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

DER TASK FORCE COMMENTS ON COMMISSION QUESTIONS ON WHOLESALE MARKET DESIGN

The DER Task Force (DERTF)

The DER Task Force ("DER Task Force" or "DERTF") is a community dedicated to unlocking the immense promise of distributed energy resources in the electric power system. Unlike most industry groups, DERTF is not sponsored or influenced by companies in this sector – all participation is from individual volunteers who are highly informed and enthusiastic about distributed energy resources. Since the founding of DERTF in 2020, membership has grown rapidly, with approximately 1500 individuals active in the DER industry, including project developers, engineers, analysts, community organizers, utility employees, policy experts, academics, and investors from some of the most forward-thinking grid edge organizations in the country.[1] The following principles serve as the foundation the DERTF believes is needed to increase the penetration of DERs on the grid and ensure they are utilized effectively and fairly:

- *Customer's Right to DER Ownership*. Customers should have the right to build assets and sell power in any quantity that can be safely exported into the grid.
- *Customer's Right to Market Participation & Compensation*. DERs should have the right to be compensated for assets behind or in front of the meter. Customers should be allowed to sell operational control to utilities, or choose instead to participate in alternative mechanisms, including the real-time wholesale market.
- *Customer's Right to Interconnection*. Third parties should have the right to interconnect into the grid or build non-utility owned distribution infrastructure.

Executive Summary

The DERTF welcomes the Commission's review of the Texas wholesale electric market design. It believes that an effective and efficient Texas electricity market -- one that avoids a repeat of the February 2021 disaster but does not create excessive administrative burden -- is possible. Updating the market design to meet these new challenges will spur market competition and new products and maintain Texas' international reputation for an innovative electric market. The DERTF also believes that the current market has many of the required pieces already in place, but to properly address the root causes behind extreme weather price spikes, the PUCT and ERCOT must take action to increase demand response liquidity and compensation. The DER Task Force implores

[1] DERTF also hosts a podcast that is available on your favorite podcast app.

the Commission to recognize the tightly linked interplay of the ORDC, VOLL, and participation rates in demand response.

Recommendation #1: Revise the Current VOLL Standard. One of the biggest barriers to demand response liquidity is an offer price cap that is too low, as it makes it uneconomical for much of the load with a Value of Lost Load (VOLL) above $9,000/MWh to participate. Removing the cap or raising it substantially will allow customers to voluntarily curtail load economically so the state will not have to do it for them. Said another way, if the demand response market was functioning and incentivized properly, there would not be involuntary rolling outages because enough load would curtail if exposed to proper price signals. This shift should be a gradual process to enable the retail market to prepare for more price risk. *To start, the Commission should launch a study into what the actual Value of Lost Load during the outages in February 2021 was in order to understand in more depth the variety of VOLLs in the market for different customer segments.*

Recommendation #2: Push Retail Electric Providers (REPs) to Offer More Integrated Demand Response Products to Customers. Under the current market structure, REPs can offer more innovative products that leverage Demand Response more effectively, and many are starting to. Being careful to build in consumer protection measures, adjustments to the cap would incentivize REPs to offer price-responsive demand response products to all customer classes, including aggregated residential, which will significantly build the grid's resiliency and responsiveness to stress events. *The Commission should engage with and listen to suggestions from the emerging energy-as-a-service sector, which is working to combine Demand Response into REP offerings.*[2]

Recommendation #3: Increase Market Participation Incentives for DER. Distributed energy resources can play an increased role in the grid's ancillary services market, including black start. *As an administratively-created program, ERCOT's current Emergency Response Service (ERS) could be a platform for the Commission to explore these market design changes, without adding significant regulatory burdens.*

WHOLESALE ELECTRIC MARKET DESIGN REVIEW RESPONSES

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?

The primary change that ERCOT could make to its energy market to access additional capacity when there is scarcity in the market is an adjustment to the calculation of the ORDC price cap. The ORDC price cap of $9,000/MWh was derived from a study that misprices the Value of Lost

[2] Companies like Leap, David Energy, Ohm Connect, Octopus Energy, Branch Energy, to name a few.

Load (VOLL), which prevents load from reacting to the market signal that would incent load reduction during these events.[3] In 2013, ERCOT commissioned a study that tried to value lost load to customers. The values ranged from $1,500 for residential customers to over $30,000 for certain industrial customers. The PUCT then set the offer cap to $9,000, administratively forcing the value of lost load to ALL market participants. What this does is make demand response uneconomical for a large portion of customers—whose VOLL is above $9,000—even if they were exposed to the wholesale price signals. Unless this underlying process is addressed, Texans are faced with a bad choice: overbuilding capacity (as capacity or IRP markets in the Northeast or California tend to do), or an "efficient" market that will break down in tail events and cause future blackouts.

Value of Lost Load (VOLL) Revisions are Required. [4] VOLL is an attempt to put a price on the value to customers of losing power and was created to help determine how high energy prices should go before they're capped, or the marginal strike price that they would bid their load reduction into the market, in the same way a power plant would bid their marginal cost to produce. From a customer perspective, VOLL is the opportunity cost of not consuming power for a particular purpose; customers will have different VOLLs for different activities. But the wide variety of VOLLs within the Texas economy make it difficult for a regulator to ascertain. The best way to discover VOLL would be for the private market to provide demand response products to Texas consumers. The current market, however, does not offer enough market-based options to allow for customer price discovery and demand response liquidity. This lack of voluntary demand response leads inevitably to involuntary load shedding – and will continue to do so in the future without reform, or at the very least, an update to the current VOLL methodology.

Recalculating VOLL through Demand Response. In most normal commodity markets, customers are exposed to end prices, and demand is elastic. By contrast, the electricity market faces both natural constraints on supply and societal inelasticity of demand. In the Texas market, this imbalance is exacerbated by inefficient market signals and driven by a lack of price exposure of customers to their Value of Lost Load. With proper price signaling, the odds of blackouts during extreme events (like Winter Storm Uri) would likely have been reduced – even with the 30GW loss of the thermal fleet. Prices would have soared well beyond $9,000/MWh, but the most valuable load would be discovered, instead of being administratively forced, and the grid could have reserved additional energy for those with a higher value of lost load. Hospitals and other critical loads that cannot curtail could hedge through a REP for a fixed price, which would allow REPs to discover VOLL within their own books and manage risk accordingly, reducing overall risk to the market.

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[3] London Economics. Estimating the Value of Lost Load. June 17, 2013. http://www.ercot.com/content/gridinfo/resource/2015/mktanalysis/ERCOT_ValueofLostLoad_LiteratureReviewandMacroeconomic.pdf

[4] VOLL is also the name of the cap to the ORDC and the offer price cap. SCED, ORDC and other mechanisms determine real-time energy prices that customers with their own VOLLs can respond to.

VOLL & Value of Grid Resiliency. Lastly, VOLL is crucial for determining the value of resilience. The market is currently under-valuing some customers' VOLL, which disincentivizes the deployment of demand response, battery storage and backup generators, assets that are critical for building in resilience in a market that doesn't "guarantee" a reserve margin. Even in a market where supply shortages never occur, natural disasters will still threaten transmission and distribution systems and individual customers.[5] Proper price discovery for VOLL is the only way to incentivize onsite resilience and wholesale reliability concurrently: if ERCOT wants to procure load reduction efficiently, then the PUCT must substantially raise the offer cap under certain conditions to allow price discovery of marginal load reduction. Correspondingly, however, ERCOT must help increase "liquidity" for demand response participants in the market, so that customers have a mechanism to react to these high prices; increased prices won't help unless the market builds a mechanism for load to react to it. Luckily, this is now possible via DERs like smart thermostats, battery storage, electric vehicles chargers, and backup generators. In short, the PUC must create incentives for retailers to create DR and DER products prior to raising or removing the market offer price cap under certain circumstances. Until the PUC addresses the underlying issue of demand participation, a structural short squeeze for retailers will continue to play out, and blow ups will continue to occur.

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?

Requiring Minimum Commitments Would Reduce Overall Grid Reliability. Because requiring participation in the Day Ahead Market (DAM) would increase costs unnecessarily and potentially reduce new investment, the DERTF does not support requiring all generation resources to offer a minimum commitment. A minimum day-ahead commitment *would* be useful in market situations where (a) insufficient knowledge of asset availability leads to system instability through inaccurate scheduling, or (b) firm knowledge of asset unavailability would allow ERCOT to incent other assets to make themselves available. Neither situation exists in ERCOT. Rather, mandating a DAM requirement would devalue assets that find it difficult to make a minimum day ahead commitment. Creating an additional devaluation factor for these resources will further discourage investment at a time when new generation financing must be encouraged.

Market Participation of Flexible Load. DERTF supports enabling load flexibility to participate fully in the market, including all ancillary services market products available to bulk system resources, or, in the alternative, allowing load flexibility to reserve its market participation for emergency conditions. Given the value that load reduction is typically providing to its consumers is usually higher than the value the market will pay on a given day, it makes economic sense to

[5] https://www.houstonpublicmedia.org/articles/news/energy-environment/2021/07/14/403191/texas-winter-storm-death-toll-goes-up-to-210-including-43-deaths-in-harris-county/

allow load flexibility the option of limiting its market participation to instances when it is needed. This is an acceptable compromise and is economically beneficial option for Texas ratepayers.

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.

Real-time Co-Optimization. The PUC should accelerate real-time co-optimization and DER provision of ancillary services directly or through aggregations. This will make it easier for customers to provide their own ancillary services through DERs and sell them back to retail electric providers, which will significantly reduce the possibility of another short squeeze evident in the February 2021 winter storm.

DER Black Start. The grid was moments away from facing a black start scenario because of Winter Storm Uri. DERs and microgrids can play important black start roles and are able to island critical portions of the electric grid during system restoration. Battery storage systems, for example, can be used to kickstart generators (which in turn can power larger generation like hydroelectric facilities or natural gas turbines). While incorporating distributed energy resources into a black start program will require specific engineering and advanced planning, the enormous aggregate VOLL cost during a grid total-black out (sum of customer values of lost load across all customers is equal to the economic production and societal benefits for the entire economy of Texas within the ERCOT region) justifies particular attention to black start to minimize the return to service costs to the Texas economy.

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

Residential Markets Are Underutilized Source of Grid Reliability. The DERTF recognizes that residential customers require additional consumer protections, and that their size makes it difficult to participate in markets on a stand-alone basis. Accordingly, the DERTF supports Project 51830, given that the average residential consumer cannot be expected to understand the tail risk associated with a fully indexed product, which can include unacceptable financial risk in the event of a high-priced event. But it would be a mistake to exclude or limit opportunities for residential customers to participate more fully in markets, given their aggregate potential to affect total grid load, particularly on very hot and cold days.[6]

[6] HB 3362 and similar legislation have also recognized the importance and potential value of increasing residential participation in demand response, but it should be noted that the Commission has the authority to implement HB 3362's concept on its own using the same authority it used when it created Emergency Response Service.

Retail Electric Providers Can Help Residential Customers Participate in Demand Response. To properly incentivize customers to reduce consumption during peak demand or emergencies, the ERCOT retail market must create demand response payments that accurately reflect a customer's VOLL. This is currently not the case, in part because the VOLL cap itself does not accurately reflect customer value. But if retailers are not managing customer load in response to high prices via their book, then the customer has no access to the market. With a more robust residential demand response market, REPs could offer payments to customers when they respond, so that even with a fixed price product, the customer is incentivized to respond while simultaneously being protected from ruin. As demand response is a physical long that smaller retailers can employ to stay competitive while managing load, our proposal will demand more innovation and participation from REPs (see *DERTF Question 5* for specific recommendations).[7]

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?

Existing ERS Program as Tool to Improve Overall Grid Reliability. ERCOT's existing Emergency Response Service (ERS) program can be used to implement several changes to increase grid reliability without adding undue administrative burden or additional regulation. ERS was created after the devastating December 2006 winter storm, where enough industrial customers opted not to curtail load – despite the benefits to the grid – because their VOLL was above the offer cap. In response, the PUCT created a revenue stream to pay customers to be ready to turn off when directed by ERCOT. Since ERS was designed prior to the Commission's first attempt to integrate VOLL into the energy price after the two extreme weather periods in 2011, the ERS program is ripe to be updated. And given that ERS was created entirely by Commission rules through the authority granted to the PUC in PURA, it is fully within the purview of PUCT to open a rulemaking for modifying the ERS program to respond to VOLL price-discovery.

Use ERS to Modify or Eliminate VOLL Cap. ERS should be modified to increase the budget cap substantially or, more appropriately, to eliminate it entirely, choosing instead to procure ERS in a manner more consistent with ERCOT market principles.[8] In the energy market, generators bid their capacity based on their marginal costs, and increasing energy prices incentivize new-build generation. In ERS, under the budget cap, new entrants necessarily drive the clearing price down regardless of system need or value to the market, decreasing the value to participants, and reducing uptake by reliable resources that have an opportunity cost higher than almost nothing. Properly valued ERS payments could incentivize customers to install equipment on their own and then respond to prices, or pay them when curtailment occurs based on the difference between their

[7] The DERTF does not suggest removing the offer cap until it could be clearly demonstrated that enough REPs were offering viable demand response programs to customers.

[8] All of these comments apply to commercial and industrial customers as well as residential customers. The root cause – a low offer cap – is the same regardless of customer class.

VOLL and the energy price plus a small standby payment to be ready to deploy. Regardless, the ERS should be updated from its dated-2006 policies to reflect VOLL in some way.

Use ERS to Implement Price-Responsive Load Based VOLL-Curve. ERS could create a VOLL-curve based on price-responsive loads. Effectively, load would bid in their VOLL much in the same way generators bid in their marginal cost to generate. It would function as a stack of strike prices at which ERCOT can call on for Demand Response in times of supply scarcity, adding more capacity to the reserve margin. To keep this consistent with the market as designed, this VOLL curve could function as a price adder to supplement ORDC. When customers are curtailed, Security Constrained Economic Dispatch (SCED) would ensure that the price reflects the determined VOLL adder for that level of load curtailment, and ERCOT could deploy ERS in a way that was included into SCED. This would allow the value of lost load to be reflected in energy prices and provide investment signals to all market participants, not just ERS providers. These adders, if necessary, should be capable of increasing the price above $9,000 if ERCOT deploys loads with a sufficiently high VOLL. This would have the dual benefit of providing an efficient market signal to customers who are able to reduce load in scarcity conditions while providing ERCOT visibility into the amount of load reduction it can expect at different price levels. If customers offered in above the offer cap, it would demonstrate that a unilateral VOLL of $9,000/MWh must be revised. Ironically, it may lead to lower aggregate prices, as a more robust ERS signal would avoid scarcity events.

Use ERS to Implement Demand Response Portfolio Standard. Using its existing authority, the Commission could additionally or alternatively require REPs to have a demand response portfolio standard as an interim step to raising or eliminating the market price cap, prompting REPs to perform the innovation that would be naturally created from higher offer caps. This mandate could be subsidized by the ERS program modifications discussed here, letting the forces of competition determine the least cost method to have substantial demand response in ERCOT and could be a triggering mechanism for increasing the price cap in ERCOT.

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?

Increasing Inclusion of DER & DER Aggregation. Many kinds of DERs can provide services like voltage and frequency support. To the extent the PUC expands these services or related incentives, it should ensure a) such services are technology neutral and b) DER and DER aggregations are eligible to participate.

Respectfully Submitted,

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