Filing Receipt

Received - 2022-12-14 10:37:04 PM
Control Number - 54335
ItemNumber - 52

PUBLIC UTILITY COMMISSION OF TEXAS

REVIEW OF MARKET REFORM ASSESSMENT PRODUCED BY ENERGY AND ENVIRONMENTAL ECONOMICS, INC. (E3)	))))	PUC PROJECT NO. 54335

Comments of Tesla, Inc.

Tesla, Inc. ("Tesla") thanks the Public Utility Commission of Texas ("Commission") for the opportunity to provide comments. Tesla appreciates the substantial efforts of the Commission and ERCOT to effectuate Market Design Blueprint Phase II[1] to preserve long-term reliability. Tesla has been directly involved in market-wide efforts related to implementing Phase I.[2] Tesla is eager to see the results of the Commission's robust implementation of the Phase I design and the positive impacts of that implementation: improved price signals for supply and demand resources, distributed resources exporting grid services in ERCOT, improved operational reliability, and enhanced Ancillary Services. These are crucial inputs to the longer-term initiative of resolving the ideal market design for Phase II.

Tesla has led the effort to pioneer solutions with ERCOT to remove current barriers for distributed energy Virtual Power Plants to participate in grid services and will continue to engage proactively in market design policy conversations to build the value stack for this asset type – participation in all available ancillary services. Tesla is also operating front-of-meter storage assets in the ERCOT wholesale market and works with commercial partners to leverage the participation of these assets in all available ancillary services products with the aim to provide dispatchability 24x7. Finally, Tesla has obtained a license to operate an affiliate retail electric provider, to leverage the opportunity to

[1] *See* Public Utilty Commission of Texas, *Review of Wholesale Electric Market Design*, Project No. 52373, Approval of Blueprint for Wholesale Electric Market Design and Directives to ERCOT (stating, "Phase II of the blueprint incorporates long-term market design reforms to promote the supply of dispatchable generation and develop a backstop reliability service.").

[2] *See* Public Utilty Commission of Texas, *Review of Wholesale Electric Market Design*, Project No. 52373, Approval of Blueprint for Wholesale Electric Market Design and Directives to ERCOT (stating "Phase I of the blueprint provides enhancements to current wholesale market mechanisms to enhance ancillary services and improve price signals and operational reliability.").

provide more targeted demand response in Texas and increase the utilization of load resources and the existing customer-owned distributed fleet for grid reliability. In these three areas, Tesla has taken and will continue to take active steps to quickly realize grid reliability value for ERCOT all while increasing reliability for its electric loads in the state, including but not limited to, its Load-Serving Entity obligations, its commercial and industrial facilities, and its storage generation fleet. Reliability is critical to Tesla's business operations as is resiliency planning to protect our customers and our operations from grid failures. Tesla offers the following responses to Staff questions.

1. **The E3's report observes that the PCM has no prior precedent for implementation, does this fact present a significant obstacle to its operation for the ERCOT market?**

Like all capacity markets, the Performance Credit Mechanism ("PCM") design would reduce the portion of total system costs driven by volatility (which batteries are good at capturing) and create a new portion of total system costs that batteries may or may not be able to capture as well, depending on the implementation details. This is an important consideration, given the substantial investment in storage Texas has already received and the gigawatt hours of standalone storage in queue today.

Additionally, a clear obstacle is timing: the Commission needs a significant stakeholder process to address concerns around collateral, market power mitigation, the structure of the forward auctions, and the way generators operate in response to PCM incentives. The Commission should also have a separate process, to individually consider how to set a reserve margin – the traditional one-in-ten year approach is overly conservative and out of date. However, in the meantime to mitigate this challenge, ERCOT should maximize Phase I market design value, focusing on operational enhancements that eliminate the ongoing Reliability Unit Commitment ("RUC") issues by increasing ancillary services ("A/S") procurement, continue to advance the Aggregated Distributed Energy Resources ("ADER") pilot quicky to unlock more A/S product value from these resources, and continue to support the quick and reliable integration of new loads and generation into the market.[3]

[3] Note: As Tesla has noted in prior comments, aggregated distributed energy resources ("ADERs") can provide sophisticated ancillary services and have already proven this capability in Tesla's market demo in Q1 2022, the results of which were filed in the Commission's Project 52373 and Project 51603. The fact that the ADER Governing Document is

Finally, for PCM to operate without major challenges in ERCOT, the PCM procurement quantity should not be based on a forward forecast. Instead, it should be based on the revenue requirements to meet a reserve margin based on actual experience in the prior year. A forward forecast just introduces more assumptions into a market design that already relies on assumptions – and assumptions on top of assumptions will inherently lead to significant price uncertainty that risks attrition of the very investments the State is seeing to attract to boost reliability needs and steel in the ground.

2. Would the PCM design incentivize generation performance, retention, and market entry consistent with the Legislature's and the Commission's goal to meet demand during times of net peak load and extreme power consumption conditions? Why or why not?

Any market design can have incentives to address these goals, but it will also have assumptions that will lead to these goals not being met. Comparing the existing energy-only market with the PCM or a traditional capacity market, the distinction among these choices is not whether the goals are met, but rather, who bears the risk of failure in the market and over what time period. Tesla encourages consideration of the market design from the perspective of allowing market participants to manage risk with tools that are aligned with ERCOT's actual operational risks. The PCM structure has the possible downside of encouraging participants to commit generators or decommit load based merely on whether a particular hour is a performance credit hour, and not on whether there is an actual reliability reason to change behavior in that hour. In other words, merely because an hour is determined by regulations to be a performance credit hour, it does not necessarily follow that this hour actually merited the commitment of additional generation, or more importantly, the decommitment of additional customer demand.

This concern is particularly important for ADERs – which in the case of solar and storage distributed assets, means aggregations of potentially thousands of residential-scale batteries powered by solar. If a retail electric provider that operates an aggregation reduces customer demand by

---

limited only to non-spinning reserve service at this time effectively depresses the price signal for ADER consumers, retail electric providers, and other load-serving entities to invest in leveraging this demand-side solution to bring more low-cost dispatchability to the grid. This price/value distortion cannot be addressed without rapid expansion of available A/S products such as ERCOT Contingency Reserve Service (when implemented), Responsive Reserve Service (available now) and Regulation (available now).

discharging batteries, or puts power onto the grid to earn performance credits, that action must be clearly tied to the customer experience of exercising decisional control to generate the highest value for that behavior. A confusing value proposition between PCM hours and real-time operations introduces barriers and risks to such programs, the accelerated commercialization of which is necessary to catalyze hundreds, and eventually thousands, of megawatts of low-cost reliability available NOW in Texas. Tesla is therefore concerned that the incentives of the PCM could lead to market signals for deployments that are unnecessary, because the hour that the customer's load-serving entity believes would be a performance credit hour, turns out not to be one. Approaches to mitigate this concern are discussed below.

3. **What is the appropriate reliability standard to achieve the goals stated in Question 2? Is 1-in-10 loss of load expectation (LOLE) a reasonable standard to set, or should another standard be used, such as expected unserved energy (EUE). If recommending a different standard, at what level should the standard be set (e.g., how many MWh of EUE per year)?**

The 1-in-10-year loss of load expectation (LOLE) standard is acknowledged as an outdated metric. The economically optimal reserve margin is the most reasonable, though complicated, alternate approach. To develop an appropriate economically optimal reserve margin, the Commission must determine the range in values of lost load ("VOLL") for the entire Texas economy.[4] Different kinds of customers have different VOLL; the ERCOT Operating Reliability Demand Curve ("ORDC") is set based on assumed sensitivities regarding VOLL - this is a real-time price at which system load/electric

[4] Note: ERCOT's last assessment of the desired VOLL occurred in 2013, in a study led by London Economics. This study concluded that "[g]iven the sensitivity of VOLL to a variety of specific factors such as customer's consumption profile, a region's macroeconomic and climatic attributes, as well as the types of outages experienced/examined, this report does not – and cannot – provide a single VOLL estimate for the ERCOT region at this time for purposes of establishing the economic impact of rotating outages at the distribution level due to inadequate operating reserves. **Arriving at an accurate VOLL estimate for ERCOT will require a comprehensive customer survey process**. The […] macroeconomic analysis could be useful, however, as indicators or points of reference on the general magnitude of the VOLL," (citing Julia Frayer et al., *Estimating the Value of Lost Load* (London Economics, June 17, 2013), available at https://www.ercot.com/files/docs/2013/06/19/ercot_valueoflostload_literaturereviewandmacroeconomic.pdf (accessed 12/14/22)(emphasis added). Thereafter, using the study as a reference point along with certain assumptions on the sufficiency of operating reserves (but no statewide surveys), ERCOT implemented an ORDC effective June 1, 2014 with a VOLL equivalent to $9,000/MWh, which sets the system-wide offer cap at the same level (effective June 1, 2015); *cf.*, Resmi Surendran et. al., Scarcity Pricing in ERCOT, FERC Technical Conference (June 27-29, 2016), available at https://cms.ferc.gov/sites/default/files/2020-05/20160629114652-3%2520-%2520FERC2016_Scarcity%2520Pricing_ERCOT_Resmi%2520Surendran.pdf.

customers are expected to voluntarily curtail their grid power consumption because the marginal value of their continued grid consumption no longer outweighs the marginal cost of purchasing grid power.[5]

VOLL variability is critical to determining the economic cost of unserved energy, and the economic value of unserved energy is the essential input into an economically optimal reserve margin. For the purpose of modeling expedience, analyses of the cost of new entry ("CONE") and generation build-out (including but not limited to the E3 report) can be overly simplistic in assuming a single-technology approach to define the economic cost of unserved energy. Given this limitation, Tesla recommends that the ERCOT CONE should reflect a "basket" of in-the-money investments rather than a single technology, reflecting the reality that buyers and sellers respond to high prices differently. These decisions are front and center to decisions at all levels of consumption on the energy system and incent new build and/or reliability-centric deployments of existing resources – from individual decisions to install home solar and batteries, to corporate buying decisions to contract for and install low-cost renewables and storage, or build natural gas peaking plants or other technologies. Focusing on CONE for only one technology misses this overall approach, so a "basket" of technologies is the best approach for this cost input.

Developing the basket of CONE inputs and spectrum of VOLL values is firstly a core academic exercise that is needed to accomplish a theoretical market design that can be tested on meaningful studied inputs. And secondly, it is critical to ensuring that the proposed PCM (or other market design with a target reserve margin) does not lead to overbuild and excess customer costs. Tesla strongly encourages the Commission to undertake careful study of these issues to protect customer costs and preserve the positive investment signals in Texas.

4. **The E3 report examines 30 hours of highest reliability risk over a year. Is 30 the appropriate number of hours for this purpose? Should the reliability risk focus on a different measure?**

---

[5] *See, e.g.,* Operating Reserve Demand Curve Web-Based Training, ("On March 1, 2019 and March 1, 2020, ERCOT updated the Operating Reserve Demand Curve (ORDC). This creates a Real-time Price Adder to reflect the value of the available reserves in real time. It reflects the Value of Lost Load (VOLL) based on the probability that load would have to be shed."), available at http://www.ercot.com/services/training/course/109606 (accessed 8/12/21).

A performance credit mechanism examining 30 days is likely too few, as it encourages participants to game opportunity hours with a very low probability of hitting the correct 30 hours, while also sacrificing alternative opportunities to mitigate ERCOT operational risk that are being signaled by scarcity prices. To reduce the risk that market participants will be encouraged to undertake inefficient decisions, the Commission should consider a higher number of performance hours in implementation discussions.

5. **Over what period should the hours of highest reliability risk be determined? A year, a season, a month, or some other interval? At what point in time should that determination be made?**

A year is too long because it is too far removed from a performance credit hour to the time that invoices are paid and charged. Lengthy terms make it difficult to communicate and strategize the most efficient behavior from market participants that have dispatchable, energy-limited resources like storage (Front of Meter and Distributed), create uncertainty around whether their performance was necessary, and increase the collateral costs for future unpaid invoices that grow larger the longer the contract settlement is.[6] Monthly PCMs are better than annual, and daily PCMs are better than monthly. However, for a monthly or daily PCM, there must also be a monthly or daily forward market to support it (in addition to an annual market). A forward market should allow virtual participation and allow participants to enter and exit positions in performance credits – creating liquidity in the PCM will be a critical challenge to address in the early days of the market design discussion.

Additionally, a confusing value proposition unknown for a year, as between PCM hours and real-time, introduces financial barriers and risks to the accelerated commercialization of retail products which could catalyze hundreds, and eventually thousands, of megawatts of low-cost reliability available NOW in Texas. To reduce this risk and risk of inefficient decision-making over a 12-month period and

[6] Example: A single invoice for X% of the market, determined annually, would require ERCOT to mandate the LSE to post letters of credit or cash to ensure that payment would be forthcoming at the 12-month + settlement period. By contrast, running the auction/reconciliation monthly would allow for invoicing and settlement on a much smaller duration, derisking nonpayment by a factor of at least 12, and thus reducing collateral costs to the market and LSEs.

to provide better information faster to the market, a PCM interval should be no greater than monthly and certainly not an annual lookback.

6. **Would a voluntary forward market for generation offers and a mandatory residual settlement process for LSE procurement provide additional generation revenue sufficient to incentivize resource availability in a way that improves reliability?**

The outcome would depend on the structure of the forward market. The Commission should take the time to develop a forward market design that allows for maximum participation and learn lessons from the Congestion Revenue Rights ("CRR") market, which has evolved and offered more liquidity (opportunities to buy and sell) over time.

7. **Does a centrally cleared market through ERCOT sufficiently mitigate the risk of market power abuse? Should additional tools be considered?**

The Commission should not move forward with a market design until it is confident that the design does not suffer from market power concerns. The PCM substantially changes incentives for market participants and market power issues must be considered in every part of the ERCOT market, including the existing day-ahead market, bilateral markets, and new proposed monthly or daily PCM and forward market auctions. Appropriate monitoring and enforcement mechanisms should continue this policy approach, even if this adds more time to deploying the chosen market design. This includes ensuring sufficient ex ante market power mitigation measures are in place: offer and bidding rules in market systems (software) that can automatically mitigate.

8. **If the commission adopts a market design with a multi-year implementation timeline, is there a need for a short-term "bridge" product or service, like the Backstop Reliability Service (BRS), to maintain system reliability equivalent to a 1-in-10 LOLE or another reliability standard? If so, what product or service should be considered?**

Tesla appreciates that the Commission understands that getting the PCM or an alternate capacity design right will likely take a multi-year implementation timeline. In the short term, Tesla believes it is most important for the Commission to act on lessons learned from summer 2022 ERCOT conservative and costly operations, which involved increasing out-of-market decisions to address ERCOT's real time operational needs. An alternative ancillary product could be the right solution to "bridge" out of non-competitive RUC commitments, and importantly, level the playing field for storage

and ADERs to participate in that solution. A technology neutral ancillary service ramping product is an appropriate bridge solution which Tesla supports.

9. **If implementing a short-term design as a "bridge" delays the ultimate solution, should it be considered? Is there an alternative to a bridge solution that could be implemented immediately, using existing products, such as a long-term commitment to buy the additional 5,630 MW of Ancillary services necessary to achieve the 1-in-10 LOLE reliability standard?**

It is unclear why a "bridge" design would be considered to delay the market design long-term solution – in fact, the market design Blueprint contemplates the former (A/S product implementation) before the latter. The PCM would be a permanent feature of the market that could take years to get right. In the meantime, the time investment to develop an adequate bridge solution will also provide critical learnings to how these nearer-term changes are helping ERCOT solve real-time operations challenges, which in turn will help inform the most cost-efficient capacity procurement approach.

10. **What is the impact of the PCM on consumer costs?**

PCM will increase consumer costs, but so would a capacity market or an enhanced energy only market – none of these solutions are cost-neutral. The important consideration is how the selected approach creates incentives for customers to reduce those costs and if those incentives align with the actual operational needs of the power grid. The energy-only market naturally aligns those issues by sending real-time price signals. The PCM may do the same if the performance credit hours are chosen to maximize alignment with real-time operational needs, and, the other matters raised in these comments are addressed.

11. **What is the fastest and most efficient manner to build a "bridge" product or service, such as the BRS, in order to start sending market signals for investment in new and dispatchable generation, while a multi-year market design is implemented by ERCOT? Please provide specific steps**

The Commission could increase the quantity of ECRS ERCOT is procuring, allow ADERs to provide all ancillary services they are capable of providing, particularly responsive reserves and regulation up and down, and, develop a new technology-neutral ancillary service product that keeps

capacity on the sidelines until ERCOT needs it, but has a longer lead time to allow some generators to stay offline until they are needed – like the proposed uncertainty product.

12. In what ways could the Dispatchable Energy Credit (DEC) design be modified through quantity and resource eligibility requirements, e.g. new technology such as small modular nuclear reactors, in such a way that it incentivizes new and dispatchable generation?

The DEC could pay all new dispatchable generator types, not just fast ramping ones. If the DEC only covered a portion of the load growth, it would be less likely to harm existing generator revenue.

Tesla appreciates the opportunity to provide comments. We look forward to participating in the implementation details of the Market Design Blueprint Phase II proceedings. Please contact the undersigned regarding this submission.

Sincerely,

Arushi Sharma Frank
U.S. Energy Markets Policy Lead & Counsel
Tesla, Inc.
1333 H St. NW, Washington DC 20005
asharmafrank@tesla.com

PUBLIC UTILITY COMMISSION OF TEXAS

REVIEW OF MARKET REFORM ASSESSMENT PRODUCED BY ENERGY AND ENVIRONMENTAL ECONOMICS, INC. (E3)	))))	PUC PROJECT NO. 54335

Executive Summary – Comments of Tesla, Inc.

Tesla appreciates the opportunity to comment. Tesla has taken and will continue to take active steps to quickly realize grid reliability value for ERCOT all while increasing reliability for its own electric loads in Texas, including but not limited to, its Load-Serving Entity obligations and distributed energy fleet, its commercial and industrial facilities, and its storage fleet. Reliability is critical to Tesla's business operations as is resiliency planning to protect our customers and our operations from grid failures.

Performance Credit Mechanism (PCM)

Like all capacity markets, the PCM design would reduce the portion of total system costs driven by volatility (which batteries are good at capturing) and create a new portion of total system costs that batteries may or may not be able to capture as well, depending on the implementation details. A significant stakeholder process is needed to address risks around collateral, market power mitigation, the structure of forward auctions, and the way generators operate in response to PCM incentives. There should also be a separate process to individually consider how to set a reserve margin to replace the 1-in-10-year standard. The PCM quantity should not be based on a forward forecast, but instead based on the revenue requirements to meet a reserve margin based on actual experience in the prior year. A forward forecast just introduces more assumptions into a market design that already relies on assumptions – assumptions on top of assumptions are a recipe for distorted price signals.

Interim Steps

ERCOT should focus on operational enhancements. An alternative ancillary product could be the right solution to "bridge" out of non-competitive RUC commitments, and importantly, level the playing field for storage (front and behind the meter) to participate in that solution. A technology- neutral ancillary service ramping product is an appropriate bridge solution which Tesla supports. The Commission should also increase the quantity of ancillaries ERCOT is procuring, allow Aggregated DERs to provide all ancillary services they are capable of providing, particularly ERCOT contingency reserve service, responsive reserves and regulation up/down, and, develop a new technology-neutral ancillary service product that keeps capacity on the sidelines until ERCOT needs it, but has a longer lead time to allow some generators to stay offline until they are needed (uncertainty product).

Correct Incentives for Distributed Megawatts to Show Up to Support ERCOT Operational Reliability:

The PCM structure has the possible risk of encouraging participants to commit generators or decommit load based merely on whether a particular hour is a performance credit hour, and not on whether there is an actual reliability reason to change behavior in that hour. As a fitting example directly impacting Tesla, mitigating this concern is important for load serving entities/retail electric providers that can dispatch generation from distributed assets. If a retail electric provider that operates an aggregation reduces customer demand by discharging batteries or puts power onto the grid to earn performance credits, that action must be clearly tied into the customer experience of exercising decisional control and generating the highest value for that behavior. A confusing value proposition between PCM hours and real-time introduces barriers and risks to the accelerated commercialization of retail products which could catalyze hundreds, and eventually thousands, of megawatts of low-cost reliability available NOW in Texas. To reduce this risk and risk of inefficient decision-making, a PCM interval should be no greater than monthly and certainly not an annual interval.