Summer Market Outlook Webinar
Q&A

Compiled: April 25, 2023

The following are answers to the questions our presenters received from participants during the summer market outlook webinar.

Weather

Q: How will the move to El Niño Southern Oscillation (ENSO)-neutral conditions affect summer weather?
A: 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. Usually there is a lag when we go from phase to phase, so some La Niña-influenced conditions are possible early in the summer before El Niño takes hold. A refresher on terminology:

> El Niño Southern Oscillation (ENSO): is a measure of sea surface water temperatures (SSTs) in the equatorial Pacific. This is a key driver of U.S. weather patterns.
>
> El Niño conditions occur when ENSO is in a positive phase (i.e. sea surface temperatures are above normal) and east winds blow weaker than normal. These conditions typically favor a warm, dry north and a cooler/wet south in the U.S. and fewer Atlantic hurricanes.
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> La Niña conditions occur when SSTs are in a negative phase and the east winds are stronger. These conditions favor a warm and dry summer across the U.S. with more Atlantic hurricanes.

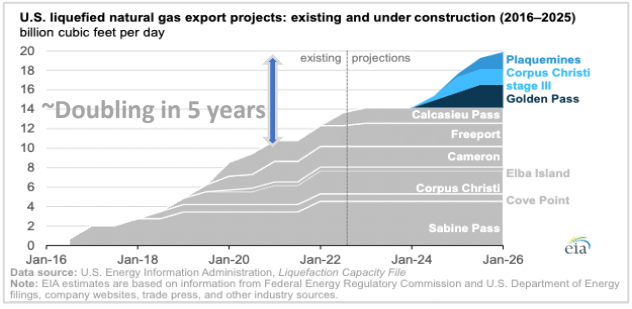
Supply/demand/fundamentals

Q: How is ERCOT preparing for sustained summer heat?
A: While 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, assesses summer and winter reserve margins for the next 10 years
- the *Seasonal Assessment of Resource Adequacy* (SARA): is published seasonally ahead of each season (will be published monthly, for each individual month, starting in the fall) and includes a scenario analysis for demand, generation availability, and renewable output. This scenario analysis provides an assessment of supply/demand balances in a wide range of conditions, including high demand scenarios.

Once the summer SARA is published, reliability conditions will be assessed and next steps, if needed, will be addressed at that time.

Q: What is the expected demand for U.S. LNG over the next 12 months?
A: U.S. LNG exports recently reached a new high of 14.8 Bcf/day in mid-April. We can expect to see additional marginal gains as active facilities optimize their operations. Current expectations for the additional buildouts show that the Golden Pass and Plaquemines facilities will begin to operate over the next year, which could push the takeaway capacity to above 16 Bcf/day.

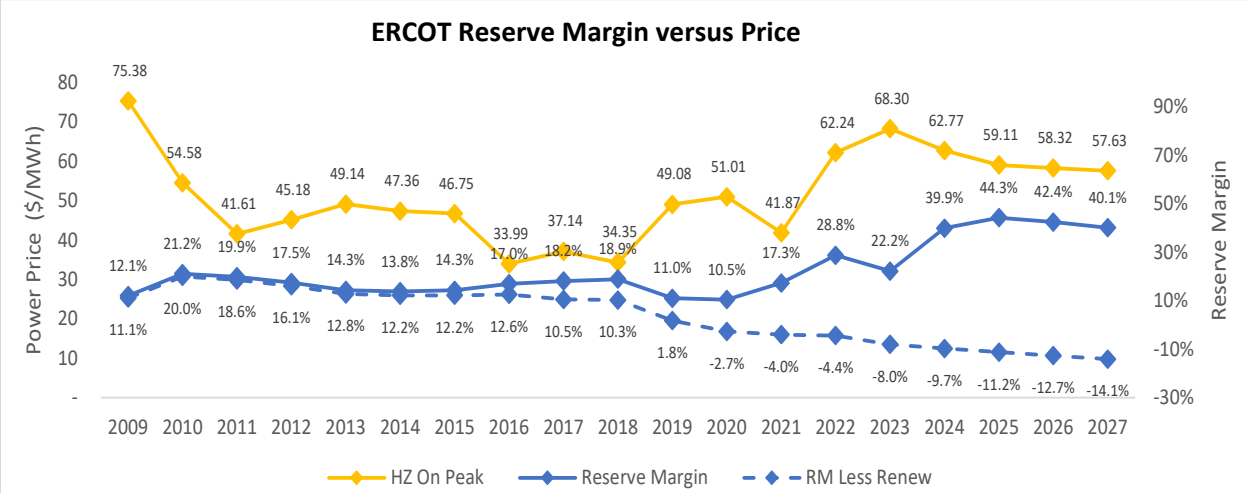


Supply/demand/fundamentals (con't)

Q: What's the difference between energy rates now and energy rates prior to Winter Storm Uri?
A: Overall, Winter Storm Uri caused a reassessment of the risk of price spikes during Texas winters. While there have been some changes made to the ancillary services market construct, which have led to slightly higher prices for ancillaries, there haven't been any material construct changes made to the ERCOT energy market yet. Thus, energy prices both pre- and post-Uri have been subject to the macro and micro fundamentals impacting both gas and power.

Something to keep in mind: the current grid stack is more renewable now than pre-Uri, which could lead to more intermittent price spikes and transmission constraints amidst robust load growth going forward. The following chart, which compares reserve margin (the amount of available capacity at system peak) to market prices (Houston Zone), illustrates just that. From 2010-2020 energy prices have been inversely proportionate to reserves. From 2021 to 2022 however, prices rose at the same time as reserves rose.

The dotted-blue line shows reserves *after removing renewables*, which causes margins to dip very low. And, since renewables are, by definition, intermittent, the market could be vulnerable to volatility if renewable resources don't deliver energy during extreme market conditions and on high-demand days.



Source: ERCOT's Capacity, Demand & Reserves (CDR) Report and NRG's proprietary curves.

In addition, we measure price "excursions" — extremely high (>$500/MWh) and low prices (< $10/MWh) — as an indicator of volatility. In ERCOT since Uri, there's been an increased frequency of upside excursions:

ERCOT - Houston Hub Real-Time

Average Hours > $500 per MWh
2015 – 2020: 23 hours per year
2021 – 2022: 142 hours per year

Supply/demand/fundamentals (con't)

Q: If California natural gas storage remains low well into summer/fall, how will this affect summer power pricing and natural gas pricing this winter?
A: California saw large withdrawals from storage when the first wave of cold came through in December 2022. Since then, the state has experienced an elongated winter, with below-normal temperatures persisting into mid-April. Although there have been injections into storage and levels are improving, they're trailing last year and the 5-year average. On a positive note, pipeline capacity restrictions from the Force Majeure on Line 2000 were lifted in mid-February 2022, allowing more gas to flow into California from West Texas and helping to alleviate some constraints on the Southern California gas system.

If gas storage remains low into summer, this could add price support for both gas and power prices, particularly if a warmer-than-normal summer actualizes. Gas is used as a reliable, dispatchable fuel to generate power, particularly during times of heightened demand in the summer. Hydro power is projected to be very healthy this year, which could offset some of the power burn demand for gas, but supply/demand/pricing will all be dependent on the weather.

Q: Do you see any potential shortages this summer which could drive real-time prices extremely high?
A: The potential for high prices in the summer period is always there — especially if there are significant generator outages during periods of extreme weather. As discussed on the call, increased reliance on wind and solar is an additional risk, as these units are not dispatchable. Each independent system operator (ISO) is very aware of these risks and has strategies to address them, but the risk remains.

Regulatory

Q: Please discuss the MISO seasonal capacity construct and where you see this kind of pricing structure going. Will MISO move to a 3-year capacity auction like PJM?
A: Stakeholders initially pushed back on the seasonal capacity construct. This was largely due to the participants feeling the market structure changes were rushed. It is now apparent that stakeholders were right, given the auction results being published mid-May. And, there is no immediate impetus to move to a more forward-looking market. MISO is actively contemplating a downward sloping demand curve, similar to that used in PJM, though the potential for implementation will likely not happen any earlier than 2025/26.

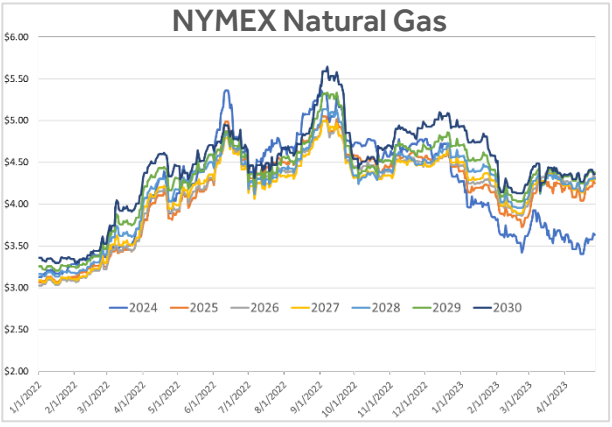
2023 PRA timeline projects posting of auction results by May

Date	Activity	Responsible Entity
Mar 31, 2023	Recalculated UCAP/ISAC ratios & updated Schedule 53 SAC values	MISO
Apr 3-17, 2023	Actions necessary to prepare for the 2023 / 2024 PRA	Market Participants
Apr 18, 2023	Planning Resource Auction offer window opened at 8:00 am EPT	MISO
Apr 18-21, 2023	Capacity offers submitted into offer window	Market Participants
Apr 21, 2023	Planning Resource Auction offer window is closed at 6:00 pm EPT	MISO
Apr 24, 2023	Auction implementation begins and is conducted in twenty (20) business days	MISO/IMM
May 19, 2023	Seasonal Planning Resource Auction results posted.	MISO
May 19, 2023	Auction results workshop	MISO

Until the auction clears with the results, there isn't a ton of information available to determine how the pricing structure will play out. The best resource for information on this is the MISO Preliminary Seasonal Report, which shows the supply/demand for each season. Based on the information available, summer has the highest demand, while supply is pretty similar throughout the year. However, given the ability for a season to clear at 4x Cost of New Entry (CONE), it is difficult to determine how different each season will clear.

During a recent Resource Adequacy Subcommittee meeting, there was mention from a stakeholder (WEC Energy Group) of putting pressure on MISO to build a forward capacity market 3 to 5 years out. However, there is no formal discussion or movement from MISO to move away from a prompt auction. Market participants will likely continue to use the bilateral market for indications of where future capacity pricing will clear.

Pricing

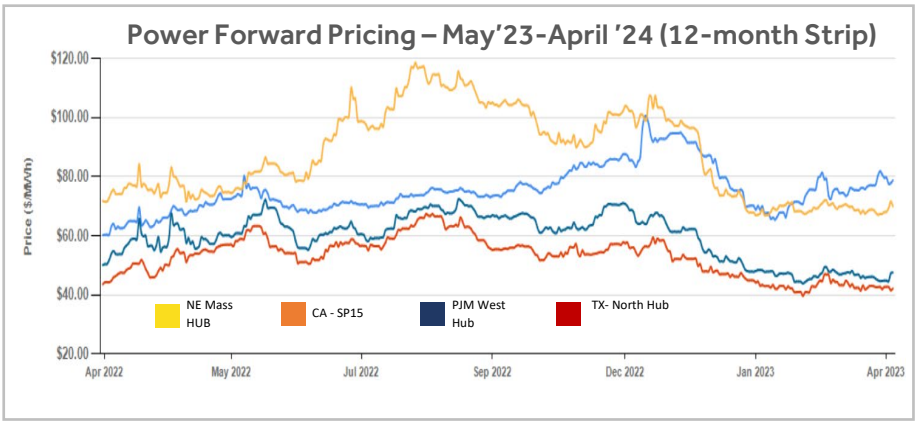


Q: What is the direction of natural gas futures prices?
A: The NYMEX curve shape has changed dramatically since the winter. Back then we were seeing higher near-term prices and lower long-term pricing (i.e. market "backwardation"). Now, with a warmer winter and a storage surplus, near-term pricing is lower than long-term pricing, indicating market "contango." Longer terms may be holding at the higher price point due to the anticipated growing demand not being matched by similarly growing production, which will be needed to maintain the current natural gas storage surplus condition.

Q: Is yesterday's 4.5-cent energy rate tomorrow's 6.5- to7-cent rate?
A: While it's tough to generalize on rates across many terms and regions, I think that the reference to "yesterday's 4.5 cent energy rates" would be a transaction executed during the lows of 2020 during the COVID period. In that regard, it's difficult to expect a return to sustained prices at the low levels from 2020 because that period of low prices was caused by abnormal market conditions of reduced demand amidst very strong supply.

Such low prices could happen again for short-term periods due to abnormal weather or other market surprises, but those lows likely would not be sustained since gas drilling reductions and/or increased international exports are also likely. Lower production and increased exports would rebalance the market to a higher level, which is what we're seeing in the long-term price curve currently (see below: Power Forward Pricing chart).

Q: Do you expect fixed energy rates to go up as the summer approaches?
While there is no way to know what the future holds, what we do know right now is that forward prices are trending lower for the near-term and higher for the further out terms. As illustrated by the chart, since September 2022, forward pricing for a 12-month strip starting May 2023 has decreased for most markets. Please consult with your NRG Account Executive for more information on what strategy option best suits your unique scenario. A fixed price may be only part of the strategy equation.



Q: Are the price volatility trends with renewables/renewable energy credits (RECs) the same or different beyond ERCOT?
A: Overall, the trends are mostly the same across all markets with a few key differences. ERCOT is a very liquid market with lots of voluntary demand. Outside of ERCOT, compliance markets drive demand and there is lack of supply. Other regional differences include:

(over)

Pricing (con't)

Supply chain issues — especially for solar panels — are consistent for all markets. In PJM, there has also been a much-publicized logjam in the "interconnection queue." PJM has not been able to keep up with the review of requested new projects. This is partially because, historically, they evaluated a few large projects per year (such as new gas generators), but now there are many small renewable projects. As a result, many new renewable projects are delayed and are not coming online until 2026 or later.

REC price volatility due to supply/demand is different beyond ERCOT because prices are supported by higher compliance standards and less supply. The result is higher prices outside of Texas.

Price volatility due to increased reliance on non-dispatchable assets has parallels in all markets. In NYISO for example, there are numerous gas generator retirements due to new peaker emissions rules. The strategy to replace these units includes both transmission from upstate (mainly hydro), as well as offshore wind however it's uncertain when these assets may come online, which could lead to volatility in the interim period.