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**Received - 2021-09-30 08:17:09 AM**  
**Control Number - 52373**  
**ItemNumber - 134**



## Energy+Environmental Economics

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To: Chairman Peter M. Lake  
Commissioner Will McAdams  
Commissioner Lori Cobos  
Commissioner Jimmy Glotfelty

Re: Project No. 52373 – Review of Wholesale Electric Market Design

Dear Chairman Lake and Commissioners McAdams, Cobos, and Glotfelty,

Please find attached a whitepaper entitled *The Load Serving Entity Reliability Obligation*. This whitepaper proposes a significant reform to the ERCOT electricity market in response to the provisions put forward by SB 3 to “establish requirements to meet the reliability needs of the power region.” The proposal would establish a formal standard for electricity reliability and require load-serving entities (LSEs) to procure sufficient resources to meet this standard if there is a projected supply shortfall across the entire ERCOT market.

This proposal is submitted by Energy and Environmental Economics, Inc. (E3) and Ms. Beth Garza. E3 is an energy economics consulting firm with expertise in electricity planning, market design, distributed energy resources, retail rate design, and asset valuation. Ms. Garza is the former independent market monitor of ERCOT. E3 and Ms. Garza were retained by NRG Energy, Inc. and Exelon Corporation to provide unbiased, independent analysis of ERCOT market design and provide recommendations for practical reforms that can improve reliability while retaining the core aspects of ERCOT’s existing competitive electricity market.

We appreciate the opportunity to submit this whitepaper and look forward to collaboratively working with the Commission and other public stakeholders to describe the proposal and provide any additional support that might be helpful.

Sincerely,

**Arne Olson**  
*Senior Partner*

E3

**Zach Ming**  
*Director*

E3

**Beth Garza**  
*Independent Consultant*

# Executive Summary

## The Load-Serving Entity (LSE) Reliability Obligation

*Whitepaper by Energy and Environmental Economics, Inc. (E3) and Ms. Beth Garza*

*Sponsored by NRG Energy, Inc. and Exelon Corporation*

The proposed **LSE Reliability Obligation** introduces a formal reliability standard and a mechanism to ensure that there are sufficient resources to meet this standard. The proposal is designed to preserve the competitive and customer choice elements of the existing ERCOT energy market, while ensuring that there are sufficient resources with the right combination of attributes, namely their ability to perform during reliability events. Additionally, the design would encourage LSEs to make investments in demand response, because those would reduce the size of the obligation the LSE must meet. Key elements of the proposal include:

- + **Reliability Standard:** the PUCT determines a formal system reliability standard. ERCOT calculates the required seasonal reserve margin to achieve this standard.
- + **Resource Accreditation:** ERCOT will accredit the reliability value of each resource for each season. 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.
- + **System Assessment:** ERCOT will project, on a 3-year forward basis, whether there are sufficient accredited resources to satisfy the seasonal reserve margin necessary to meet the reliability standard.
- + **Trigger:** The PUCT will trigger the LSE Reliability Obligation on a 3-year forward basis when ERCOT system assessment projects a likelihood of insufficient resources to meet the reliability standard.
- + **LSE Requirement:** If triggered, each LSE would be assigned a seasonal reliability requirement based on its projected firm load during critical system hours. LSEs serving interruptible loads or with demand response capabilities would receive a reduction in their reliability requirement.
- + **LSE Showing:** If triggered, LSEs would be required to show sufficient resources (based on ERCOT's resource accreditation) to meet their seasonal LSE requirement on a year-ahead forward basis. Any showing deficiency would be assessed a penalty that would be used by ERCOT to procure accredited resources and correct the deficiency.
- + **Performance Assessment:** Resources that are accredited with a reliability value and obligated as part of an LSE Showing would be required to offer into the energy market during designated reliability events, with penalties assessed for non-performance.

# The Load-Serving Entity Reliability Obligation

*A Market Design Reform to Ensure  
Electric Reliability in Texas*



September 2021



Energy+Environmental Economics

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The authors appreciate the contributions and insights of Travis Kavulla, Bill Barnes, and Vafa Mohtashami

**This whitepaper is funded by:**

NRG Energy, Inc.



Exelon Corporation



## **About this Whitepaper**

This whitepaper proposes the “LSE Reliability Obligation”, a reform to the ERCOT electricity market structure. The LSE Reliability Obligation was filed at the Public Utility Commission of Texas on September 30, 2021 under Project No. 52373 in response to the provisions put forward by Senate Bill 3 of the 87<sup>th</sup> Texas Legislature.

The basis of the proposed LSE Reliability Obligation is derived from a report published by E3 in 2021 titled “Scalable Markets for the Energy Transition” that provides a foundation for understanding the important dynamics at play in electricity markets across North America, including the need for a forward signal to procure reliability resources.<sup>1</sup>

Other important energy system reforms should be considered in conjunction with the LSE Reliability Obligation, including power-plant and gas-system winterization requirements, updated energy efficiency goals and building codes, and better communication between customers, market participants, transmission and distribution utilities, and retail electric providers.

## **About the Authors**

Energy and Environmental Economics, Inc. (E3) is an energy economics consulting firm with offices in San Francisco, New York, Boston and Calgary with expertise in electricity planning, market design, distributed energy resources, retail rate design, and asset valuation.

Ms. Garza is the former independent market monitor of ERCOT, and currently affiliated with the R Street Institute, a nonprofit, nonpartisan, public policy research organization whose mission is to engage in policy research and outreach to promote free markets and limited, effective government.

E3 and Ms. Garza were retained by the project sponsors to provide unbiased, independent analysis of the ERCOT market design and to provide recommendations for practical reforms that can improve reliability while retaining the core aspects of ERCOT’s existing competitive electricity market.

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<sup>1</sup> <https://www.ethree.com/wp-content/uploads/2021/05/E3-Scalable-Clean-Energy-Market-Design-2021.05.25.pdf>



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## 1. Executive Summary

In the aftermath of Winter Storm Uri, the Texas electricity market has been the subject of a series of discussions aimed at improving reliability. These efforts to reform the market operated by the Electric Reliability Council of Texas (ERCOT) have been wide-ranging and have captured the attention of stakeholders and policymakers at the highest levels. The cornerstone of these efforts was Senate Bill 3, a sweeping law passed by the 87<sup>th</sup> Texas Legislature directing the Public Utility Commission of Texas (PUCT) to “establish requirements to meet the reliability needs of the power region.”<sup>2</sup> To inform these market reform discussions, the project sponsors retained the consulting firm Energy and Environmental Economics, Inc. (E3) and Beth Garza, senior fellow at the non-profit R Street Institute.

As an energy-only market, ERCOT has no formal reliability standard nor any explicit mechanism to ensure there are sufficient resources to meet a specified reliability standard. Implied expectations of electricity scarcity in forward energy prices serve as the primary financial incentive for Load Serving Entities (LSEs) to procure supply and support investment. ERCOT does conduct technical studies of resource adequacy for its system, which have determined that a 13.75%<sup>3</sup> reserve margin<sup>4</sup> would be needed to meet the reliability standard most commonly used in other markets—one loss-of-load event in ten years. However, ERCOT’s actual reserve levels have fallen below that benchmark recently.

Many stakeholders have put forward proposals to improve the reliability of the system, increase financial protection of consumers, or both. Most proposals continue to substantively rely on the existing energy-only market design, merely modifying the way in which the system operator derives the prices of energy or the quantities of real-time operating reserves in the energy market.<sup>5</sup> These are actions that may improve reliability but do not establish an explicit reliability standard. Minor modifications to the current market design are not only insufficient to ensure reliable electricity supplies in ERCOT, but in some cases might inadvertently increase financial rewards for generators that do not consistently contribute to reliability. Instead, this whitepaper proposes a mechanism for directly addressing resource adequacy.

The proposed **LSE Reliability Obligation** (described more fully in Section 5) introduces a formal reliability standard and a mechanism to ensure that there are sufficient resources to meet this standard. Load-Serving Entities, or LSEs, are responsible for procuring energy on behalf of customers in Texas (both competitive retail providers and municipal/co-operative utilities) and are the natural vehicle to procure

**The LSE Reliability Obligation introduces a formal reliability standard and a mechanism to ensure that there are sufficient resources to meet this standard**

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<sup>2</sup> <https://capitol.texas.gov/tlodocs/87R/billtext/pdf/SB00003F.pdf#navpanes=0>

<sup>3</sup> ERCOT, *Resource Adequacy*, <http://www.ercot.com/gridinfo/resource> (last visited Sep. 21, 2021) (“The current minimum target reserve margin established by the ERCOT Board of Directors is 13.75 percent of peak electricity demand to serve electric needs in the case of unexpectedly high demand or levels of generation plant outages.”)

<sup>4</sup> Reserve margin is defined as the percentage buffer of resources needed by the system above and beyond expected peak demand to account for 1) abnormally high load 2) resources outages and 3) operating reserve requirements

<sup>5</sup> For example, see [https://interchange.puc.texas.gov/Documents/52373\\_55\\_1147848.PDF](https://interchange.puc.texas.gov/Documents/52373_55_1147848.PDF)





additional resources for reliability, should they be needed. The proposal is designed to preserve the competitive and customer choice elements of the existing ERCOT energy market, while ensuring that there are sufficient resources with the right combination of attributes, namely their ability to perform during reliability events.<sup>6</sup> Key elements of the proposal include:

- + **Reliability Standard:** the PUCT determines a formal system reliability standard (e.g., 1-day-in-10-years). ERCOT calculates the required seasonal reserve margin to achieve this standard.
- + **Resource Accreditation:** ERCOT will accredit the reliability value of each resource for each season. 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.
- + **System Assessment:** ERCOT will project, on a 3-year forward basis, whether there are sufficient accredited resources to satisfy the seasonal reserve margin necessary to meet the reliability standard.
- + **Trigger:** The PUCT will trigger the LSE Reliability Obligation on a 3-year forward basis when ERCOT system assessment projects a likelihood of insufficient resources to meet the reliability standard.
- + **LSE Requirement:** If triggered, each LSE would be assigned a seasonal reliability requirement based on its projected firm load during critical system hours. LSEs serving interruptible loads would receive a reduction in their reliability requirement.
- + **LSE Showings:** If triggered, LSEs would be required to show sufficient resources (based on ERCOT’s resource accreditation) to meet their seasonal LSE requirement on a year-ahead forward basis. Any showing deficiency would be assessed a penalty that would be used by ERCOT to procure accredited resources and correct the deficiency.
- + **Performance Assessment:** Resources that are accredited with a reliability value and obligated as part of an LSE Showing would be required to offer into the energy market during designated reliability events, with penalties assessed for non-performance.

A visual overview of the LSE Reliability Obligation process is illustrated in Figure 1.

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<sup>6</sup> While resources are often characterized as “dispatchable” or “firm”, these distinctions often blurred in a modern electricity system. For example, solar and wind resources can be operated dispatchably. Pairing resources together such as solar and energystorage can create a resource with firm attributes. Ultimately what matters is a resource’s ability to generate power when the system needs it the most. No resource is perfect and all resources should be characterized on an apples-to-apples basis based on their ability to generate during these critical hours.



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First appeared as part of the conference materials for the  
17<sup>th</sup> Annual Renewable Energy Law Institute session

"Integrating Renewable Energy in ERCOT's Market Redesign"