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PROJECT NO. 52373

**REVIEW OF WHOLESALE
ELECTRIC MARKET DESIGN**

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**PUBLIC UTILITY COMMISSION
OF TEXAS**

**COMMENTS OF
ENVIRONMENTAL DEFENSE FUND, INC.**

COMES NOW Environmental Defense Fund, Inc. (“EDF”) and files these comments in response to the Commission’s Questions for Comment filed in this proceeding on August 2, 2021. EDF is a non-profit, non-partisan, non-governmental environmental organization that combines law, policy, science, and economics to find solutions to today’s most pressing environmental problems.

Executive Summary

- Many policy failures beyond market design caused and worsened the February winter event. Identifying and addressing those broader systemic issues will maximize the effectiveness and benefits of new and existing investments and market design elements.
- The Commission should continue to support ERCOT’s energy-only market design, but with modifications that reflect the changing resource mix and the grid’s reliability challenges.
- Generator commitment in the day-ahead market is not an appropriate requirement for receipt of the ORDC or real-time energy market participation.
- All ancillary services should be defined in uniform, specific, performance-based, functionally defined, technology-agnostic, fuel-neutral terms and priced transparently.
- ERCOT must reassess and strengthen its requirements for black-start service to ensure providers can and will perform when needed.
- In order to increase residential demand response, competitive energy management providers should be enabled to offer services to REPs, TDUs, and ERCOT. The Commission also should require ERCOT to work with REPs, TDUs, demand service aggregators, technology providers, and actual customers to determine how to enable their active participation to support grid reliability and price formation.

- The Commission should increase ERCOT's budget to procure Emergency Response Service to increase the amount of voluntary load management available as a defense against involuntary load curtailment.
- The Commission should conder NERC's requirements regarding essential reliability services to improve the ability to manage inertia, voltage support, and frequency.

Introduction

As the Commission considers dramatic changes to the ERCOT wholesale electric market design, it also should consider the degree to which the massive electric reliability failures that occurred in February 2021 were due to causes other than market design. While it is true that ERCOT's energy-only market and existing market rules contributed to exorbitant wholesale electric prices during the February event, many policy failures beyond market design helped to cause and worsen the disaster. Identifying and addressing those broader systemic issues will maximize the benefits of new and existing investments and market designs. Failing to address them will mean that potential changes to ERCOT's market design will fail to make the ERCOT grid more reliable, will likely discourage investment in new generation resources to meet the needs of a growing population, and, if policies that discriminate against wind and solar generation are adopted, will lead to more air pollution in Texas that will constrain economic development and harm citizens' health.

Other significant contributing factors that exacerbated the February outages included:

- Many generators failed due to a lack of winterization (which the PUCT is now addressing due to statutory requirement). This failure was due not just to generator decisions, but to the failure by the PUCT to institute formal winterization requirements for generators after similar generation failures due to cold weather in February 2011 and ERCOT's failure to conduct detailed inspections to verify compliance with generators' declarations that they had completed winter weatherization preparations.
- Natural gas production and delivery system failures, beginning with the advent of cold weather around February 9, and the natural gas price spike that resulted from gas supply

shortages. These failures, affecting ERCOT and neighboring MISO and SPP, were documented in objective assessments of the February event and outages.¹

- Contributing to the natural gas system failure:
 - the failure of many gas facilities to winterize their facilities and of the Texas Railroad Commission to order winterization;
 - The PUCT and the Railroad Commission failed to effectively recognize and coordinate natural gas and electric procurement and logistics practices;
 - The Railroad Commission failed to remind or order natural gas producers and pipelines to register critical facilities with electric distribution utilities;
 - Natural gas companies and pipelines failed to fulfill many natural gas delivery contracts to power plants;
 - Natural gas facilities that, despite knowing the importance of their role in supporting electric power generation, voluntarily enrolled in interruptible load programs after discontinuing local facility backup generation to rely solely upon grid-supplied power.
- The natural gas system failures compromised power generation within ERCOT and harmed many generators across neighboring SPP and MISO grids, neither of which share ERCOT's market structure.
- The Commission's decision to extend the \$9,000 ERCOT price cap for days despite evidence that the high price was not performing its intended role of inducing additional energy production.
- The failure of ERCOT's seasonal and operational weather and load forecasting systems to accurately anticipate and manage the depth of the generator outages during the February disaster or the unprecedented magnitude of the demand spike, so these problems could have been considered and managed before the cold weather hit and failure followed.

¹ "The Timeline and Events of the February 2021 Texas Electric Grid Blackouts" (July 2021) (available at [https://www.puc.texas.gov/agency/resources/reports/UTAustin_\(2021\)_EventsFebruary2021TexasBlackout_\(02\)FINAL_07_12_21.pdf](https://www.puc.texas.gov/agency/resources/reports/UTAustin_(2021)_EventsFebruary2021TexasBlackout_(02)FINAL_07_12_21.pdf)); Southwest Power Pool, "A Comprehensive Review of Southwest Power Pool's Response to the February 2021 Winter Storm," July 19, 2021 (available at <https://spp.org/documents/65037/comprehensive%20review%20of%20spp's%20response%20to%20the%20feb.%202021%20winter%20storm%202021%2007%2019.pdf>); SPP Market Monitoring Unit, "Report on February 2021 Winter Weather Event," July 14, 2021 (available at https://spp.org/documents/64975/spp_mmu_winter_weather_report_2021.pdf).

- Texas' long-standing minimal investment in energy efficiency to lower and stabilize customer electricity demand which would have reduced the magnitude of the power demand to supply shortfall in February and helped save lives. Additionally, there is vast untapped potential and availability of demand response measures that could have helped ERCOT to better manage this and other grid reliability events.

The purpose of a competitive wholesale power market is to facilitate price formation that guides short-term dispatch and long-term investment decisions. But the effectiveness of power market operation depends as much on market design as it does on broader conditions, including reliability standards, regional transmission availability and speed of generation interconnection, end use customers' ability to see and respond to wholesale prices, distributed generation interconnection ease and speed, limits on demand response participation, gas supply adequacy, energy efficiency affecting demand levels, and more. If overarching Commission or ERCOT policies constrain the ability of customers and producers to participate in the market or to deliver reliable electricity, then market redesign measures will have limited impact. While the Texas Legislature addressed some of the above topics in Senate Bill 3 and the implementation of its provisions are underway at the Commission and ERCOT, other extra-market factors remain unaddressed.²

ERCOT's energy-only market design needs an update to better serve our changing resource mix and support reliability under increasingly challenging adverse weather conditions. However, fixing the wholesale electric market without fixing the contributing factors noted above will not prevent other power system failures in the future.

ERCOT's energy-only market design, and the way that market is managed, can be modified to adapt to the changing resource mix and growing reliability challenges. There is no need for Texas to give up on the benefits of competitive wholesale power markets nor to move to a capacity market -- particularly since capacity markets have delivered high costs and high capacity reserves without notably better reliability. Creation of a capacity market will not resolve ERCOT's electric reliability and pricing challenges, nor will it fix all of the reliability problems noted above.

² Many of the above ideas are discussed in a proposal prepared by five former Texas Commission Chairs and members, "Never Again," attached for your consideration.

Comments

1. **What specific changes, if any, should be made to the Operating Reserve Demand Curve (ORDC) to drive investment in existing and new dispatchable generation? Please consider ORDC applying only to generators who commit in the day-ahead market (DAM). Should that amount of ORDC-based dispatchability be adjusted to specific seasonal reliability needs?**
2. **Should ERCOT require all generation resources to offer a minimum commitment in the day-ahead market as a precondition for participating in the energy market?**
 - a. **If so, how should that minimum commitment be determined?**
 - b. **How should that commitment be enforced?**

Both Questions 1 and 2 ask key questions in connection with the Day-Ahead Market (DAM). Question 1 asks whether the ORDC adder should be available only to generators that commit in the DAM to provide energy in the Real-Time Market. Question 2 asks whether all generators should be required to offer a minimum commitment in the DAM as a precondition for participating in the energy-only market. The answer to both questions is no.

First, having a resource commit in the DAM does not guarantee that that resource will actually produce energy in real-time when it is needed. The DAM is a voluntary *financial* market. The DAM enables a resource to obtain financial certainty about its position in the real-time market, but there is no obligation for that resource to actually generate in the real-time market. Instead, once the resource takes on an obligation in the DAM, the resource has a choice of whether it will generate in the real-time market or contract with another resource to provide power on its behalf if the latter option is more economical; thus, DAM participation does not assure any particular resource's performance the next day. The point of the ERCOT energy-only market is to pay for actual production, not to pay for commitments to produce. From a reliability perspective, the issue whether a resource actually produces in real-time, not whether it commits to produce in the DAM.

Connecting the ORDC to DAM participation is functionally similar to a capacity market – compensating a resource for a commitment to exist. Capacity markets have notoriously high reserve margins, inflated by inefficient, low-capacity factor generators that do not.³ A better alternative would be allowing resources to offer multiple products that compete for dispatch in separate product markets – a dispatchable product for some specified (or greater) portion of its

³ Rob Gramlich and Michael Goggin, “Too Much of the Wrong Thing: The Need for Capacity Market Reform or Replacement,” November 2019 (available at <https://gridprogress.files.wordpress.com/2019/11/too-much-of-the-wrong-thing-the-need-for-capacity-market-replacement-or-reform.pdf>).

output, and a non-dispatchable, as-available product that competes in a separate but complementary market. ERCOT would have to broaden its Security-Constrained Economic Dispatch methods manage both products simultaneously.

More broadly, all market participation preconditions must be crafted in a way that is performance- and functionally-defined, technology agnostic and fuel-neutral. It is well-established that wind and solar generation are as dependable and predictable as natural gas, nuclear, and coal generation resources in ERCOT and elsewhere. Winter Storm Uri was another confirmation of this reality. Storage (physically collocated or virtual) and inverter technology can benefit almost every resource type and enable greater service offerings. Clearly defining the services ERCOT needs (ramping capability, duration, etc.), with seasonal variations as appropriate, will empower the competitive market to use whatever technology or combination of technologies and fuels will work to provide those services.

Any resource that delivers energy in times of grid stress or emergency, regardless of technology or fuel source, brings the same value to the market and customers and should be compensated equally using the ORDC.⁴ A market design that discriminates between electrons from one generation resource versus another will compromise rather than improve reliability by discouraging resources from producing when their energy is not valued as much as energy from other resources. This could also require multiple ERCOT settlement systems to track different electrons from source to sink in order to ensure that a consumer receives the financial benefit of its hedging transactions and is not financially penalized for hedging with a particular type of generation. Last, imposing discriminatory rules for different resource types could compromise ERCOT reliability by discouraging new capital investment in ERCOT and tipping existing marginal resources away from making additional investments (such as weatherization or enhanced maintenance) to remain as active market participants.

⁴ By this same token, the value of certainty and predictability of provision should be recognized for energy efficiency as an extra-market, always-on resource that delivers predictable energy and peak reduction benefits.

3. What new ancillary service products or reliability services or changes to existing ancillary service products or reliability services should be developed or made to ensure reliability under a variety of extreme conditions? Please articulate specific standards of reliability along with any suggested AS products. How should the costs of these new ancillary services be allocated.

New ancillary service products, compensated equally regardless of resource type, can increase grid flexibility and resilience, better assure reliability, and be a cost-effective alternative to new generation. Ancillary service products should be specifically and uniformly defined in performance- and functionally-based, technology-agnostic, fuel-neutral terms and transparently priced. Ensuring a level playing field for all resources by rewarding outputs, rather than defining inputs, and compensating all resources that provide a service equally, should benefit customers and the grid. In considering cost allocation, the Commission should consider the *net* costs, including the ability of ancillary service products to defer or offset traditional investments.

Regarding specific ancillary service products, conditions and challenges vary by season, so reliability standards and associated procurement of services could be modified to reflect the risks of each season, as ERCOT has already modified procurement of Responsive Reserve Service and Non-Spin Service for the summer and by time of day.

Since ERCOT is an electrical island, black-start capability is a particularly critical and under-valued ancillary service. The February disaster revealed that out of 16 ERCOT generators paid for black-start service provision, only 6 had fuel and remained operable to provide black-start service after the load drops and generator failures on the morning of February 15. Had ERCOT gone into grid collapse, it would have taken weeks to fully restore electric service across the interconnection. This requires a sweeping reassessment of ERCOT's requirements for black-start service capability, more rigorous specifications for black-start service qualification (such as on-site fuel assurance and verified communication capability) and more rigorous verification and testing that black-start providers can perform and will be available when needed. Black-start redefinition should also recognize AC and DC transmission as a legitimate black-start service source.

4. Is available residential demand response adequately captured by existing retail electric provider (REP) programs? Do opportunities exist for enhanced residential load response?

ERCOT has a tremendous opportunity to increase residential demand response beyond existing REP programs. Harnessing that potential offers grid and cost benefits year-round and can be particularly impactful during emergency events.

Most REPs have little incentive to offer their customers robust demand response opportunities because the customers can move easily to other REPs and because the new legislative ban on dynamic pricing products for residential and small commercial customers discourages powerful price revelation and response methods. Some REPs will continue to differentiate themselves with innovative offers that empower customers to manage their energy consumption, but the potential for further limitations imposed by the Commission in Project No. 51830⁵ puts such innovation in jeopardy. For those REPs that are interested in supporting residential load management products for their customers, the Commission should enable real-time access to customer consumption data so REPs and customer applications can access the data to create innovative, voluntary customer information and equipment management offerings, with the option to tie this to Green Button usage data.

In the near absence of residential demand response offered by REPs, the best way to facilitate additional residential demand response is to enable competitive energy management providers to offer demand response services to residential and small commercial customers and offer that load management service to REPs as hedges to their customer demand or through multi-year contracts to TDUs as part of TDU energy efficiency programs.

The Commission also should recognize that ERCOT residential customers are installing increasing amounts of solar photovoltaics, battery storage, grid-charged electric vehicles, and backup generators that could be used to support grid reliability and even participate in the wholesale market if the programs were designed, facilitated, and compensated appropriately. The Commission should require ERCOT to work with REPs, TDUs, demand service aggregators, technology providers, and actual customers to determine how to enable their active, compensated participation (whether from customer-side demand reductions, storage, or generation) to support grid reliability and price formation. In addition, the Commission should consider incentivizing or

⁵ Review of Certain Retail Electric Customer Protection Rules.

requiring or all new behind-the-meter and distribution-connected generation and storage to use IEEE-1547-compliant smart inverters for interconnection and encourage aggregators to facilitate these resources to integrate and enhance rather than compromise grid reliability (such as to offset PV ramping in the evening). Last, the Commission should consider whether there are less costly means than classic utility revenue-grade meters to monitor and verify customer load input and off-take from the grid, and whether TDUs could offer these meters to participating customers on a Pay-as-you-save basis rather than in a single front-end charge.

5. How can ERCOT’s emergency response service program be modified to provide additional reliability benefits? What changes would need to be made to Commission rules and ERCOT market rules and systems to implement these program changes?

At a minimum, the Commission should increase ERCOT’s annual budget for ERS procurement from \$50 million to \$150 million or more in order to build a more robust ERS program. It is important to recognize that ERS is a defense against involuntary rolling outages (as proven in 2014⁶ and 2019⁷). It is far superior for ERCOT to curtail customers who have volunteered to have their consumption curtailed and who have prepared accordingly, than to cut load to residential and small commercial customers who are not prepared and may have little to no warning. While a doubling or quadrupling of participation in the ERS program would not have averted the massive level of load-shed that occurred during Winter Storm Uri, additional ERS can provide meaningful protection in less dramatic situations such as the close calls ERCOT faced in April and June this year.

6. How can the current market design be altered (e.g., by implementing new products) to provide tools to improve the ability to manage inertia, voltage support, or frequency?

Inertia, voltage support, frequency, ramping and balancing are managed using ancillary services (also called, essential reliability services or ERS, as outlined in the NERC “ERS Sufficiency Guidelines White Paper”). FERC’s 2018 pro forma Interconnection Agreements

⁶ See ERCOT’s 2013 Annual Report on Emergency Response Service, filed in Project No. 27706 on April 15, 2014 (available at http://interchange.puc.texas.gov/Documents/27706_287_785847.PDF).

⁷ See ERCOT’s 2019 Annual Report on Emergency Response Service, filed in Project No 27706 on April 15, 2020 (available at http://interchange.puc.texas.gov/Documents/27706_437_1061046.PDF); see also ERCOT’s Report of Emergency Event for Operating Day August 15, 2019, filed in Project 207706 on August 21, 2019 (available at http://interchange.puc.texas.gov/Documents/27706_415_1030610.PDF) and ERCOT’s Report of Emergency Event for Operating Day August 19, 2019 filed on August 19, 2019 (available at http://interchange.puc.texas.gov/Documents/27706_413_1030232.PDF),

require both large and small interconnecting generators to be capable of providing primary frequency response as a condition of interconnection, and FERC Order 828 requires newly connected solar plants to ride through abnormal frequency and voltage events without disconnecting. Automated demand response measures can provide ramping, balancing and frequency support. NERC reports that batteries can offset resource variability and provide ERS such as voltage support and frequency response. In contrast, many older gas, coal and nuclear plants are knocked off-line by a large grid frequency or voltage disturbance and do not provide reliability-essential ride-through capability and continuity of service.

All ancillary services should be defined and procured in performance-based, technology-neutral terms. ERCOT's current effort to co-optimize the day-ahead, day-of and ancillary services markets should improve the ability of all resources to offer and be appropriately compensated for both energy and ancillary services in ways that advance overall grid reliability.

Conclusion

EDF appreciates the opportunity to provide these Comments and looks forward to working with the Commission and other interested parties on these issues.

Respectfully submitted,

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