PUCT PROJECT NO. 52373

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

NRG ENERGY, INC.'S COMMENTS ON THE OCTOBER 26, 2021 QUESTIONS FOR COMMENT

NRG Energy, Inc. ("NRG") appreciates the opportunity to provide feedback on the market design questions issued in this project on October 26, 2021. Included as Attachment A to these comments is an Executive Summary of NRG's responses. NRG appreciates the robust discussion of market design over the past few months and how best to achieve long-term reliability through our competitive market. The reliability goals of the ERCOT system have been made very clear by the public and state leaders following Winter Storm Uri. Grid emergencies and scarcity events will no longer be tolerated. This necessitates a change in direction from prior thinking regarding market design.

The ERCOT market will benefit from a diverse array of market participants collectively solving the reliability risk during periods of high demand, low renewable output, and generator unavailability. A comprehensive solution is required to assure reliability during these events. The solution can and should allow for differentiated and innovative approaches, especially on the demand side, by leveraging the uniquely competitive retail marketplace in Texas. The evolution of our market design has reached a critical juncture and the policy direction set forth in the project will likely determine the fate of the competitive market, which is directly linked to its ability to withstand future reliability events. While some commentators have desired to retain the current energy market structure, or merely tinker around the edges, Senate Bill 3 ("SB3") implies something more comprehensive. The law's Section 18 prescribes the following:

- Reliability requirements to be established by the Public Utility Commission of Texas ("Commission");
- A forecast, conducted at least annually, of demand during the most critical times of winter and summer, and corresponding qualification and assessment requirements of physical resources' ability to perform during those times; and

- A competition-based mechanism to procure resources to achieve system reliability during those critical times.

The law provides a framework for comprehensive reform, which is the appropriate policy path for Texas to address its reliability challenges.[1] NRG has consulted with multiple industry experts, evaluated market constructs from other regions and countries, and debated the pros and cons of various concepts since late spring, but all paths led to the same proposal, a Load-Serving Entity (LSE) Obligation. NRG agrees there are difficult decisions ahead and is committed to working with the Commission and stakeholders to preserve our competitive market and achieve the reliability Texans deserve.

I. RESPONSE TO QUESTIONS

1. *The ORDC is currently a "blended curve" based on prior Commission action. Should the ORDC be separated into separate seasonal curves again? How would this change affect operational and financial outcomes?*

No, the ORDC should continue to be a single, blended curve. The objective of the ORDC is no longer to represent the risk of seasonal load shed, it is to encourage more resource commitment to provide operating reserves. The original design of the ORDC was intended to create scarcity prices that reflect the risk of load shed based on variations of seasonal reserves. This created a dependency on severe grid emergencies to produce meaningful scarcity prices. The Commission rightly determined that dependency on severe scarcity events was not acceptable, similar to the current discussions on market design in this project. As a result, in early 2019, the Commission directed ERCOT to consolidate the ORDC into a single, blended curve and to shift the loss of load probability by half of a standard deviation. This action was a necessary modification to send price signals sooner and begin to encourage the market to not operate "on the edge." But it wasn't enough, as recognized this past year.

The ORDC reforms being contemplated in this project to extend the curve, which are important to continue to reduce dependency on grid emergencies, depart even further from the original design of the ORDC and therefore render the use of seasonal curves meaningless and

[1] Codified at Public Utility Regulatory Act § 39.159.

unnecessarily complex. As our market continues to evolve to support a more reliable system, the purpose of the ORDC has changed to better fulfill system needs for more online reserves. The Commission should focus on extending the ORDC to achieve those goals with a simple and predictable design that includes a single curve that is in effect the entire year. If seasonal curves are used again, there may be a need to set different ORDC parameters during the seasons to ensure the shape of the curve still meets the operational goals of the Commission and ERCOT which introduces more uncertainty for market participants. This further demonstrates the need to retain a single, blended curve.

2. *What modifications could be made to existing ancillary services to better reflect seasonal variability?*

ERCOT already incorporates seasonal variability into their studies to determine the amount of ancillary services to be procured each hour and day.[2] For example, ERCOT uses the following data to calculate ancillary service procurement amounts: installed capacity of wind and solar resources, hourly net load forecast error given fluctuations in historical wind and solar output and load, historical system inertia conditions, and historical forced outage data. This use of hourly data incorporates the seasonal variability of the system into the process to determine the amounts and results in differing requirements for operating reserves for each month and hour of the year. Therefore, it is not clear any modifications are necessary to improve the methodology. If the Commission intends to expand existing or create new ancillary services to procure more dispatchable capacity beyond what is needed for operating reserves (i.e. to improve reserve margins), ERCOT would need to modify their studies to determine the amount they need to procure to achieve the reliability requirement established by the Commission. However, since ancillary service products only apply to a subset of generation resources, the ability of new products to fully support system reliability is limited.

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[2] *See* ERCOT Proposed 2022 Ancillary Service Methodology and Preliminary Quantities (Oct. 25, 2021) (available at: http://www.ercot.com/content/wcm/key_documents_lists/221315/2022_AS_Methodology_Discussion_10252021_v0_WMWG.zip).

3. *Should ERCOT develop a discrete fuel-specific reliability product for winter? If so, please describe the attributes of such a product, including procurement and verification processes.*
    a. *How long would it take to develop such a product?*
    b. *Could a similar fuel-based capability be captured by modifying existing ancillary services in the ERCOT market?*

Yes, ERCOT should develop a separate product for winter fuel resiliency. The characteristics and attributes of such a product differ greatly from what the existing ancillary services procure, so it would not be a good fit to shoehorn them into an existing product. As guided by SB3, the attributes of such a product should include dual fuel capability, firm delivery for natural gas generation resources, minimum onsite storage requirements for solid fuel generation resources,[3] and minimum offsite storage requirements for natural gas generation resources coupled with firm delivery.

The product structure should include procurement through a request for proposal ("RFP") process conducted by ERCOT similar to black start service. Here, ERCOT can determine the amount to procure using historical analysis of outages during past severe winter weather events and then solicit sufficient generation resources with those attributes. Since these attributes primarily consist of long lead time, fixed cost investments, contract solicitation should occur up to three years in advance of service delivery, with a contract term of two years. If some attributes can be delivered sooner, such as offsite gas storage and firm gas delivery, those contracts can reflect an accelerated start date. Given the attributes of this product are not uniform or comparable in terms of cost, a clearing price mechanism would not work for this product so cost reimbursement should occur on an "as bid" basis. With sufficient direction from the Commission, ERCOT should be able to develop this product within a year since its impact on existing systems should be minimal (i.e. if structured similar to black start service, the settlement system would be the only system impacted).

The Commission could also consider whether this product can be rolled into or supplanted by a more comprehensive, technology-neutral approach, such as an LSE Obligation. The need for a fuel-specific reliability product may also be obviated by improvements in the reliability of the gas supply sector. Different regions in the United States, such as New England, have

[3] PURA § 39.159 (c) (added by SB3).

debated whether fuel assurance should be accomplished through a fuel reserve, as described above, or would more properly be integrated into the accreditation of generators and their ultimate performance obligation to produce electricity during critical hours. However, there is no industry-wide consensus, and it likely depends on the local characteristics concerning the vulnerability of natural gas supply.

4. *Are there alternatives to a load serving entity (LSE) Obligation that could be used to impose a firming requirement on all generation resources in ERCOT?*

The purpose of an LSE Obligation is to create demand for contracts to support investments in resources that contribute to system reliability such as dispatchable capacity or demand response. Support for investment has long been a challenge in ERCOT due to the short-term nature of the energy market and the LSE Obligation concept directly addresses this deficiency by utilizing the robust competitive retail market.

The LSE Obligation is effectively a generation firming requirement. It allows generation resources to sell no more than their accredited reliability value to LSEs for the sake of meeting the LSE's and, cumulatively, the system's reliability needs in critical hours. Once an LSE buys reliability attributes, the resources that sold them have a corresponding obligation to perform at or above that quantity in real time—or face the same kind of penalty that an LSE would face for not buying sufficient reliability. Generation is firmed in this way because, in total, an LSE has obligated to it a quantity of resources that matches or exceeds the LSE's peak load.

An alternative generation firming requirement could require resources to firm to levels *above* their reliability value, but in a way that does not correspond to LSEs' demand. Ultimately, the policy goal of a market design for resource adequacy should be to match operable resources to loads at critical hours. A generation firming requirement alienated from system demand would deviate from this principle. As a result, through this kind of firming requirement, some resources could face additional costs that would cause them to exit the market. These resources should instead have their reliability appropriately discounted through an LSE Obligation mechanism, while being allowed to compete in the market freely.

5. *Are there alternatives to an LSE Obligation that could address the concerns raised about the stakeholder proposals submitted to the Commission?*

The reliability goals of the ERCOT system have been made very clear by the public and state leaders following Winter Storm Uri. Grid emergencies and scarcity events will no longer be tolerated. This necessitates a change in direction from prior market design approaches. Continuing with a market design that does not prioritize and forcefully address reliability means a continued gamble with too much at stake. While no guarantees can be made, market design choices in this project can greatly reduce the risk and impact of future grid emergencies, if the right path is chosen. Any alternatives to the LSE Obligation should be based on the same principles with which it was developed: 1) establish a clear reliability requirement, 2) take a comprehensive, system-wide view of the resources and loads that ultimately must equal one another to ensure reliability, and 3) utilize the competitive market to the greatest extent possible to achieve the reliability objective.

NRG disagrees with comments that an LSE Obligation would disadvantage the competitive retail industry. On the contrary, the motivating principle behind the LSE Obligation is that Texas should rely on the unique and rich competitive retail landscape to help achieve system reliability. The LSE Obligation's commercial emanation would provide LSEs a significant range of freedom to piece together a portfolio of its choosing, so long as it is sufficiently reliable to cover its load during critical hours. Because LSEs are the focus of this reliability obligation, the policy also will institutionally tend to prefer demand response—since that is a product uniquely within an LSE's purview as the service provider to the demand side of the market.

Conversely, all but a single alternative proposal[4] would have ERCOT itself "buy" the insurance policy for reliability—or potentially *policies*, plural, since the growing number of centrally procured reserve products constitute overlapping areas of insurance coverage instead

[4] The exception appears to be the skeleton concept the Independent Market Monitor presented live at the Commission's Oct. 14 work session. The IMM's concept is apparently inspired by the work of Prof. Frank Wolak (Stanford), who has proposed a system that requires that each LSE hedge for its anticipated forward energy requirements, with requirements on the counterparties that sell these hedges that would measure their capability to actually produce that energy during critical times. This proposal shares critical features with the LSE Obligation (a forward showing, a central forecast, and an accreditation of resources). However, in requiring LSEs to purchase energy itself, the proposal would be more ambitious and could supplant LSEs' individual hedging strategies for the energy commodity itself (as opposed to being strictly an insurance policy to ensure systemwide resource adequacy).

of a comprehensive approach. The costs of those insurance policies then are indiscriminately allocated to LSEs. This approach creates unhedgeable costs and risks for LSEs—not unlike they faced this summer in ERCOT's sudden expansion of central reserves procurement. A central procurement inhibits LSEs from taking any action and requires them to just go along for the ride. That is a less efficient posture toward a dynamic retail market—and not one that seeks to actually make use of the manifold benefits a competitive retail market can offer for reliability.

All proposals to date acknowledge a backdrop of the need to avoid scarcity events which also means reduced reliance on scarcity prices in the energy market. That necessarily requires other revenues to support and attract dispatchable capacity. Indeed, all the alternative proposals discussed at the October 14th work session represent market constructs to increase capacity revenues.

This makes sense because increased capacity to back up fluctuating renewable output is what is needed in ERCOT. There are two proven ways to maintain and attract sufficient capacity: 1) central procurement by ERCOT or 2) establish a capacity obligation (e.g. LSE Obligation). The alternative proposals intended to improve investment signals for dispatchable capacity do so through central procurement by ERCOT in the form of new or expanded ancillary services or forward reliability services. These mechanisms would procure a subset of capacity already in existence. While this can improve revenues for resources that clear these markets and potentially encourage some new build, it also leads to questions about the prospects of resources that do not clear. If the resources that consistently do not clear decide to retire, there will be an eventual need for central procurement of all capacity to maintain sufficient reserves through a series of additional ancillary or reliability service products.

Load Serving Entity (LSE) Obligation

6. *How can an LSE Obligation be designed to protect against the abuse of market power in the wholesale and retail markets?*
    a. *Will an LSE Obligation negatively impact customer choice for consumers in the competitive retail electric market in ERCOT? Can protective measures be put in place to avoid a negative impact on customer choice? If so, please specify what measures.*
    b. *How can market power be effectively monitored in a market where owners of power generation also own REPs that serve a large portion of ERCOT's retail customers?*

c. *What is the impact on self-supplying large industrial consumers who will have to comply with the LSE Obligation and will it impact their decision to site in Texas?*
d. *What is the impact of an LSE Obligation on load-serving entities that do not offer retail choice, such as municipally owned utilities or electric cooperatives?*
e. *Can market power be monitored in the bilateral market if an LSE Obligation is implemented in ERCOT? Can protective measures be put in place to ensure that market power is effectively monitored in ERCOT with an LSE Obligation? If so, please specify what measures.*
f. *Should the LSE Obligation include a "must offer" provision? If so, how should it be structured?*

NRG agrees with sentiments of the Commissioners as discussed at the October 14th work session regarding market power. The potential for market power abuse must be sufficiently addressed and mitigated in order to proceed with the LSE Obligation. The same market power concerns were expressed over 20 years ago during the multi-year development of the zonal wholesale market in ERCOT. NRG is confident this issue can be addressed as part of the development of the LSE Obligation as it has been in the bilateral energy market.

NRG does not itself own sufficient resources to meet its load obligations. Instead, it relies on purchases from third parties substantially. NRG would be negatively impacted by an LSE Obligation were it to structurally disadvantage LSEs that needed to procure amounts to meet their obligations. NRG has asked Energy and Environmental Economics, Inc. ("E3") and Beth Garza to prepare detailed answers to the Commission's questions on the LSE Obligation, perhaps most importantly of all this question, and their response is being filed separately in this project.

7. *How should an LSE Obligation be accurately and fairly determined for each LSE? What is the appropriate segment of time for each obligation? (Months? Weeks? 24 hour operating day? 12 hour segments? Hourly?)*

NRG defers to the filing of E3 and Beth Garza to address Question 7 and its subparts.

8. *Can the reliability needs of the system be effectively determined with an LSE Obligation? How should objective standards around the value of the reliability-providing assets be set on an on-going basis?*
   a. *Are there methods of accreditation that can be implemented less administrative burden or need for oversight, while still allowing for all resources to be properly accredited?*
   b. *How can winter weather standards be integrated into the accreditation system?*

NRG defers to the filing of E3 and Beth Garza to address Question 8 and its subparts.

9. *How can the LSE Obligation be designed to ensure demand response resources can participate fully and at all points in time?*

NRG defers to the filing of E3 and Beth Garza to address Question 9.

10. *How will an LSE Obligation incent investment in existing and new dispatchable generation?*

Over the past year, certain proposals have focused on new entry (such as a strategic reserve of new, state funded power plants) and other proposals have focused on existing resources (such as the "cash for clunkers" ideas presented to the Commission to hold capacity outside the market to preserve capacity and boost energy prices). The LSE Obligation uniquely accommodates both new and existing resources' ability to perform.

As to how new entry might be achieved, the LSE Obligation at its core has three important variables: 1) the policy determination of a reliability standard, (i.e., what level of reliability risk society is maximally willing to accept), 2) technical determinations for a forecast of load during critical hours, and 3) the ability of resources to perform in those conditions. If the Commission wishes to cause the market to buy additional insurance (i.e., cause new entry of dispatchable resources), it can set a higher reliability standard or, alternatively, conservatively adjust the two other technical parameters of load forecasting and resource accreditation. NRG also defers to the filing of E3 and Beth Garza to address Question 10 to supplement this response.

11. *How will an LSE Obligation help ERCOT ensure operational reliability in the real-time market (e.g., during cold weather events or periods of time with higher than expected electricity demand and/or lower than expected generation output of all types)?*

See the response to Question 4. NRG also defers to the filing of E3 and Beth Garza to address Question 11.

12. *What mechanism will ensure those receiving revenue streams for the reliability services perform adequately?*

NRG defers to the filing of E3 and Beth Garza to address Question 12.

13. *What is the estimated market and consumer cost impact if an LSE obligation is implemented in ERCOT? Describe the methodology used to reach the dollar amount.*

NRG defers to the filing of E3 and Beth Garza to address Question 13 and its subparts.

14. *How long will the LSE Obligation plan take to implement?*

NRG agrees with the Commissioners' discussion in prior work sessions that a phased approach is best suited to address market design in a comprehensive manner. Given the pace of policy considerations the Commission has employed this fall, NRG believes the LSE Obligation could be developed within two years. NRG also defers to the filing of E3 and Beth Garza to address Question 14 to supplement this response.

15. *If the Commission adopts an LSE Obligation, what assurances are necessary to ensure transparency and promote stability within retail and wholesale electric markets?*

The competitive retail market is the most successful feature of the ERCOT market and ensuring its continued success should be a priority for the Commission. It is important that retailers play a fully aligned role with system reliability. The preservation of the retail market was a primary principle in NRG's evaluation of market design concepts. Currently, the biggest threat to the retail market is reliability. The LSE Obligation works to solve the reliability problem through the competitive market by allowing LSEs to contribute to reliability using resources they prefer. By utilizing discreet, tradable products like reliability credits that are associated with the reliability attributes of each resource, LSEs of all sizes can transact in increments that meet their obligations. Generation resources that sell this reliability to LSEs then are transparently subject to requirements to produce during critical times. Transparency and stability are thus promoted in a way that the status quo does not ensure. NRG also defers to the filing of E3 and Beth Garza to provide additional insight into mechanisms to achieve transparency and stability of the market under this concept, which are part of the considerations subsumed in their response to the market-power issues discussed in Question 6.

16. Are there relevant "lessons learned" from the implementation of an LSE Obligation in the SPP, CAL-ISO, MISO, and Australian markets that could be applied in ERCOT?

NRG defers to the filing of E3 and Beth Garza to address Question 16.

II. CONCLUSION

NRG appreciates the Commission's efforts concerning wholesale market design and the complexities of the topic in general. NRG is committed to working with the Commission and stakeholders to preserve our competitive market and achieve the reliability Texans deserve.

Respectfully submitted,

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ATTACHMENT A: NRG's EXECUTIVE SUMMARY – PROJECT 52373, NOV. 1, 2021

- The reliability goals of the ERCOT system have been made very clear by the public and state leaders following Winter Storm Uri. Grid emergencies and scarcity events will no longer be tolerated. This necessitates a change in direction from the prior thinking regarding market design. The ERCOT market needs more dispatchable capacity and therefore, any market design solution must be targeted at improving financial incentives for that capacity.
- SB 3 requires a more comprehensive approach to addressing reliability through market design and prescribes the following:
  - Reliability requirements to be established by the Commission;
  - A forecast, conducted at least annually, of demand during the most critical times of winter and summer, and corresponding qualification and assessment requirements of physical resources' ability to perform during those times; and
  - A competition-based mechanism to procure resources to achieve system reliability during those critical times.
- The LSE Obligation is a comprehensive approach to align the ERCOT market design with the reliability objectives of Texas. It is based on the following principles: 1) establish a clear reliability requirement, 2) take a comprehensive, system-wide view of supply and demand, and 3) utilize the competitive market to the greatest extent possible to achieve the reliability objectives through the creation of incentives to procure capacity that contributes to reliability.
- The objective of the ORDC is no longer to represent the risk of seasonal load shed, it is to encourage more resource commitment to provide operating reserves. Therefore, the use of seasonal curves is not appropriate.
- ERCOT already incorporates seasonal variability into their studies to determine the amount of ancillary services to be procured each hour and day. Thus, it is not clear incorporating more seasonal variability is necessary or possible.
- ERCOT should develop a separate product for winter fuel resiliency to procure specific attributes such as dual fuel capability, fuel storage capabilities, and firm supplies. The

product should provide a longer lead time to allow investments in such capabilities to be developed.

- The purpose of an LSE Obligation is to create demand for contracts to support investments in resources that contribute to system reliability such as dispatchable capacity or demand response. A firming requirement imposed on generation resources does not replicate this market incentive directionally and could lead to additional generation resource retirements.
- The preservation of the retail market was a primary principle in NRG's evaluation of market design concepts. Currently, the biggest threat to the retail market is reliability. The LSE Obligation works to solve the reliability problem through the competitive market by allowing LSEs to contribute to reliability using resources they prefer.
- The potential for market power abuse must be sufficiently addressed and mitigated in order to proceed with the LSE Obligation. NRG is confident market power concerns can be addressed as part of the development of the LSE Obligation as it has been in the existing energy market.
- NRG has asked Energy and Environmental Economics, Inc. ("E3") and Beth Garza to prepare detailed answers to the Commission's questions on the LSE Obligation, and that set of answers is being filed separately in this project.