



White Paper: ERCOT in August 2019 – What Retail Should Be Doing for the Texas Grid

Abstract

Texas retailers predominately sell electricity on a fixed price basis. ERCOT dispatches generation to meet retail demand using price signals derived from its highly transparent markets. But most retail customers have no visibility into those price signals nor any financial incentive to reduce demand. This means in times of imbalance between generation and demand (as in August 2019), the Texas electricity supply chain approaches failure.

Any market will become dysfunctional if the demand side is denied visibility into the price of that demand.

Texas has invested heavily in smart meters so that the demand from all retail customers is known on a 15-minute basis. If ERCOT mobilize their own wholesale price signals and encourage retail customers to pay for usage in accordance with those price signals, then the demand side will match the generation side.

Further, if ERCOT uses its own ORDC price adder on the demand side (as it does on the generation side), then retail customers will balance the grid instantaneously and avoid a repeat of August 2019.

Introduction

Griddy launched in Texas in April 2017 as the first app-based electricity retailer to offer wholesale electricity to residential and small business consumers. This is a subscription-based platform that allows members to purchase electricity at the wholesale price with no markup and no early termination fees.



The app provides members with tools to see wholesale rates in real-time, receive communications on market events, and monitor daily usage and spend.

By encouraging its members to use less in times of peak demand, Griddy's platform delivers genuine demand response.

All of this is accomplished with the ***price signal***.

ERCOT is charged with the responsibility of providing an efficient marketplace that instantaneously balances generation and demand. As renewables increase on the grid, as coal-fired power stations are retired, and as usage increases in accordance with a growing population, reserve margins in Texas are constrained, especially in summer.

This is a characteristic common in electricity markets in other parts of the US, in Europe and in parts of Asia. While new hardware solutions like batteries, fast-start CCGTs, evermore peaker plants are potential solutions, the lowest cost solution is simple: price signals.

Small-scale users may seem insignificant, but they represent a large portion of total demand (>50%). With the proper incentive to respond – in this case, saving money – small-scale users should be a key participant in balancing the grid.

Responsiveness to a price signal is often called demand response (DR). But most DR programs are generally industrialized, clumsy and not very effective, as the events of August 2019 in Texas showed.

August 2019

ERCOT projected that the reserve margin going into summer 2019 would be 8.6%¹ – meaning that the projected Firm Peak Load on the ERCOT system would be 72,674MW, and total available generation was 78,929MW. ERCOT's desired reserve margin is 13.75%².

¹ <http://www.ercot.com/news/releases/show/181248>

² <http://www.ercot.com/gridinfo/resource>



In addition, ERCOT introduced in March 2019 an upgrade to the Operating Reserve Demand Curve (ORDC) which is a complex formula that applies a price adder to the wholesale market, calibrated to scarcity – in other words, when the reserve margin approaches 6,000 MW, an adder is included in the wholesale price which has the effect of taking the average wholesale price of \$30/MWh³ up to as much as \$9,000/MWh.

Historically, the maximum price of \$9,000/MWh has rarely been experienced. In the 20 years since ERCOT deregulated, the price had only reached \$9,000/MWh for a total of 10 minutes in the aggregate⁴.

The point of ORDC and the entire market design is to encourage the demand-side to react to high and extreme prices of the type seen in August 2019. At a recent Public Utility Commission of Texas workshop, Chairman DeAnn Walker stated that, “[w]hen you have the [maximum price of] \$9,000, it’s not only to incent [generators] to be on, but to incent [load] to come off.” However, the fact that the grid this summer came dangerously close to imbalance many times for such extended periods, points to a systemic failure of some sort.

In August, 44% of load was residential, and 39% of load was commercial (total 83%). ***Most of this load had no price signal, whilst 100% of generation received a perfect price signal.***

Emergency Protocol – Triggered in August 2019

Further to the point, ERCOT has a series of emergency procedures that may be used when operating reserves drop below specified levels. These procedures are designed to protect the reliability of the electric system as a whole and prevent an uncontrolled system-wide outage. Per ERCOT Protocols and NERC requirements, the grid operator is required to declare an Energy Emergency Alert (EEA) when operating reserves drop below 2,300 MW or system frequency cannot be

³ <https://www.nrg.com/insights/energy-education/what-texas-businesses-need-to-know-about-scarcity-pricing-this-s.html>

⁴ <https://www.icf.com/insights/energy/ercot-summer-forecast-scarcity>



maintained above certain levels and durations. There are three levels of EEA and at Level 1 ERCOT can call on available power reserves, mainly from generation resources. At EEA Level 2 when reserves are below 1,750 MW, ERCOT can shut off large industrial loads who have been paid to respond when called. At EEA Level 3, when reserves drop below 1,375 MW, ERCOT will order transmission companies to implement rotating outages⁵.

August 13th, 2019, ERCOT declared an EEA Level 1 at 3:10 PM and Operating Reserves dropped as low as 2,025 MW⁶. Although reserves did not suffer further deterioration, all retail consumers should understand just how close ERCOT came to ordering rotating outages...650 MWs. For context, there are 36 generation facilities in ERCOT with summer operating capacity greater than 650 MWs⁷. If any one of these facilities were to 'trip' offline during this time, ERCOT would have to immediately order outages. But while generators and industrial loads were on 'high alert' (and many compensated to do so), the majority of residential customers had no idea. And even if they were aware, would they have been incentivized to turn down their thermostats, considering the price they pay isn't affected during scarcity?

Retail Failure

Electricity retailers (known in Texas as retail electricity providers or REPs) predominately sell electricity on a fixed price basis, masking the true cost of electricity, especially in times of low reserve margin.

To illustrate, if a consumer has a fixed energy price of \$80/MWh (8c/kWh) from her REP, then she has no visibility when the grid is under extreme stress. And even if she did, she would have no incentive to do anything about it – why adjust the air conditioner when she pays 8c/kWh. It makes no difference to her if the

⁵ http://www.ercot.com/content/wcm/lists/164134/EEA_OnePager_FINAL.PDF

⁶ http://www.ercot.com/content/wcm/lists/172486/Review_of_ERCOT_Summer_2019_-_PUC_Workshop_-_FINAL_10-8-19.pdf

⁷ <http://www.ercot.com/content/wcm/lists/167022/SARA-FinalSummer2019.pdf>



wholesale price is 100 times the price she pays. Therefore, common-sense dictates that she will not voluntarily reduce load.

This is a retail failure.

REPs are responsible for educating and communicating with the consumer. Instead, by keeping the consumer blind to extreme stress on the grid, REPs fail the entire Texas electricity supply chain.

Price Signals

Griddy supplies electricity at the wholesale price, which adjusts (settles) in the market every 15 minutes. For most hours of the year (96.1%), Griddy's members are paying an energy-only price that is below the average fixed retail price of 5.8c/kWh (ranging <0c/kWh to 5.8c/kWh); in 3.3% of hours, prices are between 5.8c/kWh and 30c/kWh; and in the remaining 0.6% of hours prices are higher than 30c/kWh.

During high prices Griddy notifies its members of projected price rises and again when actual prices rise.

Members thus have visibility into the potential for higher supply cost and can reduce demand by pre-cooling the house, saving laundry for later, or going to the movies, all the while preserving the savings from all those low cost hours; plus assisting the grid to avoid dangerously low reserve margins.

During the summer 2019 price spikes, Griddy's price signals were able to consistently drive reductions in daily peak demand across the entire portfolio – as high as 20% in totality, but with many individual members able to reduce their peak consumption by 50-60%. Griddy projects that with additional tools and communication, its portfolio in summer 2020 should be able to reduce demand by 30-50% when the wholesale price rises above \$1,000/MWh.

Under this scenario, only about 5.5% of the Texas market needs to be on Griddy or a Griddy-like product, to potentially increase the reserve margin by 2,000MW – effectively eliminating extreme stress on the grid at no cost to ERCOT.



By contrast to what is happening now, ERCOT’s Weather Sensitive ERS for residential and small commercial meters procured 26.4 MW of demand reduction capacity for the period June – September 2019. Griddy by itself can match that reduction by showing price signals to our membership, which currently represents just a small fraction of the overall system load.

Recommendation

The governing principle is to treat the residential and small business demand in the same way generators are treated.

Accordingly, Griddy’s recommendation is:

- ERCOT allows each residential and small business customer (without margin to the REPs) to receive the ORDC adder for all kWh that are below that customer’s prorated load for the relevant Locational Marginal Pricing node

This approach is to treat demand reduction the same as generation. Texas has invested heavily in smart meter technology that is metered in 15-minute intervals for every customer on the ERCOT grid. This recommendation neatly leverages pre-existing state-wide infrastructure investment in order to maximize value from existing power generation and minimize reserve margin risk.

So many of the retailers in Texas market fixed rate plans that advertise ‘free’ periods of usage, but energy isn’t free. Never has been and never will be. So, will Texas residents pay for it via capacity payments like other deregulated markets, or will ERCOT provide the incentive for all consumers to conserve energy when it matters, use energy when it’s abundant and keep it’s unique Energy Only Market intact?

Griddy Energy: November 7, 2019