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PROJECT NO. 52373

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

COMMENTS OF ADVANCED ENERGY MANAGEMENT ALLIANCE

COMES NOW the Advanced Energy Management Alliance (AEMA) and files these Comments in response to the Commission's Questions for Comment filed in this proceeding on August 2, 2021. AEMA is a trade association under Section 501(c)(6) of the Federal tax code whose members include national distributed energy resource companies and advanced energy management service and technology providers, including demand response (DR) providers, as well as some of the nation's largest demand response and distributed energy resources (DERs) and consumers. The comments herein represent the views of the organization as a whole rather than those of any individual member.

Executive Summary

- Residential demand response can play a critical role in mitigating grid emergencies, with an estimated 1 GW of summer load shed available today through smart thermostats alone.
- The existing options for residential demand response lack sufficient compensation for demand response resources for the value they deliver to the market which limits customer participation. We estimate that less than 10% of the thermostats already deployed participate in load management programs today.
- We recommend that the PUCT set a goal of developing demand response programs that total at least 10% of system peak load, further incentivize TDUs to expand their demand response programs and that key stakeholders including REPs, TDUs, and aggregators work to develop programs to achieve these goals.
- The ERS program should be expanded beyond the $50M budget cap to provide additional reliability.
- Texas should examine new programs/services using demand response and distributed energy resources to provide flexibility and renewable integration services.

Introduction

Demand response is a key tool to ensuring the reliable operation of the electric grid. It is a foundational proposition in all electricity markets that supply (generation output) must equal demand (customer consumption) at all times. As a result, it is axiomatic that managing demand should be a key part of the discussion regarding how to make the ERCOT grid more resilient since demand is what drives the need for generation. Any modifications to the ERCOT market that do not include serious consideration and utilization of demand response as an integral part of the solution is like someone trying to hang wallpaper with one arm tied behind their back – they are using only ½ of the resources they have available. Taking advantage of the ability and willingness of many types of customers to agree to modify their consumption in response to direction from ERCOT or in response to appropriate price signals should be a key strategy to avoiding the need for ERCOT to impose power outages on unprepared customers.

Despite the significant demand response potential on ERCOT's grid, these resources remain underutilized due to insufficient mechanisms and compensation for participation. Responsive loads can contribute to meeting customers' energy needs in ways that are consistent with competitive market objectives. Participating loads can contribute to higher reserve margins and levels of reliability, improve market efficiency, and result in lower energy costs to customers than relying entirely on new generating resources to meet total customer demand. Demand response has the advantage of being a relatively short lead-time resource, taking less time to develop than conventional generation resources. Customers' willingness to participate benefits other electric customers because the reduction in consumption can help bring supply and demand for electricity into equilibrium, thereby avoiding or reducing the likelihood of involuntary

interruptions of other customers' service. Demand response also can address market power issues by providing additional competition to generation resources.

In general, demand response falls into two broad categories: (1) programs created by grid operators, load serving entities (LSEs), or distribution grid operators which pay customers to be available to reduce demand when an emergency arises on the electric grid or to meet ISO commitments when required to do so under a capacity market program (reliability-based demand response); or (2) instances where customers act voluntarily to reduce demand as an economic response to avoid or reduce exposure to high electricity prices or to engage in other economically beneficial activities (economic demand response).[1] In the current ERCOT market design, reliability-based demand response is used to some extent but in relatively limited ways that do not always reflect the capabilities of the resources. Load Resources can qualify to provide Ancillary Services (Responsive Reserves, Non-spin Reserves, and/or Regulation Service), and even participate in ERCOT's Security-Constrained Economic Dispatch (SCED). Loads or aggregation of Loads, and certain types of generators, can provide Emergency Response Service (ERS) which is a defense against involuntary rolling outages (as proven in 2014[2] and 2019[3]). In addition, Transmission and Distribution Utilities (TDUs) have demand response programs as part of their energy efficiency programs and newly enacted Utilities Code §39.075(e) authorizes TDUs to design and operate demand response programs for nonresidential customers to be available for

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1 The Demand Response Coalition discussed the distinctions between reliability-based and price-based demand response in their comments filed in Project No. 41061 on February 15, 2013.

2 *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).

3 *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, 2091 (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).

deployment in the event of grid emergencies. Through these narrow pathways, Texas is not using reliability-based demand response as much as it could. For example, comments[4] provided to the Technical Advisory Committee after its July 28, 2021, meeting indicated that more than 6,000 MW of Load Resources are available but not utilized by ERCOT, whereas ERCOT has stated[5] that it is only looking to generation resources when adding to its reserves for September to December 2021.

Customers engage in economic demand response using various strategies. For example, while some commercial customers may reduce their consumption from the grid by curtailing business operations and residential customers may use smart thermostats or other appliances or tools to reduce consumption and shift energy intensive activities (like clothes drying or vehicle charging) to times with lower demand on the grid, both commercial and residential customers may use on-site generation and/or energy storage as alternative energy sources, and yet others may use a combination of these strategies.

The economic benefits of demand response can be significant. For example, on the PJM grid in the mid-Atlantic, customers collectively saved $11.8 billion in one year alone through demand response.[6] In its Distributed Energy Resource Roadmap, the New York Independent System Operator stated it "believes that providing resources with the flexibility to meet wholesale and distribution system needs will deliver the maximum benefit to New York electricity

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4 Available at http://www.ercot.com/content/wcm/key_documents_lists/214207/Stakeholders_Comments_Received_08032021_on_Proposed_Ancillary_Service_Changes.docx.

5 Jeff Billow, Operational Reserves Update, Technical Advisory Committee, July 28, 2021 (available at http://www.ercot.com/content/wcm/key_documents_lists/214207/Stakeholders_Comments_Received_08032021_on_Proposed_Ancillary_Service_Changes.docx).

6 Link to PJM Market Monitor report can be found here: https://aem-alliance.org/aema-reacts-strongly-market-monitor-report/.

consumers."[7] Baltimore Gas and Electric's SmartEnergy Rewards program, in which Maryland customers lowered their energy usage in response to signals from the utility, is estimated to have avoided $93 million in transmission capital expenditures and $72 million in distribution capital expenditures—savings that are then passed along to the customers.[8]

Distributed Energy Resources as a whole can contribute to a more secure, reliable, and affordable grid. DERs, such as demand response, rooftop solar, energy efficiency, energy storage (and soon to include electric vehicles) can bolster grid reliability and resilience while lowering energy bills for Texans. Given generation issues during Winter Storm Uri, a portfolio of diverse options should be considered to protect consumers in Texas. A survey of customers of all sizes and types released by AEMA found that consumer expectations of resilience are shifting; that distributed energy supply options are expanding and becoming increasingly economic; and that holistic customer solutions can bring essential support to the resilience of the electric grid.[9] As far back as Hurricane Sandy, microgrids in New York and New Jersey enabled university campus facilities to continue operation in the face of massive power outages.[10] When hurricanes hit Texas, Florida and North Carolina, distributed solar and demand response were able to stabilize the grid and prevent surges when power was restored. During heat waves in California, hundreds of energy storage facilities at office buildings in San Francisco were called to operate collectively as a "virtual power plant," reducing demand on an over-taxed grid. During the solar eclipse in 2017, over 750,000 smart thermostats were lowered by their consumers to reduce demand by 700 MW

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7 "DER Energy Market Design: Dual Participation". New York Independent System Operator, Feb 2018, 2019. https://www.nyiso.com/documents/20142/5256593/DER%20Energy%20Market%20Design%20Dual%20Participation%20022819.pdf/cfaf3647-4b77-a706-b86d-24129d460ecf.

8 Report on this program can be found here: https://www.utilitydive.com/news/behavioral-demand-response-gives-baltimore-gas-and-electric-a-business-reas/546895/.

9 AEMA paper on resilience: https://aem-alliance.org/aema-releases-whitepaper-on-consumer-resilience/.

10 Article on Princeton's microgrid can be found here: https://www.princeton.edu/news/2014/10/23/two-years-after-hurricane-sandy-recognition-princetons-microgrid-still-surges.

as solar systems across the U.S. were displaced in the temporary darkness.[11] Those thermostats alone provided as much grid service as seven gas peaker plants, often the most inefficient and pollution emitting resources.

Clearly, demand response and DERs have proven to be key components to support reliable grid operations. The Commission should be sure to include these resources as key elements of any modifications to the ERCOT market structure.

Comments

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.

Please see responses to questions 4 and 5 below. As discussed below, the Commission should ensure that any new ancillary service products or reliability services that are created as a result of the Commission's review of the ERCOT market design include the opportunity for aggregator provided demand response and DERs to be eligible to provide the services.

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

No. Available residential demand response is not adequately captured by existing REP programs. Today the majority of residential demand response, outside of NOIE territories, is captured by aggregators in TDU programs and ERS weather sensitive load. AEMA estimates that less than 10% of the residential thermostat load shed potential participates in load management programs today. The primary barrier to enhancing residential load response is the lack of sufficient compensation for demand response resources for the value they deliver to the market. To enhance

[11] See description of program here: https://awards.ixda.org/entry/2019/nest-solar-eclipse-rush-hour/.

residential load response capabilities and enroll more customers in demand programs, we encourage the Commission to take the following actions:

- **Set a goal of developing emergency- price- and reliability- responsive demand response programs that can cut at least 10% of system summer peak load and winter peak load; and**

- **The Commission should significantly increase ERCOT's annual budget for ERS procurement to be more than the current limit of $50 million and should further incentivize the TDUs to grow their demand response portfolios. This would enhance demand response opportunities across all customer classes.**

The goal of increasing residential customer participation in demand response can be met by expanding the budgets of existing programs, which would enhance the value of ERS, and increasing the bonus potential of kW reductions for TDUs. AEMA also recommends building out new programs including launching a day-ahead non-spin ancillary service product that residential load can participate in.

Established thermostat demand response programs, such as Austin Energy's Power Partner program or CPS Energy's Wi-Fi Thermostat Rewards program, have the ability to shift ~1kw per thermostat during peak times. This action can be triggered remotely by a REP, TDU, or aggregator, and does not require direct customer action. Often the adjustment occurs in the background, and the customer does not even notice the thermostat change. Programs typically precool customer's homes making sure to prioritize comfort. Customers also have the flexibility to modify the temperature, if need be, thus opting them out of an event, and can also often opt-out of participation in the program. For example, Google Nest and ecobee have customized control algorithms that prioritize comfort and always provide customer's control over their own device.

NOIEs, REPs, TDUs, and ERS WSL have supported smart thermostat growth by creating programs that market and incentivize their adoption. Based on industry estimates, over a million

homes in Texas have a smart thermostat installed today.[12] If all deployed smart thermostats in Texas were enrolled in demand response programs, they could collectively provide 1 GW or more of summer load shed right now. But there are over 8.5 million Texas homes with central heating and/or cooling systems – the exact systems where installing a thermostat could enable meaningful load reductions.[13] At scale, fully deploying smart thermostats in Texas could equate to up to 8.5 GW of controllable load on the grid. Unfortunately, AEMA estimates that less than 10% of Texas homes with thermostats are enrolled in demand response programs.

The lag in program enrollment can be attributed to a number of factors, primarily due to participants and providers not being sufficiently compensated for the value they deliver, or due to the low economic value of the resource today outside of NOIE territories. For instance, Austin Energy is currently offering customers a $130 incentive to join their Power Partners demand response program plus a $25 EE rebate. The avoided cost for Texas is $80 based on the "Avoided Cost of Capacity and Energy for the 2021 Program Year" published by the PUCT[14]. However, for comparison, the ERS auction is netting aggregators of weather sensitive loads about $13.58[15] per kW this summer. How could the same resource, in the same state, have such a stark difference in value?

Based on the enrollment rates of utility thermostat demand response programs across the country, where the utility provides greater than a $50 enrollment incentive, it is entirely within reason that Texas could enroll 20% of the total installed base of thermostats into a demand response

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12 Based on Park Associates estimates of 13% smart thermostat penetration in January 2018: *See* http://www.parksassociates.com/blog/article/pr-06142017#:~:text=New%20Parks%20Associates%20research%20shows,by%20the%20end%20of%202017

13 American Housing Survey, 2017 Texas Data https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=00048&s_year=2017&s_tablename=TABLE3&s_bygroup1=3&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1.

14 11/04/2020. Avoided Cost of Capacity and Energy for the 2021 Program Year. Project No. 38578 - Energy Efficiency Implementation Project under 16 TAC § 25.181(q).

15 ERCOT ERS summer auction results.

program today, which would equate to an additional 100 MW of residential demand capacity coming online over the next year. This could be increased even more by expanding the installed base of the thermostats, which grows organically 11-13% YoY.[16]

While the question presented and the discussion above focus on increasing residential demand response, the opportunity to expand demand response participation by commercial customers also provides significant opportunities to support more reliable operations of the ERCOT grid and should not be left out of the discussion. AEMA members currently provide significant MW of load curtailment in ERS and LR, but limited budgets challenge the ability of these resources to provide grid resiliency. As noted below, these resources can also be used more actively to provide integration resources under properly structured flexibility services offering.

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?

The Commission has the authority and should significantly increase ERCOT's annual budget for ERS procurement to be more than the current limit of $50 million. As the aftermath of Winter Storm Uri has demonstrated, the economic impact of grid outages is enormous and makes the investment in additional insurance to help avoid the need for involuntary forced outages pale in comparison. ERCOT should be given the financial flexibility to increase this critical line of defense. In 2019, ERS deployment enabled ERCOT to avoid going beyond Energy Emergency Alert Level 1 (EEA1).[17] ERS also enabled ERCOT to avoid the need for involuntary forced

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[16] S&P Global. https://www.spglobal.com/marketintelligence/en/news-insights/blog/smart-thermostats-gain-traction-in-us-point-to-modest-electricity-savings.

[17] *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, 2091 (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).

outages during the Polar Vortex event in 2014.[18] 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.

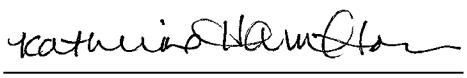
6. How can the current market design be altered (e.g., by implementing new products) to provide tools to improve the ability to manage inertia, voltage support, or frequency?

While this would not be a quick fix capable of being implemented by the end of the year, while Texas examines market structures and how to enhance reliability, a key component will be engaging loads – and any behind the meter DERs they possess, to help provide reliability and grid resiliency. The Commission should consider what market services that loads/DERs can provide. These resources could help provide new ancillary services or energy market services such as ramping, load following, and other key services traditionally provided solely by the fossil generation fleets. This would allow very localized grid support as well as system wide solutions.

Conclusion

AEMA 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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[18] *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).