ERCOT MARKET UPDATE WEBINAR
After the call summary

Compiled: June 8, 2023

Important highlights at a glance

We hope that you were able to join the ERCOT Summer Market Update webinar. The following summary will give you a quick overview of the most important elements of the presentation.

Weather outlook

After three full years in La Niña conditions, the ENSO region has seen strong warming trends this spring and has rapidly pushed into neutral-positive territory, with a likelihood of pushing into positive territory and El Niño conditions this summer.

This indicates that summer 2023 has the potential to be a cooler and wetter summer. This does not eliminate the potential for periods of prolonged heat but it could indicate that load doesn't reach its full potential.

Regulatory

Grid reliability vs. resource adequacy (RA)

ERCOT is currently facing a problem with resource adequacy. While much of the focus has been on solving for operational flexibility — or having enough resources to respond to real-time conditions — there has been no reliability standard for RA set, so scarcity pricing has become a fallback solution.

ERCOT Offline Reserves



The blue line represents 7/11/22 and the orange line is 7.13/22 over a 24-hr. period.

The PUCT and ERCOT are working through some key activities related to market design:

Establishing a reliability standard: reviewing the value of lost load and the economics of customer load shed; evaluating reliability metrics and the proper level of reserve margin.

Implementing a market-based solution for RA: implementing a performance credit mechanism (PCM) to create value for dispatchable resources that meet the reliability standard.

Evaluating bridging solution for the interim: to retain existing assets and build new dispatchable generation until the PCM can be fully implemented. The current preferred bridge solution is a multi-step floor: 6,500 MW @ $20/MWh and 7,000 MW @ $10/MWh, which aligns with the PCM and directs 80% of the revenue increase to dispatchable resources.

88th Legislative Session

HB1500-PUCT Sunset Bill: signed by the governor on June 7, 2023, the key details include:

- new ancillary service provided by dispatchable resources that is available two hours in advance and can operate at max output for four continuous hours
- firming requirements or minimum generation performance requirements during tight grid conditions for gen resources with signed interconnection agreements after 1/1/27
- PCM guardrails and further establishing the details of how this program will work
- transmission interconnection cost allocation allowance paid by generators

SB2627-Loan program: to expand/construct dispatchable resources, was signed by the governor on June 7, 2023. This sets the parameters for loans to incent expansion and/or construction of dispatchable resources, including: a 20-year term, a 3% interest rate, and a completion bonus of $120k/MW for generation energized by 6/1/2026.

Market fundamentals

Historical prices vs. market factors

To look ahead, we took a look back at historical prices in the Houston North Load Zone and layered that over the various market conditions during this timeframe:

2018	4GWs of coal retired
2019	very volatile August; 8.6% planned reserve margin, peak demand record set at 74.6GWs
2020	first year of COVID lockdowns, calm index prices with lower demand
2021	Winter Storm Uri occurs, reliability initiatives begin
2022	Gas rally in February as several bullish factors converged, followed by record-setting spring and summer heat – June and July were hottest on record – 31 days with peak demand over prior record from August 2019 – new monthly peak demand records set June-Aug – new all-time peak set on 7/20/2022 at 80.2GWs
2023	lower demand for gas during above-normal winter causes gas sell-off, low index prices so far this year

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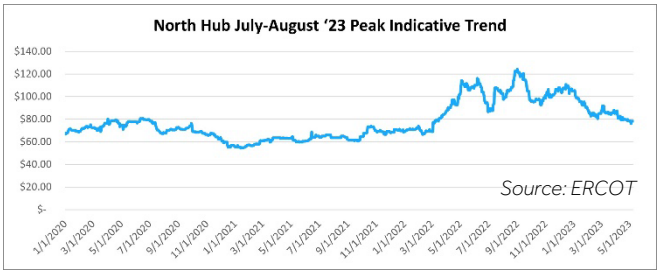
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Historical prices vs. market factors (con't)

July-August '23 peak pricing at North Hub (NLZ) is indicatively around $80, which is inline with the 5-year real-time NLZ average ($80.36) but much lower than where prices settled in real-time last year (roughly around $163).



This is primarily driven by natural gas prices, which are lower now than last summer due to the warm winter and robust production. And, gas is still the marginal unit dispatched in ERCOT that sets the price in real-time. However, some things to consider:

- real-time grid conditions are more related to the real-time performance of renewables therefore current forward prices may not be the best indicator of real-time volatility this summer.
- cooler and wetter weather forecasts don't negate the possibility that we could see similar grid tightness and strong pricing that we saw in 2022.
- load is forecasted to be higher this summer with more renewables + flat reserve margins compared to summer 2022. This implies a larger portion of the estimated reserve margin is made up of non-dispatchable generation.

Natural gas fundamentals

Gas demand is ramping up over the next 10 years, driven mostly by LNG exports:

- LNG Feedgas sits at 14 Bcf/day and is forecast to grow 1.6 Bcf/day this summer vs. last with the Freeport LNG facility coming back online.
- By end of 2025, peak nameplate capacity in LNG exports is expected to grow at least 6.5 Bcf/day from current levels up to 20.3 Bcf/day (22.1 Bcf by the end of 2028).

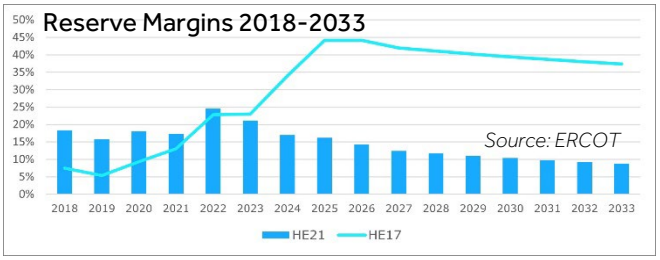
Though the market is well-supplied and near-term gas prices reflect that, bullish factors include the increased demand in LNG exports coming down the curve, which will further link North America to higher global pricing. This demand will necessitate new production, which will come at a higher cost from inflationary pressures and escalating extraction costs. This is reflected in the contango curve.

Power fundamentals

ERCOT's supply and demand forecast for summers over the next 10 years shows robust solar and load growth:

- peak solar is leading supply growth at 23.5 GW over the next 10 years
- HE17 reserve margins are forecasted to expand significantly with solar growth
- there is minimal growth from other supply resources that contribute during non-solar hours
- peak load is forecasted to grow by 5.2 GW over the next 10 years

Load growth is outpacing supply growth during the non-solar hours, starting at HE21.



This shows the potential for scarcity pricing going forward is much higher than the HE17 reserve margins indicate, and much higher now versus the last five years. Despite this risk, the July-August forward strips are backwardated.

Key takeaways for summer & beyond

- Consider long-term procurement strategies, as both gas and power have asymmetrical upside risk
- Bullish scenarios: a higher likelihood for scarcity pricing going forward (versus historicals), as a larger percentage of operating reserves will be non-dispatchable. And, ERCOT prices are still following the gas market, which contains upside risk due to demand growth amidst supply uncertainties.
- Bearish scenario: gas prices are low in the near-term due to a well-supplied market. ERCOT forward summers, which typically drive calendar prices, are backwardated and below recent real-time clears.

Resources

The Electric Reliability Council of Texas (ERCOT) performs a wide array of reliability analyses, two of the most used are:

- the *Capacity, Demand and Reserves Report* (CDR): is ERCOT's planning document, published twice a year, that assesses summer and winter reserve margins for the next 10 years
- the *Seasonal Assessment of Resource Adequacy* (SARA): is published ahead of each season and includes a scenario analysis for demand, generation availability, and renewable output.

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