U.S. SUMMER MARKET OUTLOOK WEBINAR
After the call summary

Compiled: April 25, 2023

Important highlights at a glance

We hope that you were able to join the summer market update webinar. The following summary will give you a quick overview of the most important elements of the presentation.

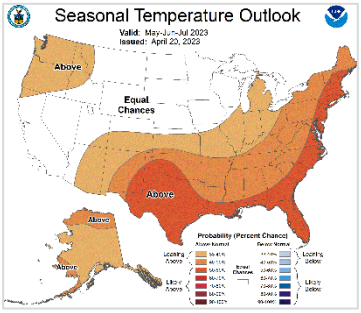
Weather outlook

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.

What does this mean for U.S. weather?

El Niño Southern Oscillation (ENSO) is a measure of sea surface water temperatures (SSTs) in the equatorial Pacific and 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, which are rather rare for summers, **typically favor a warm, dry north and a cooler/wet south in the U.S. and fewer Atlantic hurricanes**. According to the Oceanic Nino Index (ONI), June-August has been classified as El Niño only eight times since 1982.

Since 2000, summers on average have been trending warmer. Latest climate models for summer 2023 show broad warmth and higher anomalies favoring northern areas, while the latest NOAA outlook favors warmth from the South to East Coast. Above-normal precipitation is favored for the Southeast by both NOAA and climate models alike.



Atlantic tropical forecasts

Source	Named Tropical Systems	Hurricanes	Major Hurricanes (Cat 3+)
Colorado State	13	6	2
WSI *Weather Services Intn'l*	15	7	3
MAXAR	14	6	2
2022	**14**	**8**	**2**

Market Fundamentals

Natural gas demand

Overall U.S. demand came in at the 5-year average mark for January and February, despite lower-than-average residential and commercial demand. This is because of the growth in other demand sectors — primarily exports and demand for gas-fired generation plants brought about by coal and nuclear plants retiring and low natural gas prices to run gas generators.

- Total U.S. demand January-February 2023 trended quite a bit lower than last year's average for the same period due to a warmer-than-average temps across most regions of the country.
- March and April month-to-date demand has come in at or above the top of the 5-year range, as temperatures have trended more average, coupled with the growth in power burn/exports.

Natural gas exports

Exports have grown and we currently sit at the all-time high for LNG exports due to high global LNG pricing and growing export capacity. According to the EIA, from 2021 through the end of 2025, total LNG export capacity is expected to double, from 10 Bcf/day to 20 Bcf/day. From 2021 to today, we have seen almost a 40% increase.

Natural gas production/storage

Since the sharp falloff just prior to the start of last year, production has grown, currently averaging 5-6 Bcf/day higher year-to-date, compared to the same time last year. According to the EIA, we currently sit at a storage surplus compared to last year and the 5-year average — and it's expected that we will continue to have a surplus into the next withdrawal season. This growth is projected to slow through the next year due to producers' sentiments about production costs being above current NYMEX pricing.

Natural gas pricing

The supply surplus is apparent in the downward shift in forward pricing we've seen since September 2022. Near-term prices dropped significantly, with the recent bottom set at the end of February. Pricing for years 2025 through 2030 have remained higher due to the market expectations that a higher price point is necessary to incentivize the production growth needed to meet the growing demand.

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Power pricing

Index pricing over the last 120 days for most U.S. deregulated power markets has been quiet (especially compared to what we saw in 2022), after spiking due to cold temperatures at the end of December when Winter Storm Elliott moved across the continent. Over the last year, forward power pricing for the 12-month strip of May 2023 through April 2024 has moved down.

Regional power price drivers

East and Midcontinent: there is a focus on **power plant retirements** due to higher regulatory costs, higher priced coal, and low-capacity auction results. As these plants retire, peaker plants and higher-priced generation assets may be needed to meet the load during high demand periods — which can drive prices higher. There is also a **bottleneck in PJM to get new generation approved** as older plants retire. And, stagnant regional natural gas production can impact power prices as well in this region.

Northeast: besides facing generation plant retirements, natural **gas pipeline constraints** also hinder bringing ample gas to the region for generation and heating. In NYISO, there's a price disparity between upstate and downstate: upstate faces **transmission constraints** and downstate faces **higher capacity prices** due to demand.

Texas: Texas is seeing dramatic load growth in sectors such as crypto, data mining, and hydrogen, but this creates difficulty because of the flexible nature of the load. While renewable/intermittent generation has been growing, there is **not enough dispatchable thermal generation to meet the growing demand**. ERCOT and the PUCT are working through a market redesign to address the growing reliability issues.

California: **pipeline constraints across** the West, coupled with **declining in-state gas storage levels**, are continuing to put a strain on the flow of natural gas. The unseasonably cold winter weather in the state prompted large natural gas storage withdrawals. Both gas basis and power pricing have risen in response to the Y-o-Y storage deficit.

Energy purchasing considerations

Where we were: the NYMEX curve from last fall indicated backwardation: near-term NYMEX was over $7.00/DTh, while longer-term prices were under $5.00/DTh. At this time, a common strategy was to "go long" in an effort to take advantage of lower prices further out on the curve and ultimately reduce/smooth out the rate for the term.

Where we're at: current conditions indicate contango, whereby there is a drop in the front end of the pricing curve, while longer-term contracts (especially > 2025) have seen a much more modest decline. This presents less opportunity for reducing price by "going long," but still may offer opportunities for a lower overall contract price. If you priced a 12-month contract on April 21, 2023, versus last Oct. 1, 2022:

- May 2023 start: there was a 39% decrease for NYMEX and about a 25% decrease for PJM-PSEG, NEISO-Mass and ERCOT-North hubs.
- May 2025 start: there was a 5% decline for NYMEX and PJM-PSEG and ERCOT-North hubs were close to flat. NEISO-Mass hub however decreased16% — which can likely be attributed to the dramatic regional highs in 2022 from rising global LNG.

Where we're going: forward pricing for next winter (Dec. 2023-Feb 2024) is above this winter's average day-ahead price. Some considerations for your strategy:

- Be careful using this past winter's data as a basis for next winter's strategy decisions. It was extremely warm across the U.S. and Europe and the price spikes we saw due to weather occurred during a slower demand period (over the holidays).
- What is your risk tolerance? A premium could be worth paying if monthly cash flow can't tolerate unexpected price spikes.

Renewables

Pricing: Green-e® RECs, which are mostly sourced from Texas wind facilities, are the most commonly purchased and liquid RECs in the U.S. As recently as 2020, they traded < $1.00/REC and were considered a cost-effective option to offset some/all of your supply. Since then, Green-e RECs rose to as high as $7.00/MWh and are now trading near $3-4 for most vintages. This is due to less overall supply, whether due to production shortcomings or older wind generators losing their certification status.

Transition: As more renewable generation (non-dispatchable assets) has been added across North America, there has been an impact to dispatching strategies and pricing. An example of this: in ERCOT although reserve margins are rising, which includes an increase in renewable generation assets, prices are still rising.

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