early morning, when demand is generally lower. Yet peak demand requires generation in the middle of the day and especially the late afternoon, when solar production is at or near its peak.[1]

Solar installation is also rapidly increasing. At the beginning of 2019, the ERCOT region had approximately 1,500 MW of utility scale solar and by April, solar generation was approximately 2.1% of all generation capacity in ERCOT. More than 40,000 MW of utility-scale solar capacity was under study in the ERCOT at the beginning of the year, and of these, approximately 4,300 MW have signed interconnection agreements and may be in service by 2020. While costs of wind development continue to decrease, the decline in costs of solar development is expected to accelerate at a greater pace in the next few years. Table 2 provides a comparison of the top states, including Texas, with respect to installed solar and wind capacity.

[1] *See* Slusarewicz, Joanna & Cohan, Daniel, "Assessing solar and wind complementarity in Texas", *Renewables: Wind, Water, and Solar* (Dec. 2018).

Table 1 - Expiration of and Proposed Changes to Renewable Energy Tax Credits

Phase-out of Production and Investment Tax Credits	Typical Use	Proposed Changes
Production Tax Credit: Wind projects can receive a federal production tax credit ("PTC") for each kilowatt hour (kWh) of renewable energy generated in the first 10 years of operation. The PTC is subject to an annual adjustment for inflation and in 2019 is 2.5 cents per kWh. Although wind projects may elect to use either the PTC or the investment tax credit (described below), wind projects have typically utilized the PTC. The PTC expired for renewable facilities other than wind commencing construction after 2016. Although the PTC has remained available for wind facilities commencing construction post-2016, the PTC for such facilities has been subject to a phase-down (as set forth below), with wind facilities commencing construction after 2019 not able to claim the PTC. • For wind construction commenced in 2017, the PTC is reduced by 20%. • For wind construction commenced in 2018, the PTC is reduced by 40%. • For wind construction commenced in 2019, the PTC amount is reduced by 60%. • For wind construction commenced after 2019, the PTC will no longer be available.	Wind Projects	The Taxpayer Certainty and Disaster Tax Relief Act of 2019, introduced in the U.S. House of Representatives in June, includes a provision for a one-year extension of the PTC.
Investment Tax Credit: Renewable energy projects can receive a federal investment tax credit (the "ITC") that permits the deduction of a percentage of the cost of the construction. Solar project developers typically have utilized the ITC, and the PTC cannot be used for solar projects commencing construction after 2017. The ITC is subject to a phase-out for wind facilities and a phase-down for solar projects. For commercial solar projects, the project must be placed in service by December 31, 2023 to receive the ITC at a percentage greater than 10% and must commence construction: (1) Before January 1, 2020 to receive the 30% ITC (2) In 2020 to receive the 26% ITC (3) In 2021 to receive the 22% ITC (4) Any time thereafter (regardless of the year placed in service) to receive the 10% ITC For large wind projects commencing construction by the following dates, the ITC percentage is as follows: (1) By December 31, 2016, 30% (2) By December 31, 2017, 24%	Solar Projects	In July, U.S. Senators introduced the Renewable Energy Extension Act of 2019, which would provide a 5-year extension of the ITC, delaying the incremental phase out of the ITC. In addition to solar, the bill would extend the ITC for other clean energy technologies set to phase out, such as fiber-optic solar, fuel cells, small wind, microturbines, combined heat and power, and geothermal heat pumps.

(3) By December 31, 2018, 18% (4) By December 31, 2019, 12% (5) Thereafter, no ITC		

Table 2 - Top States for Installed Solar and Wind Capacity

Top Wind States*	Top Solar States**
1. Texas – installed capacity 25,629MW 2. Iowa – installed capacity 8,957MW 3. Oklahoma – installed capacity 8,072MW 4. California – installed capacity 5,842MW 5. Kansas – installed capacity 5,653MW 6. Illinois – installed capacity 4,861MW **Wind capacity data current to 2Q 2019*	1. California – installed capacity 25,016MW 2. North Carolina – installed capacity 5,467MW 3. Arizona – installed capacity 3,788MW 4. Nevada – installed capacity 3,452MW 5. Florida – installed capacity 3,155MW 6. Texas – installed capacity 2,957MW **Solar capacity data current through Q1 2019*