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REVIEW OF MARKET REFORM	§	BEFORE THE
ASSESSMENT PRODUCED BY	§	PUBLIC UTILITY COMMISSION
ENERGY AND ENVIRONMENTAL	§	OF TEXAS
ECONOMICS, INC. (E3)		

COMMENTS OF CHRIS DUNBAR

Executive Summary

I file these comments in response to PUCTs questions for comment filed November 10th 2022. I have been involved professionally in the ERCOT market place for over 10 years and file these comments independently based on my knowledge to ensure that any market redesign ensures consumers have a right to provide their own reliability to the grid and in doing so help keep the power on for all Texans during times of grid stress.

- There has been much talk of a need for “steel in the ground”. Since winter storm Uri many GWs of thermal dispatchable generation have in fact been installed. It is just behind the meter backup generators (e.g. Generac) at Texans homes and businesses rather than traditional transmission level generation.
- We must ensure a mechanism exists that incentivizes all consumers with backup generation to bring it online during times of grid stress. This mechanism must and can be built into any market reform so such customers can “self provide” their reliability requirement by switching on their backup generation, and in doing so avoid all additional charges that would otherwise be imposed on them by PCM, LSEO or any other mechanism.
- Various solutions are discussed that involve using smart meter data, and smart meter controls to automate and analyse “performance” of backup generation during the high risk hours of an event.
- During winter storm Uri there were many Texans who could have gone “off grid” to make more grid power available to others in need. Many customers with backup generators did not use their generators as their homes never lost power. We must ensure there is a mechanism to voluntarily take your load off the grid during times of stress and it is only appropriate you are rewarded for doing so. It would be a tragedy if these resources are sitting idle during the next winter storm while people are dying.

Introduction

I am an energy market professional who has been involved in both retail and wholesale markets across the US and Europe for over 15 years. For the last 10 years I have focused on the Ercot market working for REPs of all sizes in a variety of roles across wholesale and retail operations.

Reframing The Problem

Much has been made of the need to get “new steel in the ground¹” by Chairman Lake and the wider industry. I agree with this assessment, if you do the simple math and assume a peak load of 77GW² (the estimate of load that would have been served during Uri), very low renewable output (0.5GW), and a reasonable assessment of available thermal generation 69.7GW³, then 6.8GW of load would go unserved with a well functioning generation fleet... If outages turn out to be higher then the shortfall will be even higher. Unfortunately the E3 report “does not include the extreme cold weather event caused by Winter Storm Uri... Such analysis is beyond the scope of this study⁴”. We have to recognize what our problem is before we can solve it. It appears the E3 analysis is not focused on the extreme event outlined above which is the problem and I find it highly concerning that important decisions will likely be made based on a report that doesn’t even focus on the problem at hand. We must recognize that 99.9% of the time our current market framework is delivering low cost and reliable power to the people of Texas. Our risk is a “1 in 10 year”⁵ event (the other 0.01%) that could last up to a week, and as shown above we do not have the supply resources to meet demand. I would highly encourage the PUCT to have analysis performed on expected reliability for each redesign proposal for the extreme weather event. Will they ensure the lights stay on? That is the key question that Texans want to know.

Rethinking “Steel In The Ground”

There is much concern that our current market structure is not incentivizing more thermal generation to be built, and that a market redesign that provides a more stable revenue flow rather than the “boom and bust” of the energy only scarcity pricing we currently have is needed to do so. In fact members of the Texas Senate are even concerned the proposed changes with the PCM will not lead to more generation being built⁶. I am sure it would

¹ Chairman Lake – Fox 26 “<https://www.fox26houston.com/news/chairman-of-texas-public-utility-commission-pledges-power-grid-can-withstand-upcoming-winter>”

² Ercot Winter Storm Review – “https://www.ercot.com/files/docs/2021/03/03/Texas_Legislature_Hearings_2-25-2021.pdf”

³ Ercot Winter 2022-2023 SARA – adding “expected capacity” for thermal, PUN, Hydro

⁴ E3 Report Article – “<https://www.power-eng.com/news/texas-grid-regulators-spent-600k-on-a-market-redesign-study-that-doesnt-consider-extreme-weather/>”

⁵ For sake of argument we had a winter event in 2011 and 2021 so a 1 in 10 year event timeline seems reasonable

⁶ Texas Senate Open Letter - <https://www.dallasnews.com/news/politics/2022/12/02/disarraytexas-senators-might-halt-ercot-power-grid-redesign/>

come as a surprise to most involved if I told you since Winter Storm Uri we have actually built a significant amount of new generation. The people of Texas don't wait for the government to solve their problems, they solve it themselves. As a result of the storm, many Texans have installed backup generators at their homes. These generators automatically switch on when grid power fails, and can enable a residence or business to meet their power needs for days if utility power fails. Generator installation companies haven't been able to keep up with demand since the storm with customers waiting for months for their install⁷. These are resources that represent "steel in the ground" and can be dispatched when required. They also fit the problem perfectly they are dispatchable and are designed to run for the few hours (0.01%) where extreme weather risk exists to take load off a stressed grid. Unfortunately unless the consumer loses grid power these resources will likely sit idle during the next extreme weather event. The Commission currently has an opportunity to ensure such resources are built into the market redesign, and customers are giving an opportunity to self provide their reliability requirement.

Backup Generator Capacity

Do we have enough backup generators installed in Texas to take a significant amount of load off the grid? I do not have hard data on this, and I would encourage the Commission and Ercot to use their resources to find out. I have however performed a calculation on data I have been able to find. According to Generac "5 percent of the nation's homes have installed generators"⁸. It could be argued Texas is likely to have a higher install percentage since the events of winter storm Uri and the hurricane risk faced by our Gulf Coast communities. If we take 6 million residential meters across Ercot (likely a low estimate), then that means if 5% of homes have a backup generator we can expect 300,000 homes with backup generation capacity. On average a home with a generator will likely be larger than average. This article states that for homes that requested permits in the Austin area, "the average home size in this group is about 3,700 square feet. Half of these homes were 3,000 or more square feet; 71 percent were more than 2,500 square feet."⁹. I will assume an average load of 7.5kW per household. 300,000 consumers off grid at 7.5kW reduces

⁷ Article on generator installs in Austin area – "<https://www.kxan.com/investigations/austin-home-generator-sales-skyrocket-installations-backlogged-after-winter-storm/>"

⁸ Chronicle Article On Generators –

"<https://www.houstonchronicle.com/business/energy/article/Homeowners-find-power-peace-of-mind-in-generators-15815344.php>"

⁹ "<https://theaustinbulldog.org/backup-plan-part-1-unreliable-electric-system-creates-rush-to-backup-generators/>"

grid demand by 2.25GW. That is a massive potential equal to almost 2 nuclear power plants of capacity, and about one third of the total capacity needed (6.7GW) based on the calculation at the beginning of this response.

Using Smart Meters To Integrate Backup Generators Into Market Redesign

One of the challenges with backup generators is there is very limited visibility into their operation (they are behind the meter). How do we know if they are operating and the customer is off grid and “performing” (as is required by the PCM)? It has often been argued that the capability of smart meters has never been fully utilized¹⁰. However a backup generator program allows us to unleash the promise of smart meters in multiple ways:

i) Smart Meter Data Used To Verify Performance

In a very simple setup, customers would voluntarily opt-in to a generator program whereby when an event is called they are required to go off grid and run their backup generator. During this time if they perform and go off grid then their smart meter will record zero usage. If zero usage is recorded then they are adjudged to have performed on their commitment take their load off the grid. Obviously there wont be extreme events regularly so performance will need to be tested. Test events can be organised during which the consumer must also reduce their usage to zero to perform on their obligation. This is very similar to the way demand response programs run by the TDSPs currently work to judge performance¹¹.

ii) Smart Meter – “Disconnect For Reliability”

In a more advanced automated setup customers could voluntarily opt-in to a backup generator program whereby a disconnect request is sent to their smart meter. We currently send disconnect signals for non payment, move out etc. through the EDI process. We could create a new “disconnect for reliability” EDI transaction that would disconnect the customer for an emergency event where they would self supply using their backup generation. This would have the advantage of ensuring that the customer performs. For many consumers their generators will automatically sense that grid power has been lost and start up and restore power within 5-10 seconds. There is little inconvenience to the

¹⁰ Smart Meter Not Delivering Promised Benefits – “<https://www.utilitydive.com/news/97-of-smart-meters-fail-to-provide-promised-customer-benefits-can-3b-in/632662/>”

¹¹ Centerpoint Demand Response Standard Offer Program – “<https://cnprlm.programprocessing.com/>”

consumer but massive potential benefits to the grid at scale. I understand that the smart meter network was not designed to work like this, and that the question of whether rotating outages could be managed better using smart meters rather than via distribution level switching via SCADA has already been asked, and the response was that it is not possible. However, even if that would be an effort of switching 6+ million meters every 30 minutes or so, this would be an order of magnitude less with up to 300,000 meters switched once at the start and end of the event. I would like to point out smart meters were in fact used for rotating outages during Uri albeit on a small scale¹². I would challenge the TDSPs to think about changes and improvements that could be made to the smart meter network to add such a capability and explain if it is not technically possible why that is so. This capability is certainly something that should be thought about for the roll out of 2nd generation smart meters although that is clearly much further into the future.

Compensation For Providing Reliability Services Through Backup Generators

One of the key principles that comes up time and again during discussions around market redesign is that any solution should be technology agnostic. I wholeheartedly agree with this principle. As a result it is critical that consumers are afforded the opportunity to “self provide” their reliability requirement rather than simply having the additional costs of reliability imposed on them. Below I describe how a backup generator program could be built into both the PCM, DEC, BRS, and the LSERO frameworks as proposed.

i) Performance Credit Mechanism (PCM) Integration

One could argue that the incentive is “inbuilt” into the PCM. There is nothing stopping a REP offering a program whereby an incentive is offered to a customer to turn on their backup generation during the peak hours and thus they are able to reduce their PCM obligation and can compensate their customer for doing so. However the problem with this is that there is no way to assess a backup generator’s “availability”. They are behind the meter and not continuously in communication with Ercot to provide their status like a transmission level resource. It is not reasonable to expect a backup generator to run to “prove” they are available either. As the mechanism is retrospective they would also have to “guess” which hours to run. To keep implementation simple, I suggest that any consumer who is adjudged to have performed through any tests and events (via their smart meter data) as outlined above is then awarded a performance

¹² City Of Farmersville Smart Meter Load Shed – “<https://www.tantalus.com/2021/07/08/texas-freeze-load-shed-lessons-for-summer-heatwaves/>”

credit equal to their “assumed load” (an estimate of what they would consume if they were consuming grid power). The assumed load could be based on their actual usage history or in a simpler implementation based on an average customer (e.g. taking the settled load profile for their customer type). If an event occurs their “assumed load” would be added to their REPs actual load in assessing their PCM requirement to avoid double counting the benefit.

ii) Load Serving Entity Reliability Obligation (LSERO) Integration

Although the LSERO seems to have fallen back in the order of preference as it is a forward looking mechanism it makes it much easier to implement alongside a backup generator program. Any consumer with a generator who is adjudged to have performed with their backup generation should be assigned an LSERO of zero since their load was zero at the times of maximum grid stress. This is far easier to implement versus the PCM.

iii) Dispatchable Energy Credit (DEC) Integration

Integration into the DEC mechanism would be fairly simple as well. The customer would receive DEC credit equal to their “assumed load” once judged to have performed. As with the PCM this could either be based on usage history or simply using an average value such as a load profile.

iv) Backstop Reliability Service (BRS) Integration

Integration into the BRS would be similar to the DEC / LSEO. Backup generators that are judged to have performed would exempt the consumer from being assigned a BCM obligation as they are providing their own backstop reliability through their generator.

The economics of backup generators

Backup generators are being installed for numerous reasons. Clearly a lack of confidence in the grids ability to provide reliable power during winter storm Uri is top of that list. However, the reality is that power can be lost due to transmission and distribution equipment failure, and also damage from natural disasters such as wind and flood damage from hurricanes, consumers want to ensure they have power during such events. Many consumers faced significant damage to their homes such as burst pipes and they decided to buy their own insurance through a backup generator against such an event happening again. Consumers are making decisions to invest in backup generation without any compensation for the potential grid reliability benefits they can bring. So could backup generators

generate a true economic return through revenue streams through a backup generation program incentive? Taking the system cost summary table from the E3 report¹³, a quick estimate can be made using the E3 analysis. If we assume that a consumer with backup generation is considered to have provided their own reliability and is exempt from any reliability costs with LSERO or PCM, the cost for PCM or LSERO & FRM is \$5.67Bn, then using estimated yearly consumption on the Ercot System of 382million MWh¹⁴, that implies a rate benefit of \$5.67Bn / 382m MWh or \$14.84 /MWh (1.484 ¢/kW). If we assume a customer with backup generation is slightly larger than usual with load of 20,000kWh / year, then the reliability savings by self providing through backup generation would be 20,000kWh @ 1.484 ¢/kW = \$297 / year. While this would be a long payback on a \$10,000 - \$13,000 whole home generator setup, for those running lower cost setups based on portable generators¹⁵ where the cost is less than \$2,000, this could lead to a payback in as little as 7 years. Alongside the additional benefits of having power under all scenarios should power delivery equipment fail, Texans may determine that with the additional revenue from the generator backup program the right decision for them and their family is to self provide their reliability through backup generation. In the name of free markets and fair competition Texans must be given this opportunity to provide their own reliability.

Conclusion

Backup generators provide the “steel in the ground” that the Commission and the legislator are searching for. They should be treated as equals alongside transmission level generation aligning with the Commissions own principle of being technology agnostic, and be integrated into any market reform in the same way as transmission level generation. They are resources that are already paid for and have the potential to provide GWs of capacity at scale. The Commission’s goal should be to create rules that allow all resources to compete to provide reliability. That should include home backup generators. Texas prides itself on free markets and open competition. We must give Texans the choice if they want to self procure their reliability, and in doing so we may find a better solution to our reliability problem that the rest of the country and indeed the world may end up looking to. We must set fair rules and let the market decide the right resources to deploy.

¹³ E3 - Assessment Of Market Reform Options to Enhance Reliability Of the ERCOT System (p.6)

¹⁴ Ercot Fact Sheet – “<https://www.ercot.com/files/docs/2021/11/23/ERCOT%20Fact%20Sheet.pdf>”

¹⁵ Houston Chronicle Portable Generators – “<https://www.houstonchronicle.com/business/article/Home-generator-demand-along-with-ingenuity-16244832.php>”