



AOBA Market Update

January 31, 2024

Factors Affecting a Balanced Gas Market

- Natural gas production
- Gas storage inventories
- Pipeline capacity
- Coal supply
- Pipeline imports
- Gov. regulation



- Weather
- Economy?
- LNG Exports
- Pipeline exports
- Fuel switching/
coal floor
- Coal retirements
- Generation
outage season

Customer Takeaway: Significant changes to both supply and demand can result in an imbalance in the market. This presents energy buyers with both upside risk and downside buying opportunities when considering a risk mitigation strategy for energy.

Source: EIA

Overview: Key Market Drivers

Weather – Bearish

- Above-average temps expected for the northern tier/mid-con with some storminess on the coasts and South will lead to variability for those regions.
- Medium-term outlooks introduce some southern coolness but will lack punch because of the absence of arctic air.

Economy – Neutral/Bullish

- More good news for the Fed as Q4 GDP's initial estimate came in 3.3% above Q3 while PCE, the Fed's preferred measurement of inflation showed a 0.2% increase from November to December and a +2.6% annual clip.

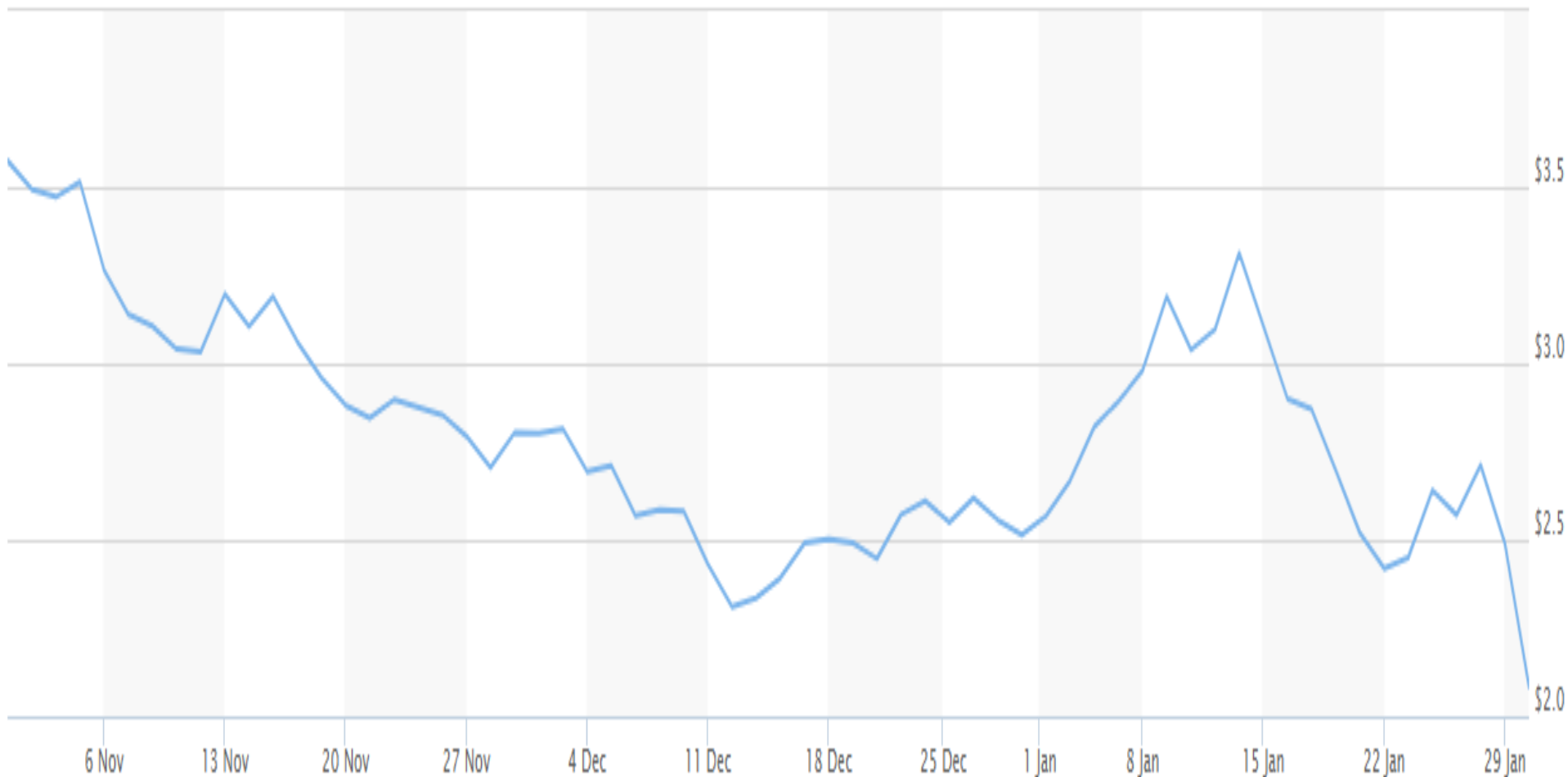
Supply and Demand – Neutral

- The NYMEX February natural gas contract expired on **1/29 at \$2.49/MMBtu** after dropping 22 cents on the day. The March contract has rolled to the prompt and trades at a paltry **\$2.07/MMBtu**, up 2 cents from previous close.
- A monster **326 Bcf pull** was reported on January 25 which reflects substantial heating demand across the country from the passing **Winter Storm Heather**. The pull was **third highest since 2010** and highest since Winter Storm Uri back in February 2021 (338 Bcf). Surplus to last year and the 5-year shrank materially to 4% and 5%, respectively.
- **Biden's pause** on LNG export reviews means a holding pattern for any prospective project not already under construction (operation dates 2027 and beyond). Could be bearish for energy prices in the long-end.
- **Freeport LNG liquefaction train #3's** refrigeration motor was taken out during W.S. Heather on January 17 and will be offline another month or so meaning ~0.7 Bcf/d of natural gas unable to be liquefied and exported.

Customer Takeaway: Energy fundamentals have perked up a bit following the brief cold shot that was Winter Storm Heather. The two pieces of LNG news can potentially be linked directly to the long- and short-term price formation as less LNG exports can lead to an unexpected surplus of natural gas.

Nat Gas Pricing Trends

Prompt NYMEX Natural Gas Contract Rolls to Lowly March



Customer Takeaway: After a fleeting rally from Winter Storm Heather the temperature maps have turned mostly red taking prompt month prices near the 2023 low of \$1.99/MMBtu seen last March. Warmer forecasts coupled with bearish LNG news and a well-supplied Europe seem to be more-than-offsetting the rising geopolitical risks in the Middle East.

NYMEX Prompt Comes Full Circle

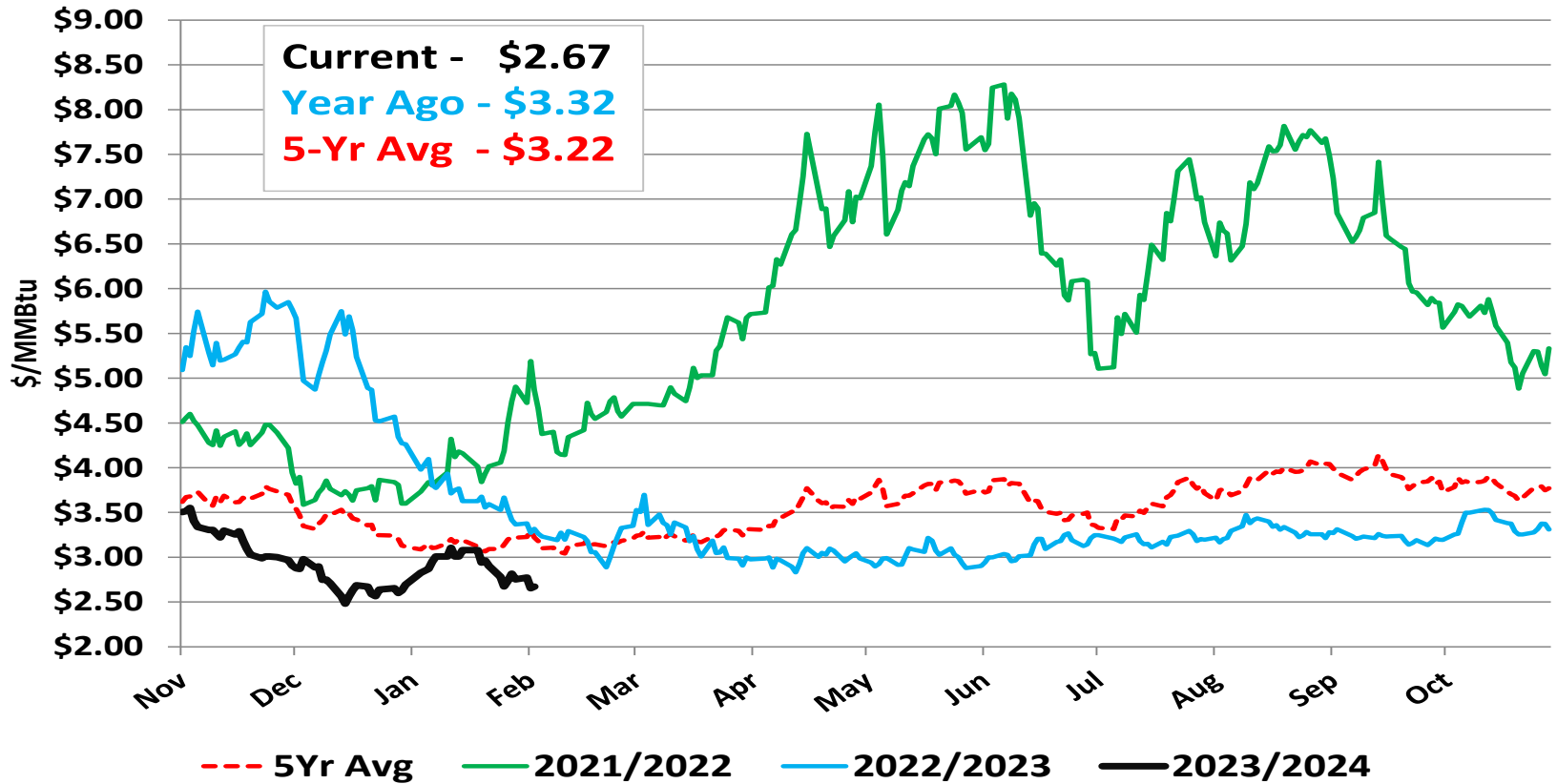


Source: Reuters



NYMEX 12-Month Back Below \$3/MMBtu

NYMEX 12-Month Rolling Strip Nov-Oct Trend

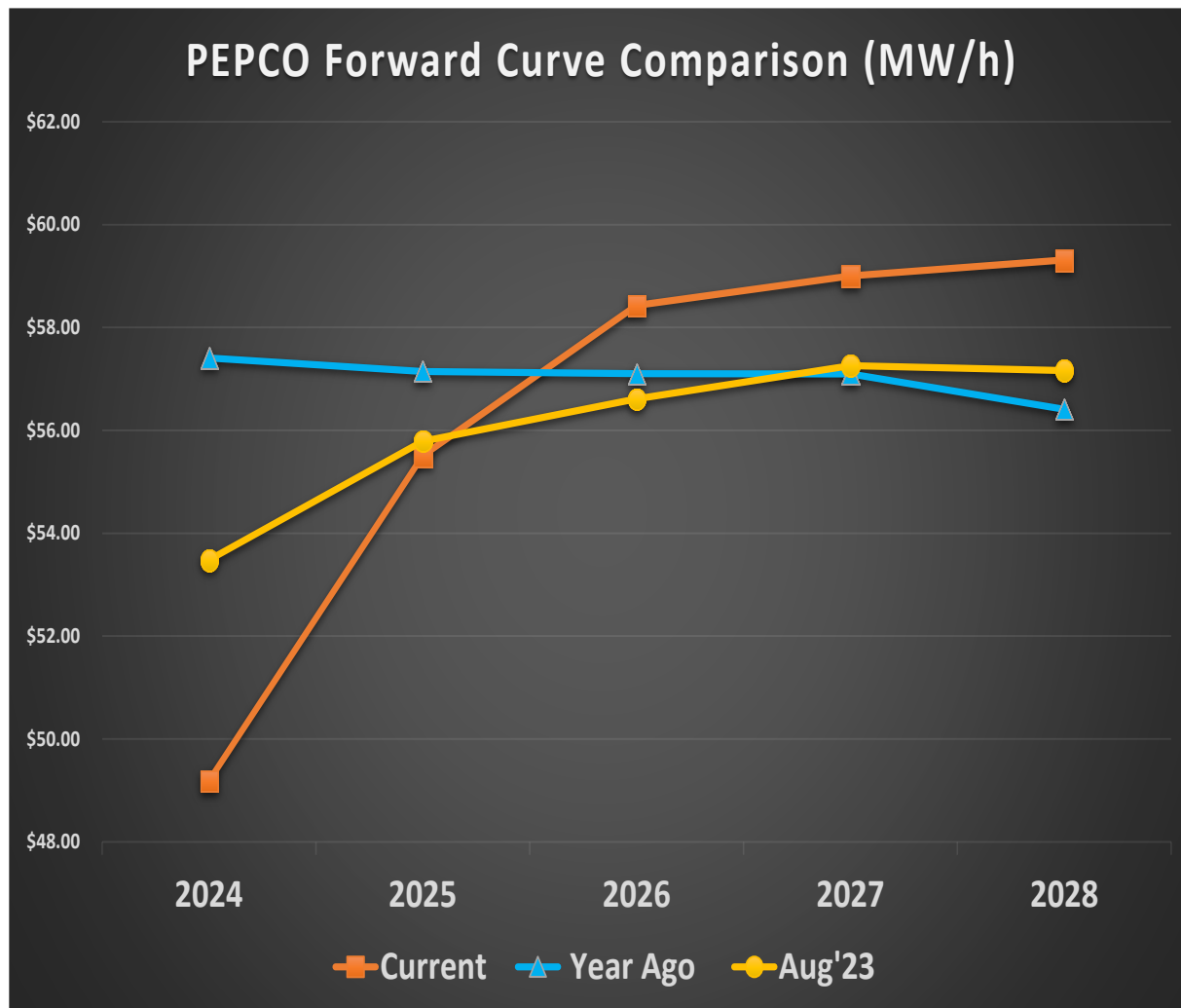


Customer Takeaway: The lack of perceived risk to natural gas supply at this point of winter continues to press prices downward further-out on the curve due to projections over the next 12 months.

Source: EIA

Power Pricing Trends

Forward Power Curve Then and Now



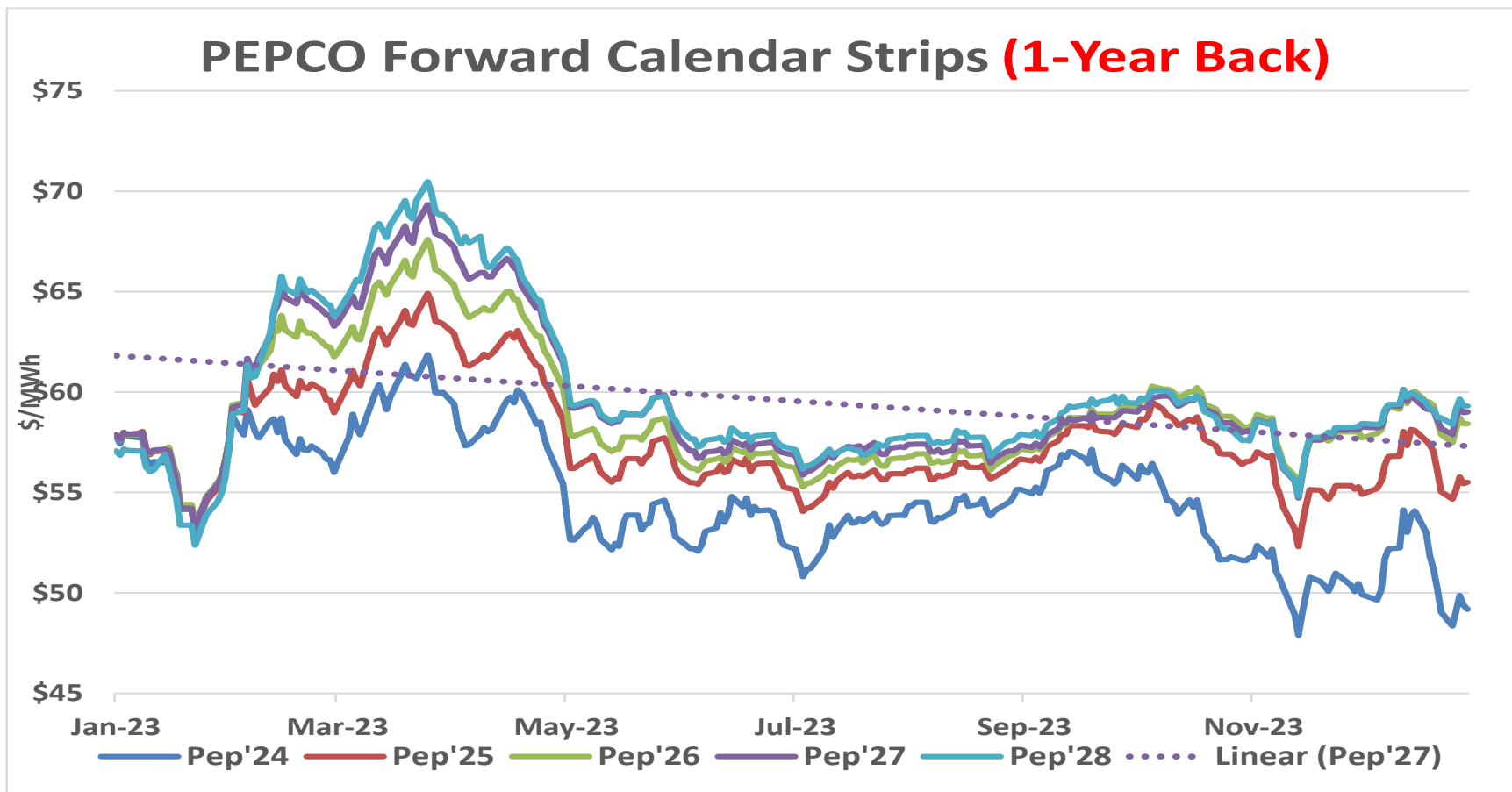
PEPCO	Current	Year Ago	Aug'23
2024	\$ 49.18	\$ 57.41	\$ 53.48
2025	\$ 55.51	\$ 57.15	\$ 55.79
2026	\$ 58.43	\$ 57.10	\$ 56.61
2027	\$ 59.00	\$ 57.09	\$ 57.26
2028	\$ 59.31	\$ 56.41	\$ 57.16
Avg	\$ 56.29	\$ 57.03	\$ 56.06

Strip	\$/Chng	% Chng
2024	\$ (8.23)	-14%
2025	\$ (1.64)	-3%
2026	\$ 1.33	2%
2027	\$ 1.91	3%
2028	\$ 2.90	5%
Avg	\$ (0.75)	-1%

Strip	\$/Chng	% Chng
2024	\$ (4.30)	-8%
2025	\$ (0.28)	-1%
2026	\$ 1.82	3%
2027	\$ 1.74	3%
2028	\$ 2.15	4%
Avg	\$ 0.23	0%

Source: Constellation Prices as of COB 01/27/2024

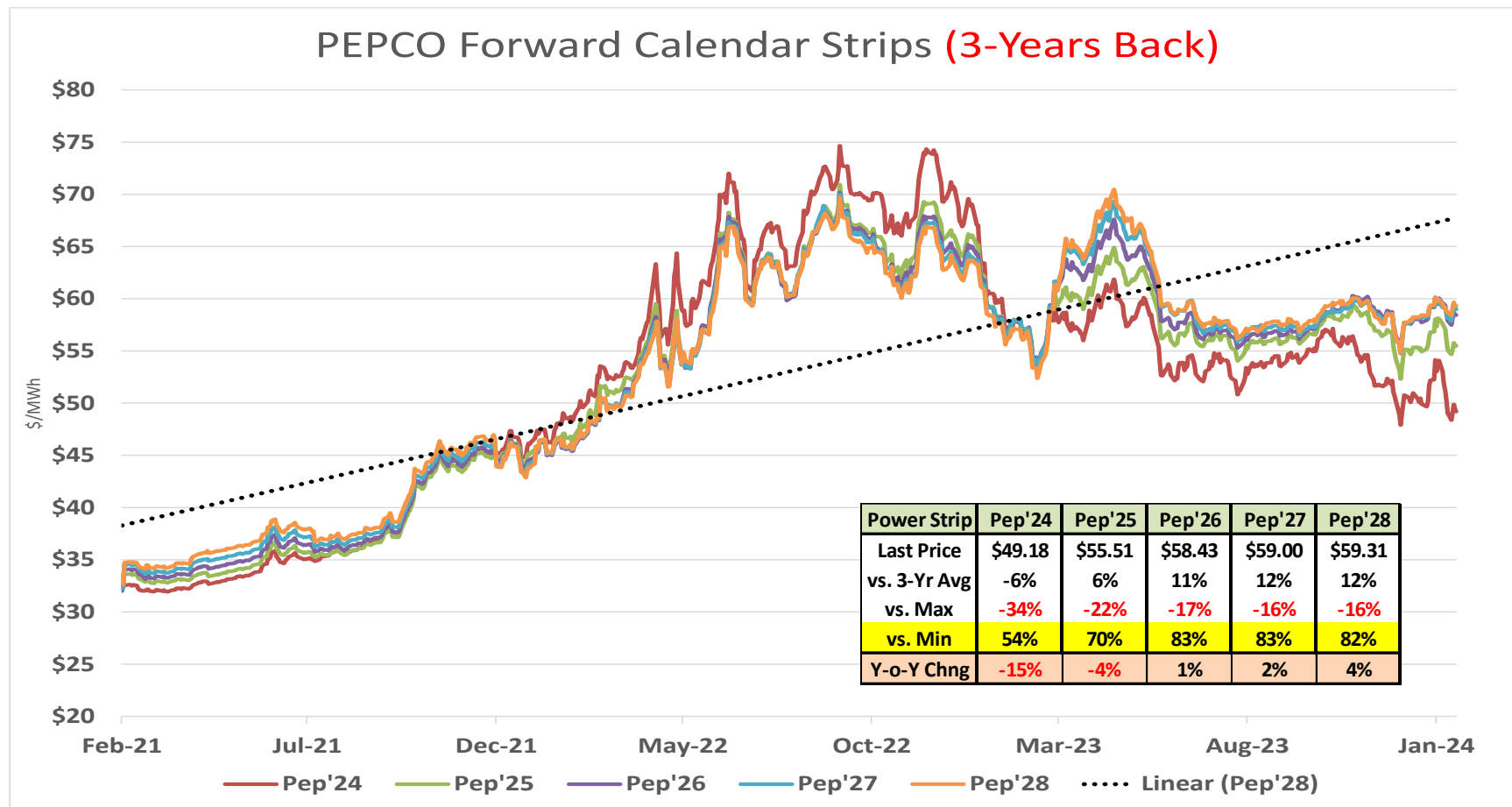
Yearly Move in PEPCO Forwards



Customer Takeaway: Forward power prices in PEPCO have been trending downwards in the near-term due to record high natural gas production leading to an over-supplied market currently.

Source: CEG

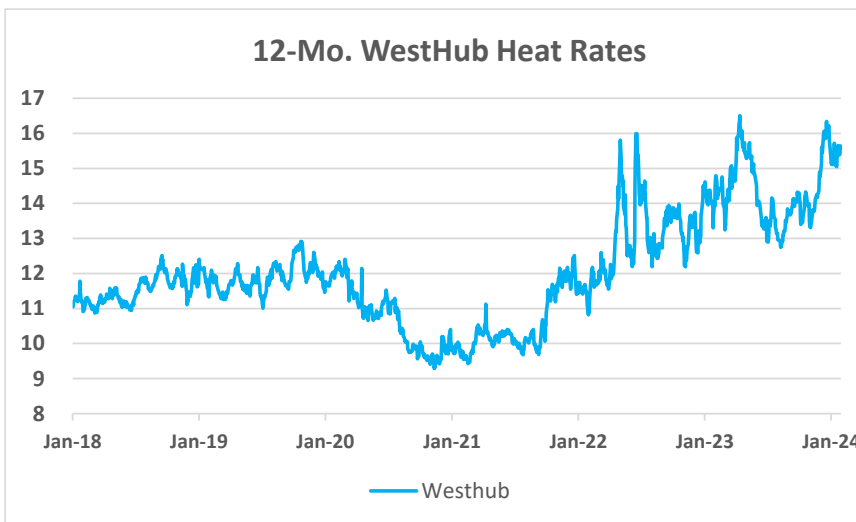
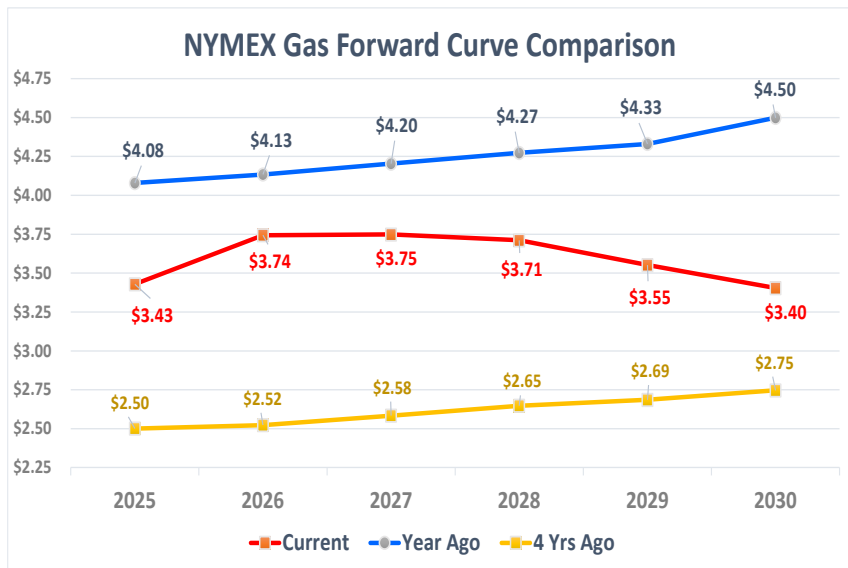
Long-Term Pricing Trends in PEPCO



Customer Takeaway: Forward power prices in PEPCO have been trending upwards over the past three years due to higher long-term natural gas prices due to inflationary factors.

Source: CEG

Relationship Between Power and Natural Gas



\$4.25/MMBtu X 14.53 Heat Rate = \$61.75/MWh

\$3.60/MMBtu X 15.64 Heat Rate = \$56.30/MWh

\$2.66/MMBtu X 12.03 Heat Rate = \$32.00/MWh

Bucket	AdHub	IndyHub	Westhub	NiHub	MichHub
6-Yr Avg	11.60	11.84	12.03	10.07	11.82
3-Yr Avg	12.80	13.40	13.37	11.19	13.13
1-Yr Avg	13.74	14.63	14.53	12.20	14.34
Current	14.74	15.33	15.64	13.02	15.16

NYMEX	Current	Year Ago	4 Yrs Ago
Average	\$ 3.60	\$ 4.25	\$ 2.61

Customer Takeaway: Heat rates are the ratio of power prices over natural gas prices. They determine the efficiency factor of generating stations in a particular zone. Power Prices = Heat Rate X Natural Gas Prices

Source: CEG

PJM Update

Capacity Market Delayed - Energy Transition in PJM

PJM capacity market clearing prices (\$/MW-day)



On **October 13**, PJM submitted proposed market reforms amid increasingly extreme weather and a changing generation fleet.

Two filings to FERC:

Docket No. ER24-99 **improved testing requirements** and the **measuring and valuing of a given resource's contribution** to maintaining resource adequacy.

Docket No. ER24-98-000 focuses on the **caps of offer prices** and **capacity performance rules** as well calculations that establish a **minimum offer price**.

- Renewable or hybrid resources make up **94%** of the **230 GW** in PJM's interconnection queue.
- **Wind and solar** power production doesn't always align with load when needed.
- Ensure **resource adequacy** and still **maintain competition and incentives** for future investment in new resources

Customer Takeaway: Transition away from fossil fuels toward intermittent resources poses an operation challenge for RTO. FERC currently has until 2/6 to accept changes or request modifications.

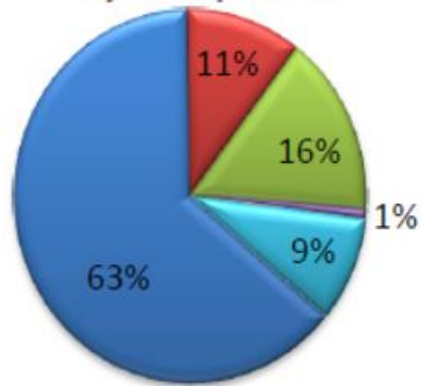
Source: CEG

Components as a Proportion of Your Bill

February 28, 2022



Estimated 12 Month Price by Component

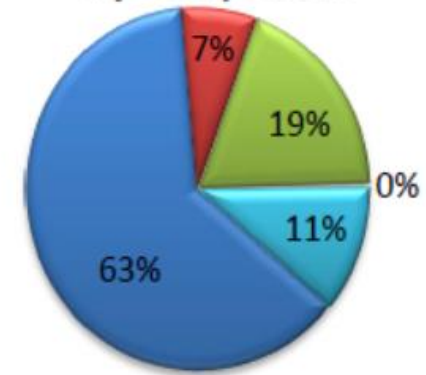


■ Energy
 ■ Capacity
 ■ RPS
■ Ancillaries
 ■ Transmission

January 30, 2023



Estimated 12 Month Price by Component



■ Energy
 ■ Capacity
 ■ RPS
■ Ancillaries
 ■ Transmission

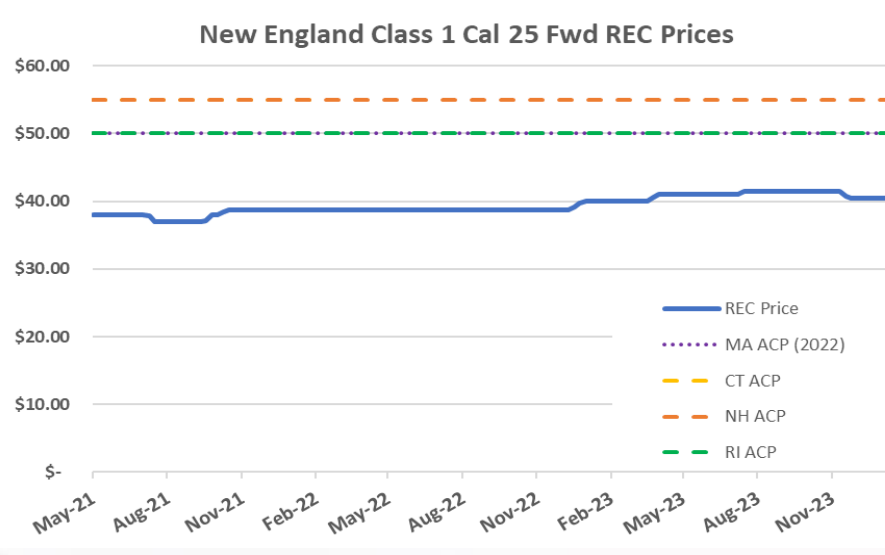
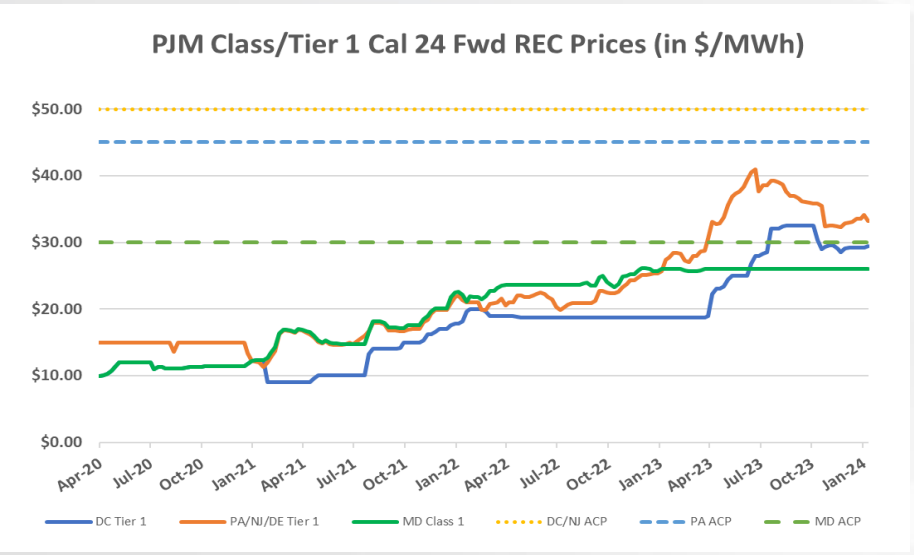
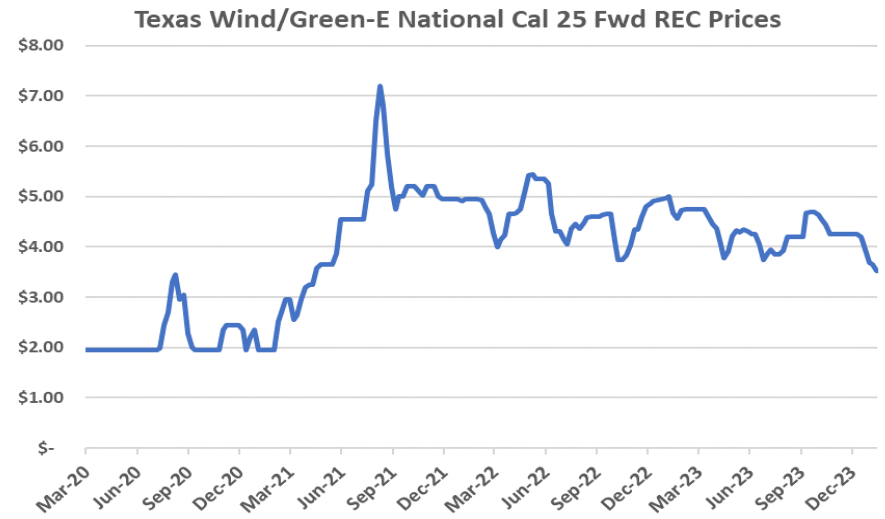
Customer Takeaway: While the energy portion of your bill has stayed steady over the past year, the RPS and transmission portion has grown while the capacity portion has gotten less due to declining auction prices over the past three auctions.

Source: CEG

RPS/REC Updates

Renewable Energy Certificate (RECs) Pricing Trends

- It remains a challenge for PJM developers to get new build renewable projects online which has led to an undersupply of Tier 1 RECs.
- The northeast offshore wind industry continues to struggle with the economics of past and current contracts leading to delays and outright cancellations, not to mention NIMBY resistance.
- Many corporations have recently been averse to elevated and very out-of-the-money PPA prices and instead looking for unbundled, source-specific additionality RECs.



Sources: Constellation



Weather

Short-Term Weather Outlook



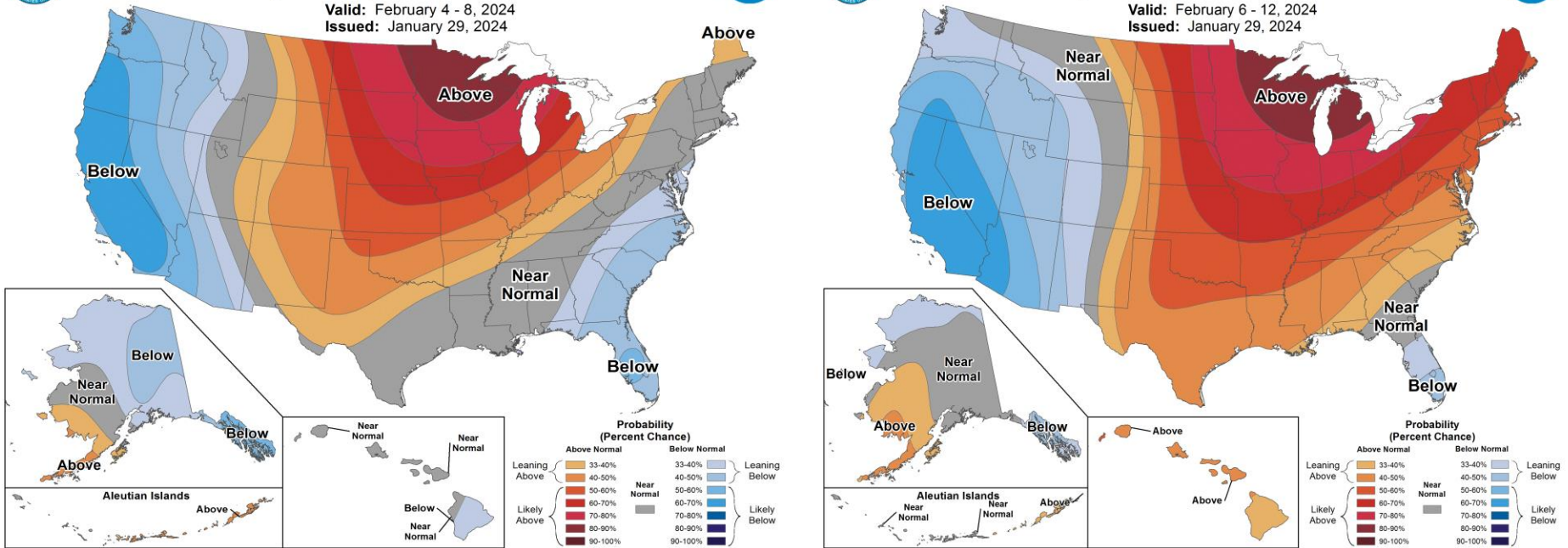
6-10 Day Temperature Outlook

Valid: February 4 - 8, 2024
Issued: January 29, 2024



8-14 Day Temperature Outlook

Valid: February 6 - 12, 2024
Issued: January 29, 2024

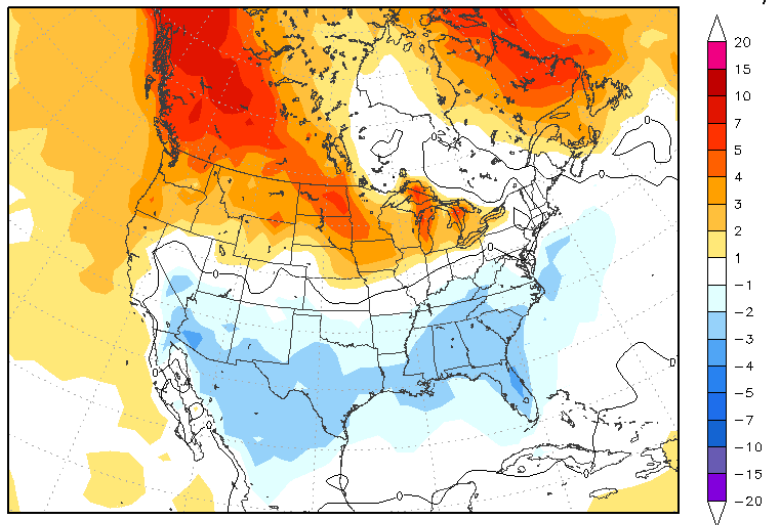


- An El Nino based pattern has returned to the U.S. following a short, but intense cold period in the middle of January.
- The Rockies, Plains and Midwest will likely average well above-normal for the first 10 days of February, while storminess in the East and South produces a little more variability.
- National demand will continue to average below normal as Arctic air remains limited.
- Storminess should remain active in the West, especially in California and the Southwest.
- Improvement is likely in snowpack in California, while the Columbia River Basin runoff forecasts will remain below normal.

Medium-Term Models Introduce Some Coolness But Limited

16-30 Day European Model

2 m Temperature Anomaly (F) ECMWF-WEEKLY
Valid: 00z Tue 13 Feb 2024 - 00z Wed 28 Feb 2024 16-30 Day



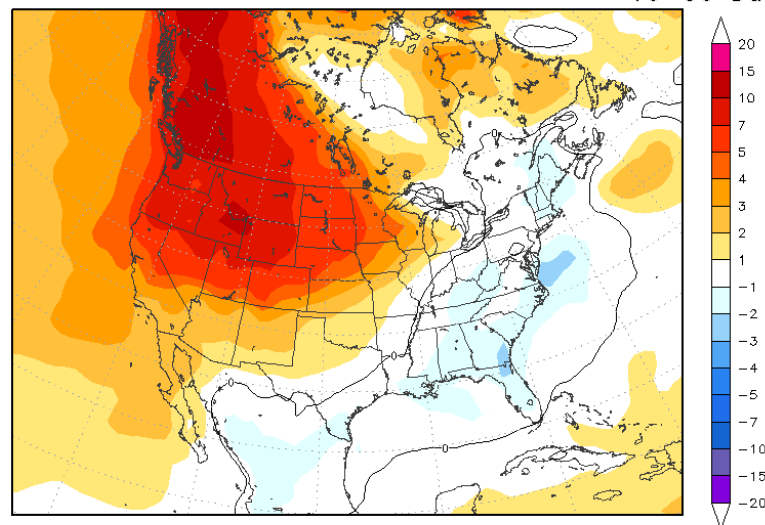
G/ADS: OOLA/IGES

StormVistaWxModels.com

Init: Mon 29 Jan 2024
2024-01-29-15:15 ET

16-30 Day American Model

2 m Temperature Anomaly (F) (16 mems, last 4 cycles) CFS-WEEKLY
Valid: 00z Tue 13 Feb 2024 - 18z Tue 27 Feb 2024 16-30 Day



G/ADS: OOLA/IGES

StormVistaWxModels.com

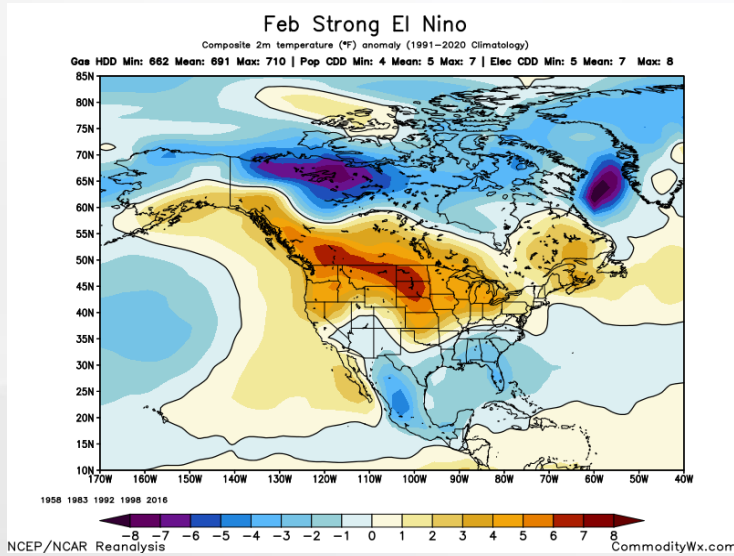
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- Both long range models show a lack of cold air supply in western Canada as temperatures are forecast to be well above-normal through the end of February.
- The both weeklies show more variability across the South and East due to storminess; a typical El Nino signature.
- While a colder period is possible for the East during the middle of February, such an event would likely be short lived. Nationwide demand should average below-normal on most days.
- A blend of the models suggest that unless a much colder flip to the pattern occurs, a top-5 warm winter is becoming increasingly likely for the U.S.

Source: Storm Vista

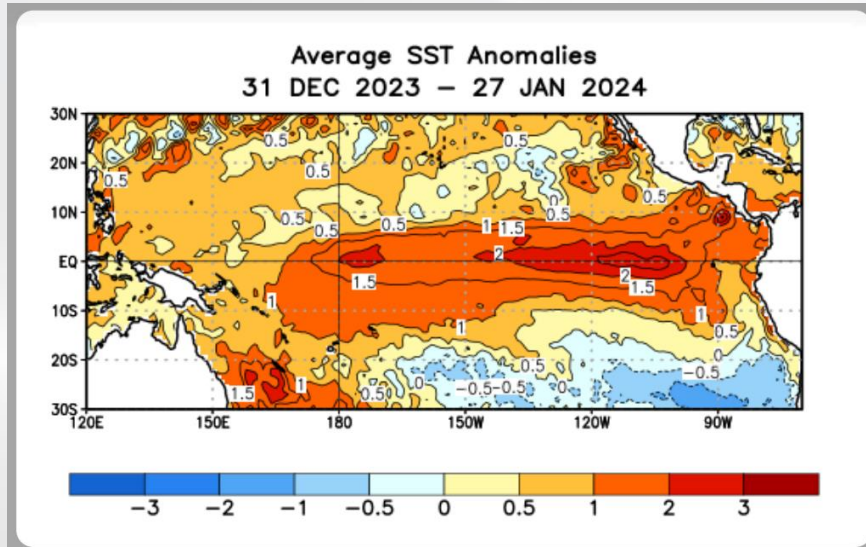
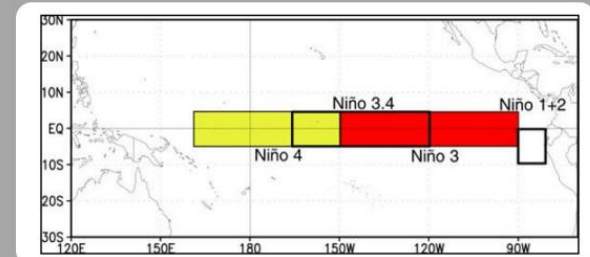
El Nino Starts to Weaken at a More Rapid Pace

February El Nino Correlation



The latest weekly SST departures are:

Niño 4	1.6°C
Niño 3.4	1.7°C
Niño 3	1.8°C
Niño 1+2	0.7°C

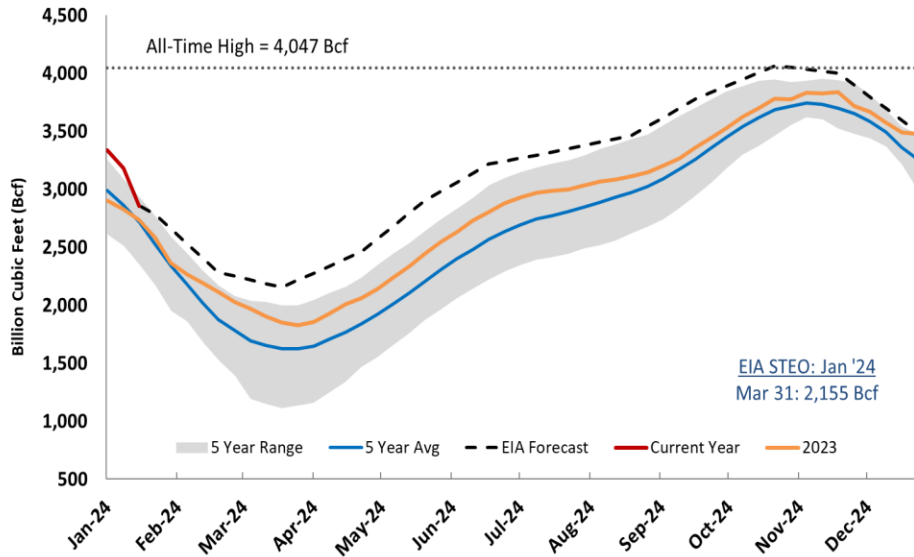


Source: NOAA, CPC

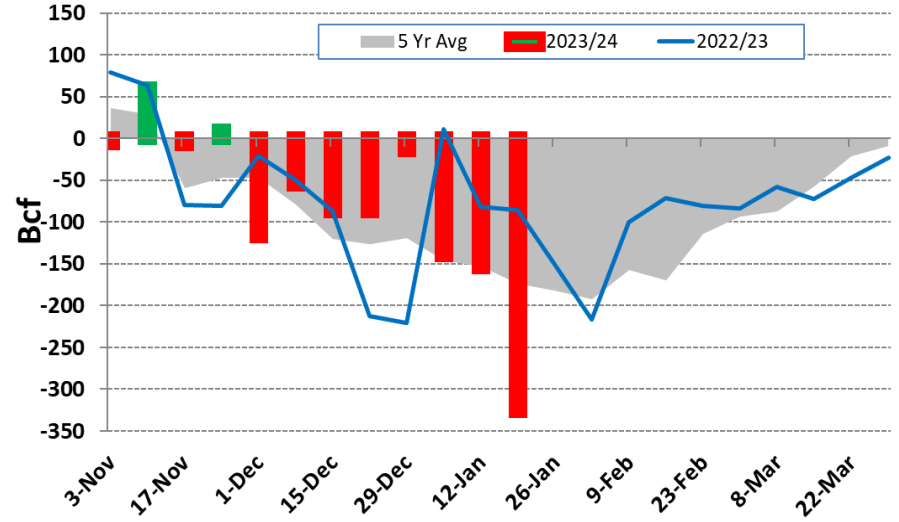
Supply & Demand Fundamentals

Biggest Draw Since Winter Storm Uri Dents Storage

Natural Gas Underground Storage



EIA Weekly Gas Storage Report (Bcf) vs Year-Ago and 5-Year Avg

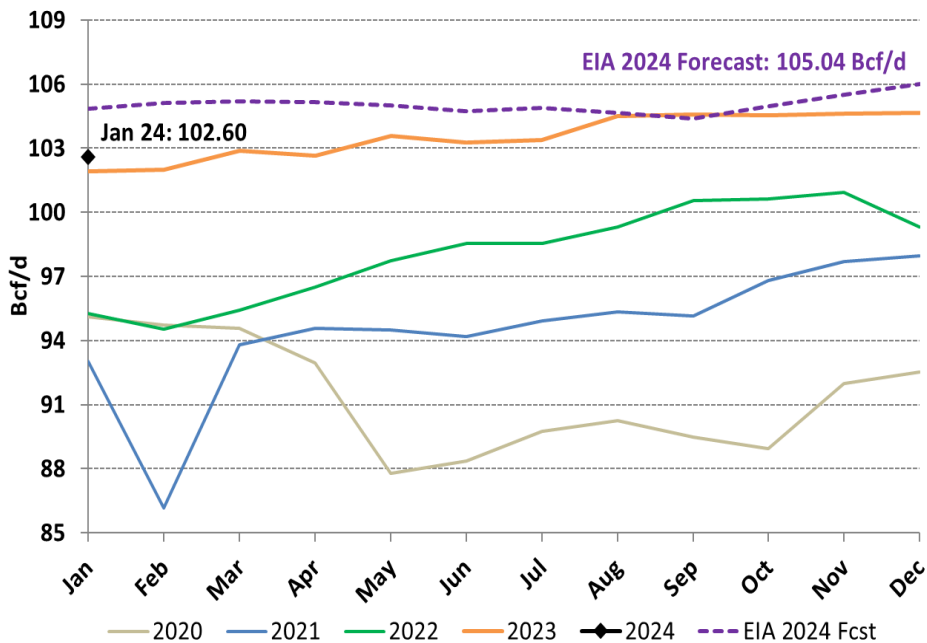


- The market saw winter-to-date's largest withdrawal last Thursday (Jan 25) as the EIA reported 326 Bcf taken out of storage for week-ending January 19 which was right at market expectations.
 - While blowing through last year's 86 Bcf as well as larger than the 5-year average of 148 Bcf, this ranked as 3rd highest pull since 2010 - falling short of 359 Bcf in 2018 and 338 Bcf in 2021 (Winter Storm Uri).
- The surplus to the last year dropped from 12 to 4% while the 5-year benchmark also fell from 11 to 5%.
- The latest forecast from the EIA pegs April 1 inventories to come in over the bearish and optimal 2,000 Bcf (2,155) mark.

Customer Takeaway: Despite this minor bullish blip, the mild winter-to-date has pushed this fundamental driver to the bearish side of the balance sheet. If a mild February is realized, we'll likely see the surplus pushed back higher to the low-teens that we had before this week's whopper.

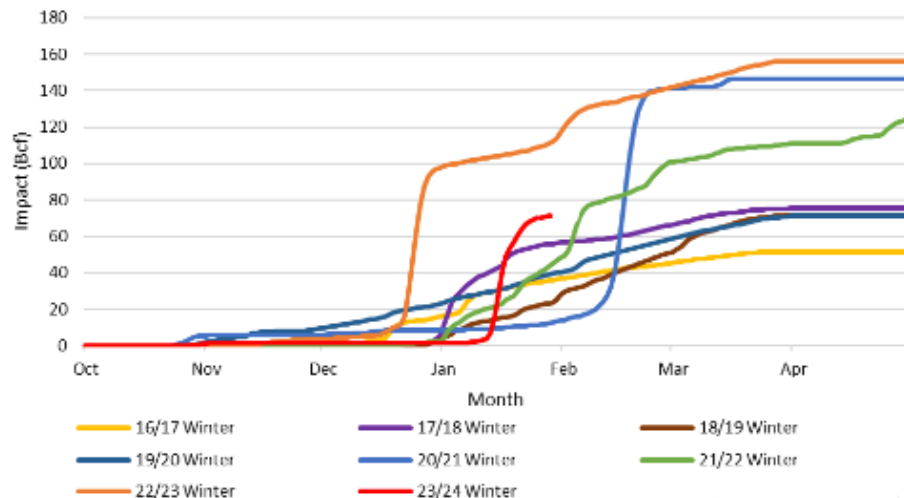
Freeze-Offs Briefly Impact Production

US Dry Gas Production (Bcf/day)



- The latest production figures from the EIA show 2023 ended at a very steady rate with the last 5 months in very narrow range from 104.5 to 104.7 Bcf/d.
- 2024 has started with a bit of a whimper as freeze-off impacts from Winter Storm Heather finally come to roost this winter.
 - Daily production reached a daily minimum ~90 Bcf/d on January 16 but has since rebound as of late to ~105 Bcf/d
 - Total freeze-offs winter-to-date is running just under 80 Bcf which is just above the 7-year median.

Annual Cumulative Freeze-off Impact



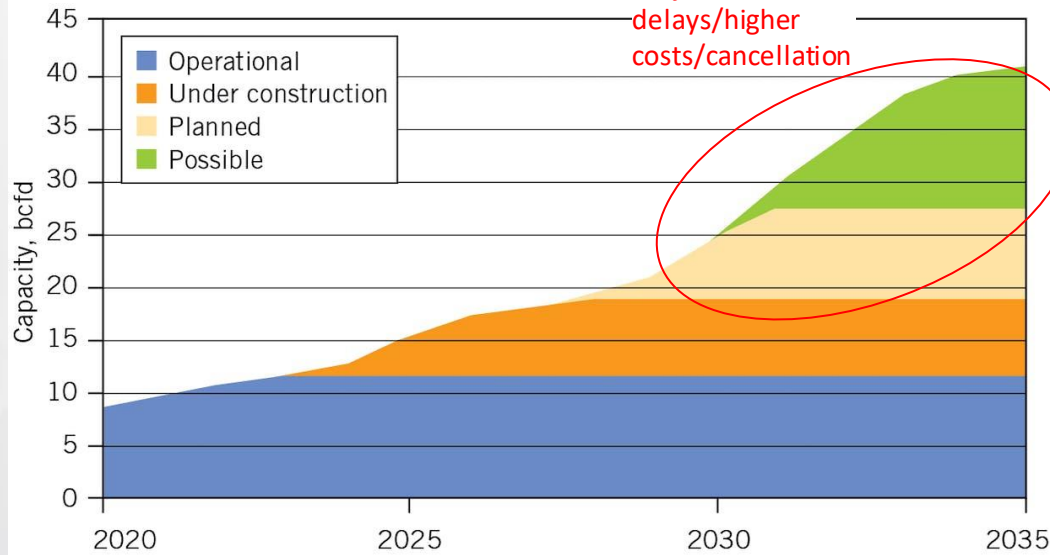
Source: EIA, Constellation,



Customer Takeaway: Winter freeze-offs are to be expected and early January's production loss was the first of its kind for the season. Recent readings near 105 Bcf/d show this occurrence was just a blip on the radar of an otherwise bearish fundamental - though the 2024 EIA forecast does show output flattening which could tighten the market slightly.

Biden Administration Instructs DOE to Review LNG Approvals

US LNG EXPORT CAPACITY

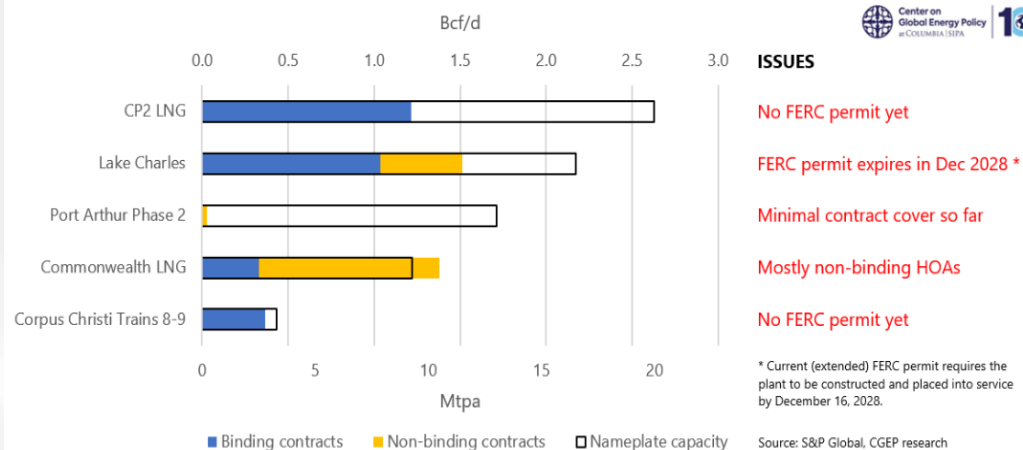


Source: Baker & O'Brien analysis

- A pause, announced on January 26, for any pending LNG export facility approval is expected to last several months as the Department of Energy will review the economic and environmental impacts of such projects seeking federal approval.
- This will not impact facilities currently under construction with all necessary approvals in hand meaning LNG export growth is still assumed to increase ~5 Bcf/d in the next 2-3 years.
- Projects looking to come online in 2027 and beyond could be most impacted by this (see “planned” and “possible” in left graph & below)

[Statement from President Joe Biden on Decision to Pause Pending Approvals of Liquefied Natural Gas Exports | The White House](#)

US LNG Export Projects Pending DOE Approval*



Customer Takeaway: Net market impacts are not yet known as this amounts to only a freeze on authorizations. Results of the review will ultimately determine the fate of long-term LNG exports in the US. What was a seemingly freight train of natural gas growth heading down the tracks has caught a smidge of headwinds due to sustainability and politics. More to come on this issue...

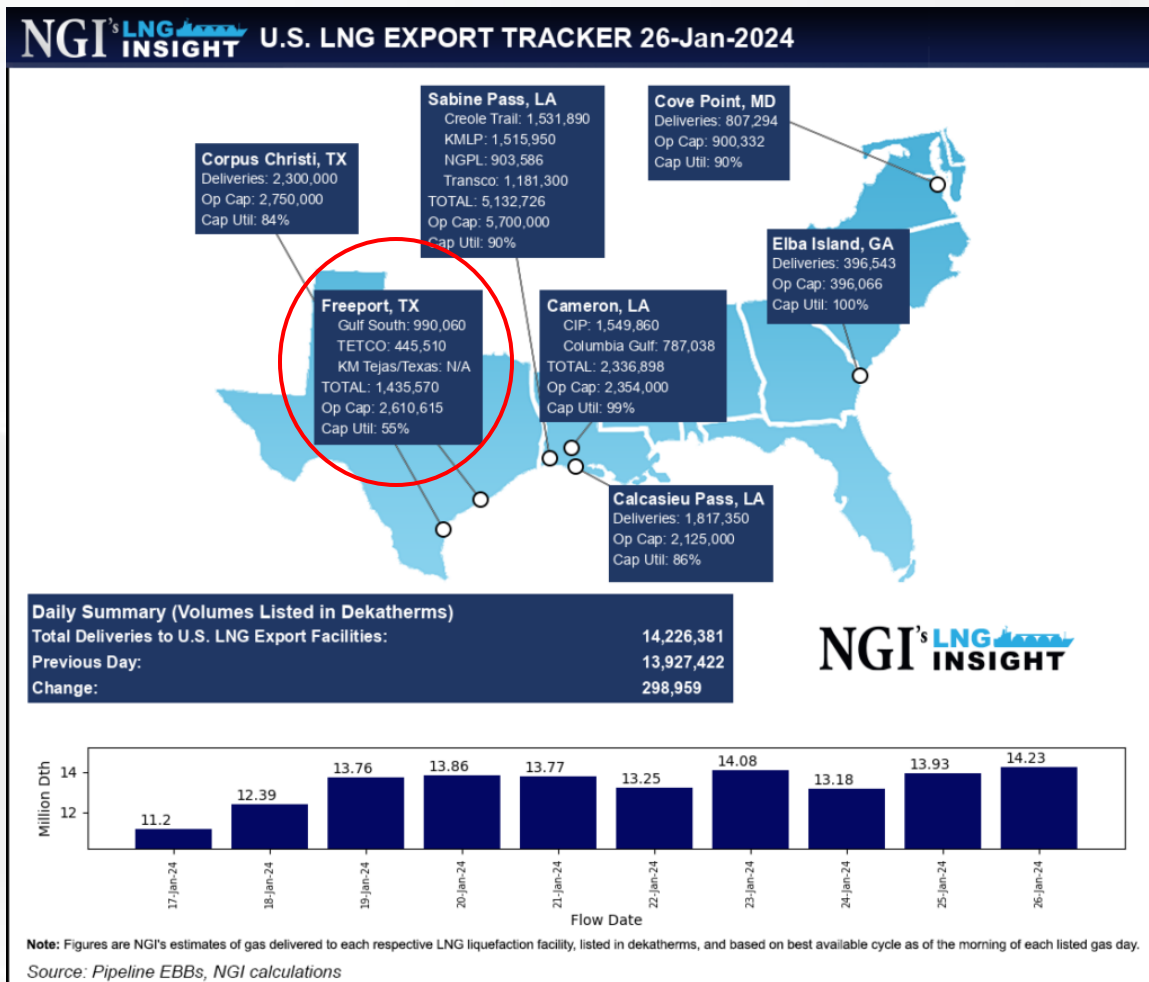
Sources: Oil & Gas Journal, Bloomberg, Columbia SPIA

*Pre-FID, to export to non-FTA countries

Freeport LNG Back in the News

- Freeport LNG announced that its 3rd train which liquifies ~0.7 Bcf/d will be offline for about a month to replace one of its refrigeration electrical motors with an on-site spare.
- The motor was knocked out of service after the deep freeze from Winter Storm Heather on January 17.
- As some may remember, this is the same terminal which was taken offline in June of 2022 for ~9 months due to an unplanned outage/explosion and subsequent delays in returning to full-scale operations.

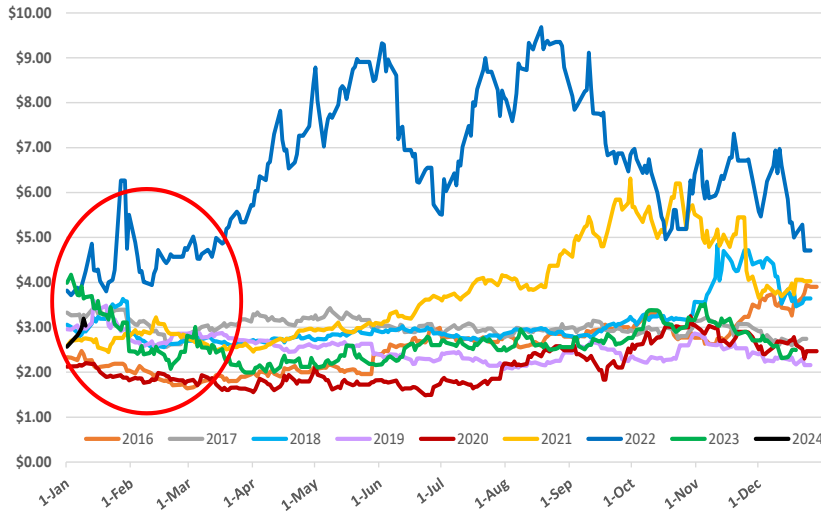
Customer Takeaway: Total impacts to this announcement are expected to be minimal as a month from one train amounts to only ~7 cargoes but still bearish for market nonetheless. We've seen this terminal struggle to ramp back up following previous outages so the market will for sure keep tabs on progress in the next month or so.



Sources: Pipeline Gas and Journal, NGI

What to Do? Seasonal Lows Typically Come in Q1

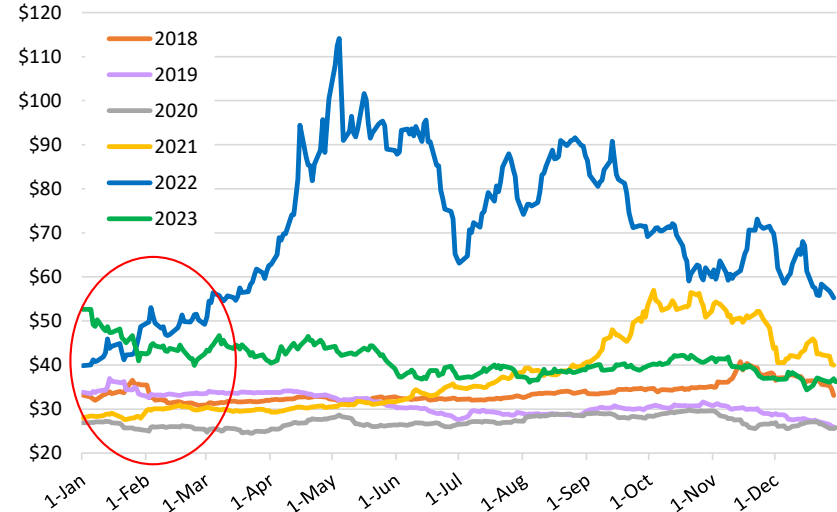
Yearly Comparison of NYMEX Prompt Month Natural Gas



NYMEX Prompt Mo Nat Gas

	Date	Price
2023	29-Mar	\$ 1.99
2022	4-Jan	\$ 3.72
2021	22-Jan	\$ 2.45
2020	25-Jun	\$ 1.48
2019	5-Aug	\$ 2.07
2018	12-Feb	\$ 2.55
2017	21-Feb	\$ 2.56
2016	3-Mar	\$ 1.64
2015	17-Dec	\$ 1.76
2014	26-Dec	\$ 3.01

PJM West 12-Month Rolling Power Strip



12-Mo Rolling PJM

	Date	Price
2023	12-Dec	\$ 42.86
2022	3-Jan	\$ 46.63
2021	22-Jan	\$ 29.81
2020	23-Mar	\$ 27.21
2019	31-Dec	\$ 29.17
2018	16-Feb	\$ 33.95
2017	12-Jan	\$ 32.58
2016	29-Feb	\$ 34.39
2015	15-Dec	\$ 35.14
2014	9-Jan	\$ 40.76

Customer Takeaway: Natural gas and power forward prices, historically, have shown a consistent trend in which yearly lows for those contracts have hit lows in Q1 more than any other time period throughout the year.

Source: CEG

Thank you

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