



# Natural Gas Market Overview

27 February 2024

# Today's Speaker

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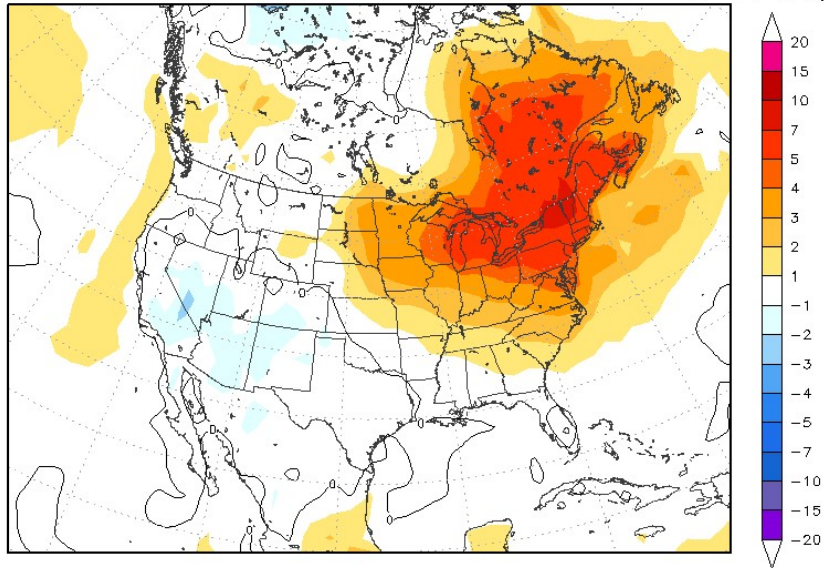
**Brian Habacivch**  
**Principal, Commodities Management Group**  
**Constellation Energy Corp**

# Weather

# Winter: Not Made Like It Used to Be

## European 16-30 Day Forecast

2 m Temperature Anomaly (F) ECMWF-WEEKLY  
Valid: 00z Tue 05 Mar 2024 – 00z Wed 20 Mar 2024 16–30 Day



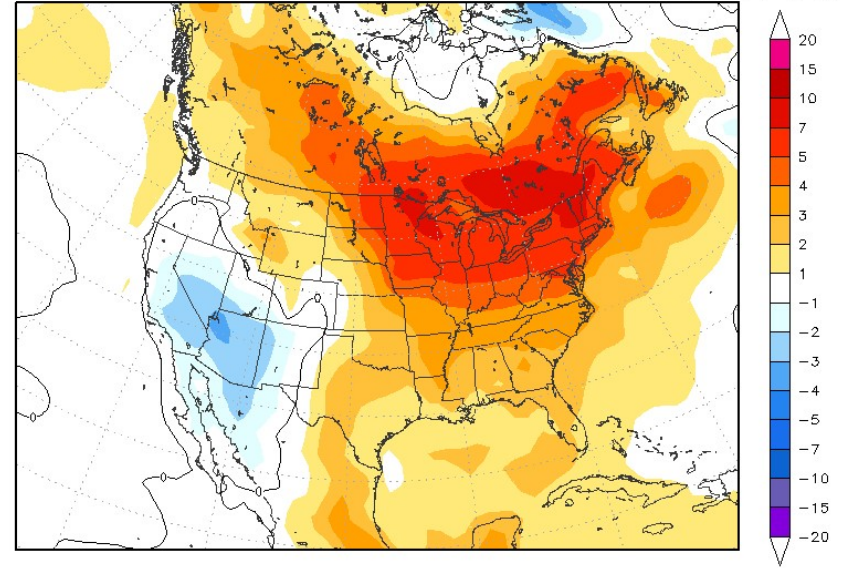
GrADS: COLA/IGES

StormVistaWxModels.com

Init: Mon 19 Feb 2024  
2024-02-19-15:18 ET

## American 16-30 Day Forecast

2 m Temperature Anomaly (F) (16 mems, last 4 cycles) CFS-WEEKLY  
Valid: 00z Wed 06 Mar 2024 – 18z Wed 20 Mar 2024 16–30 Day



GrADS: COLA/IGES

StormVistaWxModels.com

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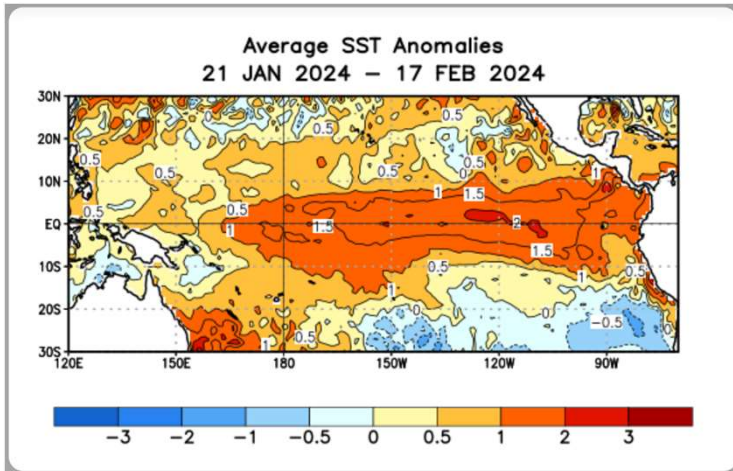
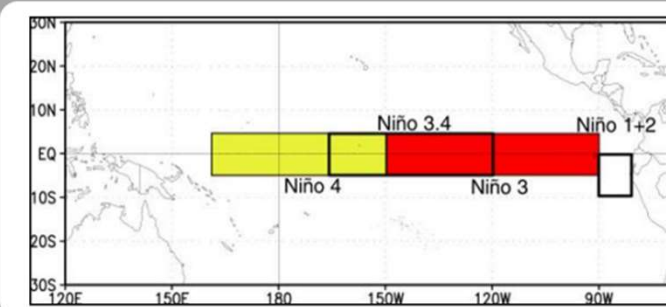
- Despite Arctic air in the pattern at times over the last half of February, this winter is set to take the title as warmest on record with near 2180 PWHDDs. This smashes the old record of 2250, set in the winter of 2015-16.
- Both the European and American weekly models suggest variability in the 16-30 day forecast across the South and West due to storminess; a typical El Niño signature. Generally, a mild weather pattern is likely in the Midwest and the East for the next few weeks. Lower 48 demand should average below normal on most days during the first half of March.

Sources: CWG, Storm Vista

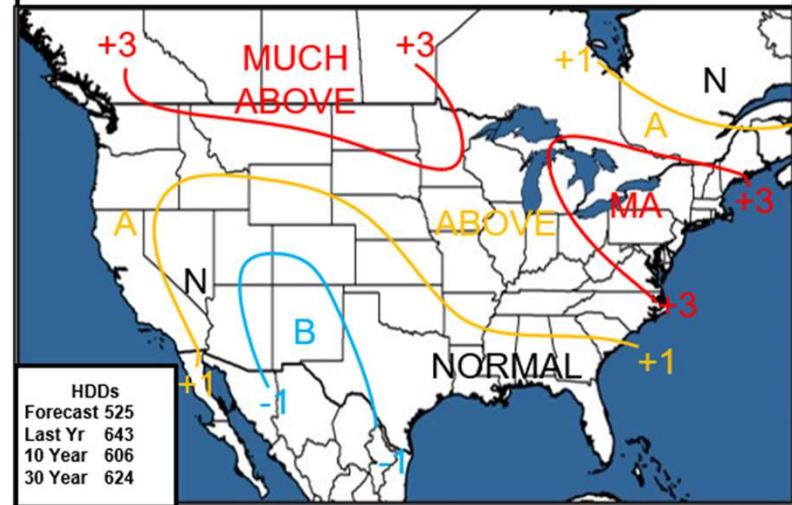
# El Niño Begins to Fall Apart

The latest weekly SST departures are:

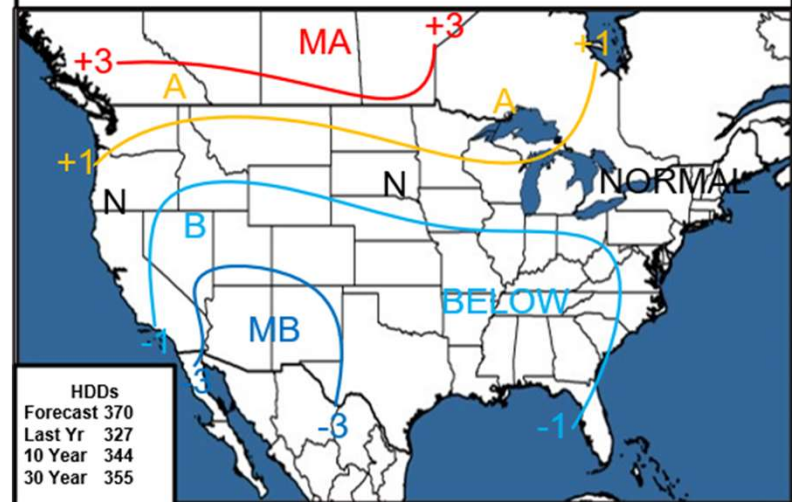
Niño 4	1.1°C
Niño 3.4	1.5°C
Niño 3	1.5°C
Niño 1+2	1.1°C



Constellation March 2024 Forecast



Constellation April 2024 Forecast



Sources: Constellation, NCEP, NOAA, CPC

# Supply & Demand Fundamentals



# Production Rebounds as Freeze Offs Thaw

## Days per 10,000 Lateral Feet Drilled



## Increased Completion Stages per Day...

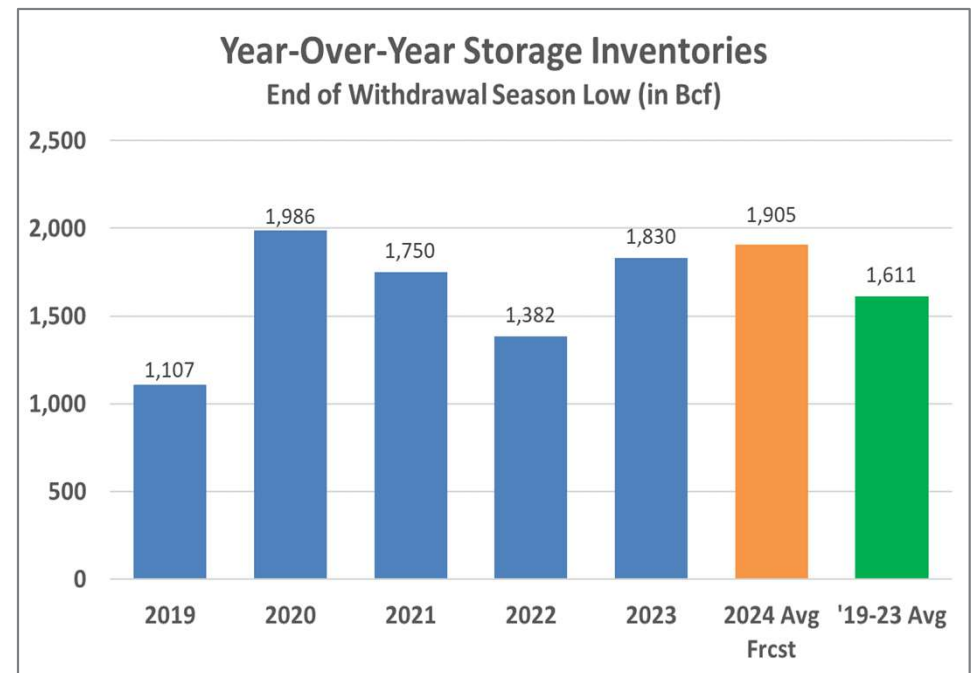
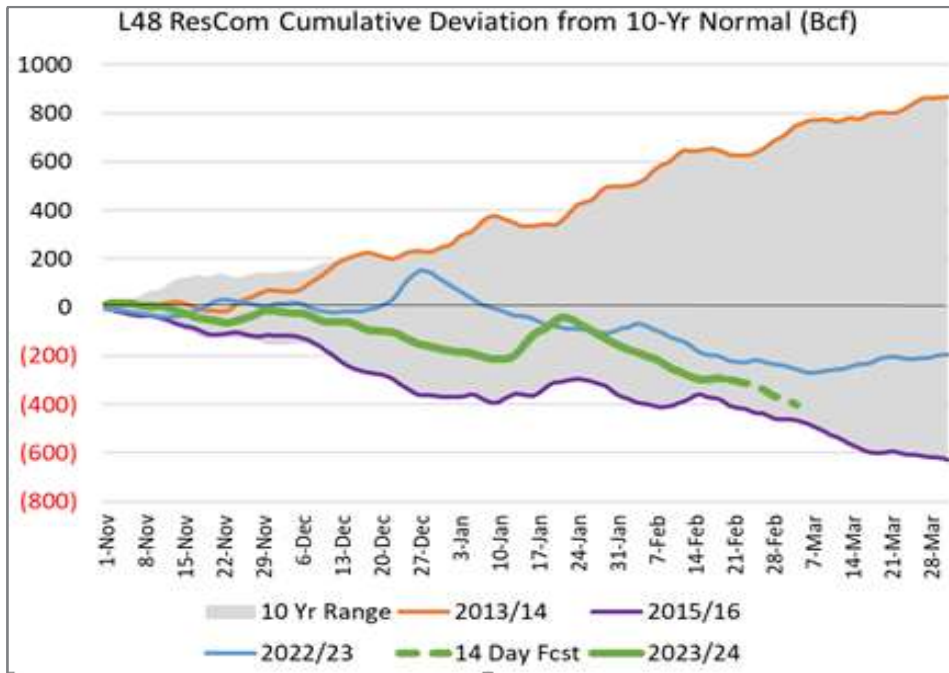


- Production is averaging ~105 Bcf per day in February.
- Freeze offs reached 62 Bcf cumulative level quickly in January but have plateaued since.
- 2024 Guidance: Several Appalachian producers have hedges in place but will curtail production if PA/OH prices drop below \$1/MMBtu. Producers such as Antero Resources and others continue to drive efficiencies in drilling and completion operations that are reducing costs.

**Customer Takeaway:** Gas production rebounded from a weather driven January slowdown returning to ~105 Bcf/d. With NYMEX prices below \$2.00 MMBtu, drilling budgets could be at risk of being trimmed as producers conserve capital despite recent efficiency gains resulting in lower break-even costs.

Sources: EIA, S&P Platts, Antero Resources

# Nat Gas Storage



- U.S. gas storage is 2,535 Bcf for week ending Feb 9<sup>th</sup> after a withdrawal of 49 Bcf came in below the estimate of 71 Bcf. Heating demand has diminished since mid-January's storms.
- The surplus over 2023 expanded to 255 Bcf (11%) and 348 Bcf (16%) over the five-year average.
- EIA's February Short Term Energy Outlook includes their forecast for an end of season gas stocks value of 1,905 Bcf. This is about 200 Bcf below where we are today.

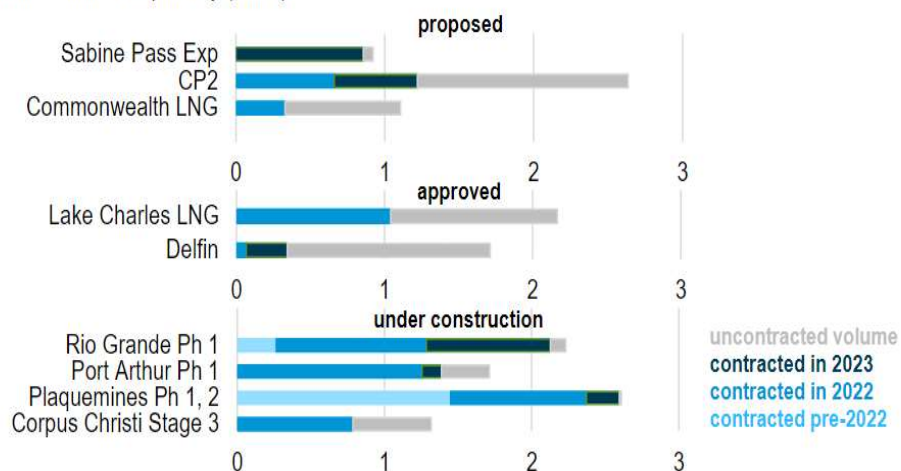
**Customer Takeaway:** With the peak of heating demand this winter likely in the rearview mirror, the market is looking for any sign that weather driven demand will assist in getting gas out of storage to create room for the injection season.

Sources: EIA, Constellation

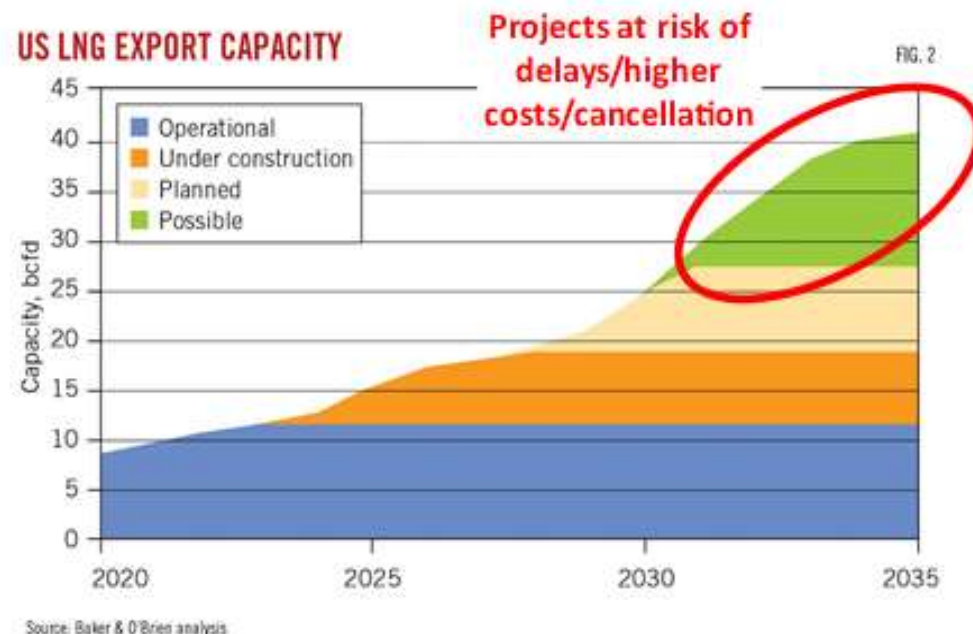


# Overview: LNG Export Moratorium

U.S. LNG production volumes contracted in SPAs by project status (as of Dec 31, 2023)  
billion cubic feet per day (Bcf/d)



Data source: U.S. Department of Energy, Office of Fossil Energy and Carbon Management, and company press releases  
Note: Approved=received respective regulatory approvals; Ph=phase; LNG=liquefied natural gas; SPA=sale and purchase agreement.



- Existing and facilities currently under construction are not affected.
- To provide for assessment (economic/environmental) as to future exports being in “the public interest”.
- White House energy advisor Amos Hochstein stated the review “could last 10-14 months” and then DOE will decide to either continue, pause or approve all or some projects”

**Customer Takeaway:** Approximately 10.5 Bcf/d of new LNG export capacity is under construction and not affected. Canadian projects are not affected, and Mexican projects under construction are largely not affected. About 4 Bcf/d of new export capacity near FID is likely delayed at least one year, 3rd and 4th wave projects are at risk.

Sources: Bloomberg, Reuters, WSJ

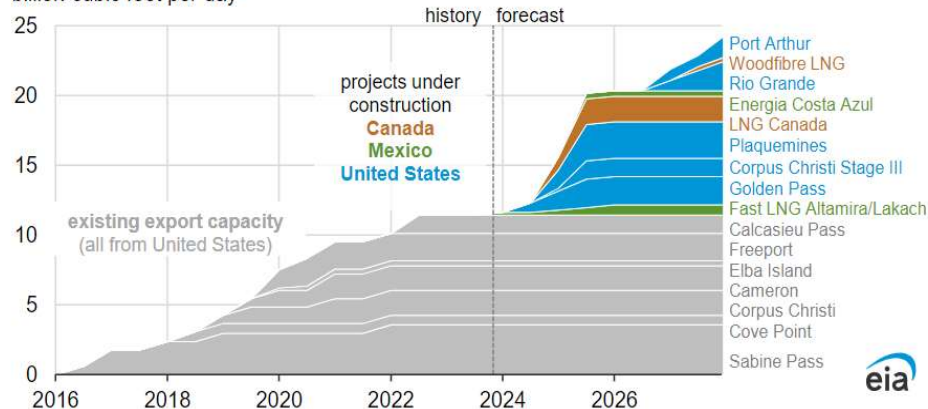
# Does this change the trajectory from Q4 2023?

NOVEMBER 13, 2023

## LNG export capacity from North America is likely to more than double through 2027

### Annual North American liquefied natural gas export capacity by project (2016–2027)

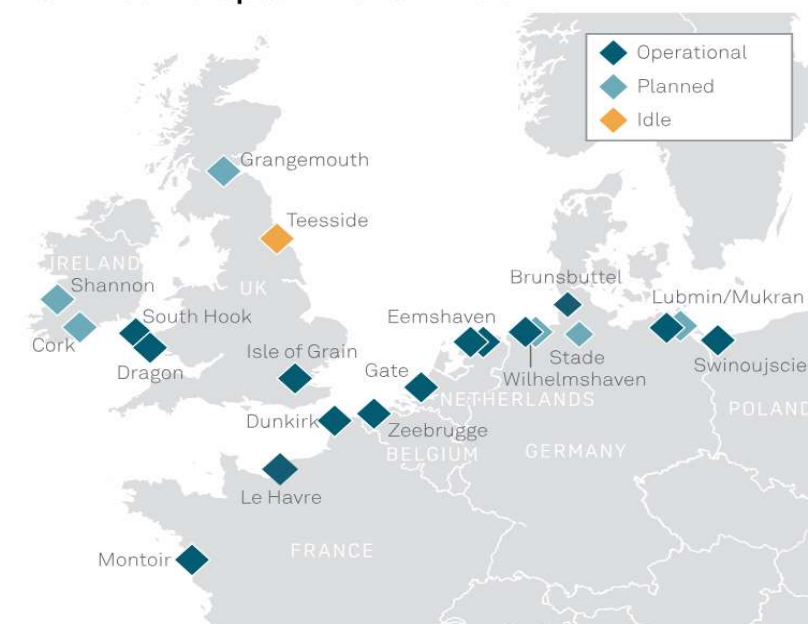
billion cubic feet per day



Data source: U.S. Energy Information Administration, *Liquefaction Capacity File*, and trade press

Note: LNG=liquefied natural gas. Export capacity shown is project's baseload capacity. Online dates of LNG export projects under construction are estimates based on trade press.

## Northwest European LNG terminals



Source: S&P Global Commodity Insights

- Near and mid-term outlook for exports is unchanged from Q4 2023.
- Since 2021, US LNG exports to Europe have tripled – in 2023, US LNG was 50% of EU imports.
- Europe built six new LNG import terminals since 2022 – six additional terminals are planned.

**Customer Takeaway:** Currently operating projects are unaffected and the narrative “US LNG exports to double by 2028-29” remains intact. Gas and power prices have not reacted to the moratorium. There are many long-term implications domestically and geopolitically, as well as from this November’s election.

Sources: EIA, S&P Platts

# NYMEX Natural Gas

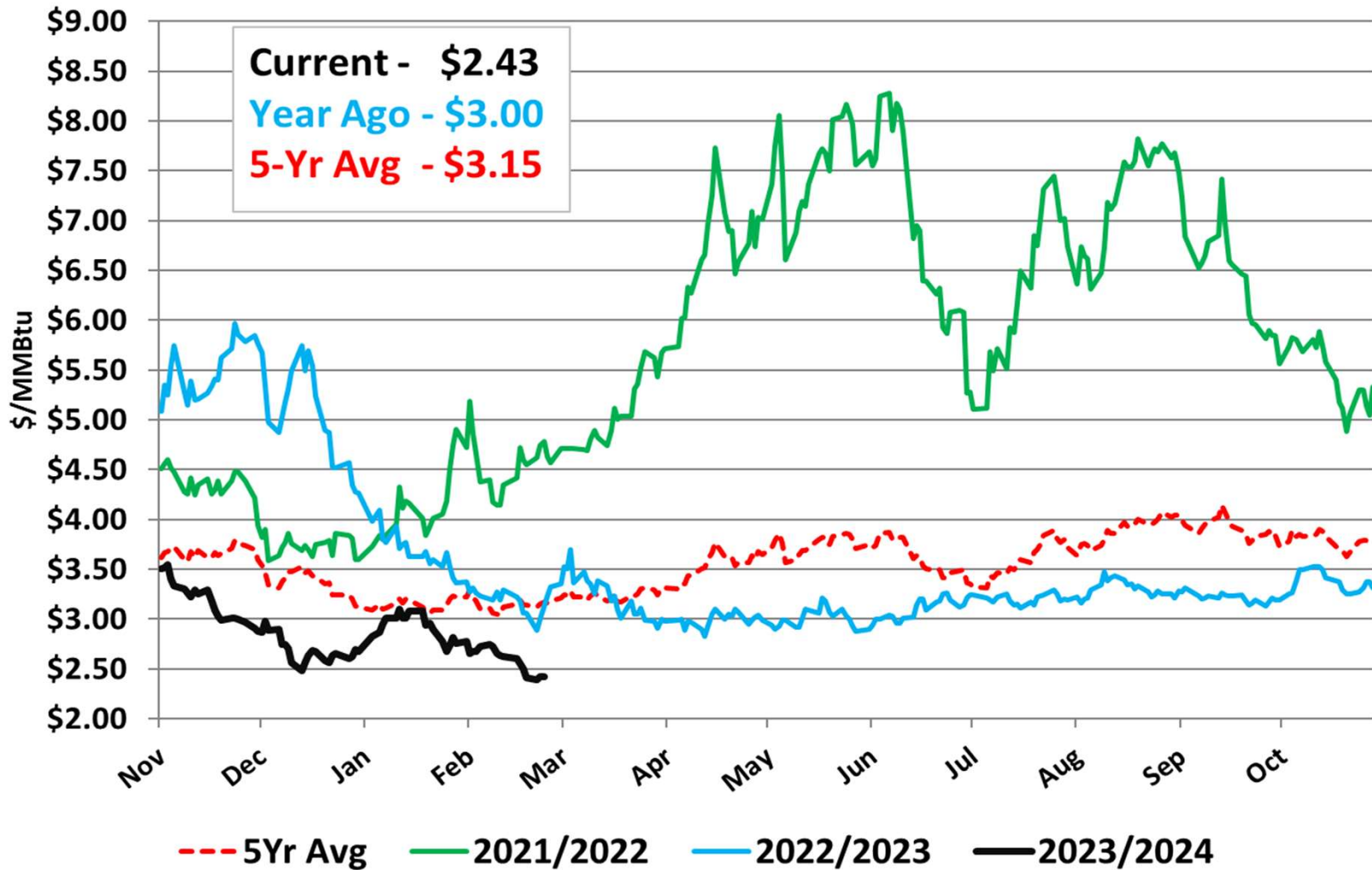


**Customer Takeaway:** NYMEX prices are close to 2020 lows of \$1.48/MMBtu in what is now the warmest winter since 1950 and continued strong production. LNG exports and power burns continue to support demand but end of season storage expectations at ~1.9 Tcf are providing plenty of security.

Source: Nymex

# NYMEX 12 Month Strip

## NYMEX 12-Month Rolling Strip Nov-Oct Trend

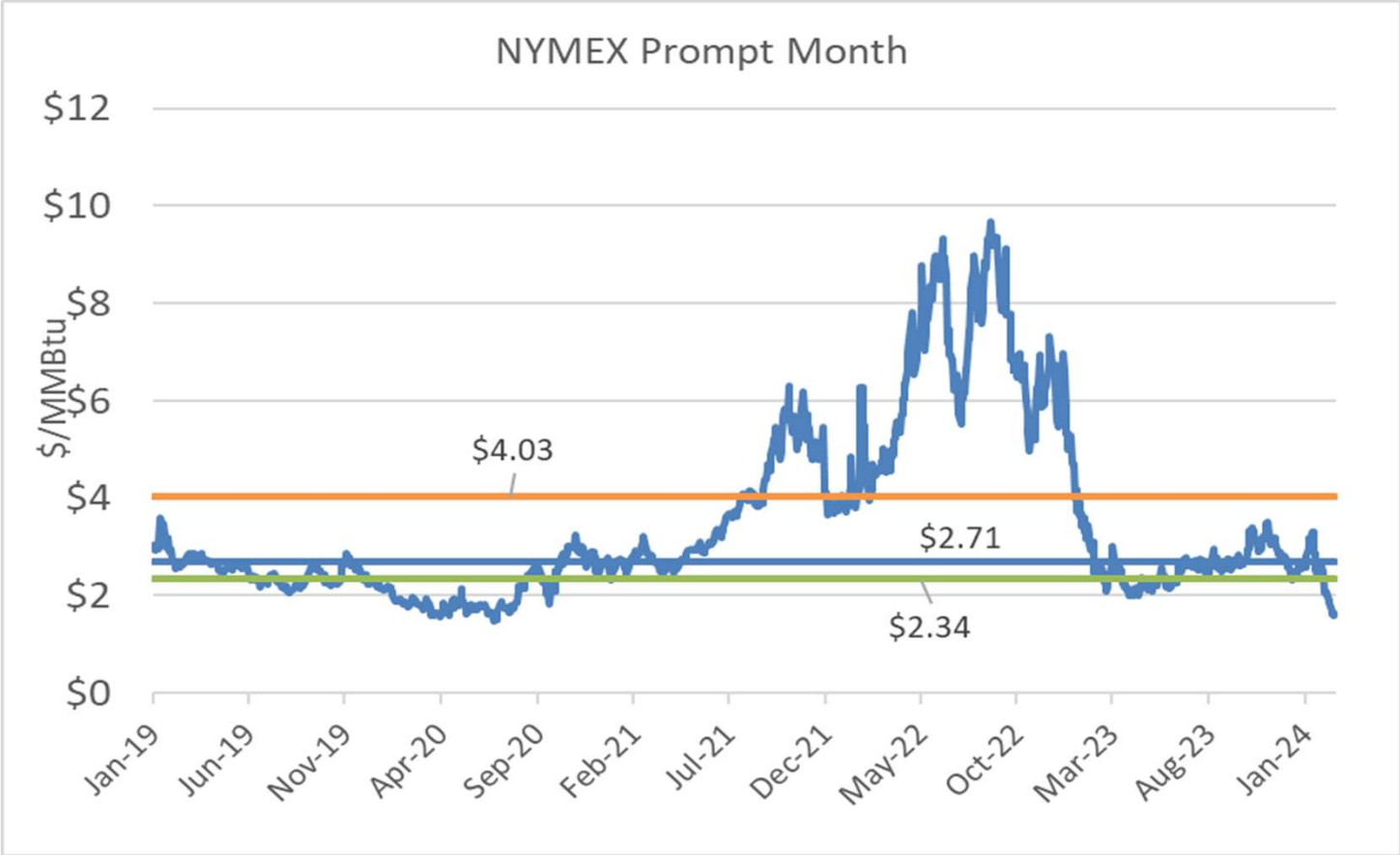


Source: Constellation

Data as of COB 2.20.24



# NYMEX by Quartile: 2019 to Current



		Percentiles			
Min	25th	50th	75th	Max	NYMEX -1d
\$1.48	\$2.34	\$2.71	\$4.03	\$9.68	\$1.58

**Customer Takeaway:** NYMEX prompt month is \$1.58/MMBtu as of Feb 20<sup>th</sup> and is ~\$1.10 below the median 5-year average price (\$2.71). Using quartiles to view current prices helps us understand the distribution of data and provides valuable insights as to how current prices can be bucketized relative to history.

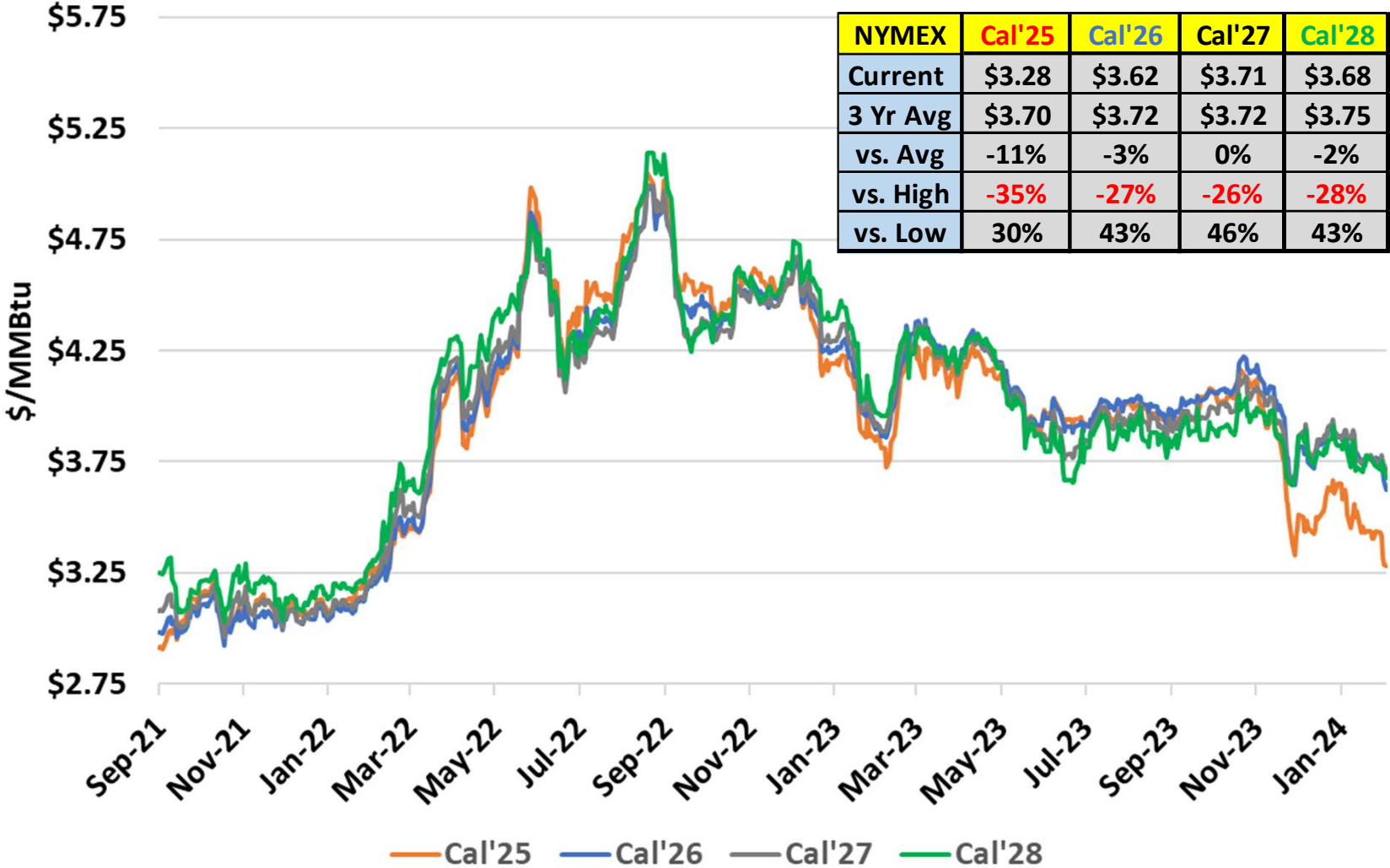
Sources: Nymex, Constellation





# NYMEX Natural Gas Forward Strips

## NYMEX Natural Gas Forward Calendar Strips



Source: Constellation

Data as of COB 2.20.24



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# Energy Market Update February 2024

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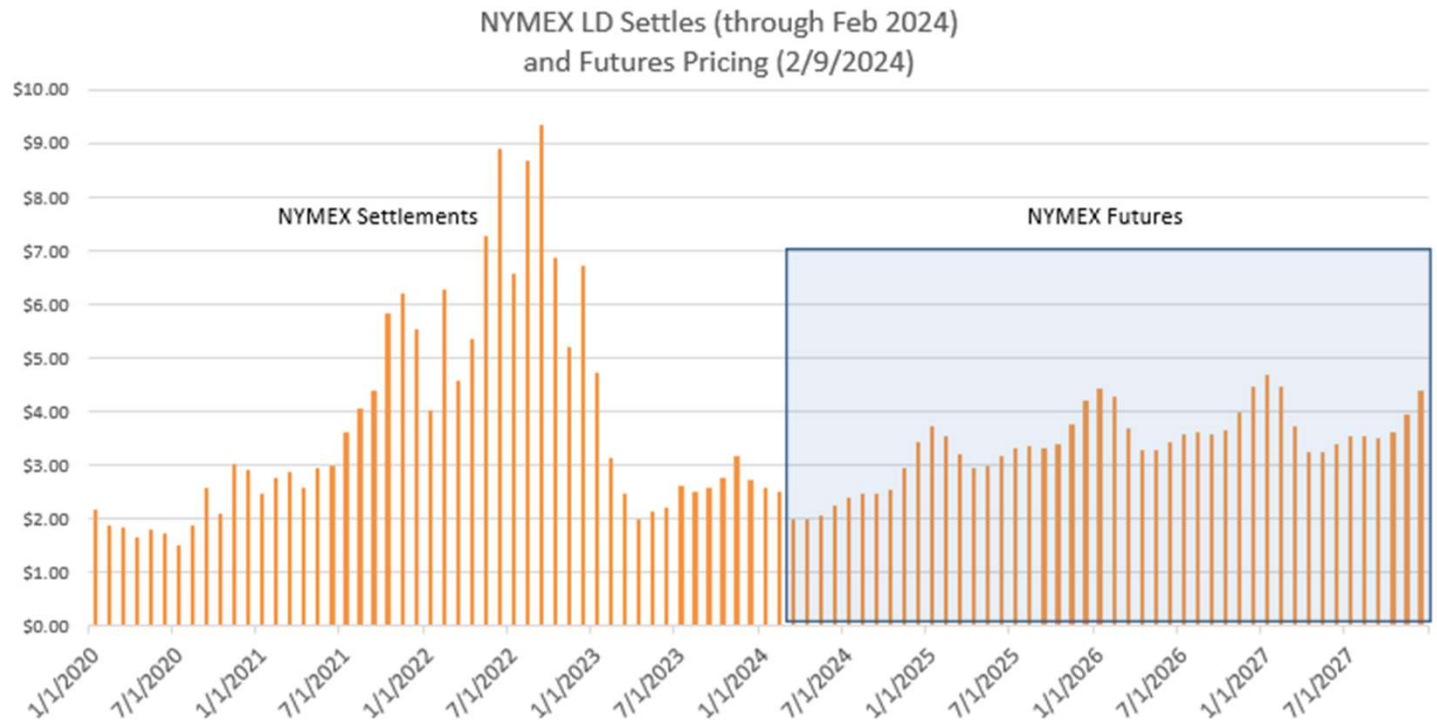
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# NYMEX Natural Gas Pricing (2/9/2024)

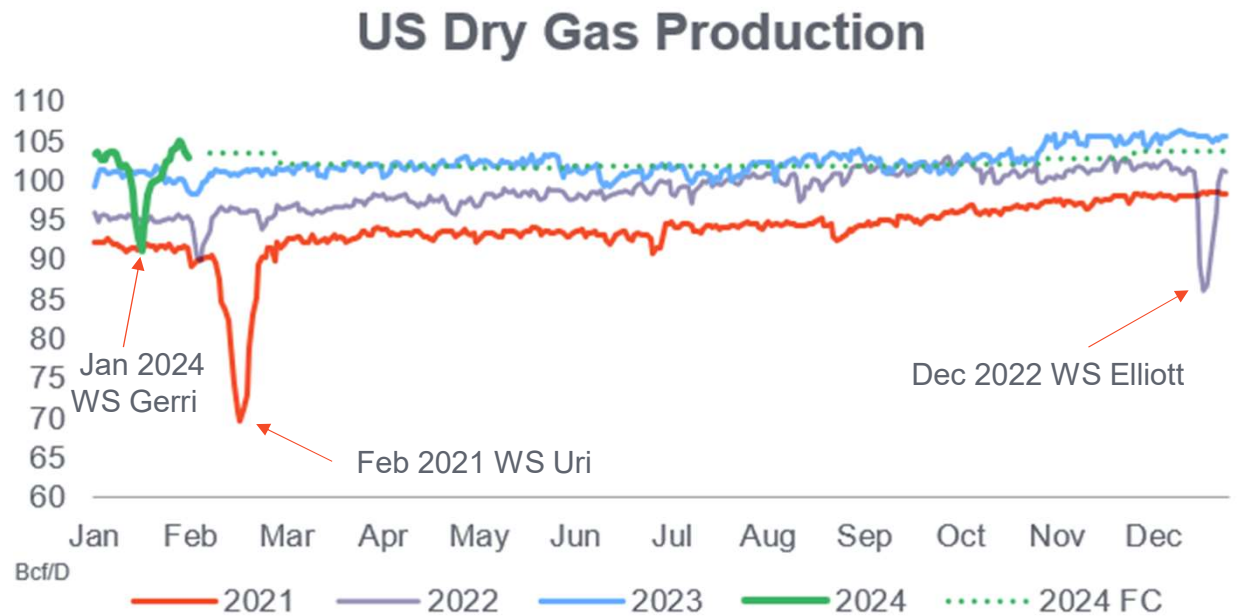
- Rem Cal 2024: \$2.39
- Cal 2025: \$3.42
- Cal 2026: \$3.76
- Cal 2027: \$3.764





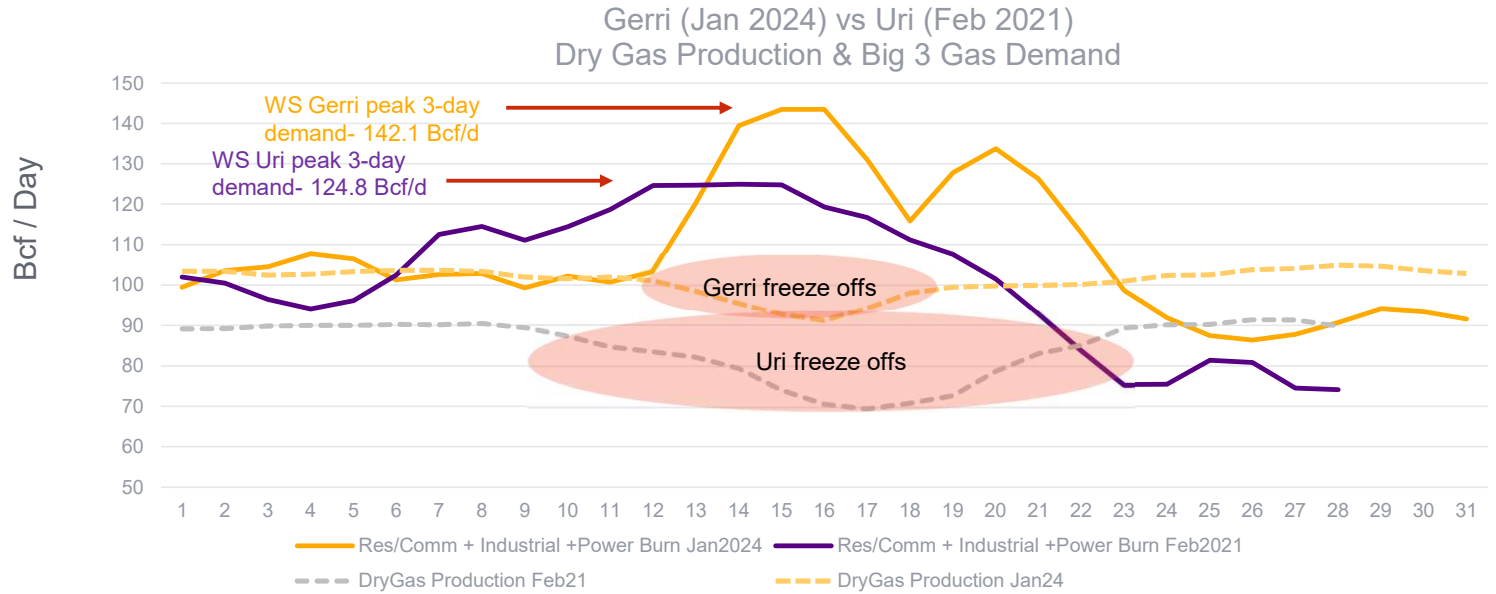
# Natural Gas Production - US

- January 2024 production averaged 101.05 Bcf/day, down 4.45 Bcf/day from Dec '23
- Production was declining at start of 2024 but declined even more due to freeze-offs from WS Gerri



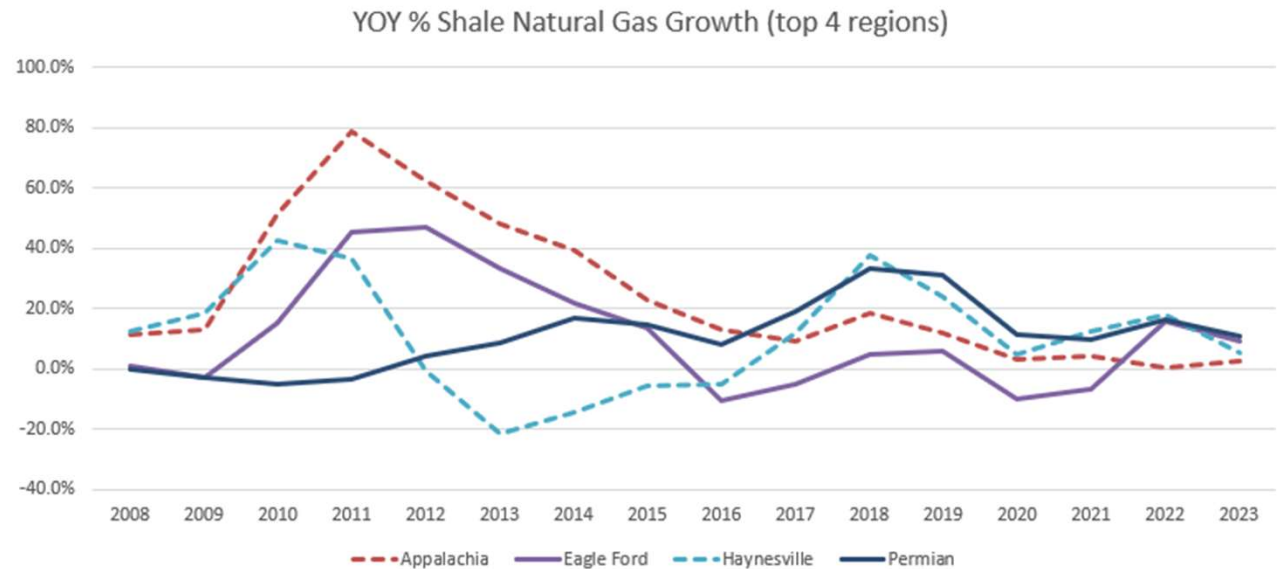
# Jan24 Winter Storm Gerri & Feb21 Winter Storm Uri

- Big 3 peak demand (Res/com, Industrial, Power gen) 17.3 Bcf/day higher for WS Gerri vs WS Uri
- But freeze offs and time offline nearly half of WS Uri
- National average spot pricing during Gerri \$16.70/MMBtu vs Uri at \$70.90



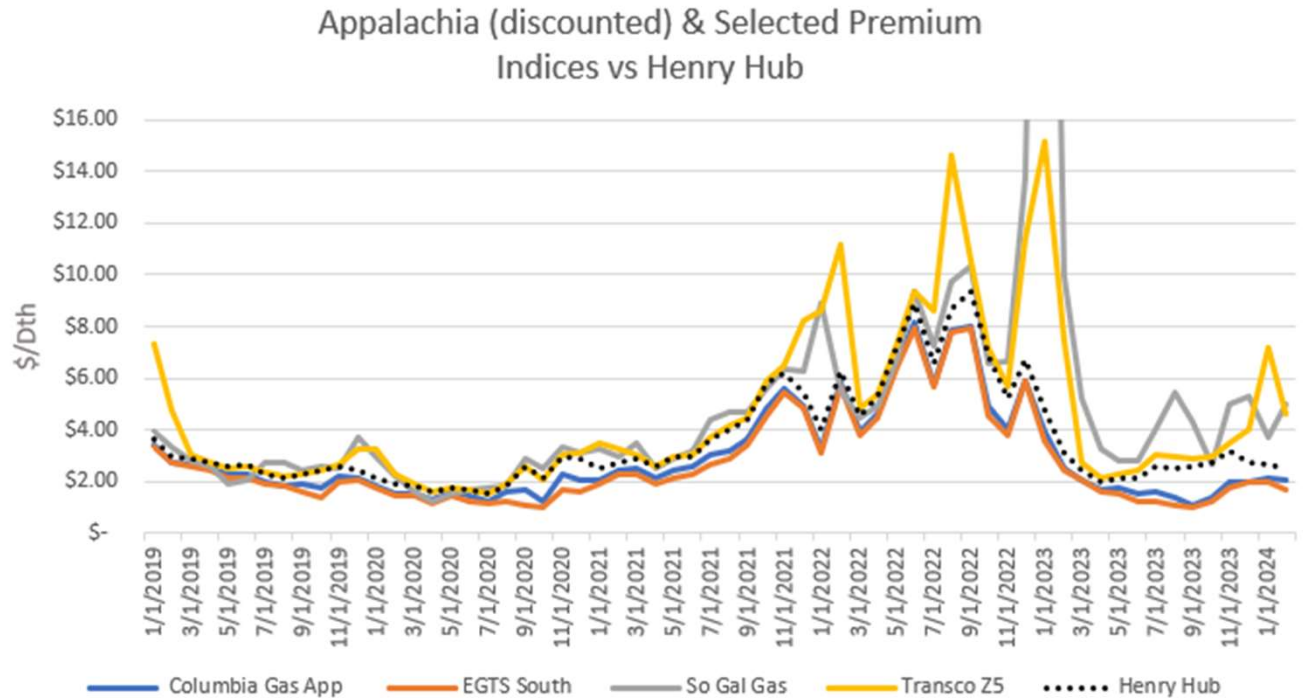
## Natural Gas Growth (top 4 producing regions)

- YOY natural gas growth out of Appalachia has declined 4 of last 5 averaged 4.5% YOY growth over the last 5 years
- Haynesville has averaged 12.9% YOY growth over the past 5 years and Permian has experienced 15.9% YOY growth
- Average new gas well in Haynesville produces 13,517 Mcf/d while Appalachia well produces 26,571 Mcf/d (EIA Drilling Productivity Report 1/16/2024)



# Discounted vs Premium Basis Pricing- 2019-2023

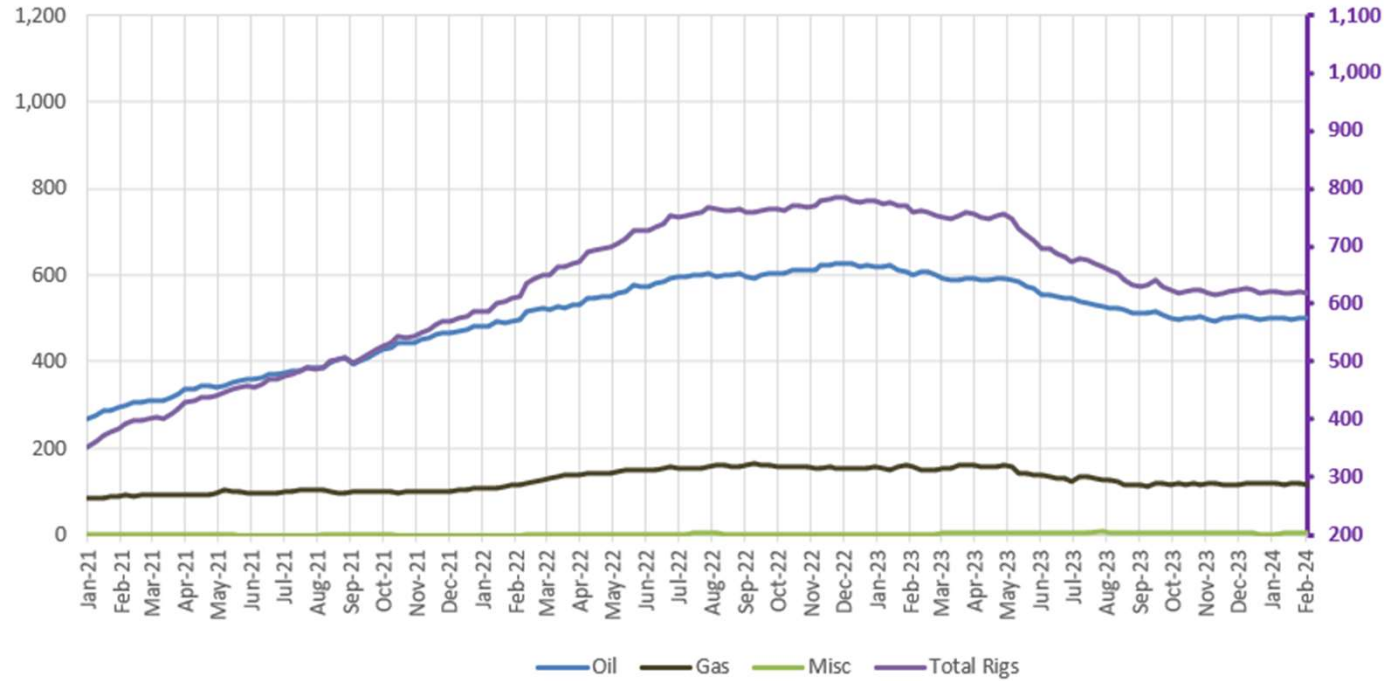
- Appalachian monthly Index pricing (TCO and Dominion So) have traded at an average discount \$0.62 and \$0.80/Dth, respectively to Henry Hub since 2019
- Premium markets do exist, like Transco Z5 (SE Atlantic Coast) and SoCal Gas (California), which traded at a \$1.03 and \$1.46/Dth premium over the same period



# Rig Counts

- Total rig counts for the week ending 2/2 down 2 to 619
- Oil rigs down 100 rigs from year ago levels, currently at 499
- Gas directed rigs at 117 currently, down 41 from year ago
- Temporary price spikes by cold weather are not reflected in futures pricing, which is a driver for additional rigs

US Drilling Rig Count

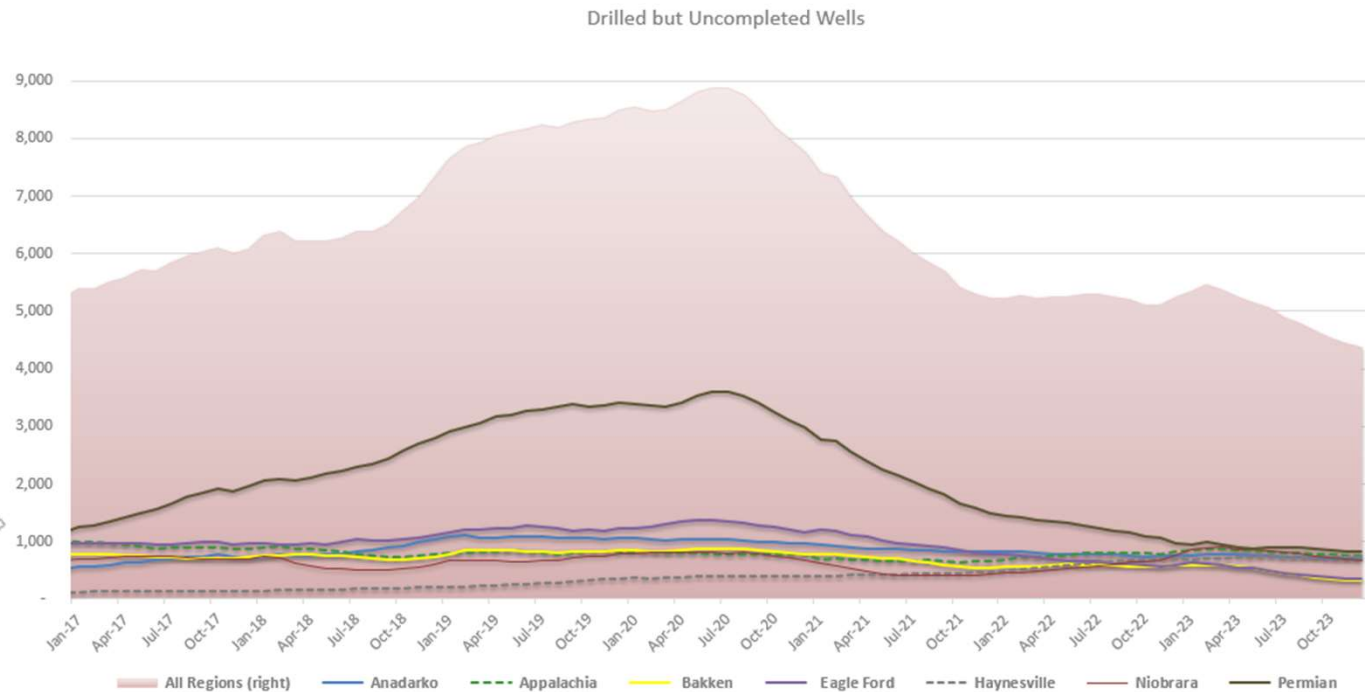
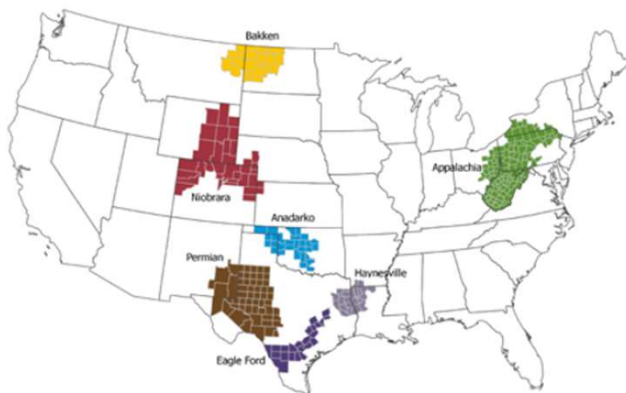


Source: Baker Hughes



# But Drilled but UnCompleted (DUC) Wells

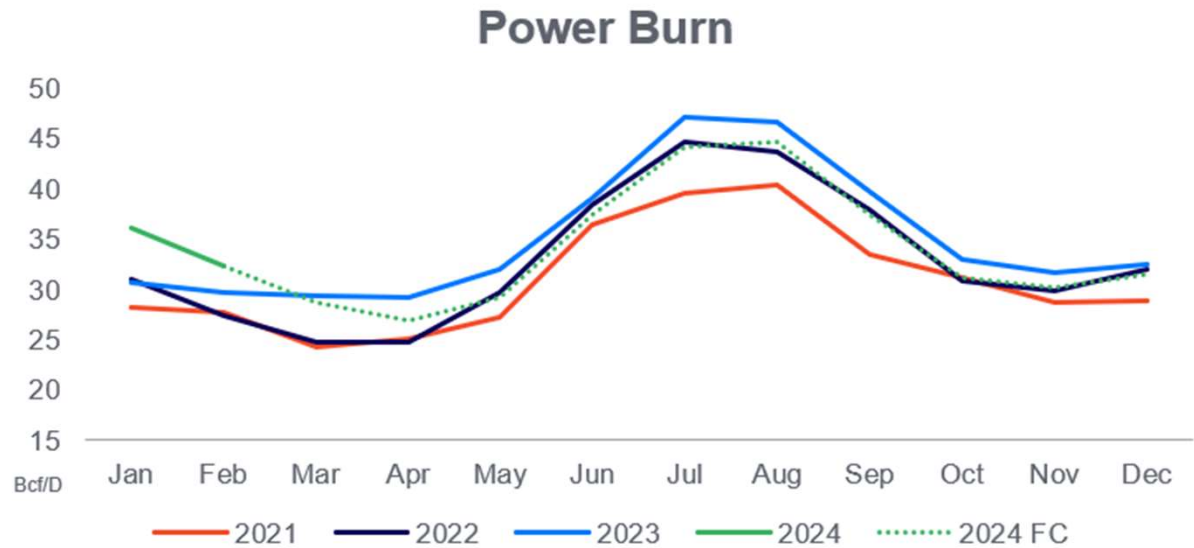
- Currently at 4,374 wells
- DUC count continues to rapidly decline, losing another 64 last month and 866 in the past twelve months
- Both Exxon and Chevron recently announced plans to expand Permian growth second half or 2024 and stockpile DUCs



Source: EIA Data

## U.S. Power Demand

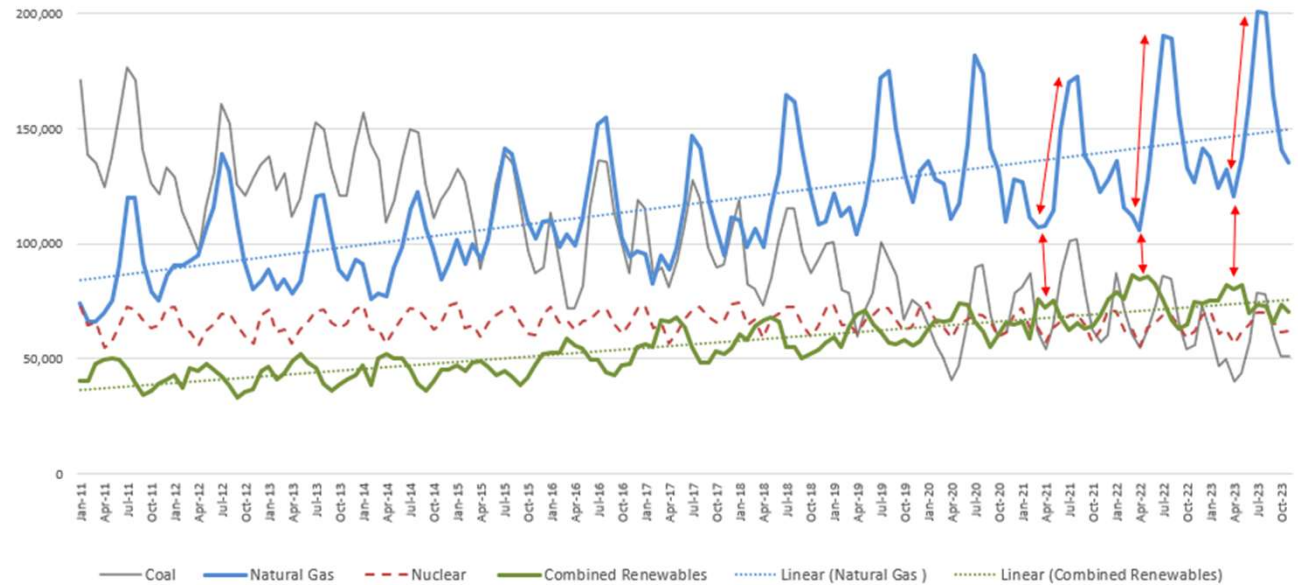
- Power burn for natural gas in January averaged 36.2 Bcf per day
- 5.5 Bcf per day more than January 2023, which was an extremely mild weather month
- Low gas prices in Feb should incentivize coal to gas switching near term



# Power Generation by Fuel Trends

- Coal demand continues to fall
- Renewables and natural gas continue to rise
- Overall power demand is increasing with electrification of nearly everything
- Natural gas peaks and valleys of demand are widening with lowest demand in Apr/May (highest renewable production)
- 12-month average
  - Natural gas 42.8%
  - Renewables 21.3%
  - Nuclear 18.5%
  - Coal 16.5

Power Generation by Fuel Source  
Thousand MWh

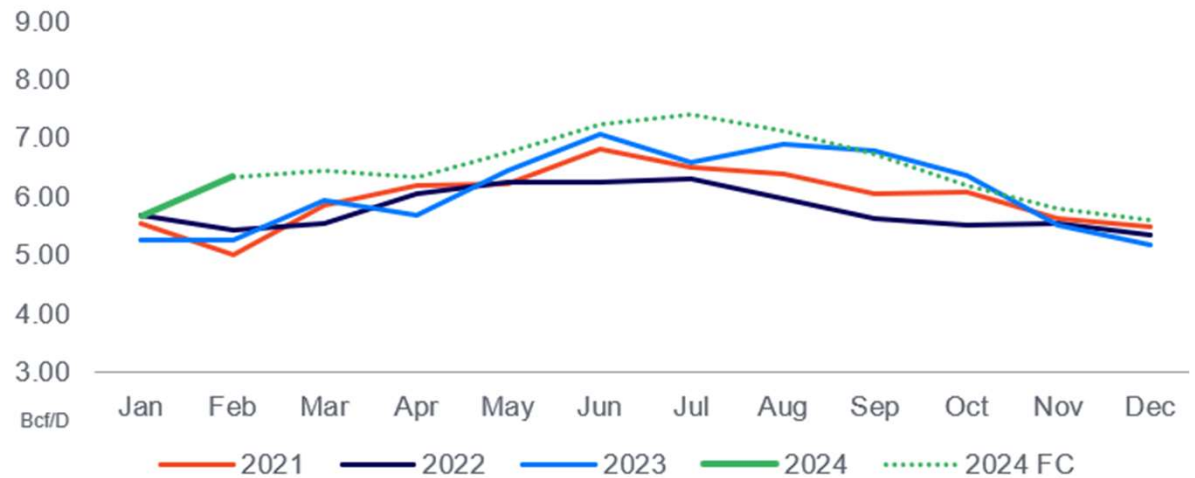


Source: EIA data

## U.S. Exports to Mexico

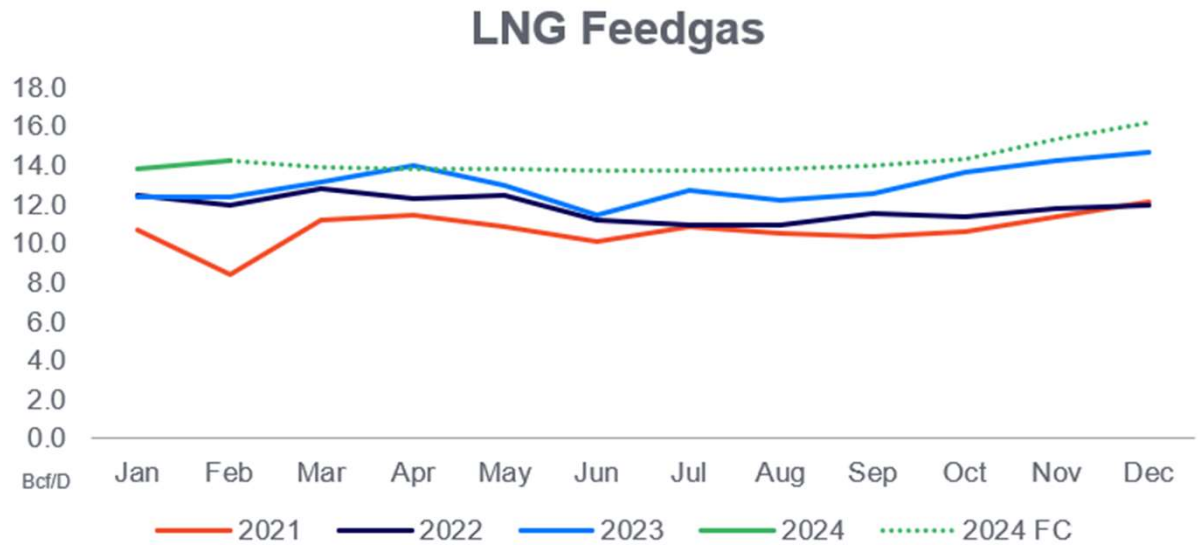
- Exports to Mexico averaged 5.67 Bcf/day and in line with previous years
- Exports expected to jump in February due to healthy US storage, low US gas prices and Freeport LNG down 1 train
- New export capacity coming

### Net Exports to Mexico



# U.S. LNG Feedgas

- LNG exports rose in January to average 13.83 Bcf/day
- New record for January by eclipsing Jan 2022 by 1.38 Bcf per day
- Limited LNG growth until Q4 this year when potential commissioning volumes start to materialize
- Golden Pass, Plaquemines & Corpus Christie III likely online 2025



Market Update

# LNG Pricing 2/12/24

- Henry Hub prompt Mar now at \$1.75/MMBtu
- European and Asian benchmarks remain a premium to Henry Hub
- Current LNG pricing (MMBtu)
  - JKM- \$9.44
  - TTF- \$8.13
  - NBP- \$7.92
  - Henry Hub- \$1.75

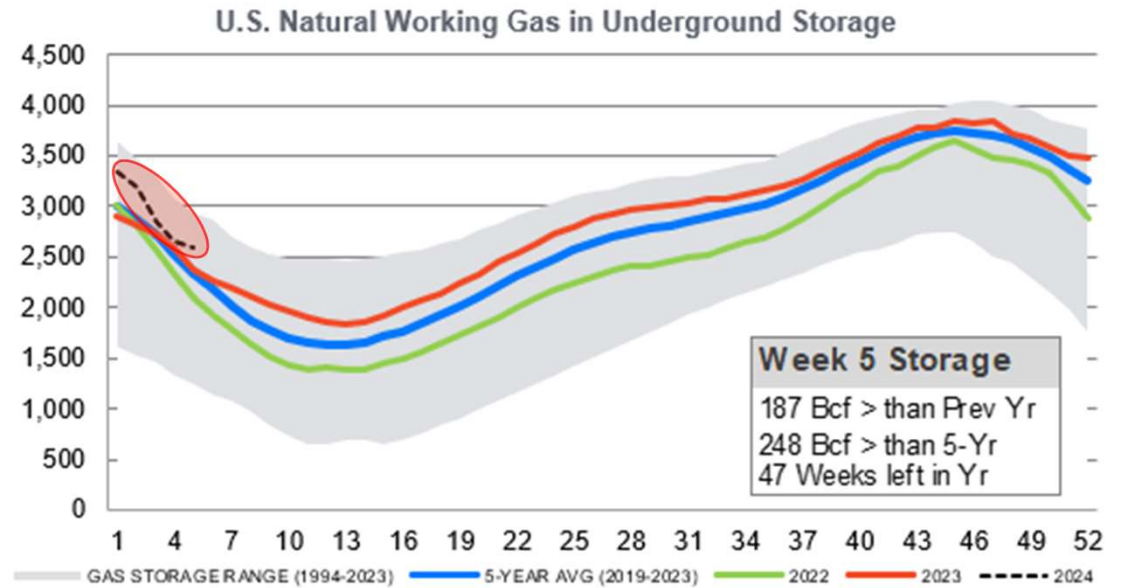


Source: Bloomberg



# U.S. Natural Gas Storage (week 5)

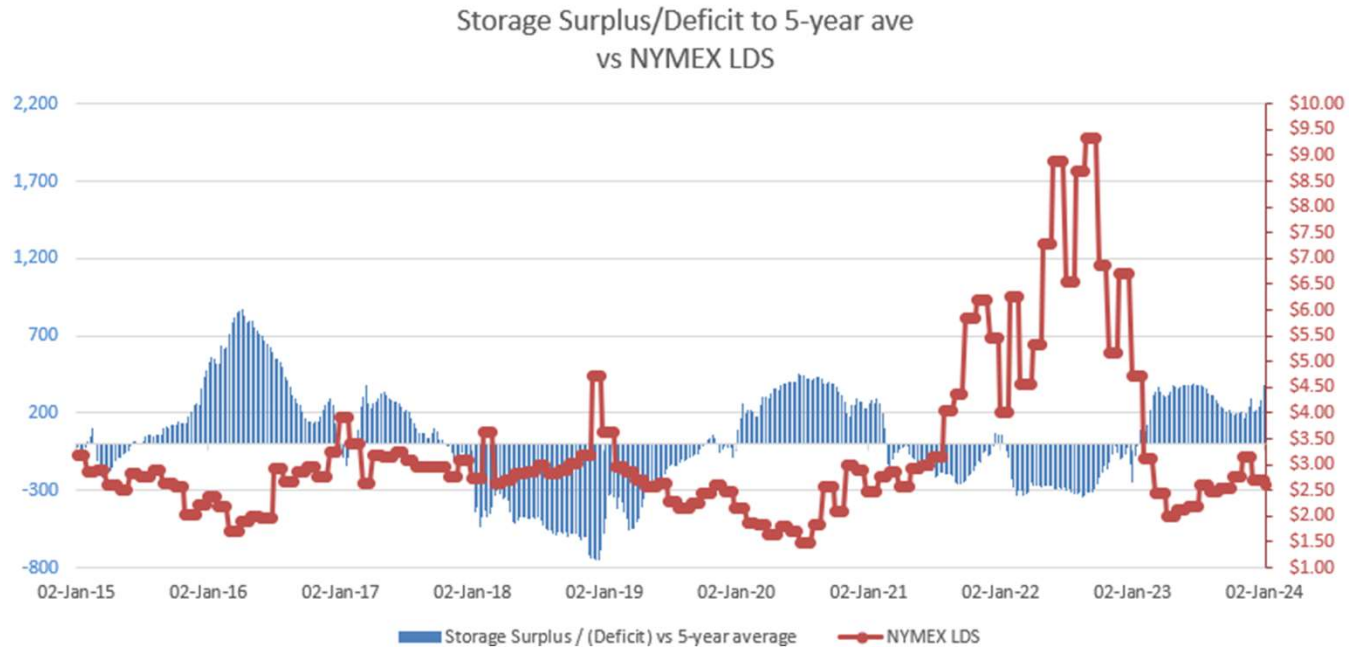
- 2024 started with a significant YOY storage surplus of +436 Bcf
- But the surplus has fallen to 187 Bcf YOY surplus due to WS Gerri draws
- Next two EIA storage reports should help replenish significant amounts of the YOY surplus
- Likely a YOY surplus this summer



Source: EIA Data

# Storage Status Correlation to NYMEX Pricing

- NYMEX LDS pricing is inversely correlated to the current year storage surplus/deficit to the 5-year storage average
- The higher the storage surplus, the lower the NYMEX price & the larger the storage deficit, the higher the NYMEX price
- Summer of 2024 likely to have a significant storage surplus absent cold finish to winter or extreme hot summer
- Leading to weak summer gas prices



# Other Fuels

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Market Update

# Crude Oil WTI Prompt Contract (2/12/24)

- WTI March 2024 March 2024 up to \$76.88 2/12/24
- Continued Houthi attacks in Red Sea wreaking havoc on international logistics costs
- Causing longer transport routes and shipping delays



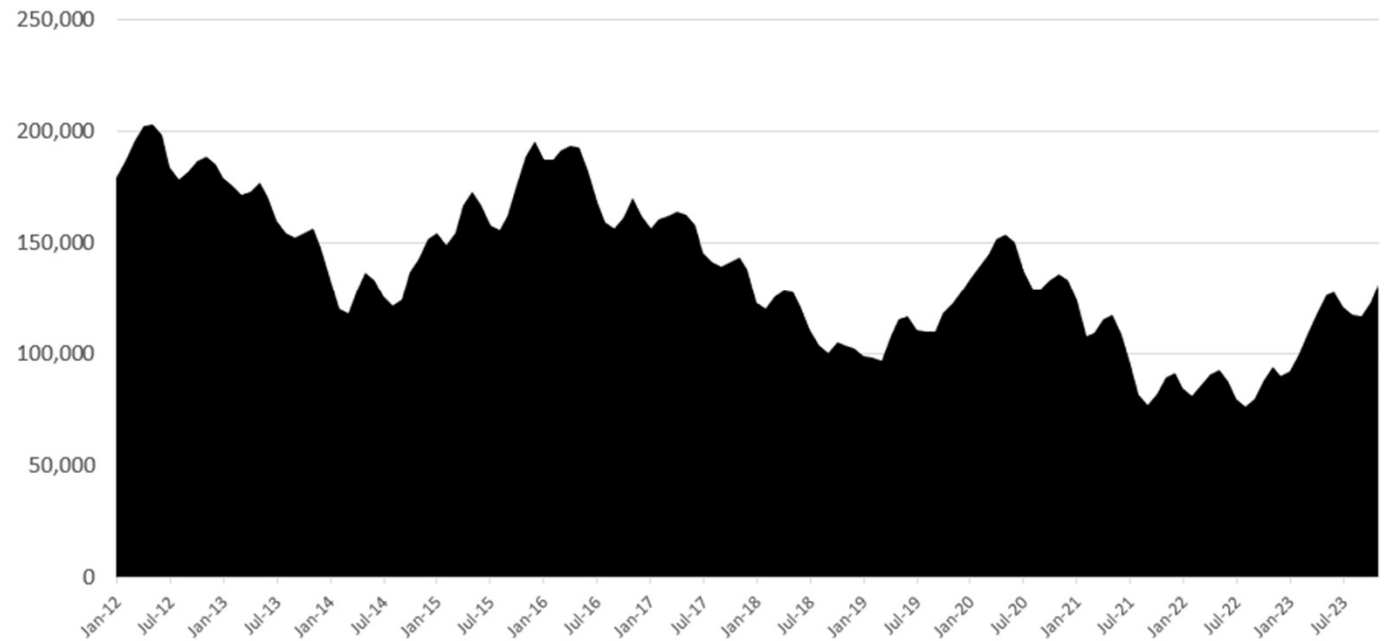
Source: Bloomberg

Market Update

# Coal Inventories- Power Sector

- Stockpiles currently at 131,277 million ST
- Growing significantly in November, reaching 164 days of burn
- More than double the 80 days of burn during from 2010-2019 when considering the amount of retired coal plants
- The glut of anticipated inventories between coal & natural gas likely to determine which will see switching near term for power gen

Total Power Sector Coal Stockpiles (Million Tons)



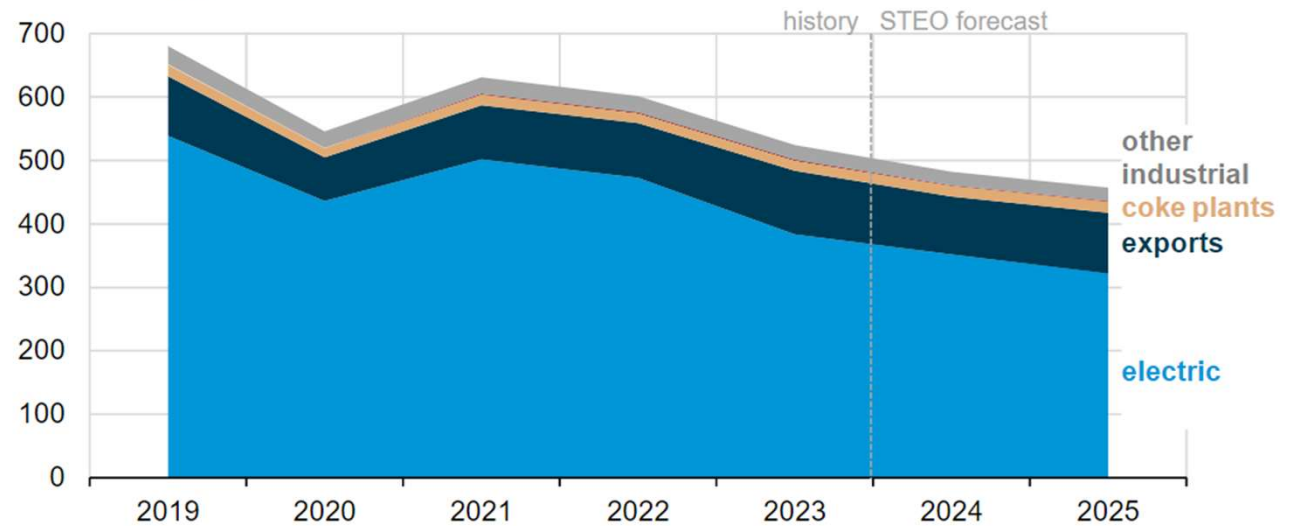
Source: EIA Data

Market Update

# Coal Demand – Power Down/ Exports Up

- Domestic U.S. coal consumption declining, falling to 524 MMst in 2023, mostly due to declining power gen demand
- Exports of coal growing to Asia and Europe in 2023 (estimated at 100 MMst)
- Primarily due to record demand in Asia and increased demand in Europe for U.S. coal due to Russian sanctions.

Total annual consumption of U.S. coal by end sector (2019–2025)  
million short tons



Source: EIA

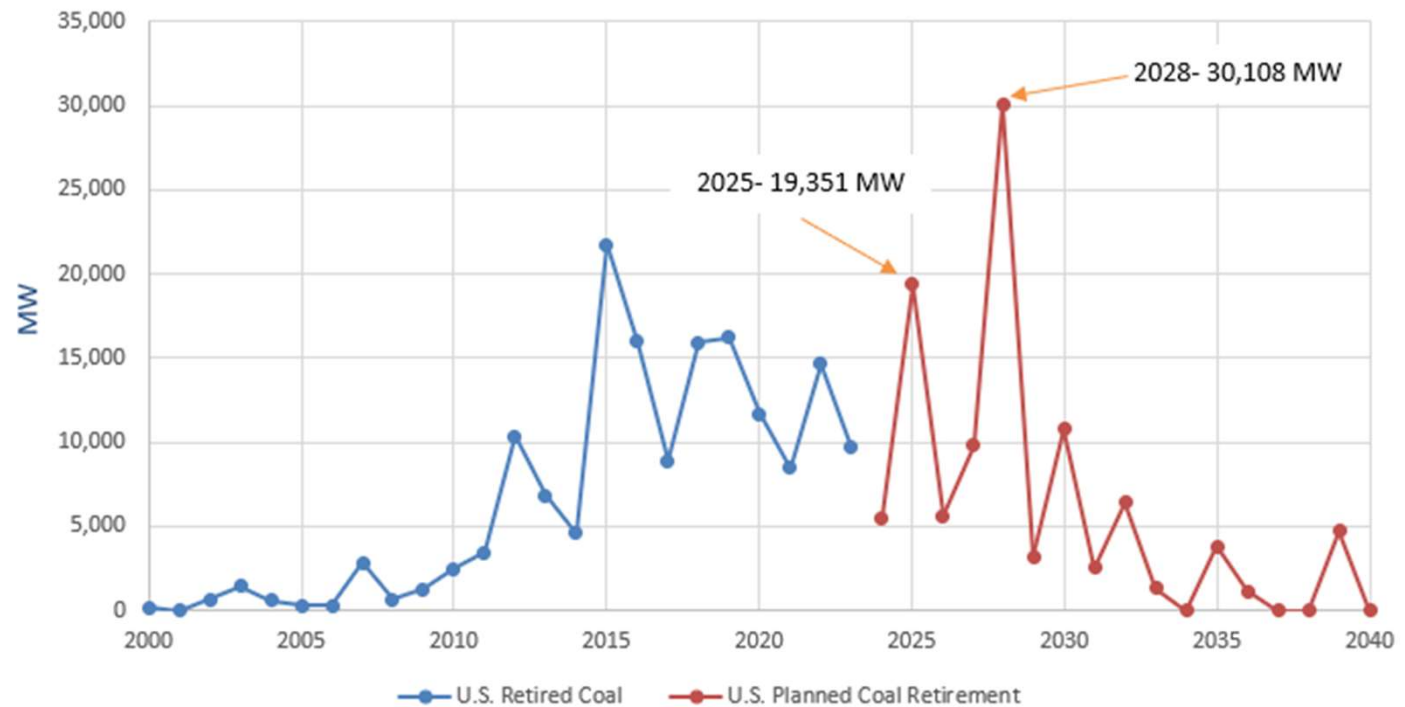
[U.S. coal exports account for larger share of a shrinking market - U.S. Energy Information Administration \(EIA\)](#)



# Coal Retirements – U.S.

- In the last 9 years, the U.S. has retired 123,152 MW of coal capacity
- In the next 7 years, there is another 84,250 MW planning to retire
- Includes 19,351 MW in 2025 and 30,108 MW in 2028
- Future reliability / reserve margins receiving a lot of attention

U.S. Coal Plant Retirements - Actual and Planned



Source: Global Energy Monitor data

## Expect Volatility

### Near Term Weakness

- No winter weather to speak of
- Storage surplus for nat gas and coal stockpiles are healthy but resets every winter
- ~1 Bcf/day of excess gas supply
- LNG growth delayed until 2025
- Highest renewable production is April/May
- U.S. production of nat gas and oil still strong near all time highs

### Longer Term Variables

- 5 LNG export facilities under construction adding 9.7 Bcf/day of capacity (U.S.)
- Low gas prices today don't incentivize production growth tomorrow (rig count, DUC decline)
- Power demand continues to grow, coal continues to retire, and renewables continue to be intermittent
- Permit reform desperately needed to allow transmission (gas and power) to get built
- Majority of gas growth last 3 years has come from oil economics (associated gas) and OPEC still manipulates pricing
- Presidential and Congressional Elections & new FERC Commissioner appointees

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# BACKUP SLIDES

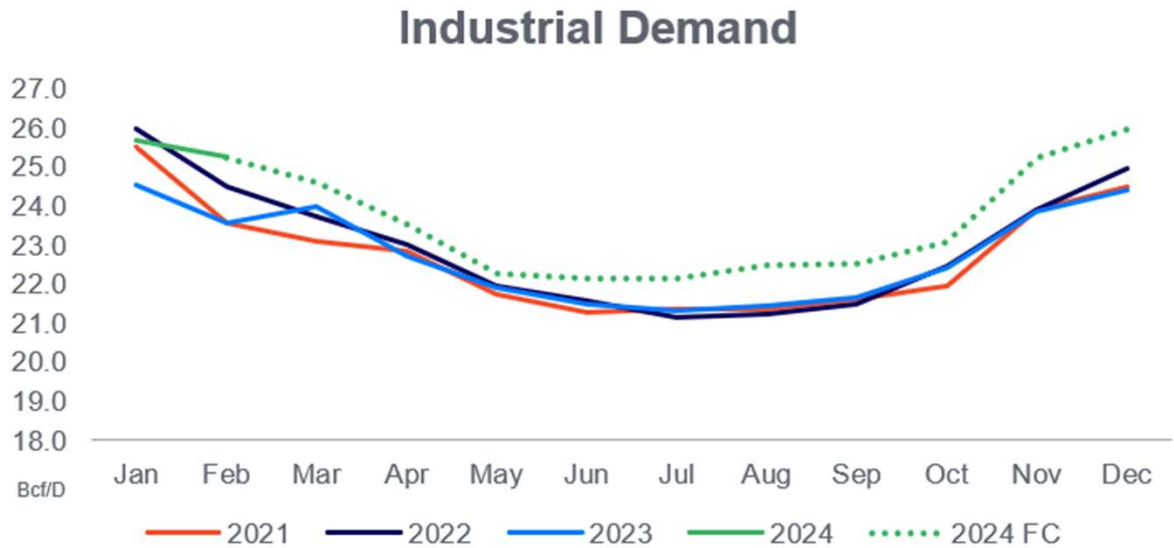
Source: Bloomberg



Market Update

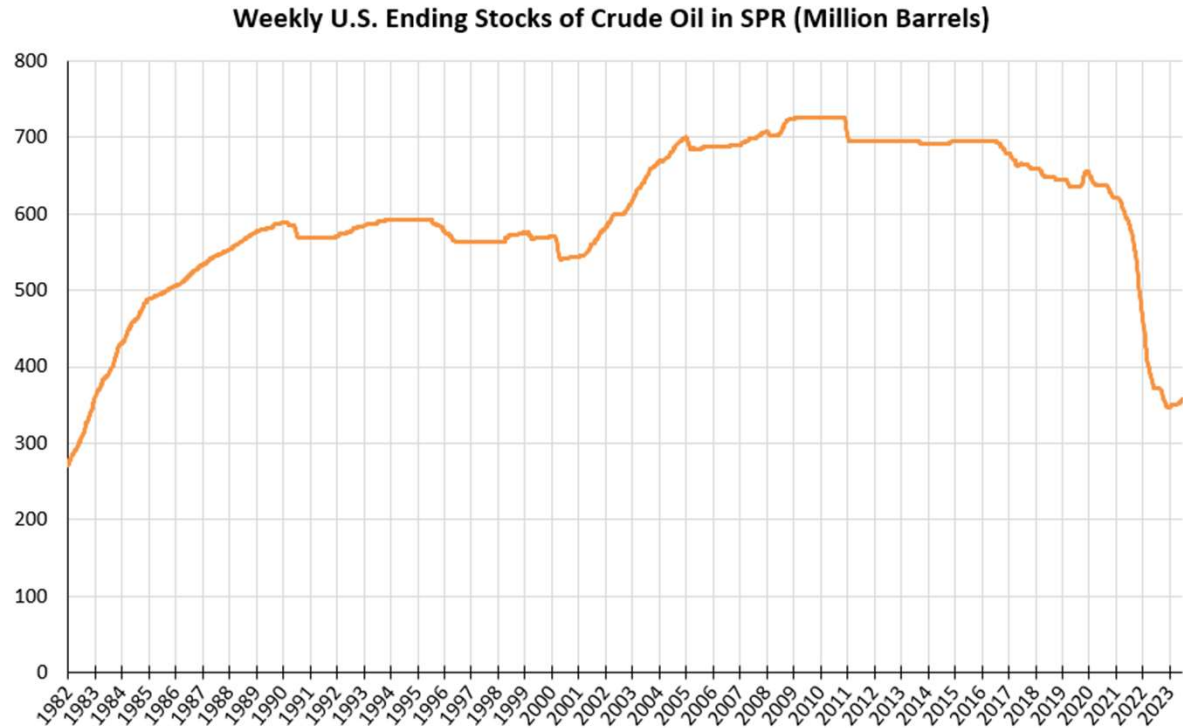
# U.S. Industrial Demand

- January industrial demand average 25.66 Bcf per day
- 1.1 Bcf/day higher than January 2023
- Expectations are for significant YOY growth



# Crude Oil- Strategic Petroleum Reserve

- Currently at 358.01 million barrels
- Slowly starting to refill, adding 11.25 million barrels over last seven months
- Likely targeting heavy sour blends that aren't produced in most U.S. regions

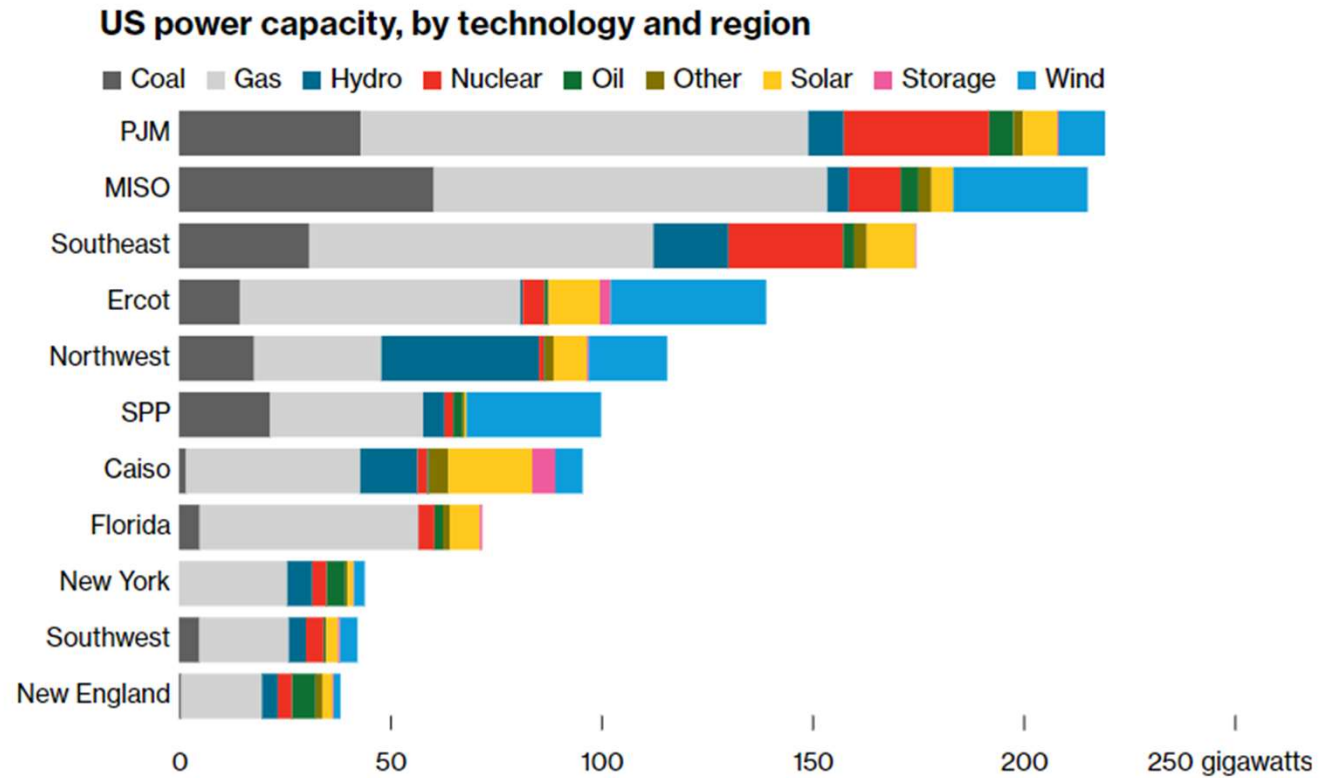


Source: Bloomberg



# Power Generation Capacity by Region

- Overall capacity and technology varies significantly by region but totals 1,262GW
- 10.6GW of new capacity came online in Q2 2023, 6.3GW (59%) was from renewables.
- Another 9.6GW of battery storage capacity expected by end of 2023 (EIA).
- PJM, MISO & Southeast markets makes up 2/3 of the existing coal capacity in the country, which has dropped 75.6GW since 2017.

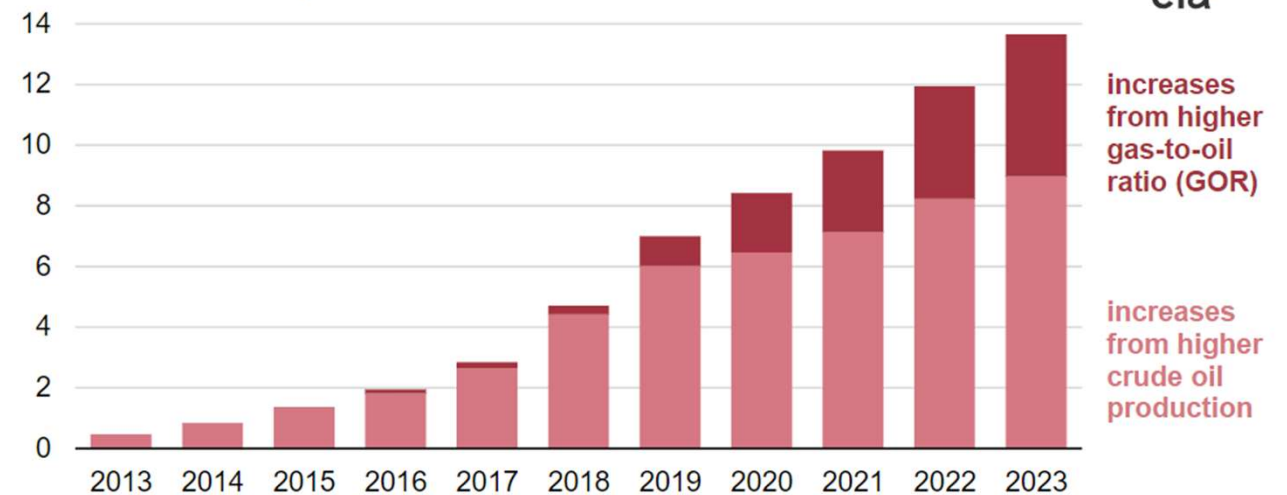


# Associated Natural Gas Production - Permian

- Associated gas from oil wells has almost tripled since 2018
- In the life of an oil well, the gas-to-oil (GOR) ratio grows, producing more gas over time
- Permian region accounts for 40% of all current crude production and has grown in gas production from 4.7 Bcf/day in 2018 to average 13.7 Bcf/d in 2023 (Aug YTD) from 3 largest plays within Permian

Annual associated natural gas production from oil wells in the three major oil plays in the Permian region by disposition (2013–2023)

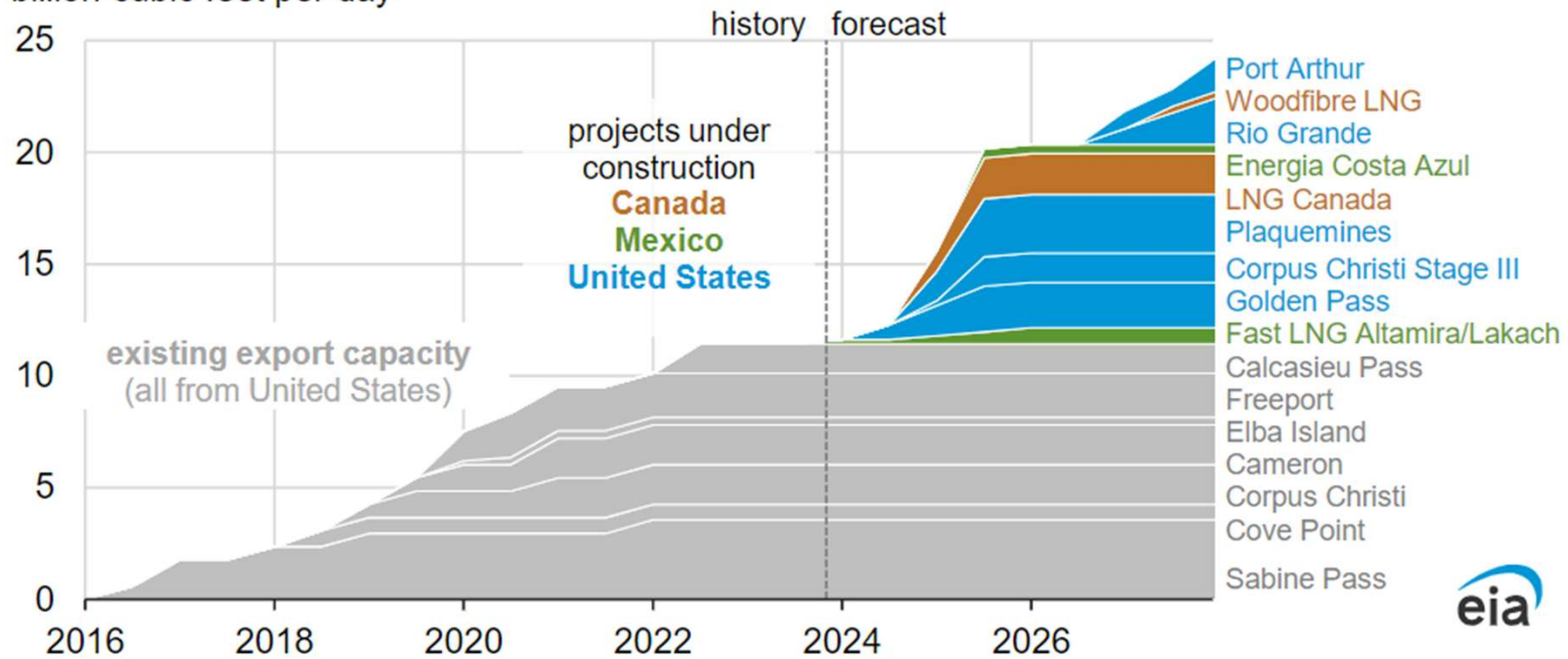
billion cubic feet per day



Source: EIA/Enverus

# LNG Export Capacity- North America

**Annual North American liquefied natural gas export capacity by project (2016–2027)**  
billion cubic feet per day

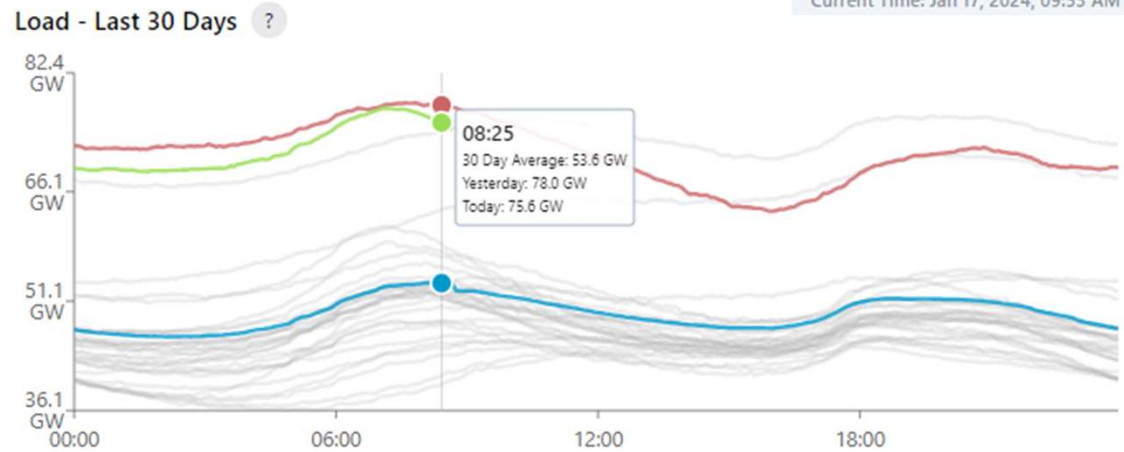


Market Update

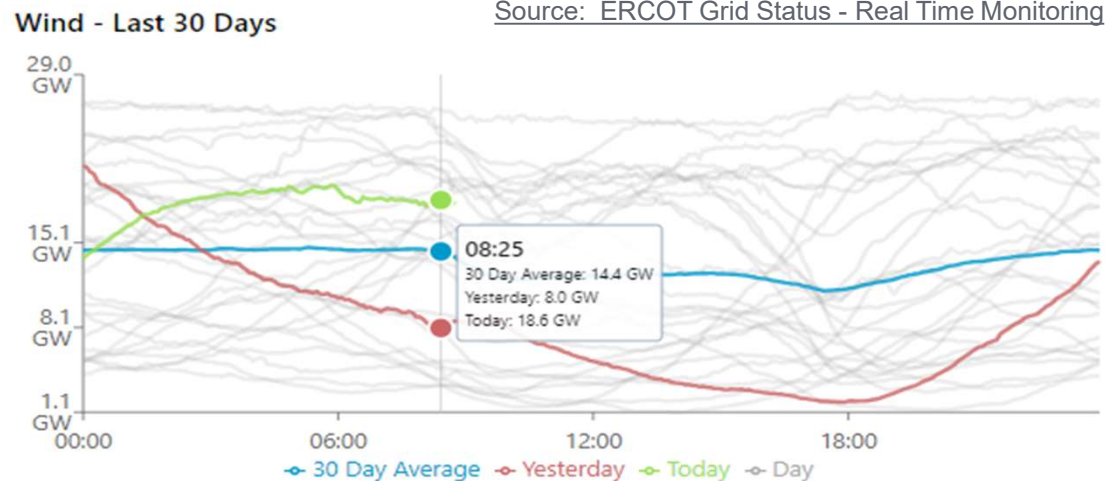
# ERCOT Wind Impact on Peak Power

- Peak power demand in ERCOT on 1/16/24 was 78 GW
- Wind generation 30-day average produced 14.4 GW but only generated 8.0 GW at peak demand (8:25 AM -1/16/24) 10.2% of total
- Supporting the need to maintain significant amounts of dispatchable fuel generation
- Just one day later on 1/17, wind picked up and is currently generating 18.6 GW (9:53 AM EST) 24.6%

Current Time: Jan 17, 2024, 09:53 AM EST



Source: ERCOT Grid Status - Real Time Monitoring



## BIOGRAPHICAL INFORMATION

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Constellation Energy Corp.**

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Brian Habacivch began his career in the natural gas industry as the Associate Editor of Gas Daily, the nation's leading natural gas industry information service and price index. Brian covered the natural gas spot market compiling the daily pricing indices for traders, brokers, producers and end-users of natural gas and regulatory matters at the Federal Energy Regulatory Commission in Washington, D.C.

Brian has worked in natural gas sales and marketing, business development, energy project development, energy consulting and management, and energy market intelligence at Allegheny Energy, Sprague Energy Corp., Fellon-McCord and Associates, and Constellation. Brian was in charge of energy market intelligence, risk, and publications for one of the leading energy consulting firms in the U.S. providing risk management services to a large portfolio of the nation's leading manufacturers and institutional end-users in the U.S. and E.U. Brian's comments on energy markets have been featured in The Wall Street Journal, Barron's, and Industry Week.

Today, Brian is Principal, Commodities Management Group with Constellation Energy Corp (Nasdaq CEG). Constellation is among the leading U.S. electric power generators and is the largest supplier of electric power and natural gas to industrial, commercial, and institutional consumers of energy. Constellation is the largest generator of carbon free energy in the U.S. and operates the largest fleet of nuclear-power generation in the country. The Commodities Management Group, within Constellation, is the energy-market-intelligence function of the company covering electric power, natural gas, crude, coal, and other inputs that affect the direction and pricing of energy markets.

Brian has spoken at hundreds of industry events during his career both in the United States and the European Union and interacts with thousands of industrial, commercial, and institutional consumers of energy. Brian is a past member of the Petrochemical Refiners Association Shale Energy Committee, The Aluminum Association of America, and works closely with The Energy Professionals Association.

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Jeff Bolyard has been in the energy business for over 35 years and started his career working for TC Energy/Columbia Gas Transmission, a FERC regulated interstate pipeline, in various roles in the accounting and marketing groups. From there he worked for a regional natural gas marketer where he bought production and sold gas to industrial and commercial clients. For the past 23 years, Jeff has held various positions within Edison Energy as an advisor to large industrial clients, designing and implementing their physical and financial procurement strategies, the management of pipeline and storage assets and the negotiation of utility agreements. He is currently responsible for the development of energy market intelligence for Edison Energy, with a focus on the fundamental market price drivers across several commodities. His exposure to various aspects of the energy industry has allowed him to have insight into the complex and constantly changing energy industry.

Jeff graduated from Mount Vernon Nazarene University with a BA in Accounting and currently resides in Charleston, WV.