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PROJECT NO. 52373

REVIEW OF WHOLESALE ELECTRIC MARKET DESIGN	**§ §**	**PUBLIC UTILITY COMMISSION OF TEXAS**

COMMENTS OF
ENVIRONMENTAL DEFENSE FUND, TEXAS CONSUMER ASSOCIATION & ALISON SILVERSTEIN CONSULTING

COMES NOW the Environmental Defense Fund, a non-profit, non-partisan, non-governmental environmental organization, the Texas Consumer Association, a non-profit advocate representing small business and individual Texas customers on pocketbook issues, and Alison Silverstein, an independent energy consultant, to offer these joint-filed Comments responding to the Commission's invitation for market design proposals in Project No. 52373, the Review of Wholesale Electric Market Design.

The Commission's discussions in Market Design work sessions and the October 21, 2021 Open Meeting and questions laid out in Chairman Lake's October 25, 2021 memo indicate that the Commission is eager to act quickly to address the reliability problems revealed by the Winter Storm Uri failures and recent conservation alerts. We concur with the need to address reliability problems and improve ERCOT's market and operations immediately.

Measures already under way are substantive – let's evaluate their reliability and cost impacts

The Public Utility Commission has already adopted or committed to adopt a number of substantive measures that address several of the direct causes of the Winter Storm Uri grid disaster and recent non-peak Emergency Energy Alert events: (1) adopting generation and transmission winterization requirements, (2) moving to modify the Operating Resource Demand Curve and (3) Emergency Response Service resource availability and timing, and (4) trying to accelerate dispatchable resource transmission interconnection (if done in a non-discriminatory

manner). Those measures appear likely to substantially and quickly improve ERCOT reliability and more demand-side resources are available to avert the descent into emergency conditions.

Mandating generator winterization should improve winter fossil and renewable generator availability relative to February 2021, even absent corresponding winterization of the natural gas production and delivery system. Similarly, transmission winterization requirements should improve generation deliverability to load under adverse weather conditions. Those winterization measures together should materially improve generation and transmission performance under a variety of future extreme weather and grid conditions during peak and non-peak hours.

Thoughtful modifications to the ORDC will deliver more compensation in more hours to generation and demand response, which should improve their availability and performance under a variety of reliability-challenging conditions year-round.

We should determine the likely impacts of these measures upon the reliability problems that caused the Uri disaster and what they will cost to ERCOT electricity consumers. This will enable the Commission to report the near-term beneficial impacts of the substantive steps already taken to improve ERCOT grid reliability.

If we know how much immediate reliability improvement the Commission's first tranche of reliability and market improvements may deliver, that will clarify the risks ERCOT stakeholders and customers could face for the winter and summer ahead and in subsequent years. This analysis could reveal which specific reliability and resilience challenges will be addressed by the measures now under way, and what power system reliability and operational gaps remain to be filled with additional measures such as firming reserves, LSE Reliability Obligations, and other longer-term proposals.

Most of the recently proposed market design proposals are intended to direct more revenues to dispatchable resources (which includes thermal plants, renewable resources with storage, and many demand response resources). We should understand how much money the upcoming ORDC and ERS changes could deliver to different ERCOT resource groups, and how those revenues may incent resource availability, performance and operational reliability, before adopting further measures intended to deliver more revenues to those same resources.

The Commission must also identify the cost and bill impacts of measures now under way. Generator winterization will increase generators' costs, and those will certainly flow through to customers. Similarly, changes to the ORDC will change the distribution of per-kWh charges across the year and will likely increase the total cost of electricity to customers as they flow through LSE rates and REP retail offerings. Since ERCOT customers already face bill increases from generator weatherization and securitization of gas company, generator and some Retail Electric Provider losses, it is important to know how these first measures will likely change power system cost and retail electric bill baselines. This new estimated cost and bill baseline (reflecting current bills with weatherization, ORDC and ERS changes) should become the new basis for evaluating the dollar impacts of additional proposals to enhance reliability.

<u>What reliability and resilience problems do we need to solve?</u>

Commissioner Cobos has properly asked whether we are looking at solutions to the right problems. The LSEO and several of the other measures proposed are intended to improve resource adequacy relative to peak load, even though ERCOT's problem during Winter Storm Uri wasn't that we had too few resources, but that too many of those resources didn't perform when we needed them. As all Commissioners have recognized, the problem is how to assure that we have enough fast, flexible, and dependable resources to cover predictable renewable ramping

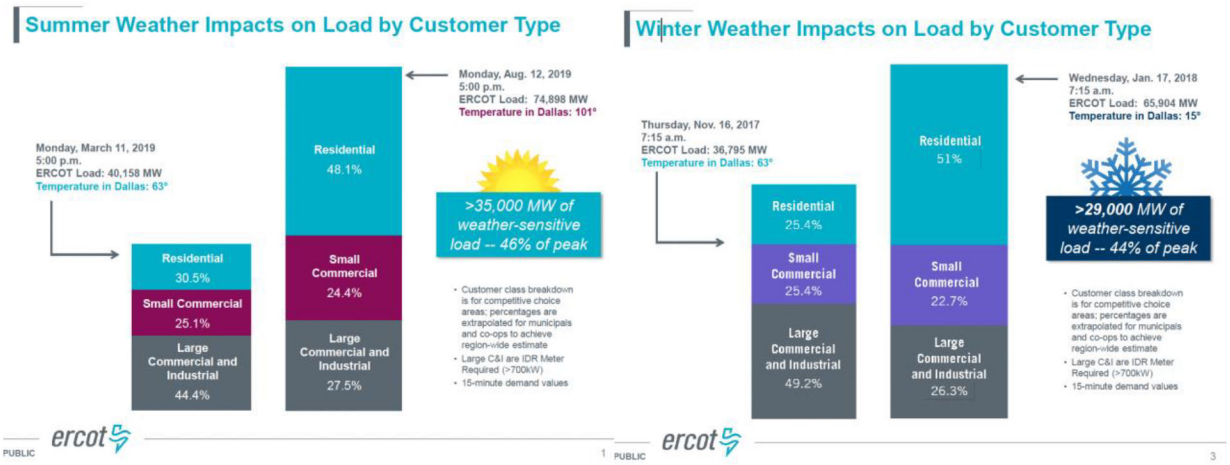
needs, sudden drops from loss of wind or thermal plant trips, and weather-driven peak and net peak loads in a time when heat and drought become more extreme every year.

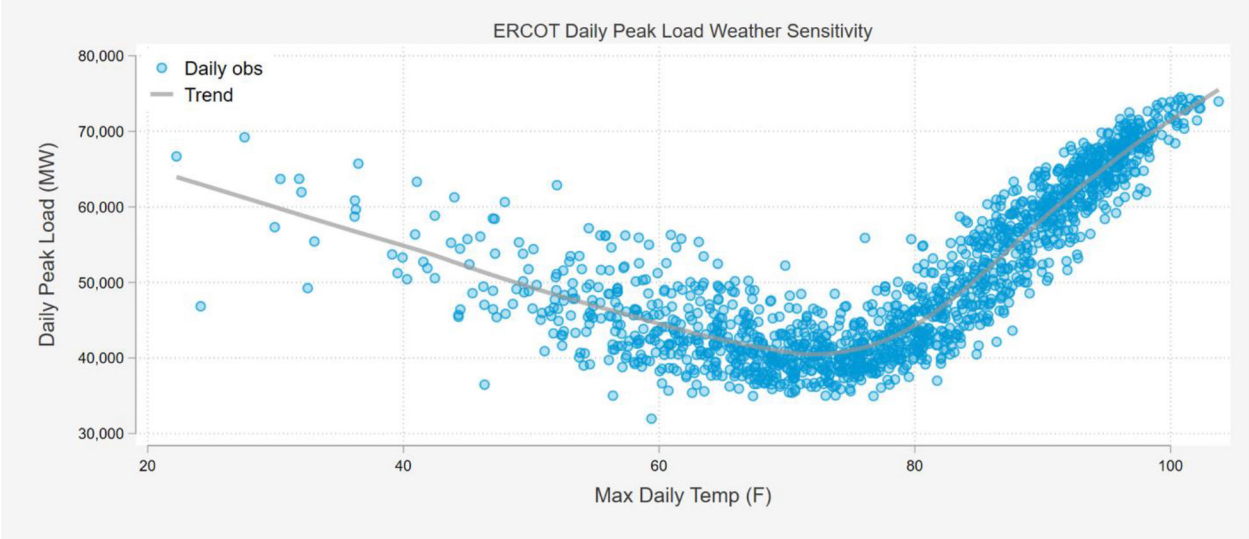
It is not clear that ERCOT and the Commission have yet performed sufficient forward-looking analysis to illuminate the reliability and resilience challenges that we must now solve. ERCOT's planning methods to date focus on simple historically-based forecasts of upcoming peak loads without sufficient attention to forward-looking threats, shoulder season and intra-day net peak challenges.[1] The imminent additions of thousands of MW of new utility-scale solar generation and storage, in combination with growing behind-the-meter PV and batteries, will materially change the duration, frequency and timing of ERCOT's ancillary service needs. At the same time, hotter summer temperatures with longer heat waves will increase loads and drive thermal plant and transmission line deratings. We should determine what combinations and amounts ERCOT needs of capacity overall, short duration high flexibility dispatchable resources, long duration firming, or other types of energy and reliability products to maintain and enhance reliability and resilience in the years ahead before initiating costly market changes that will likely take many months or even years to design and implement.

ERCOT will need a diverse set of resources and performance capabilities to meet these challenges, and we should understand those needs before we jump to adopt any new market design mechanism, particularly one aimed principally at increasing the availability of dispatchable fossil generation. ERCOT's peak demand has grown by 6.4% from 2015 through

[1] NERC's 2020 Long Term Reliability Assessment, echoing ERCOT, warns of reduced availability of operating reserves around summer peak demand and declining reserves in non-peak months. This warning proved true during ERCOT's repeated shortages and calls for conservation in April, June and September of this year. California's August 2020 rolling blackouts occurred because of shortages during net peak rather than peak demand. NERC recommends assessing energy adequacy risks, building resource portfolios, and reducing reliance on single fuel sources or delivery modes.

2020 and total electric energy use grew by 10% from 2015 through 2020. Half of winter and summer peak demand are weather-driven, as shown in the figures below. In the face of such high growth rates, we need to use energy efficiency and demand response to slow and manage weather-driven demand spikes and stabilize demand levels year-round.





(Source: Josh Bode, Demand Side Analytics, October 31, 2021 using ERCOT data for 2017-2021)

Immediate, substantive residential demand response and energy efficiency should reduce the amount of total capacity needed and the height of ramping requirements. These measures will buy time while we figure out how to improve supply-side and market reliability needs and tools. Energy efficiency and demand response will also improve customer and community

resiliency in dealing with future grid events and natural disasters, and cushion future customer bills against the securitized costs of Winter Storm Uri and the probable cost increases due to upcoming market improvements.

Don't adopt any new measures without understanding their reliability, market and cost impacts

The Commission's October 25, 2021 Questions explore the Load Serving Entity Obligation (LSEO) proposal. But neither the Commission nor most of the ERCOT stakeholders have sufficient detail about the LSEO proposal or any other to answer these specific questions. Even if the Commission receives competent answers to these specific questions, those answers will not offer sufficient information upon which to base a decision that risks future grid reliability and raises electricity costs for millions of Texas citizens and businesses.

The PUCT has asked many questions exploring potential changes and additions to ERCOT's current energy-only market. Those questions can only be answered by analytical firms that possess deep modeling capabilities for backcasting and forecasting using extensive ERCOT-specific resource and weather data. Perhaps only ERCOT, Brattle (on behalf of the Commission), the Independent Market Monitor and a few well-resourced stakeholders can answer most of these questions with expert, credible analysis. Given the reliability and financial stakes of these proposals, it would go against the Commission's history of well-analyzed, well-reasoned decision-making to adopt any of these proposals without extensive, transparent analysis by objective third-party analysts.

Therefore, we ask that the Commission not make any significant policy decisions or commitments – on ORDC, ERS, LSEO or other matters – based solely upon assertions and analyses offered by self-interested stakeholders and their consultants, but instead **analyze every proposal using a common, consistent set of models, scenarios and data**. These analyses

should be performed in parallel by both the Brattle Group (Brattle) and the ERCOT Independent Market Monitor (IMM) and their results should be reported in full to the public and all stakeholders as well as to the Commission.

Don't just evaluate the LSEO proposal

Questions 6 through 16 of the October 25, 2021 Market Analysis memo pertain to the LSE Obligation proposal. Yet the Commission received numerous other proposals that might be viable alternatives or complements to the LSEO and the reliability improvement measures already adopted and under way.

Commission Question 5 asks: *Are there alternatives to an LSE Obligation that could address the concerns raised about the stakeholder proposals submitted to the Commission?* The comments submitted on October 19, 2021 offered many alternatives to the LSEO proposal, including Strategic Dispatchable Standby Reserve Service (Vistra), Contingent Reserve Service (NextEra), Dispatchable Reliability Service (LCRA), Backup Reliability Service (TIEC), Forward Shortage Hedge (Patton), and increasing energy efficiency and demand response (ACEEE). Until all alternatives have been fully detailed and explored beyond the level of the submitted comments, the Commission lacks sufficient data and analysis to believe that the LSEO could improve ERCOT reliability more effectively and cost-effectively than the other proposals offered to date.

The selection of one or more specific market-modifying, reliability-improving measures should be informed by the consistent, objective reliability, cost and market impact analyses recommended above, and by comparison between the measures to determine the relative effectiveness and cost-effectiveness of each. The Commission would betray its mission and obligations to protect customers, foster competition and promote high-quality infrastructure if

you adopt a specific proposal without fully exploring its impacts, merits and costs in comparison to the other proposals offered.

The No Regrets Proposal

During the October 21, 2021 Open Meeting, Commissioner Cobos asked the parties whether anyone else has reliability-enhancing programs or market modifications to offer. Consistent with the ERCOT Stakeholders Reliability and Market Design Improvement Recommendations submitted on October 19, 2021, we offer the following set of measures as the No Regrets Proposal for immediate consideration and implementation:

DEMAND FLEXIBILITY PROGRAM

1. **Massively expand TDU energy efficiency and demand response programs --** Immediately modify, expand and accelerate the statewide energy efficiency program administered by the transmission and distribution utilities (TDUs) using the measures recommended by the American Council for an Energy Efficiency Economy (ACEEE)[2]:

    - Change the focus from summer energy-saving to summer and winter peak reduction, using specific high-value efficiency and demand response measures with high benefit-cost ratios, with a much higher investment in residential customer measures.
    - Reform the energy efficiency goals to no less than 1% of retail sales annually by 2025.
    - Require every LSE to be able to deliver demand response for no less than 10% of its peak load by 2025, with particular focus on residential customers.
    - Change ERCOT market rules for demand response aggregation and compensation to better enable aggregated residential demand response and market participation.
    - Change energy efficiency and demand response cumulative program funding to spend no less than $1 billion per year from 2024 through 2027 (ramping up to that level in 2022 and 2023), with no customers allowed to avoid paying those charges.
    - Undertake a new energy efficiency and demand response potential study to determine the amounts of energy efficiency and demand response are economically available within Texas, with particular attention to programs focused on summer and winter demand reduction.
    - Determine the impacts of high levels of peak-focused energy efficiency and demand response upon ERCOT system reliability (i.e., how do lower peaks around the clock change capacity and ramping requirements and shortfall probabilities) and how

[2] ACEEE's analysis finds that selected energy efficiency and demand response measures, aggressively implemented, could deliver 7.7 GW of summer peak demand reduction and 11.4 GW of winter peak reduction by the end of 2027 at a total program cost of under $5 billion over five years.

dependably lower peak and year-round load levels change ERCOT's long-term and operational risk levels and shortfall event frequencies.
- Determine the cost impacts and customer bill savings from delivering high levels of peak-focused energy efficiency and demand response upon ERCOT system reliability and compare those costs and cost-effectiveness to supply-side measures.

2. **Remove barriers to DR-DG-VPPs providing ancillary services**

   - Immediately begin removing barriers to the ability of demand response, distributed generation, virtual power plants, distributed storage and other aggregated resources to provide all ancillary and firming services they are functionally capable of providing.
   - Direct ERCOT to make specific changes and deliver outcomes such as ancillary service product definition, market compensation, alternate telemetry and verification methods that are not slowed or compromised by ERCOT stakeholder processes.
   - Open Commission rule revisions on an expedited basis to assure that demand-side and aggregated resource measures have no regulatory exclusions to full ancillary service provision and compensation.

3. **Fix distribution interconnection rules for new distributed energy resources** – The TDUs' interconnection rules and processes for interconnecting new storage and generation resources to the grid and behind the meter are inconsistent and often slow. These hamper customers and others from bringing new resources onto the system, whether to support their own premises or participate directly in the ERCOT market. These rules obstruct the customer choice that Texans prize and delay the addition of new resources that could make the entire system more reliable.

STUDY AND ADDRESS RELIABILITY NEEDS

4. **Increase ERS** – In conjunction with current work to exercise ERS use before the grid faces a true operational shortfall, expand ERS procurement levels immediately up to 3,000 MW for every season. Expand the ERS budget as needed to support these procurement levels. ERS is significantly less costly than generation Reliability Unit Commitments and is more fair to customers than uncompensated voluntary conservation or loss of service.

5. **Study ERCOT's reliability needs and redefine ancillary service needs and volumes** -- Use recent and forward-looking weather data and asset performance data to perform detailed probabilistic analyses of reliability and ancillary service needs (particularly examining variations by season, location, needed response speed and needed response duration) to suit ERCOT's evolving resource mix. Use those findings to update reliability needs and ancillary service product definitions and provisions requirements (e.g., how much of X service will be needed at different times, conditions and locations) and qualifications, assuring that the new ancillary service products are technology-neutral and are not defined in ways that unnecessarily exclude particular resource types. Use the results to reframe ERCOT's reliability needs and modify ancillary services requirements and procurement.

ALREADY UNDERWAY

6. **Power plant and transmission weatherization** – This rule was adopted on October 26, 2021.

7. **Modify ORDC** to shift revenue away from crises and deliver revenues to resources that respond to system needs.

8. **Accelerate transmission interconnection for all resources** – now being discussed.

9. **Accelerate TDU use of enhanced transmission throughput technologies** and measures such as Dynamic Line Ratings, as recommended by Commissioner Glotfelty in his October 25, 2021 memo.

10. **Improve ERCOT load and supply forecasting methodologies and accuracy**, with particular attention to making them more forward-looking given the dramatic increases in Texas population growth and extreme weather threats.

We believe that these No Regrets Proposal measures, taken as a whole, will quickly and substantially improve ERCOT reliability and resilience and enhance customers' well-being with high dependability, low risk and low costs. Implementation of the No Regrets Proposal will begin to improve the supply and demand balance within ERCOT in predictable and measurable ways while the Commission continues work to explore and adopt other possible reliability measures.

Question 4

Question 4 implies that ERCOT needs a firming requirement on all generation resources in ERCOT. It is not clear what this is calling for, since NERC (the entity that sets reliability standards for North America) does not recognize or define a "firming requirement". If the Commission means by "firming requirement" the concept that variable resources require more active load-following capability, modern power systems have a diverse resource mix with highly specified ancillary service requirements and compensation specifically to assure that all supply,

storage and demand resources collectively support the capabilities and shortcomings of each other.

It is premature to assert a need for undefined "firming services," because neither ERCOT nor the Commission have yet performed sufficient analysis to explain what types and combinations of ancillary services are needed to meet the needs ahead.

Question 8

The Commission's Question 8 asks: *Can the reliability needs of the system be effectively determined with an LSE Obligation?* This question is premature. Rather, we must now ask what are the reliability needs of the ERCOT system and how can we structure and assemble a variety of measures to meet those reliability needs? The reliability problems that ERCOT must solve are not immediately about being capacity-short, but about having too much demand and too few power plants that perform reliably when needed, whether in an icy winter storm or in a shoulder month when the wind dies while gas plants are down for maintenance. Item 5 above in the No Regrets Proposal, to study ancillary service needs, is one necessary step in a forward-looking reliability needs analysis.

Questions 8.a. and 8.b. ask about the LSEO resource accreditation system. The LSEO accreditation system is closely related to the use of the Effective Load Carrying Capacity calculations, and both concepts are used extensively in the California ISO Resource Adequacy approach. The firm E3, which developed the LSEO proposal for NRG and Exelon, has contributed extensively to the CAISO's Resource Adequacy construct, which is implemented in its Resource Adequacy procurement program. E3's writings and presentations on ELCC[3] make

[3] See in particular, Schlag, Ming, Olson, et al., "Capacity and Reliability Planning in the Era of Decarbonization – Practical Application of Effective Load Carrying Capability in Resource Adequacy," August 2020, from which the above quotes are taken.

clear that the assignment of simple capacity credits to individual intermittent or energy-limited (storage) resources is appropriate for systems with low penetration of renewables and storage, but those simplifications "do not appropriately capture the reliability dynamics of the system [or the resources] at higher penetrations." Furthermore, ELCC calculations rely on "loss of load probability modeling simulating the system under many combinations of resources and load conditions to identify the expected frequency, duration and magnitude of reliability events," not simply on historical performance on individual plants or resource classes. "ELCC is a property of a portfolio of resources, not of the individual resources." Last, ELCC can be applied to traditional firm resources such as dispatchable thermal plants to reflect the fact that with maintenance and unplanned outages, their capacity value is less than 100%.

The E3 proposal to this Commission recommends that ERCOT establish a formal reliability standard, calculate the required quantity of reliability services to implement it, calculate that out three years, and trigger the LSEO obligation if a shortfall appears imminent, using a seasonal reliability accreditation process for individual resources. There is not yet enough information available about E3's LSEO proposal to determine whether the proposed accreditation method complies with or violates their observations about how to use ELCC appropriately.

E3's September 30, 2021 filing indicates that, "resources with dispatch limitations – whether due to intermittency, energy output duration limitations, or fuel supply challenges -- would be accredited according to their expected performance during reliability events." By this logic, ERCOT's thermal resources should also receive ELCC accreditation values that reflect their recent high forced outages and unavailability during shoulder months.

Black-start service

To date, this Commission has devoted minimal attention to the failure of much of ERCOT's officially designated, well-compensated black-start fleet during Winter Storm Uri. Had ERCOT actually experienced a full system collapse, it could have taken weeks to put the system back together, particularly given that so many contracted black-start units were out of service. It is not clear that those units responsible for but incapable of black-start provision in February have been held responsible for their failure to be available, nor that ERCOT or the Commission have explored how to modify black-start service requirements and procurement terms to improve black-start assurance in the future. We ask that the Commission place black-start service reformation high on your list of high priority tasks to improve ERCOT reliability.

Conclusion

This Commission is already taking significant steps to address several elements ERCOT's power system reliability challenges. The new generator and transmission weatherization requirement and anticipated ORDC and ERS reform promise to substantively improve generator availability and deliver pre-emergency load relief. The Commission should assess the reliability and cost impacts of these measures to understand their immediate benefit before undertaking additional market reforms.

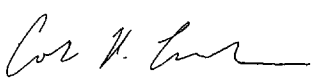
We do not yet have a clear view of what reliability problems we need to solve in ERCOT. That requires a detailed, forward-looking but historically informed probabilistic and granular analysis of the frequency, duration, timing and magnitude of potential resource shortfalls. That study should reveal what combinations of ancillary services and resources are needed for future system reliability. Those combinations will reveal which reliability problems must be solved (e.g., do we need 6-hour or 1-hour duration products?). The Commission should assess every market reform proposal according to whether it solves the right reliability problems. And every

proposal should be evaluated by a credible, objective third party (Brattle and/or the ERCOT Market Monitor) to evaluate its reliability, market and cost impacts and compare those against other proposals to see which are most reliability-effective and cost-effective.

The No Regrets Proposal outlined here offers a viable, low-cost set of solutions to address ERCOT's reliability and market needs. The measures recommended are not hard to implement, will have immediate measurable impact on ERCOT reliability, will reduce risk of power system failure at low cost compared to other options, and will create a time buffer for the Commission to conduct analysis and deliberations on more complex market redesign proposals.

The Commission should not adopt partially-defined, unanalyzed proposals such as the LSEO at this time. Rather, significant analysis is needed to understand whether the LSEO and other proposals can deliver meaningful reliability improvements without harming ERCOT's competitive retail market and raising costs to all electricity customers. This Commission owes it to the people of Texas to conduct such careful analyses before it makes crucial wholesale market design decisions.

Respectfully submitted,



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EXECUTIVE SUMMARY

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NO REGRETS PROPOSAL

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   - Undertake a new energy efficiency and demand response potential study.
   - Determine the impacts of high levels of peak-focused energy efficiency and demand response upon ERCOT system reliability.
2. Remove barriers to DR-DG-VPPs providing ancillary services.
3. Fix distribution interconnection rules for new distributed energy resources.

UNDERSTAND AND ADDRESS RELIABILITY NEEDS

4. Increase ERS size and funding.
5. Study ERCOT's reliability needs and redefine ancillary service needs and volumes.

ALREADY UNDER WAY

6. Power plant and transmission weatherization
7. Modify ORDC
8. Accelerate transmission interconnection for all resources.
9. Accelerate TDU use of enhanced transmission throughput technologies.
10. Improve ERCOT load and supply forecasting methodologies and accuracy.

The Commission should not adopt partially defined, unanalyzed proposals such as the LSEO at this time. Rather, significant analysis is needed to understand whether the LSEO and other proposals can deliver meaningful reliability improvements without harming ERCOT's competitive retail market and raising costs to all electricity customers. This Commission owes it to the people of Texas to conduct such careful analyses before it makes crucial wholesale market design, reliability- and cost-affecting decisions.

[4] ACEEE's analysis finds that selected energy efficiency and demand response measures, aggressively implemented, could deliver 7.7 GW of summer peak demand reduction and 11.4 GW of winter peak reduction by the end of 2027 at a total program cost of under $5 billion over five years.