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PROJECT NO. 54584

**RELIABILITY STANDARD FOR
THE ERCOT MARKET**

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**PUBLIC UTILITY COMMISSION
OF TEXAS**

REPLY COMMENTS OF TESLA ON STAFF QUESTIONS

Tesla is pleased to file these reply comments in response to Commission Staff's Request for Comment filed on March 7, 2023,¹ in the above-captioned Project. Tesla, Inc. ("Tesla") thanks the Public Utility Commission of Texas ("Commission") for the opportunity to provide comments.

I. REPLY COMMENTS

Tesla supports ERCOT's proposal to use the Strategic Energy & Risk Valuation Model (SERVM) for its proposed study framework towards creating an ERCOT Reliability Standard as required under Senate Bill 3. As presented by ERCOT at its March 15, 2023 workshop, the study should be defined by probabilistic metrics that cover the dynamic features of loss-of-load events across both average reliability and tail event/extreme condition avoidance. These metrics should include as ERCOT proposes, a limit on both the magnitude and duration of any single loss of load event, and, a limit on the frequency of loss of load events. Importantly, scenarios captured by this metrics-based analysis (per diagram below) must include scenarios that capture the reliability/availability of aggregated and single-site distributed energy resources and other demand-side flexibility tools readily available to ERCOT and

¹ Memorandum (March 7, 2023), Project Nos. 54584, 52373, 53298, available at https://interchange.puc.texas.gov/Documents/54584_2_1278476.PDF.

dispatchable at a market price; this will be a critical exercise that contributes to a realistic assessment of additional supply-side and demand-side generation/load response needed to avoid exceeding the study criteria in any given scenario (magnitude, frequency, duration).

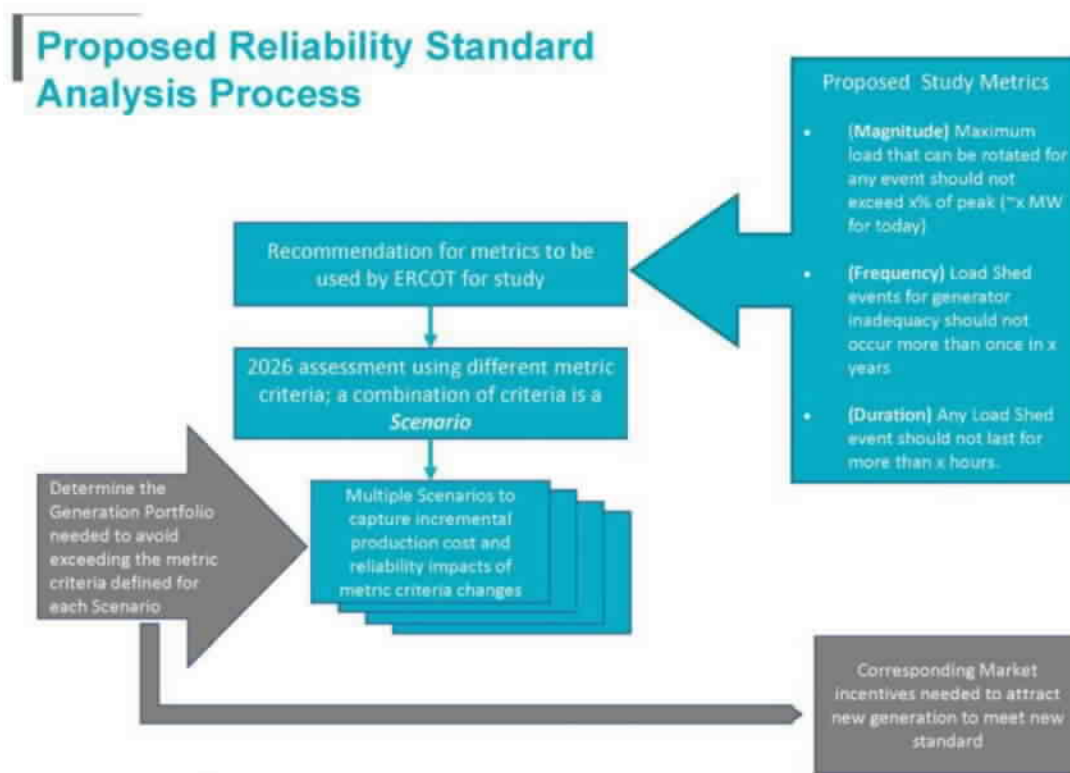


Diagram Source: ERCOT'S FOLLOW-UP INFORMATION RE THE PROPOSED RELIABILITY STANDARD FRAMEWORK AND POTENTIAL REQUEST FOR PROPOSAL (RFP) FOR A VALUE OF LOST LOAD (VOLL) CONSULTANT (filed March 20, 2023), Project No. 54584 (Appendix A, slide 3), available at <https://interchange.puc.texas.gov/search/documents/?controlNumber=54584&itemNumber=4>.

Relatedly, Tesla concurs with the reply comments filed by Rakon Energy (Control No. 54584, item 28), emphasizing agreement with the following points.

- **“The value of distributed energy resources (DERs) and load resources must be captured in ERCOT’s study.”**

- **“A thorough Loss of Load Expectation analysis should indicate the locational value distributed energy resources and load flexibility provide.”**

Tesla emphasizes that ERCOT's study must recognize and build scenario analyses around the independent, measurable reliability contribution that DERS can and will continue to provide to the ERCOT grid. Price-responsive, dispatchable DERs such as Tesla Powerwall residential energy storage systems can provide an equivalent or better reliability contribution as a conventional single-site generator on the transmission system in a variety of scenarios under scope of the proposed study. This proposition can be illustrated by a simple example: 300 <1 MW DERs have an objectively better, measurable reliability value than one 300-MW transmission connected generator in a scenario that implicates loss of carrying capability on an ERCOT transmission element– the 300 MW generator can trip offline due to any one failure in this scenario. By contrast, 300 DERs operating on a diversity of independent interconnections to the low voltage grid are in this scenario are: (i) aggregated up to a diversity of physical transmission elements, (ii) by design located on dozens of distributed circuits which aggregate to diverse electrical buses, (iii) distributed across an area as large as the entire ERCOT interconnection, and (iv) subject to physical and software controls (imposed by the DER owner & operator, and distribution utility including mandatory disconnects between the grid and the DER), which effectively island potential cascading or chain failures to single <1 MW sites or to physically proximate co-located DERs, preventing failure across the 300-MW distributed footprint. ERCOT would retain deliverability from some knowable percentage of this

aggregated, distributed footprint against the known and certain failure risk of the single plant in this scenario.

Tesla underscores the importance of ERCOT utilizing its internal and independent consulting resources as contemplated in its reliability study proposal, to include intentional study of the reliability value of DERS in a variety of scenarios including anticipated load shed scenarios in which these resources are carrying ancillary services/system stability services in addition to, and in lieu of, transmission-connected generators providing those services. The outputs of such an effort will be critical to informing other proceedings in which the Commission and ERCOT are wrestling with the theoretical value of distributed resources deliverability during average reliability scenarios and tail events: this includes, proceedings such as the Commission Project No. 51603, in which ERCOT has filed a memo proposing to restrict the participation of DERS in grid reliability services², and in ERCOT's policy proposal NPRR 1171, Requirements for DGRs and DESRs on Circuits Subject to Load Shedding, which formalizes these recommendations and potentially deprives distributed resources – and the distribution system infrastructure to which they interconnect – from receiving price signals needed to encourage investments in reliability on what is ostensibly the most vulnerable part of the Texas grid, the distribution system. As the recent December 2022 cold snap conditions demonstrated, even though ERCOT generation and reserves remained adequate during the cold spell and ERCOT did *not* undergo load shed, power was not

² ERCOT RESPONSE TO QUESTIONS CONCERNING SECTION 3.8.6 OF THE ERCOT PROTOCOLS, Project No. 51603, Item 72 (October 19, 2022), available at <https://interchange.puc.texas.gov/search/documents/?controlNumber=51603&itemNumber=72>.

deliverable to customers in freezing conditions.³ To increase power deliverability to the distributed grid, ERCOT rules and Commission policy must encourage private investment in both the build-out of the distribution system and DER deployments, and incent distribution system investments which provide upgrades needed to add system strength where vulnerabilities persist through increasingly challenging, seasonally recurring conditions as well as tail events. ERCOT and Commission policy should provide more, not less, investment signals to distributed asset developers and distribution infrastructure owners and operators alike. The basis of this policy should be a combination of learned experience from operating the entire grid to date, and the outcomes of scenario analyses in the proposed reliability study.

Said another way, the contested issues surrounding the reliability value of DERS in multiple proceedings outside the instant Project, can be readily addressed through development of objective data in ERCOT's reliability standard assessment. The universal goal for the market and for regulators is to prevent poor policy outcomes and enhance reliability from the first to the last mile of the Texas electric grid.

Finally, Tesla notes that Texas residents have already demonstrated their Value of Lost Load ("VOLL") when they purchase a backup home energy generation system such as solar and a residential battery energy storage system. Where

³ See, e.g., Texas Tribune, "Texas power grid holds amid record winter demand, but test isn't over", Emily Foxhall (Dec. 23, 2023) (stating "Even with the grid running smoothly so far, some Texans still saw outages. In the greater Houston area, around 16,000 CenterPoint Energy customers were without power at 9 a.m. because of the strong winds, and 189,000 had lost power but had it restored within the past 24 hours. Thousands of households in Bandera and Medina counties, near San Antonio, were also experiencing power outages Friday morning because of surging demand and equipment failures."), available at <https://www.texastribune.org/2022/12/23/ercot-power-winter-weather/>.

consumers purchase more than one such device or system, that decision prices in the higher value assigned by that consumer to protecting against a higher magnitude or duration of an anticipated outage, so the value they assign to these investments depends on their expectation of the frequency of events. Consumers are already expressing their risk tolerance through these investments, which hedges the full energy value at risk from all sources of loss of power, including transmission, distribution, and capacity events. Customer-sited DERs provide resiliency benefit even during rolling outages or blackouts, since a customer-sited DER can still provide power, or said in terms of reliability metrics, the DERs can serve unserved energy. This resiliency benefit can be recognized by an appropriately developed Expected Unserved Energy (“EUE”) metric which recognizes the reliability contribution of this investment against additional reliability investments which customers will also pay for under the chosen reliability standard.

Tesla supports and encourages the Commission to support ERCOT’s request to issue an RFP for a VOLL consultant that can capture the magnitude of these customer-directed investments in competitive retail choice areas and in regulated areas of ERCOT. Market data on the adoption rates and average cost of adoption across these customer classes (residential and commercial) which is readily available from independent third parties, must be a core input to ERCOT’s study objectives, particularly the work scoped for an independent VOLL consultant.

Finally, Tesla reiterates and incorporates in the record in this proceeding, comments filed in Project No. 54335 in response to Question 3, regarding the appropriate reliability standard for the Performance Credit Mechanism (PCM)

proposed market design. As Tesla discussed in its filing in that proceeding, the Commission's approach to a reliability standard should be based on principled customer study that moves away from outdated, static assumptions about the Texas economy's VOLL, assumptions which have undergirded ERCOT's energy scarcity market design since 2014.⁴ Tesla supports the approach proposed by ERCOT in its technical workshop on March 15, 2023 which would require an independent study of the Texas economy to determine VOLL - VOLL variability is critical to determining the economic cost of EUE, and the economic value of EUE is the essential input into an economically optimal reserve margin. Tesla agrees with ERCOT that the scope of work for the VOLL request for proposal should include both foundational work to establish a VOLL magnitude through global survey, and a comprehensive state-specific customer survey. The importance of this second phase cannot be understated: regulatory decisions about securing the electric grid should be made based on direct inputs from customers served by the grid who pay for the right to receive reliability from the grid.

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_value_of_lost_load_literamrereviewandmacroeconomic.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.

II. CONCLUSION

Tesla thanks the Commission for the opportunity to submit reply comments in this proceeding. With regard to the Commission's request for additional studies and expertise to support its deliberation in these matters, Tesla looks forward to providing recommendations and support in the ERCOT stakeholder process and/or in staff deliberations. Tesla encourages the Commission and ERCOT to ensure this effort studies, assigns value, and applies the value of DER reliability contributions in these efforts.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Arushi Sharma Frank', with a long horizontal line extending to the right.

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