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PROJECT NO. 52373

**REVIEW OF WHOLESALE
ELECTRIC MARKET DESIGN**

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**PUBLIC UTILITY COMMISSION
OF TEXAS**

**JOINT COMMENTS OF
TEXAS SOLAR POWER ASSOCIATION AND
SOLAR ENERGY INDUSTRIES ASSOCIATION**

COMES NOW the Texas Solar Power Association (“TSPA”) and Solar Energy Industries Association (“SEIA”) and file these joint recommendations regarding potential market design changes for the ERCOT Region in response to the Commission Staff’s request dated September 20, 2021. TSPA and SEIA are not affiliates, but we (“the Solar Associations”) have combined our comments for this filing to assist the Commission.

INTRODUCTION

The TSPA is a statewide industry trade association that promotes the development of solar electric generation. Our member companies invest in the development of solar photovoltaic products and projects in Texas, serving customers in both wholesale and retail markets, with products ranging from utility-scale generation, community solar and customer-sited solar and storage solutions.

SEIA is the national trade association of the solar energy industry. Through advocacy and education, SEIA and its members are building a strong solar industry to power America. As the voice of the industry, SEIA works to make solar a mainstream and significant energy source by expanding markets, removing market barriers, strengthening the industry, and educating the public on the benefits of solar energy. SEIA represents solar companies across a variety of solar energy technologies, including photovoltaic (“PV”), solar water heating, and concentrating solar power (“CSP”). Additionally, SEIA represents diverse solar companies providing utility-scale generation community solar, and customer-sited solar and storage solutions.

SUMMARY OF COMMENTS

The Solar Associations support the Commission's goal of incentivizing additional dispatchable generation in the ERCOT market while moving away from a crisis-based model of providing adequate revenue to generators.

Solar generators have added more than 6,000 megawatts of valuable capacity to the ERCOT grid in the past two years and are building across a wider expanse of the state that allows increased reliable output from solar generation in general. In addition, solar generators are rapidly incorporating battery energy storage into their development plans to further boost dispatchability and their ability to provide various grid services. There is currently more than 9,000 MW of storage capacity co-located with solar currently in development in ERCOT.

At a high level, the Solar Associations encourage the Commission to rely on market-based solutions to solve problems, rather than trying to use government mandates and central planning to target every reliability issue with a specific solution. Market participants can react very swiftly to clear market signals as well as technological innovations. Market participants can deploy a diversified portfolio of resources to ensure reliable performance across the widest array of system needs.

The foundation of this effort should be to ensure that energy prices reflect the value of reserves or the conditions in the electric grid. With clear price signals, generators will be driven to ensure their availability when needed, whether by preventative maintenance to reduce forced outages, appropriately scheduled seasonal maintenance, the addition of battery storage to smooth or stretch output across key hours, or other methods. If prices cannot reliably solve a known problem, the Commission should then consider new products for that situation.

Our specific recommendations include:

- Modify the **ERCOT scarcity pricing mechanism**. Increase the Minimum Contingency Level (Value of X) to at least 3,000 MW and adjust the Operating Reserve Demand Curve to express the economic Value of Lost Load not just at near-crisis moments of physical scarcity but also at higher levels of operating reserves, so that meaningful investment and behavior incentives are sent during more hours with more predictability.
- Modify the **ERCOT Power Balance Penalty Curve** to ensure that market prices adequately reflect current operating conditions.
- Ensure that **Ancillary Services** are designed and sized appropriately to address identified needs, remain technology-neutral to allow participation by solar and storage generators as well as other technologies, and have costs allocated in a non-discriminatory manner consistent with cost-causation.
- Continue to expand pathways for the full utilization of **Distributed Energy Resources** in the ERCOT market.
- Bolster the **Black Start** program as a foundation of system resiliency.
- Continue accelerating investments in economic and reliability **Transmission** projects to ensure that available generation is able to reach customers when needed.

DISCUSSION

Wholesale Market Design

First, the Solar Associations want to re-emphasize the unique nature of a well-designed wholesale market to solve reliability issues. System operating conditions are constantly changing due to fluctuations in both energy demand and generator availability across fuel types for reasons such as forced outages/derates, seasonal maintenance, and wind/solar resource variability. Efficient markets promptly respond to these issues so that the most efficient, least cost-solution can respond to changing conditions, or more realistically, a combination of multiple actors can work in concert without needing direct coordination with the ERCOT control room. By letting the real-time market price these events, the aggregate solution will consistently be more effective than a series of out-of-market actions. The control room at ERCOT can step in when the need exceeds the market's ability to react in unusual circumstances, but the daily management of known events is best handled by a diversity of market actors.

In this way, all generators (and responsive load) back up all other generators through prices, without the need for complex contracting to have backup generation be provided by some

generators to other generators explicitly. If a generator has an outage, it can buy replacement power from the market to meet its contractual obligations. If the risk of that purchase is too high, it can buy call options so that it has the right to buy power at a specified price in the future. For example, assume a generator has a contract to sell power at \$45 around the clock for years to its customer. The generator's costs are \$25, so it stands to make \$20/MWh in excess revenue. However, if it has an outage and an option to buy power at \$45, then it can at least break even on its contracts. If power prices stay low, at \$30, it can still make a profit by buying from the market. If prices rise to \$100, its options contract protects it from paying \$100 for replacement power. Effectively, this options contract increases the generator's operating costs and could be considered to be a variable fuel cost for the generator. But, as this example shows, there are a variety of tools in the competitive market to ensure that a generator meets its obligations. Maintaining clear price signals that accurately reflect grid conditions is critical for these healthy responses.

Battery Energy Storage

The Solar Associations agree with the Commission that battery energy storage is an important new resource. These investments increasingly are becoming a key part of solar power developments in ERCOT for a number of reasons, including technology improvements, cost reductions, customer demand, and existing market signals for real time generation. In the last year alone, the amount of battery energy storage capacity in the ERCOT interconnection queue planned to be co-located with solar has grown from 3.8 GW to 9.2 GW (140% increase). There are now 67 such co-located solar + storage projects proposed in 47 different counties, with storage capacities ranging from 25-500 MW. Of the 30,600 MW of total planned storage in the interconnection queue, 64% is stand alone and 30% is co-located with solar. A mix of standalone and co-located storage will support reliable operations in ERCOT. Providing clear pricing signals will improve

the likelihood that these proposed storage projects will reach completion. If the Commission has particular intentions for storage in terms of the amount deployed or certain performance characteristics, there will likely need to be clear market signals for those units to respond to and be compensated in a way that brings sufficient revenue certainty to ensure financeability.

Pricing the Market

The Solar Associations agree with the Commission that changes need to be made to ensure resource adequacy in ERCOT. In practical terms, resource adequacy means having sufficient operating reserves in all hours of the year and in our energy-only market that is achieved through price signals. Simply put, to increase generator investment in ERCOT, the Commission will need to modify current price signals to increase revenues available to generators who are producing energy when needed.

The Operating Reserve Demand Curve (“ORDC”) concept was introduced to provide clear price signals regarding the fact that as operating reserves fall the system value of the next MW of generation or load reduction is necessarily higher because of what it means for overall system reliability. In this way, electricity prices are made a function of both generator costs and the customer value of boosting operational reserves in various circumstances.

As originally designed, the ORDC price adders derived from the multiplication of customer Value of Lost Load (“VOLL”) and loss of load probability (“LOLP”) are mostly delivered at very low levels of operating reserve so in practice have been relatively rarely present – but it doesn’t have to be that way. The Commission can design that signal to be sent not just at near-crisis moments but also at higher levels of operating reserves, so that meaningful investment and behavior incentives are sent during more hours with more predictability.

To design the market to achieve these results, the Solar Associations encourage the Commission to (1) modify ORDC and (2) modify the power balance penalty curve.

Regarding ORDC modifications, the Solar Associations recommend that the Commission raise the minimum contingency level (“MCL” or “the value of X”) to at least 3,000 MW. The minimum contingency level is the point at which the ORDC adders are equal to the HCAP (or LCAP). Raising this reserve level to at least 3,000 MW means that those high prices will occur sooner, or without relying on the current scarcity of reserves or a crisis. Said another way, if the Commission wants to indicate a higher value of reserves now compared to prior to Winter Storm Uri, raising the minimum contingency level explicitly means raising the value of reserves. It shows that the Commission wants more reserves and will price the loss of those reserves accordingly. This is the single most effective way to move away from a crisis-based pricing model while retaining the energy market’s largely effective constructs. The Solar Associations agree with the Commission’s interest to decouple economic scarcity from physical scarcity. The simplest way to do this is to increase the value of more reserves in the ORDC curve.

The all-time peak demand as of 2014 when the ORDC was adopted was 68,305 MW (from 2011). The 2,000 MW MCL at that time was 2.9% of peak demand. Today’s all-time peak demand is 74,820 MW (August 2019) so an MCL of 2,000 MW represents just 2.7% of all-time peak demand. Setting the MCL at 3,000 MW would increase the proportion of valued reserves to roughly 4% of peak demand. Setting the MCL as a percentage of peak demand, as originally recommended by Engie North America, would allow this increased value of reserves to increase as peak demand increases rather than erode over time.

Similarly, raising the height of the curve beyond the MCL also would reflect a higher value for reserves. In its comments submitted in this proceeding on August 16, Vistra and Engie each

provided example curves that highlight this approach. While there is room for debate about the specific HCAP or specific slope, a piecewise linear line from the MCL to a specific end point is appropriate alternate approach to calculating the ORDC adder. Price adders along the slope should be high enough so that demand can respond to them by reducing consumption, or batteries could charge and discharge to meet the expected reserve level's pricing outcomes.

The Commission should explicitly recognize trade-offs when designing this slope. For example, high adders may lead to load curtailments. On the other end of the scale, frequent low adders may just shift revenue to generators for no change in behavior at very high reserve levels and slightly extend their retirement date. Additionally, many low adders may not increase the likelihood of adding storage, but rather, could just increase the cost of charging batteries, directly harming the business case for storage investments.

However, ORDC isn't the whole ball game. In addition to ORDC that can add the value of lost reserves to the settlement point price, the power balance penalty curve represents the value of having enough generation to serve load given the operating constraints of the existing reserves. When the Real Time Market's SCED engine does not have enough generation to meet supply, a power balance violation occurs. The cost of this violation is on a curve, just like ORDC. However, when a violation occurs, ERCOT uses ancillary services to fill the gap and meet demand. This should come at a very high cost for several reasons. First, ERCOT's new operating model is to protect reserves. When reserves are needed to meet load, the cost should be high. Second, this condition typically occurs during tight ramping conditions – even if there are plenty of reserves online, they might not be able to ramp quickly. This ramp can occur during evening hours when solar ramps down and load ramps up – what other markets have called “the duck curve.” Making

sure this ramp is well-priced will allow market participants to react to it through investments, including by installing storage at solar facilities or DERs at loads.

Ancillary Services

Various concepts of new or revised Ancillary Services have been discussed by the Commission and stakeholders. Ancillary Services can provide clear price signals to the resources ERCOT needs to ensure reliable operations of the electric grid. While not proposing any particular design concept, the Solar Associations recommend that ERCOT ensure that the amount of Ancillary Services it procures be sized appropriately to address identified needs, remain technology-neutral to allow participation by solar & storage generators, and have costs allocated in a non-discriminatory manner consistent with cost-causation as discussed in TSPA's 8/16 comments.

DERs and Demand Response

Distributed Energy Resources are critical to matching supply and demand. They are smaller, incremental investments that can add up to a large, responsive, dispatchable resources. These investments can support local resiliency, but also simultaneously support increased reserves on the ERCOT system. We recommend that the Commission consider SEIA's August 16th comments in this proceeding that made specific recommendations for DERs. The Commission should almost always prefer voluntary or paid demand response to involuntary load curtailment.

Black Start

Black Start is an area that deserves special attention from the Commission. Black Start contracts are how ERCOT plans to recover from a total grid black out – which Texas barely avoided in February. Solar plus storage in load centers can provide black start, and black start contracts could encourage additional investments in storage resources. In addition, black start contracts can encourage investment in onsite fuel storage for thermal generators without the Commission having to design specific programs for fuel storage which could be complicated to administer and difficult to hedge. ERCOT's expenditures on black start could encourage capital upgrades under long-term contracts.

Transmission

The Solar Associations appreciate that the Commission has included transmission access as a key part of ensuring system-wide resource adequacy. Transmission access can increase the amount of capacity available to the ERCOT grid in an emergency. While that is not the explicit request for comments today, we hope the Commission will continue to have a policy focus on this important area.

CONCLUSION

The Solar Associations appreciate the opportunity to provide these Market Reform Recommendations and look forward to working with the Commission and other interested parties on these issues.

Respectfully submitted,



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INDUSTRIES ASSOCIATION

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