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Data Centers, Power, and Permian Energy Markets: A Look to 2030

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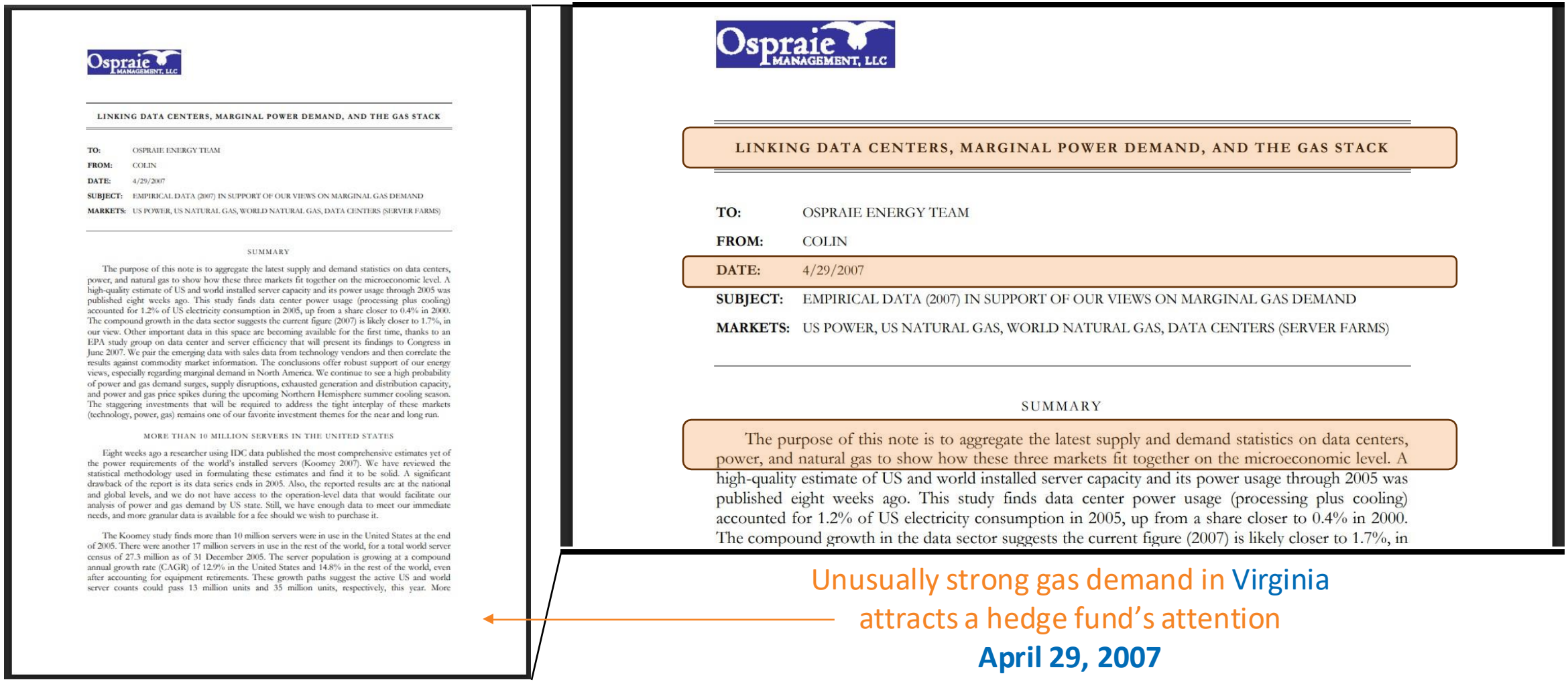
Midland, TX | March 5, 2025

The Data Center <—> Gas Nexus Did Not First Emerge Within the Past 18 Months

Commodities



Ospraie MANAGEMENT, LLC

LINKING DATA CENTERS, MARGINAL POWER DEMAND, AND THE GAS STACK

TO: OSPRAIE ENERGY TEAM
FROM: COLIN
DATE: 4/29/2007
SUBJECT: EMPIRICAL DATA (2007) IN SUPPORT OF OUR VIEWS ON MARGINAL GAS DEMAND
MARKETS: US POWER, US NATURAL GAS, WORLD NATURAL GAS, DATA CENTERS (SERVER FARMS)

SUMMARY

The purpose of this note is to aggregate the latest supply and demand statistics on data centers, power, and natural gas to show how these three markets fit together on the microeconomic level. A high-quality estimate of US and world installed server capacity and its power usage through 2005 was published eight weeks ago. This study finds data center power usage (processing plus cooling) accounted for 1.2% of US electricity consumption in 2005, up from a share closer to 0.4% in 2000. The compound growth in the data sector suggests the current figure (2007) is likely closer to 1.7%, in

Unusually strong gas demand in Virginia attracts a hedge fund's attention

April 29, 2007

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MORE THAN 10 MILLION SERVERS IN THE UNITED STATES

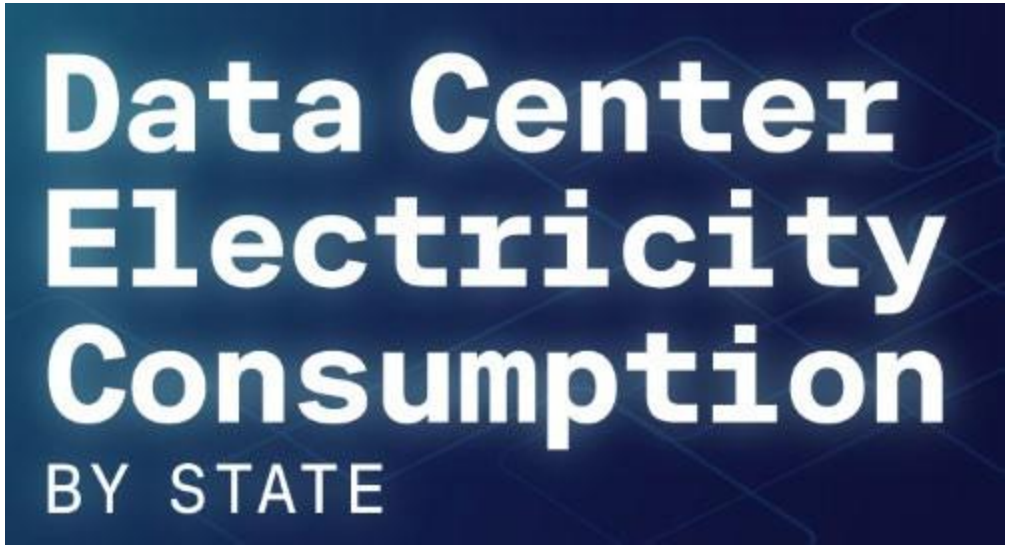
Eight weeks ago a researcher using IDC data published the most comprehensive estimates yet of the power requirements of the world's installed servers (Koomey 2007). We have reviewed the statistical methodology used in formulating these estimates and find it to be solid. A significant drawback of the report is its data series ends in 2005. Also, the reported results are at the national and global levels, and we do not have access to the operation-level data that would facilitate our analysis of power and gas demand by US state. Still, we have enough data to meet our immediate needs, and more granular data is available for a fee should we wish to purchase it.

The Koomey study finds more than 10 million servers were in use in the United States at the end of 2005. There were another 17 million servers in use in the rest of the world, for a total world server census of 27.3 million as of 31 December 2005. The server population is growing at a compound annual growth rate (CAGR) of 12.9% in the United States and 14.8% in the rest of the world, even after accounting for equipment retirements. These growth paths suggest the active US and world server counts could pass 13 million units and 35 million units, respectively, this year. More

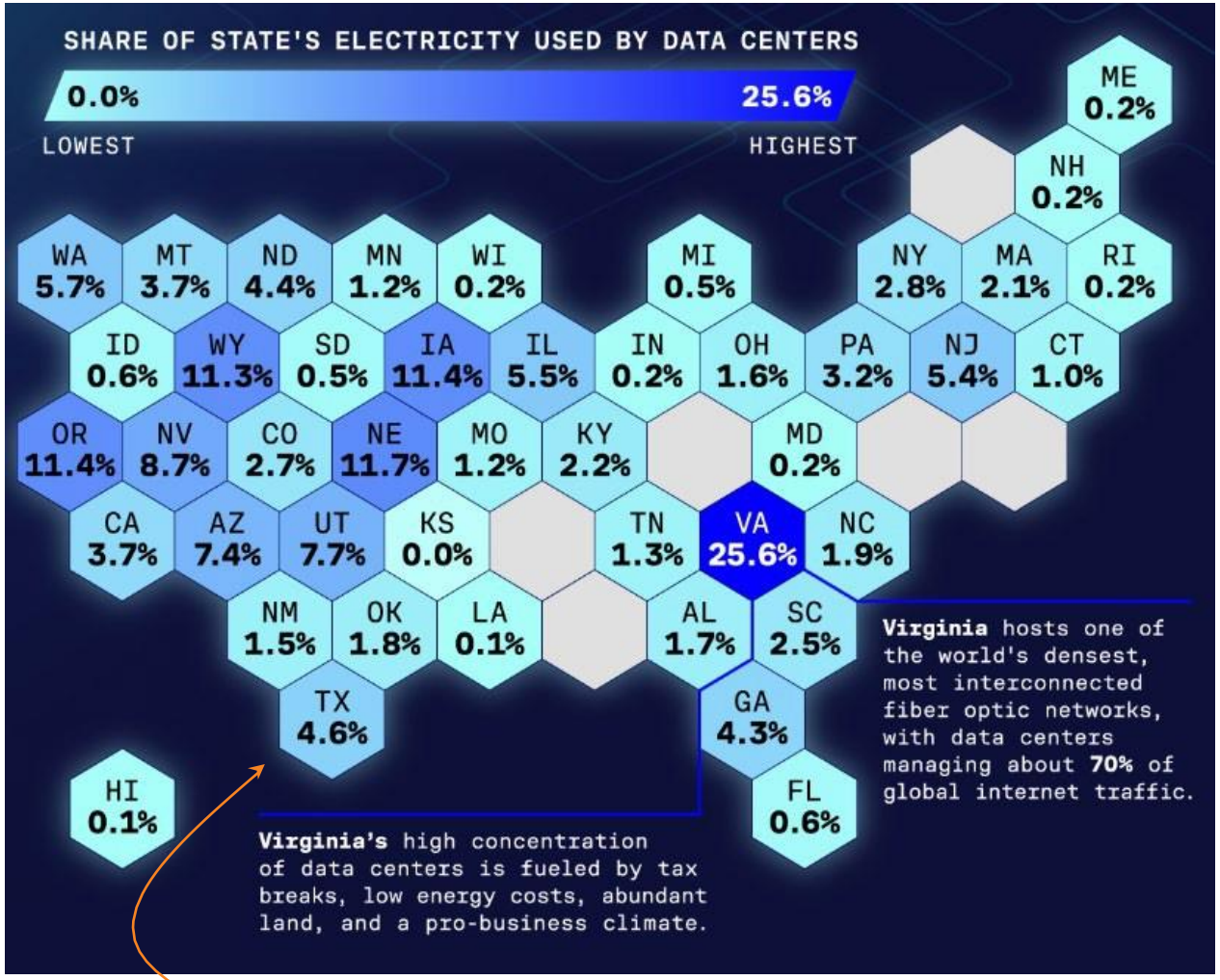
Source: Ospraie Management, 22V Research.

18 Years Later, Virginia is still the #1 most power intensive state for data centers

Commodities



One-quarter of Virginia's electricity consumption comes from data centers that manage about **70% of global internet traffic**



Source: EPRI, Visual Capitalist, 22V Research.

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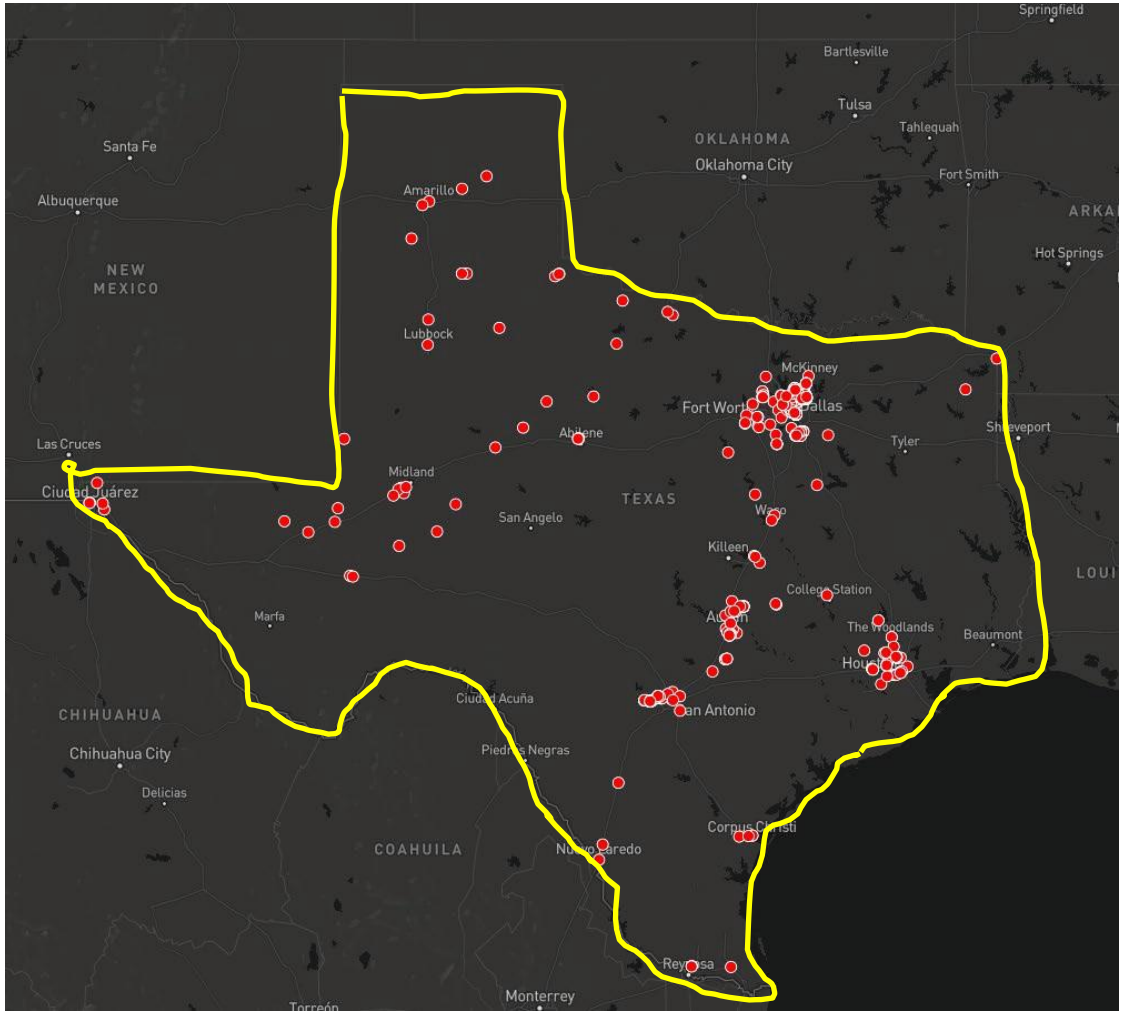
In 2024, this figure for Texas increased from **4.6%** to **8.8%**.

Texas is second only to Virginia by count of data centers in state, and it's growing faster

Commodities

Region	Count, Current* Data Centers	Count, Under Construction
Austin	47	8
Dallas	189	34
El Paso	6	1
Houston	39	2
North Texas	4	1
San Antonio	52	11
West Texas	42	15
Other	19	-
Texas	**398**	**72 (+18%)**
Virginia	**605**	**67 (+11%)**
United States	**3,389**	**383 (+11%)**



Source: Baxtel, 22V Research.
*Data as of March 3, 2025. Texas power for data centers is now **8.043 GW**.
Total U.S. power for data centers is **41.089 GW**.

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Data centers now account for more than 4.4% of total U.S. electricity consumption

Commodities

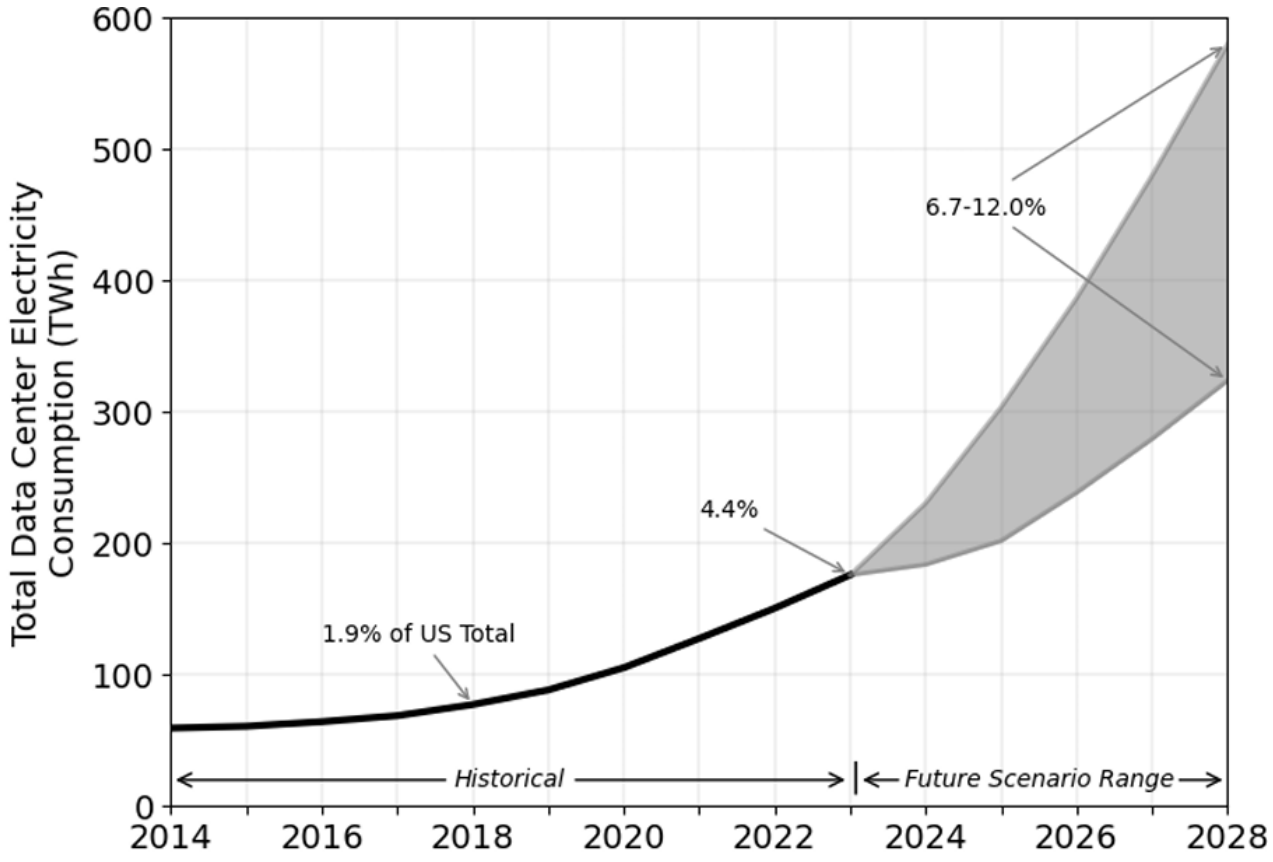


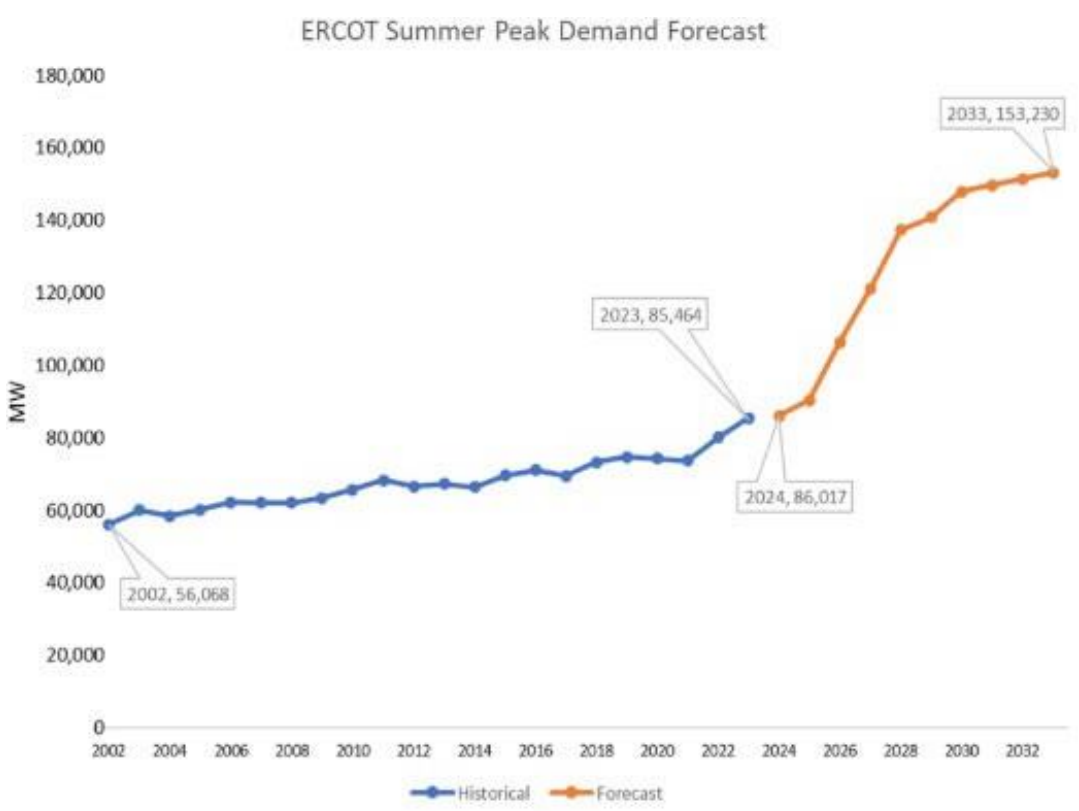
Figure ES-1. Total U.S. data center electricity use from 2014 through 2028.

"As Figure ES-1 shows, U.S. data center annual energy use remained stable between 2014—2016 at about 60 TWh, continuing a minimal growth trend observed since about 2010. In 2017, the overall server installed base started growing and Graphic Processing Unit (GPU) accelerated servers for artificial intelligence (AI) became a significant enough portion of the data center server stock that total data center electricity use began to increase again, such that by 2018 data centers consumed about 76 TWh, representing 1.9% of total annual U.S. electricity consumption. U.S. data center energy use has continued to grow at an increasing rate, reaching 176 TWh by 2023, representing 4.4% of total U.S. electricity consumption."

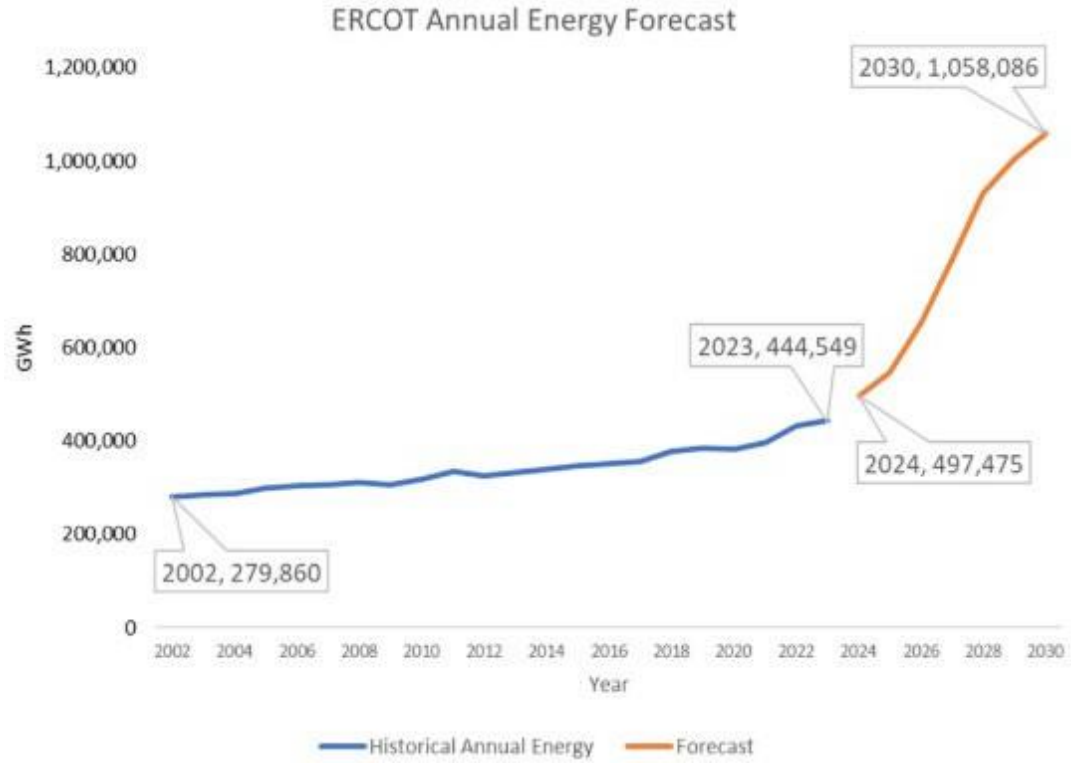
Source: U.S. Department of Energy.
Note: DOE projects data center electricity usage will increase to between 325 and 580 TWh by 2028.

ERCOT's long-term load forecast expects a doubling in Texas power demand in <8 years

Commodities



Summer Peak Demand
86 GW (2024) → 153 GW (2033)



Annual Energy Consumption
497 TWh (2024) → 1058 TWh (2030)

Source: ERCOT.

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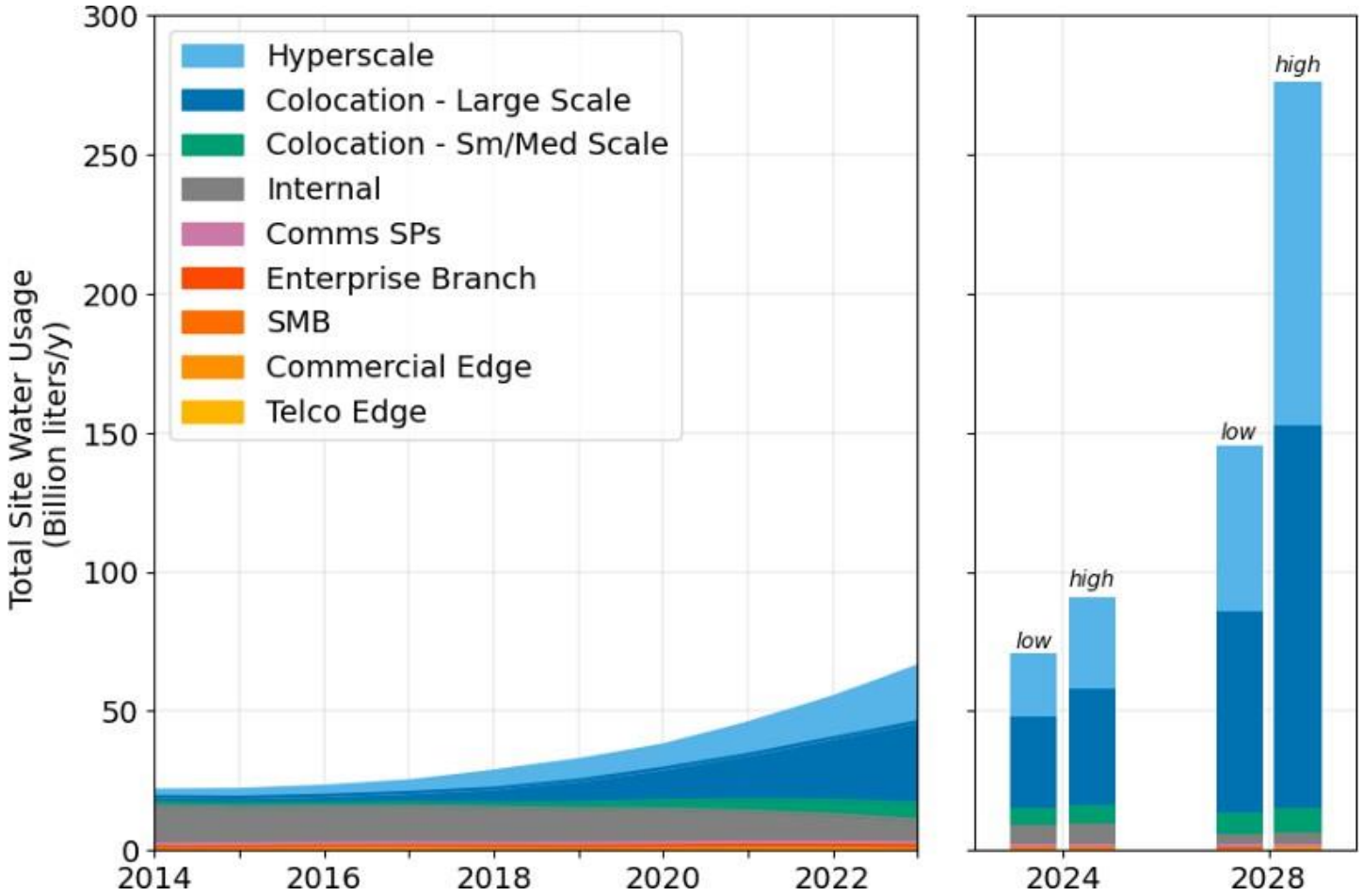
Direct water consumption by data centers is also a key resource consideration

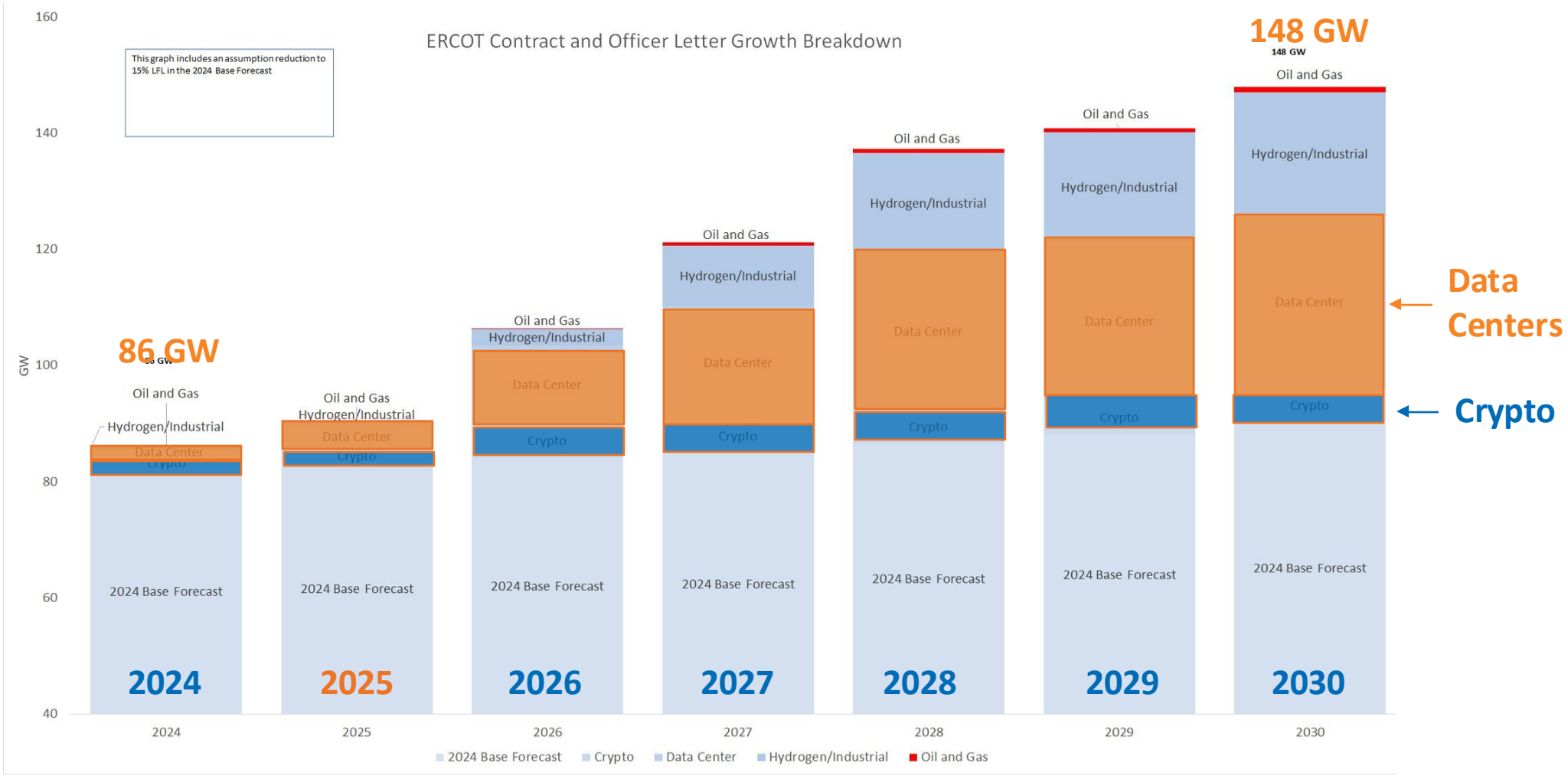
Commodities



Source: U.S. Department of Energy.

Data centers are a large wedge in ERCOT's power demand growth projection to 2030

Commodities



Source: ERCOT, 22V Research.

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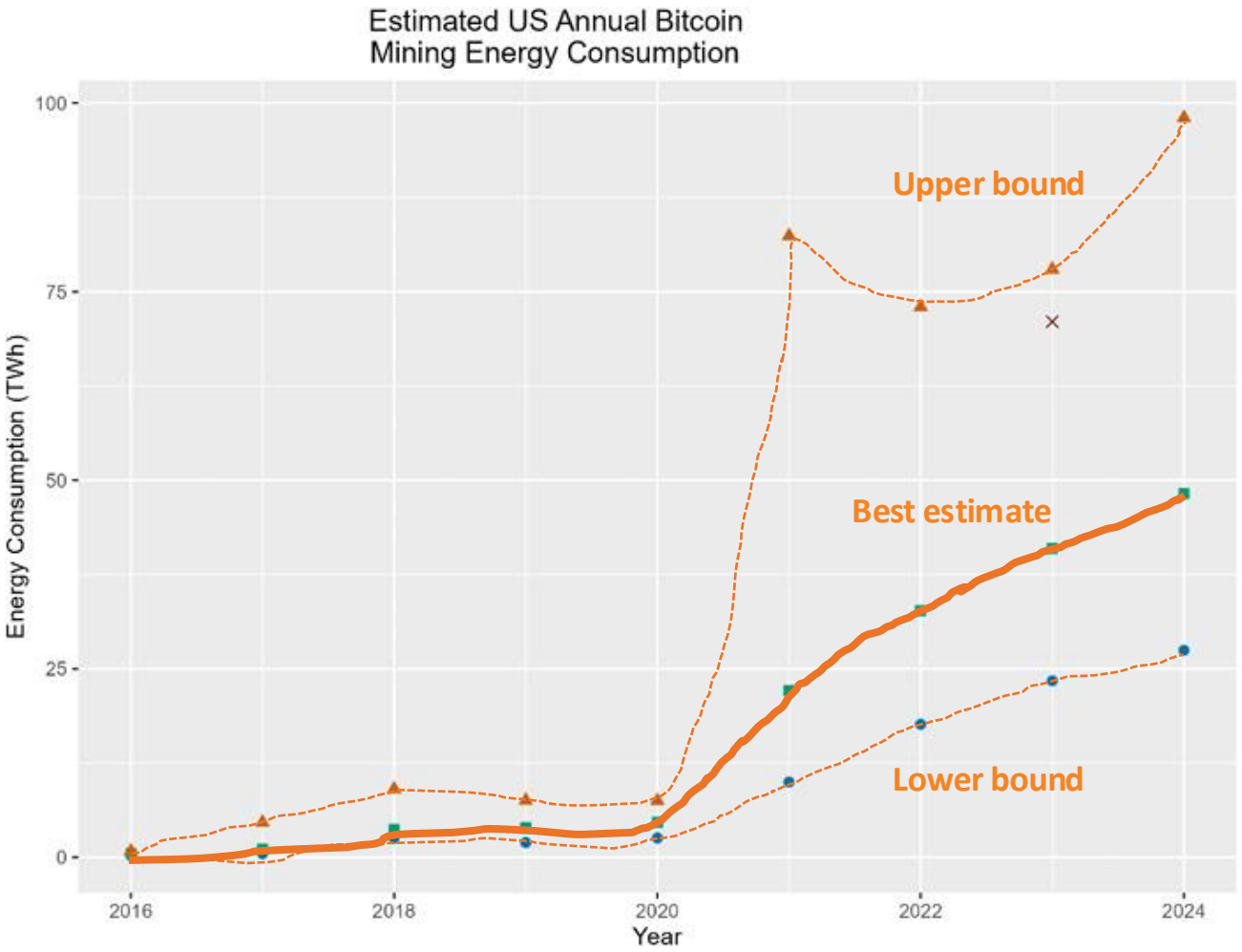
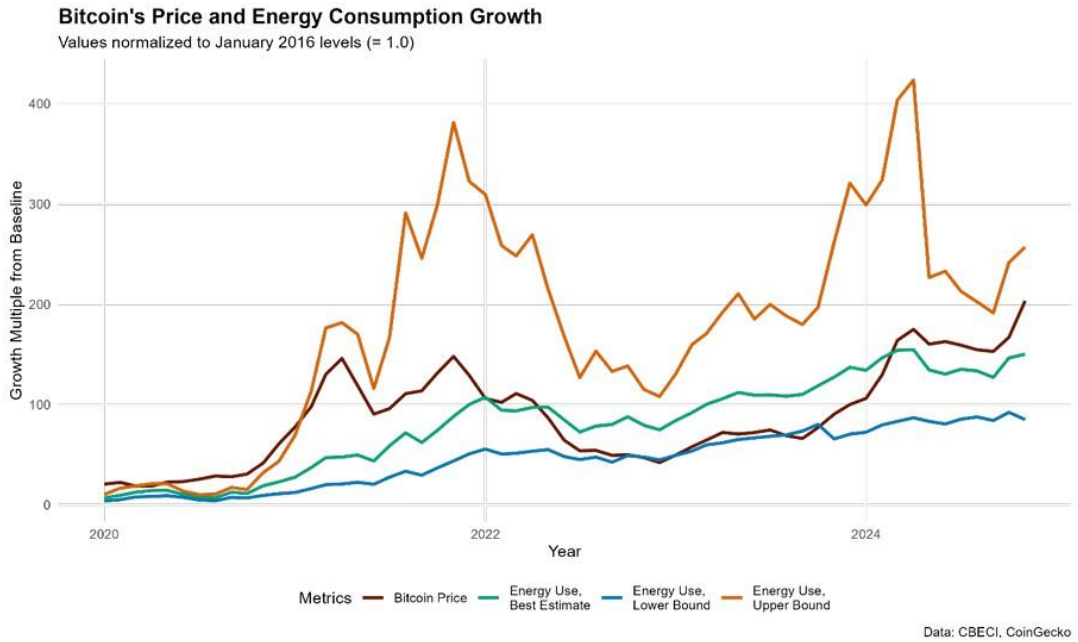
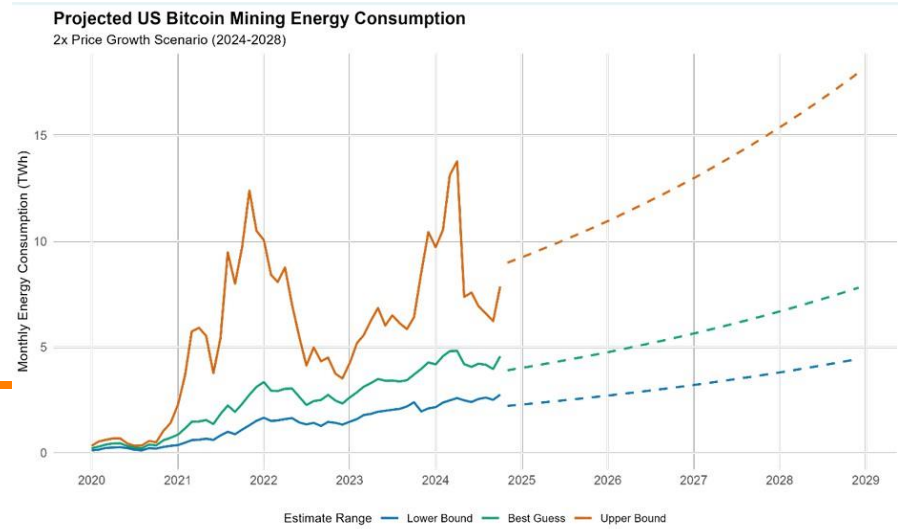
U.S. energy consumption from bitcoin mining doubled in the past 3 years

Commodities







Source: U.S. Department of Energy, CBECI, CoinGecko.

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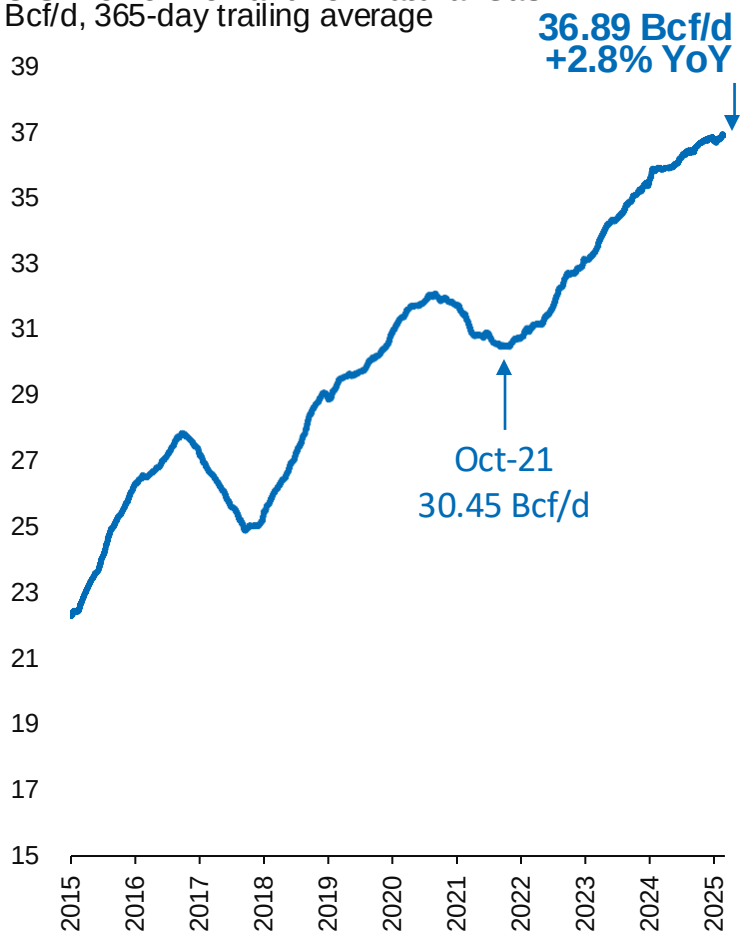
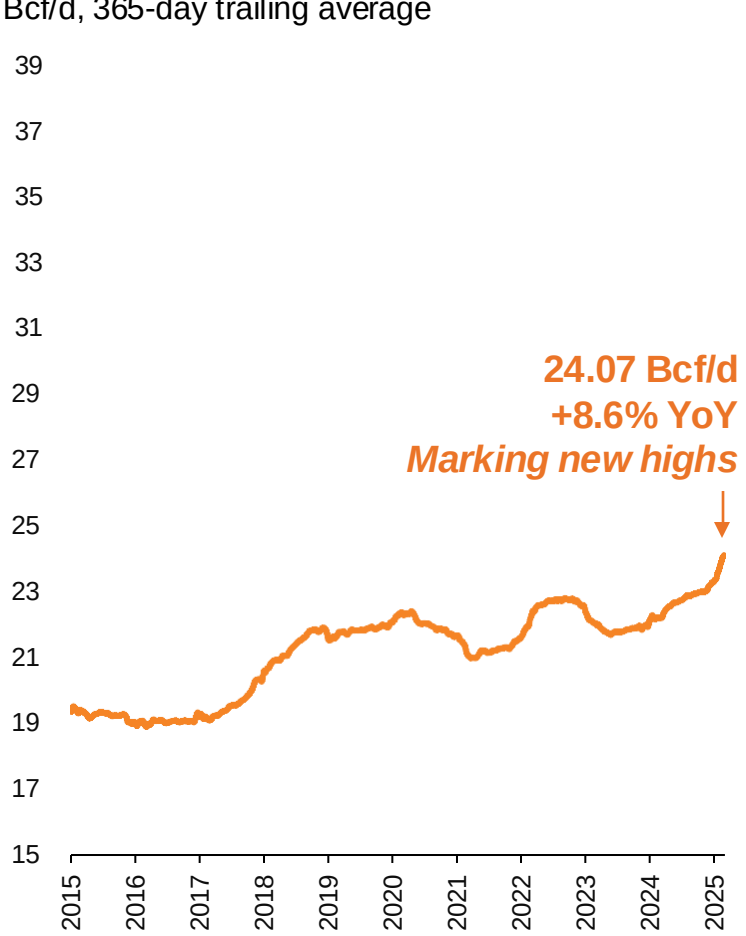
U.S. gas demand for power generation has increased by >6 Bcf/d in the past 3 years

Commodities

U.S. Power Demand for Natural Gas
Bcf/d, 365-day trailing average



U.S. Industrial Demand for Natural Gas
Bcf/d, 365-day trailing average



2025 YTD U.S. Gas Demand Growth by Segment (Bcf/d)		
R&C	+5.68	(+14%)
Industrial	+4.92	(+21%)
Power	+0.71	(+2%)
Plant	+0.08	(+2%)
Pipe	+0.39	(+9%)
Total US	**+11.78**	**(+11%)**

Source: Bloomberg, Genscape, 22V Research.
Daily data as of March 3, 2025.

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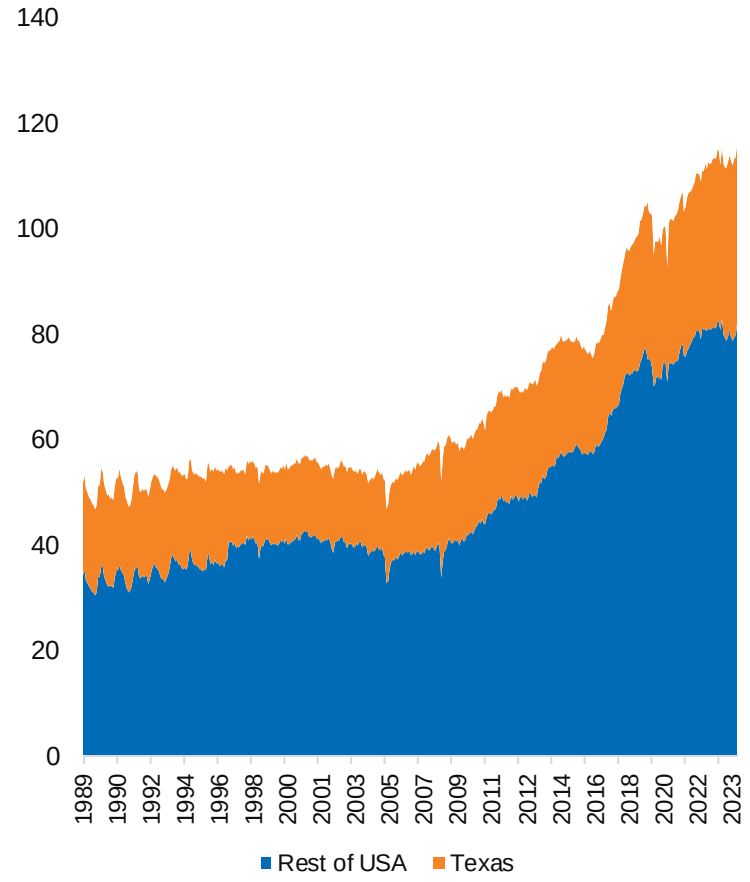
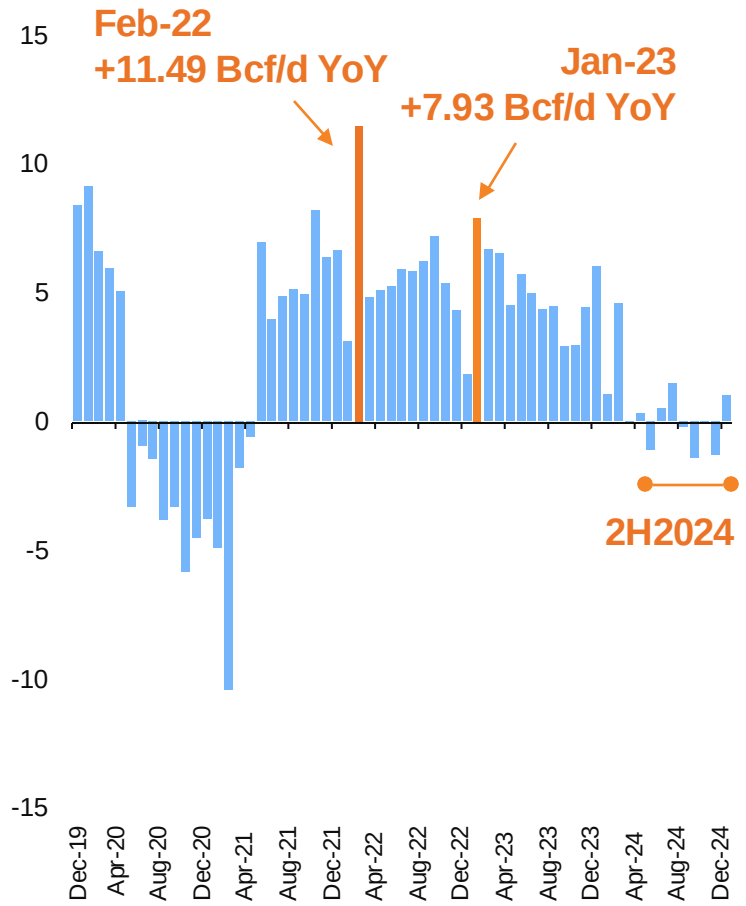
U.S. gas producers chased demand & supply-side factors, yielding large output 2022-23

Commodities

U.S. marketed gas production
Bcf/d



Growth, U.S. marketed gas production
Bcf/d YoY



Texas' share of U.S. marketed gas production by year (%)	
2017	24.7%
2018	24.4%
2019	25.7%
2020	26.9%
2021	26.6%
2022	27.1%
2023	28.0%
2024	**29.2%**

Source: EIA, 22V Research.
Monthly data through December 2024.

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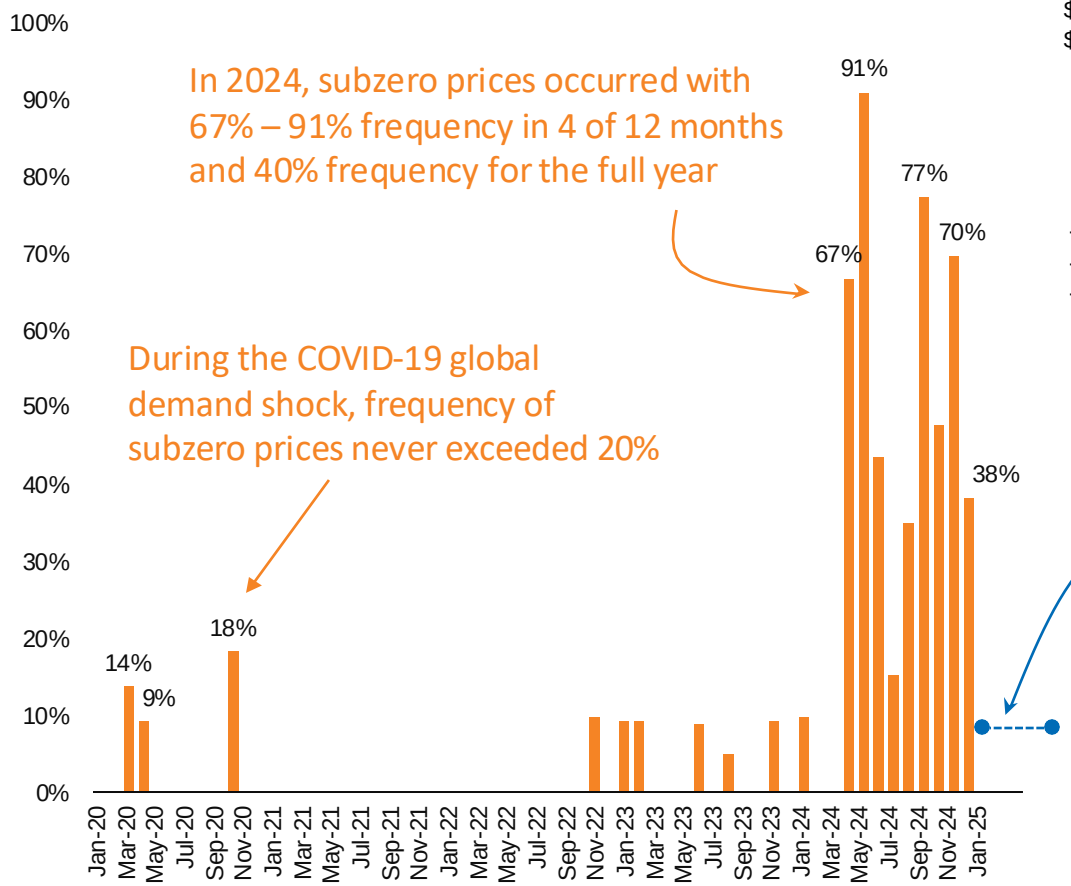
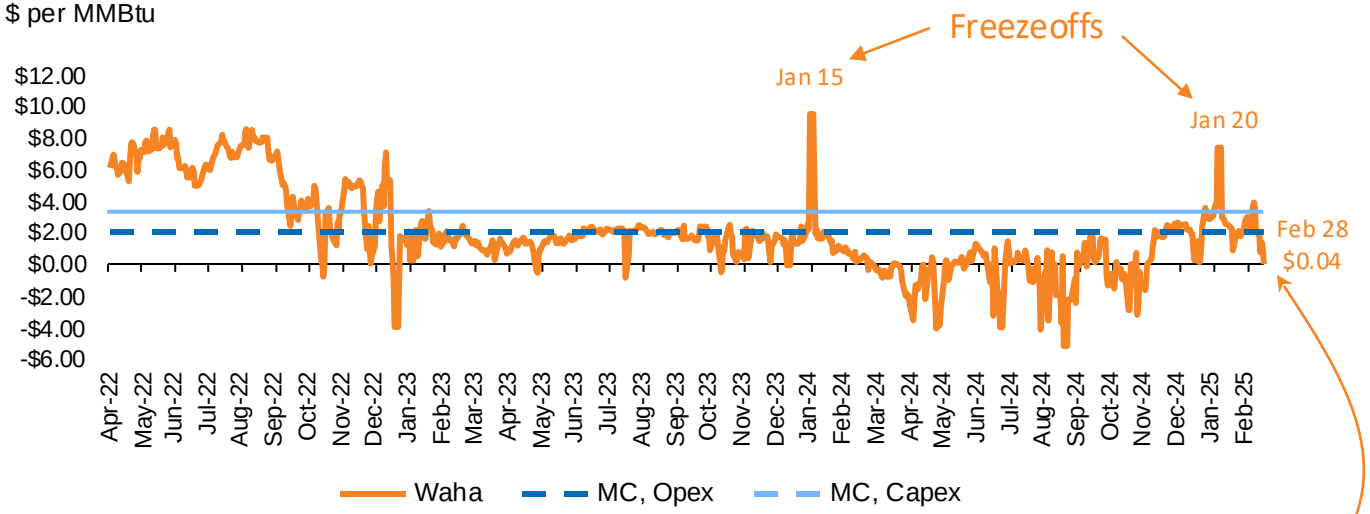
Subzero gas prices in the Permian are evidence of insufficient takeaway capacity

Commodities

Frequency of subzero gas prices at Waha Hub
% by month, January 2020 through February 2025



Cash Price, Natural Gas at Waha Hub
$ per MMBtu



No subzero prices since November 2024

but…. Feb-25 ended with a **+$0.04 price**

Source: Bloomberg, 22V Research.
Note: MC = marginal cost

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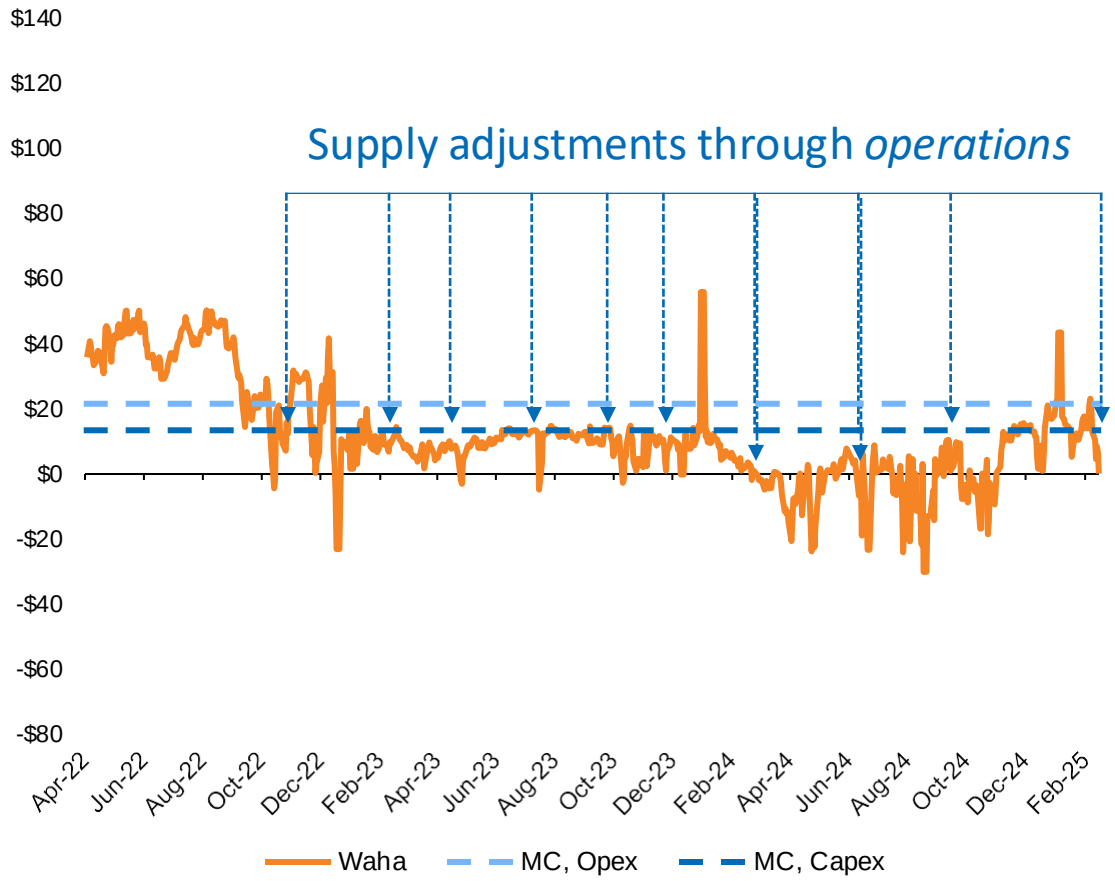
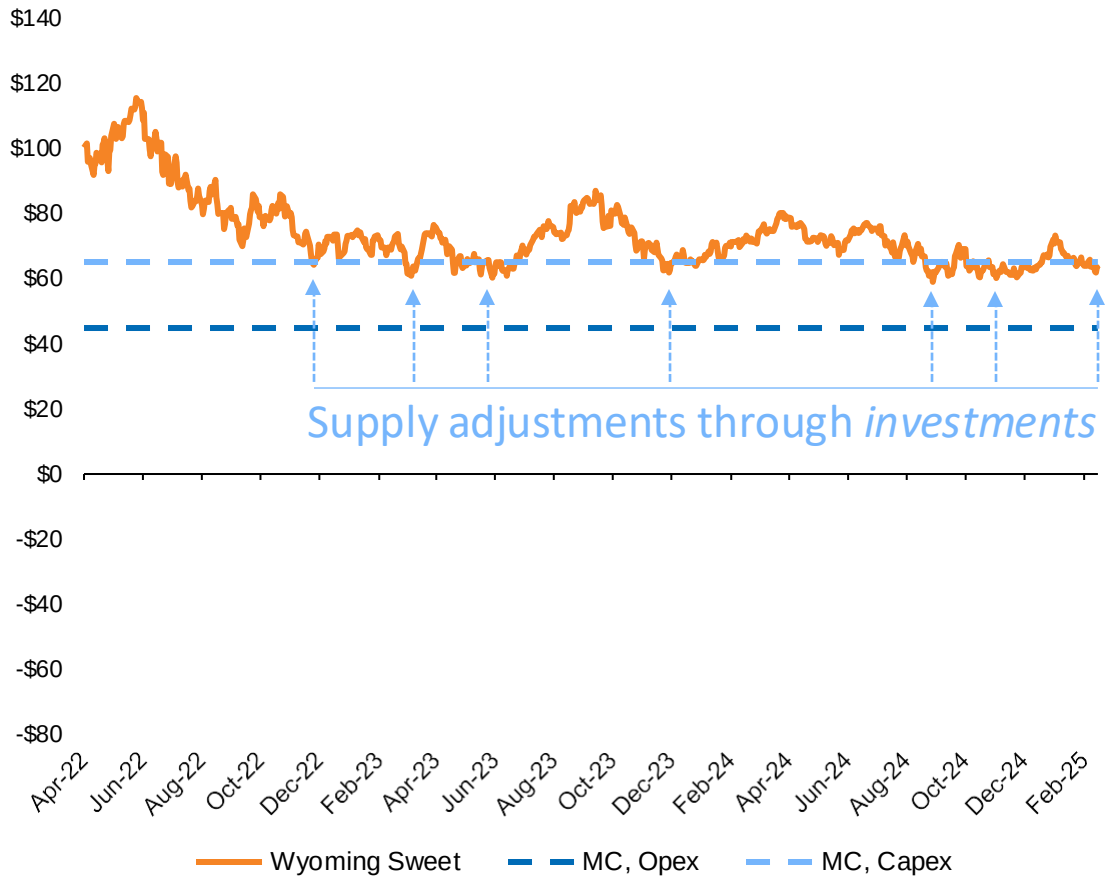
PADD 4 oil also has logistical challenges, but they've resolved through capex not opex

Commodities

Cash Price, Natural Gas at Waha Hub
$ per boe



Cash Price, Wyoming Sweet Crude Oil
$ per bbl



Source: Bloomberg, Plains, 22V Research.
Note: MC = marginal cost

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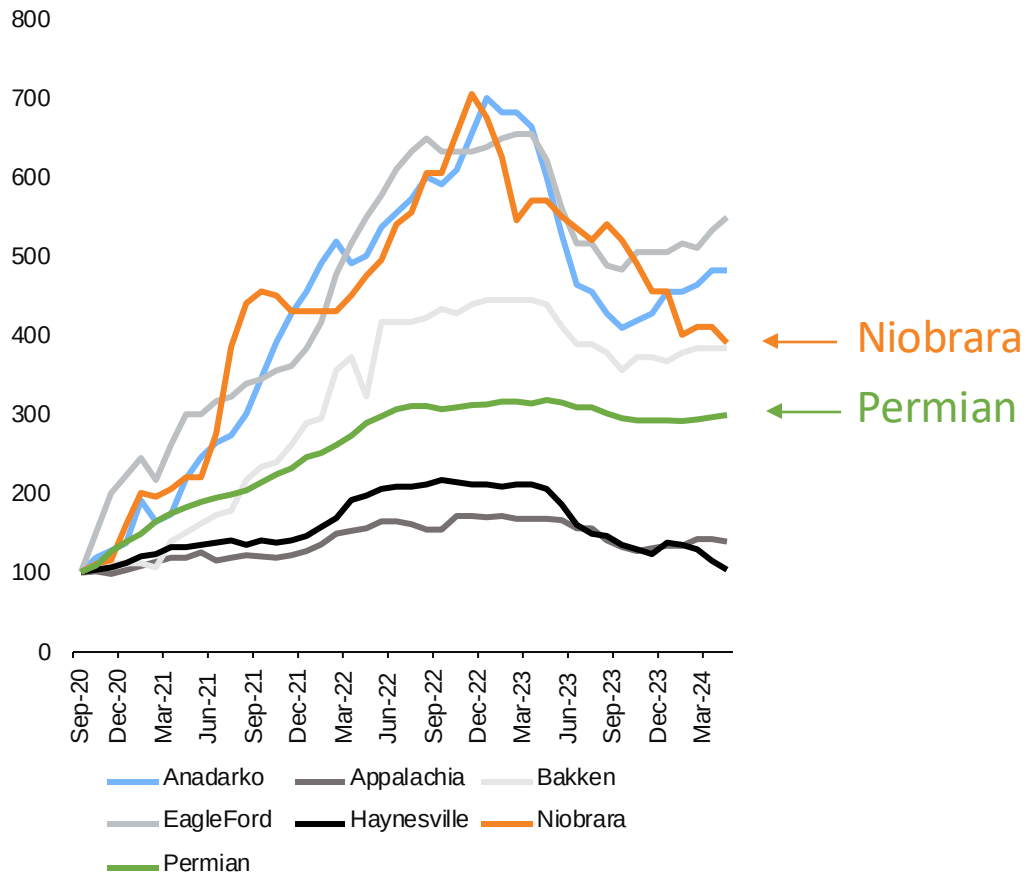
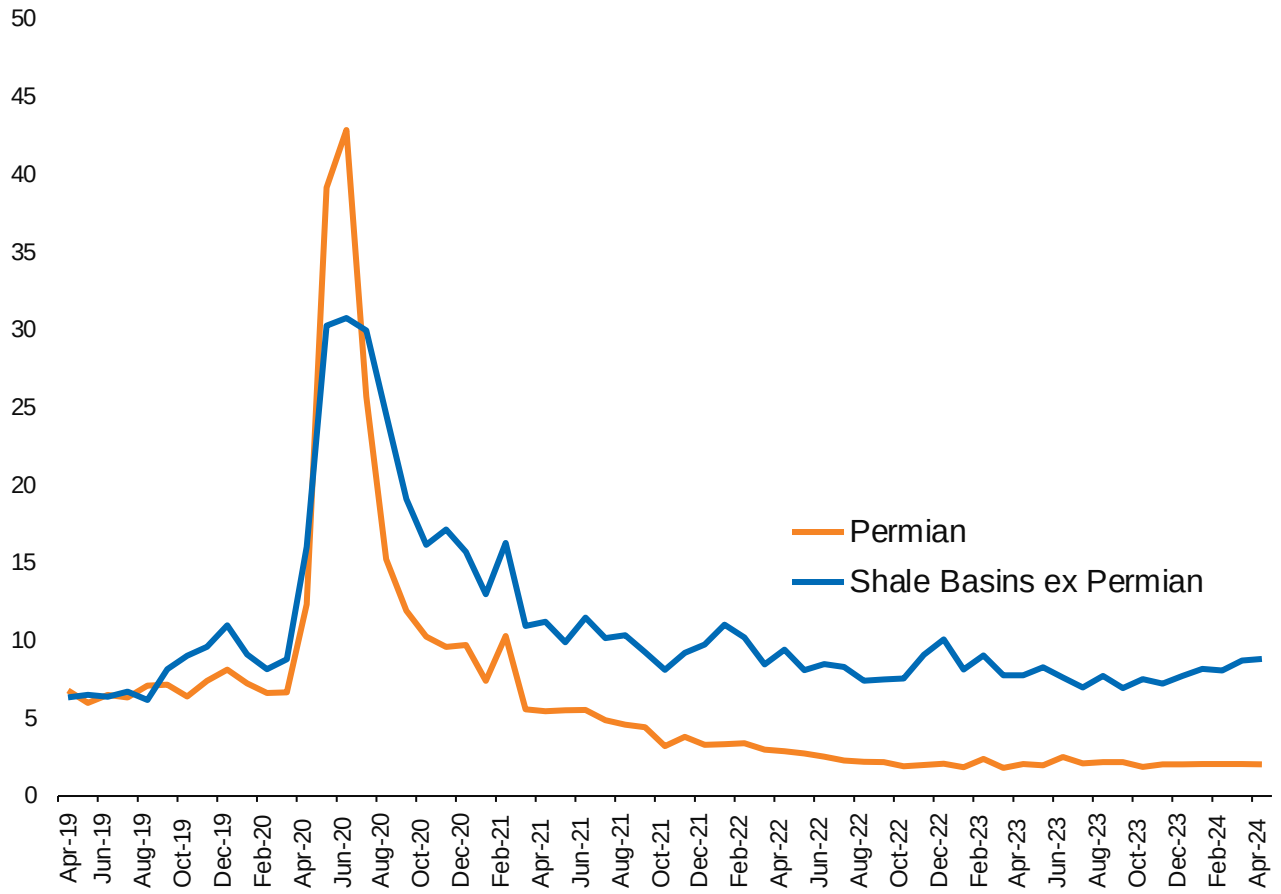
These marginal cost economics are visible in the drilling data

Commodities

Wells Drilled by Shale Basin
Index 100 = September 2020



Ratio of Drilled but Uncompleted Wells to Completions
ratio



Source: EIA, 22V Research.
Note: data run through April 2024 in the legacy DPR report.

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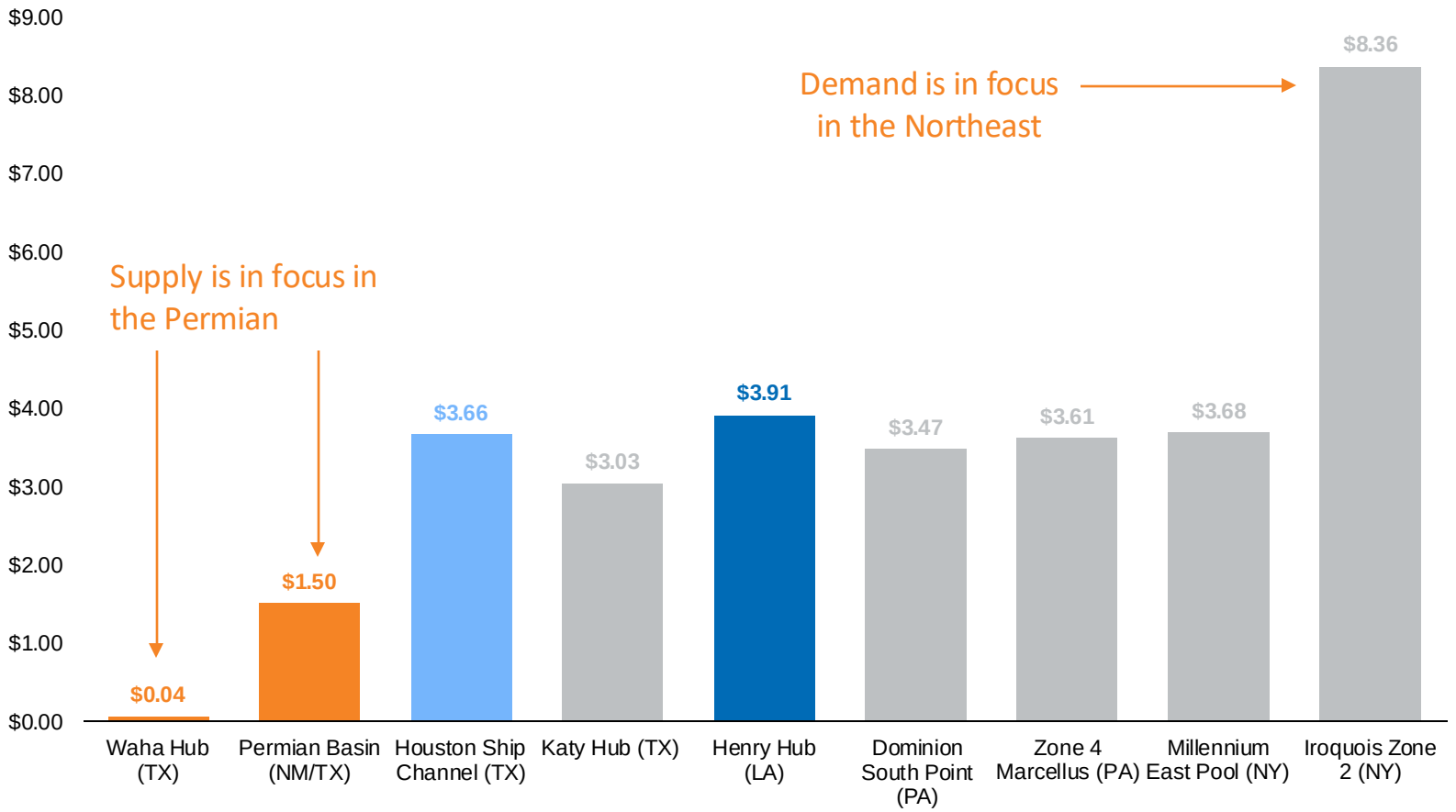
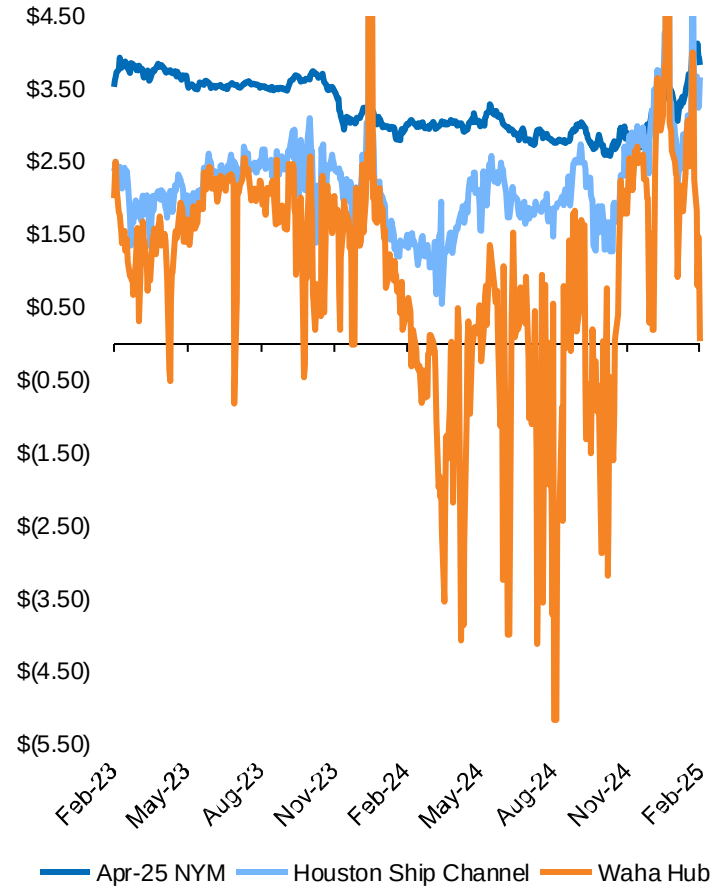
Basis in the Permian has shifted focus from winter demand back to spring supply

Commodities

Cash Prices, Natural Gas
$ per MMBtu



Apr-25 NYM vs Basis
Futures: 8c below Henry Hub & 17c above HSC



Source: Bloomberg, 22V Research.
Prices as of 28-Feb-2025.

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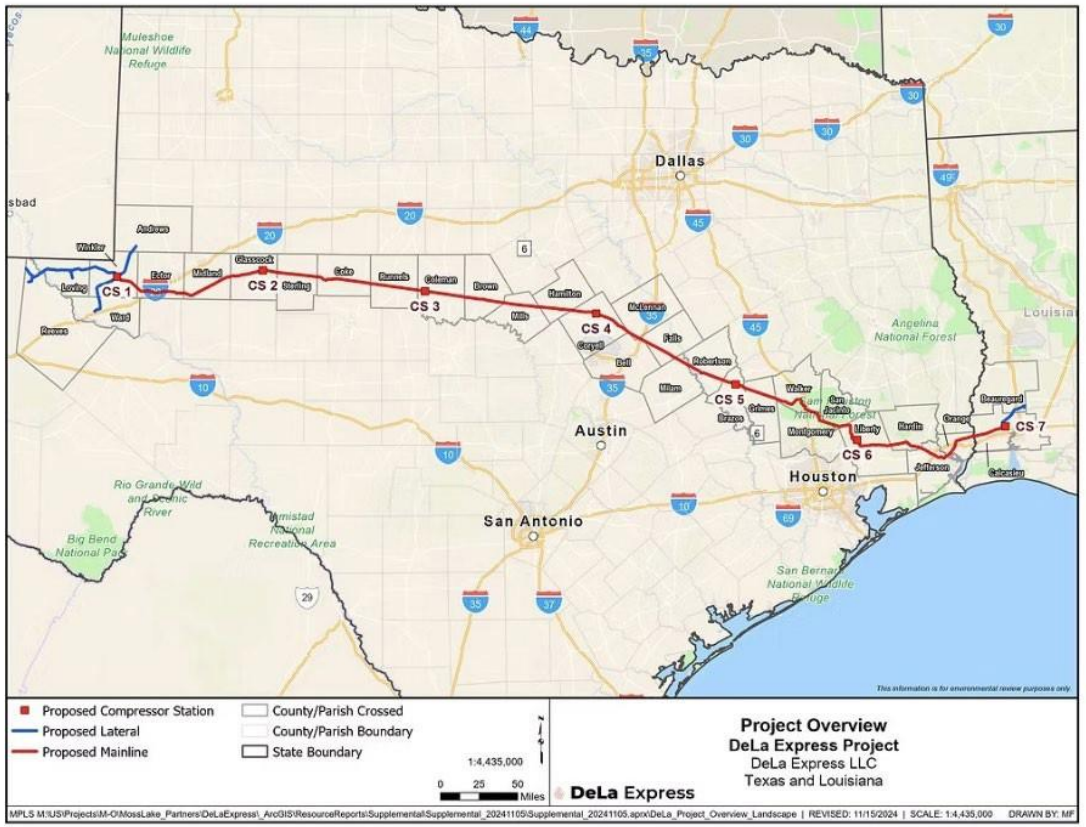
Pipeline investments are adding capacity to basin egress

Commodities

DeLa Express Project Pipeline Route and Facilities

The Project is designed to transport natural gas from the Permian Basin in West Texas to markets in and around Lake Charles, Louisiana. DeLa Express plans to construct over 750 miles of natural gas pipeline and associated facilities including 6 new compressor stations across 27 Texas counties and 1 Louisiana parish.



Gas Pipeline Projects for New Takeaway Capacity from West Texas

Project	Matterhorn Express	Hugh Brinson	Apex	DeLa Express
Operator	WhiteWater Midstream	Energy Transfer	Targa	Moss Lake Partners
Status	Development	Development	Announced	Announced
Capacity	2.5 Bcf/d	2.0 Bcf/d	2.0 Bcf/d	2.0 Bcf/d
Pipe Diameter	42 inches	42 inches	42 inches	42 inches
Length	580 miles	325 miles	563 miles	750 miles
Origin	Permian Basin	Permian Basin	Permian Basin	Permian Basin
Destination	Katy Hub	Fort Worth	Houston	Lake Charles

Source: FERC, 22V Research.

Opportunity 1: Behind the Meter

Commodities

Behind the Meter (BTM) is a configuration that allows data centers to get power directly from a power facility on the same site. This enables the data center to be independent of the utility grid for most of its power needs, providing several benefits for these energy-intensive operations. BTM can help data centers avoid grid connection queues, offer operational resilience during grid disruptions, and protect against fluctuations in energy prices.

BTM can be established through a Power Delivery Agreement (PDA), where an energy provider installs generation equipment on the site, and the business pays a predetermined rate for power over time.

Source: VoltaGrid.

Opportunity 2: Microgrid Solutions

Commodities

Source: VoltaGrid.

Opportunity 3: E-frac Fueling

Commodities

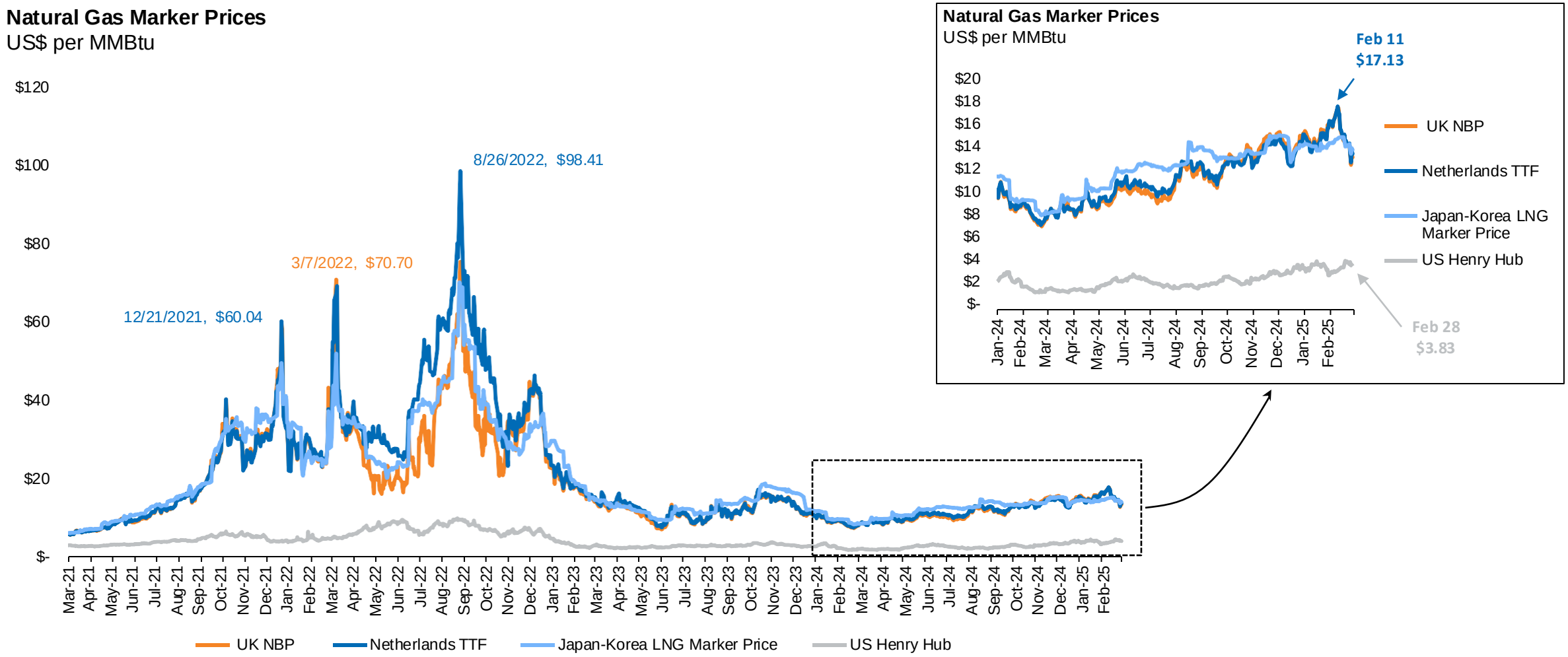
VoltaGrid provides turnkey fuel conditioning and delivery services for our electric hydraulic fracturing customers. Our all-electric mobile refrigeration unit (MRU) and booster compression systems enable our generators to run on CNG, LNG, field gas, residue gas, renewable natural gas, or a mix thereof.

Our patent-pending, all-electric MRU uses a single-trailer process design with the capacity to produce up to 4.2 MMSCF per day of conditioned gas per system. When paired with our single-trailer, all-electric booster compression system, our MRU can accept inlet gas pressures as low as 80 psi and as high as 5,000 psi. Since our generators can accept gas from 850 LHV to 1,150 LHV, VoltaGrid's MRU strips out natural gas liquids (NGLs). We subsequently return the NGLs to our customers to sell on the wholesale market, offsetting some of the costs of deploying our fleets.

Source: VoltaGrid.

Opportunity 4: World Markets

Commodities



Source: Bloomberg, ICE, NYM, 22V Research.

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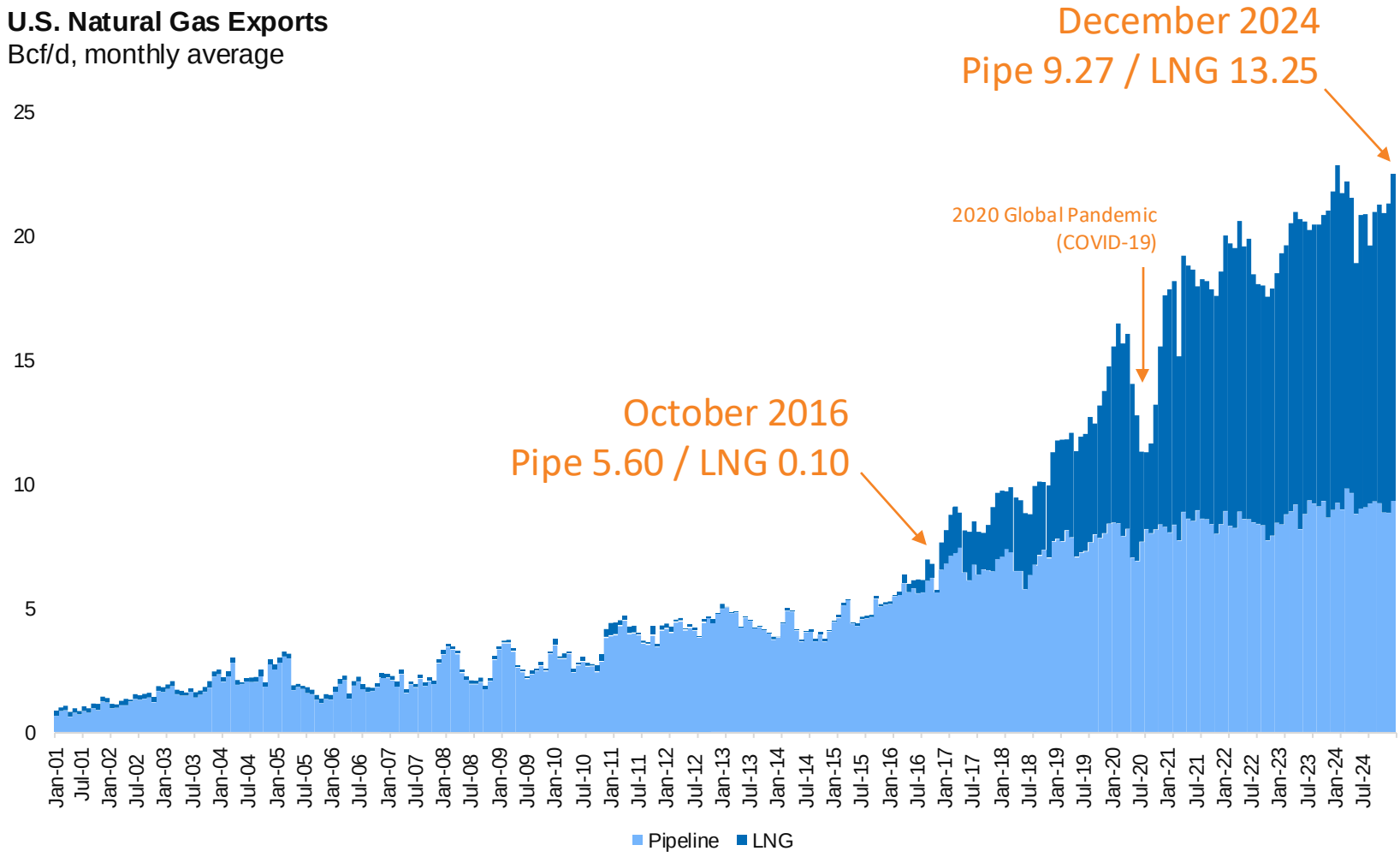
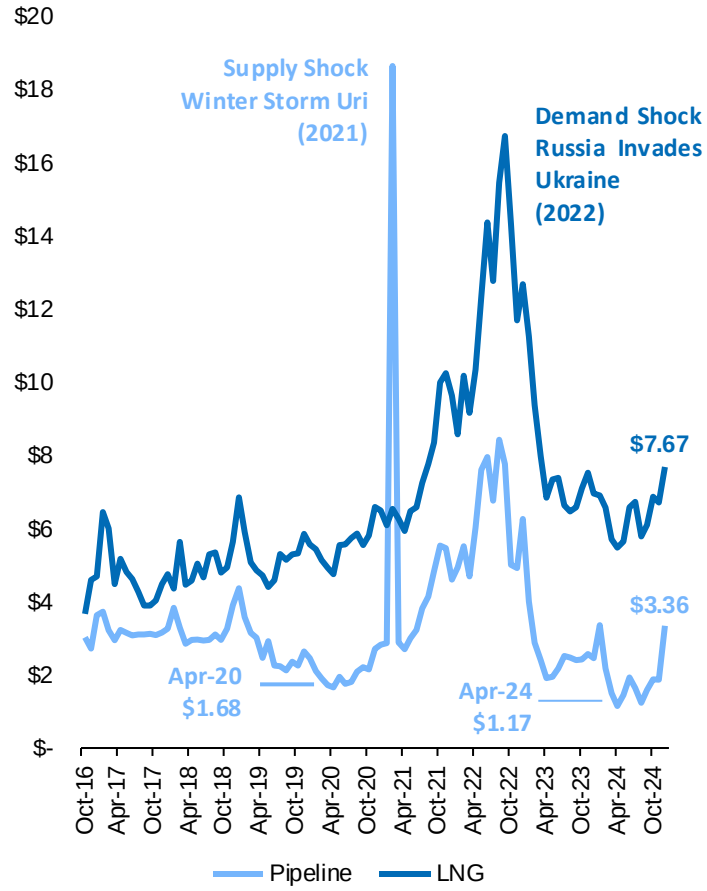
Export egress is a sturdy demand channel that lessens price volatility for domestic users

Commodities

U.S. Natural Gas Exports
Bcf/d, monthly average



U.S. Natural Gas Export Prices
$ per Mcf, monthly average through Dec-24



Source: EIA, 22V Research.
Note: maximum achieved total gas exports = 22.86 Bcf/d (Dec-23)

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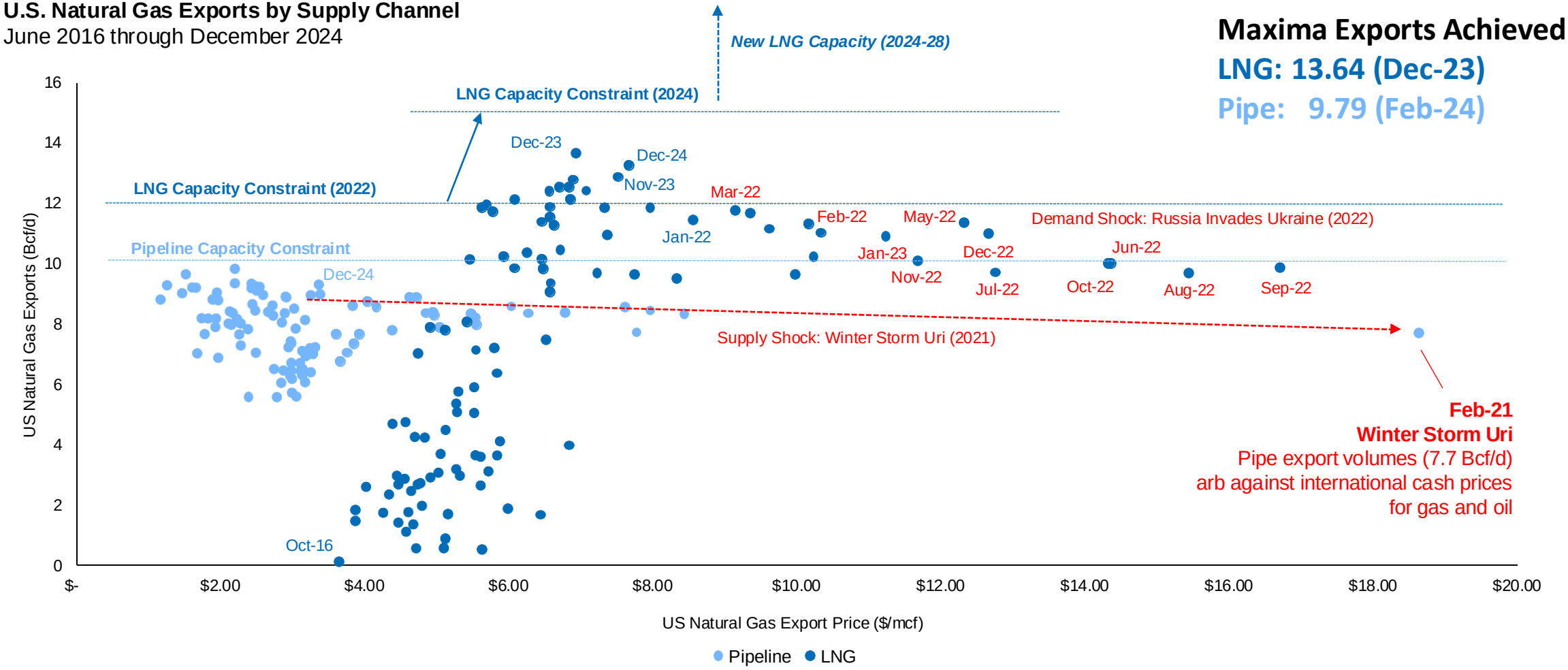
New LNG export capacity offers a new degree of freedom for Permian gas producers

Commodities

U.S. Natural Gas Exports by Supply Channel
June 2016 through December 2024



Maxima Exports Achieved
LNG: 13.64 (Dec-23)
Pipe: 9.79 (Feb-24)

Feb-21
Winter Storm Uri
Pipe export volumes (7.7 Bcf/d)
arb against international cash prices
for gas and oil

Source: EIA, 22V Research. Note: monthly averages.

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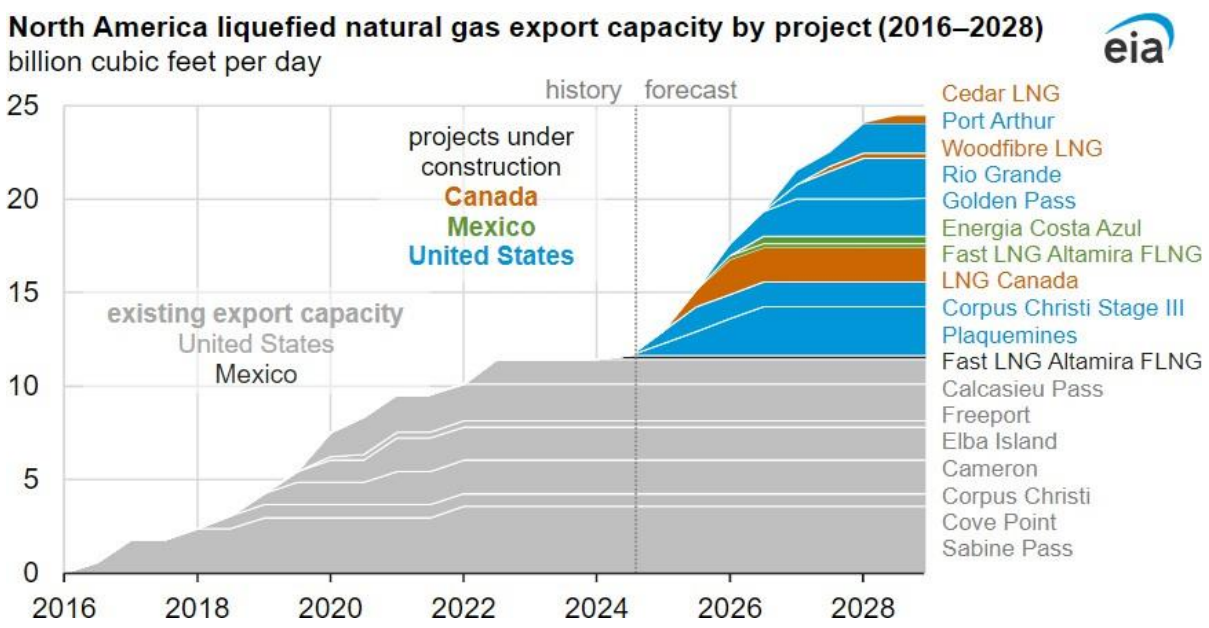
New Infrastructure: U.S. plans to add +9.7 Bcf/d in new LNG export capacity by 2028

Commodities



Key Observations

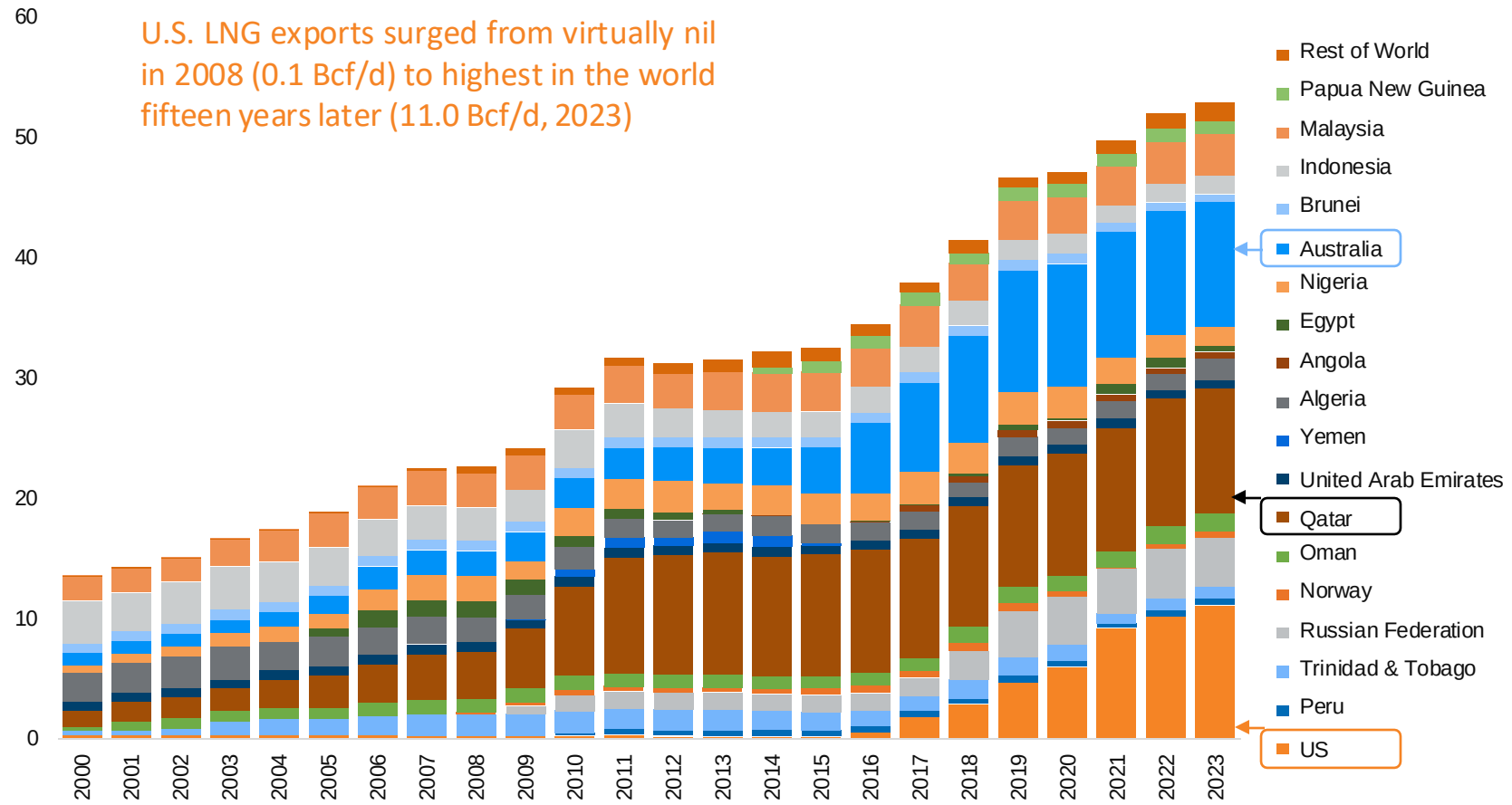
- **North American LNG export capacity is poised to more than double over the next three years.** Capacity will reach 24.4 Bcf/d in 2028 if projects under construction commence operations on time.
- **Canada:** Three projects with combined export capacity of 2.5 Bcf/d are under construction in British Columbia. Canada's energy regulator has authorized another four projects, with combined proposed capacity of 4.1 Bcf/d.
- **Mexico:** the Fast Altamira 1 project added 0.2 Bcf/d of floating LNG capacity earlier this year. Fast Altamira 2 and Costa Azul will add another 0.6 Bcf/d. Five other proposals would add another 4.5 Bcf/d, but none has reached FID.
- **United States:** Five projects currently under construction will add a combined export capacity of 9.7 Bcf/d (blue shading in chart at top left).

Source: EIA (V. Zaretskaya and J. O'Sullivan), 22V Research.

Where does U.S. rank among the world's LNG exporters? First and pulling further ahead.

Commodities

LNG Exports by Origin
Bcf/d



Key Observations

- The United States became the world's largest LNG exporter in 2023 with 11.01 Bcf/d of shipments.
- Qatar slipped to second place (10.4 Bcf/d) and Australia dropped to third (10.3 Bcf/d).
- In 2024, U.S LNG exports routinely surpassed 13 Bcf/d, further outpacing the competition.
- The principal destinations for U.S. cargoes in June 2024 were:
  - South Korea, 1.36 Bcf/d
  - Netherlands, 1.16 Bcf/d
  - India, 0.96 Bcf/d
  - Japan, 0.93 Bcf/d
  - China, 0.69 Bcf/d
  - Germany, 0.60 Bcf/d
  - Italy, 0.59 Bcf/d
  - Spain, 0.58 Bcf/d

Source: EI, EIA, 22V Research.

Natural gas balances for select countries: domestic production – domestic consumption

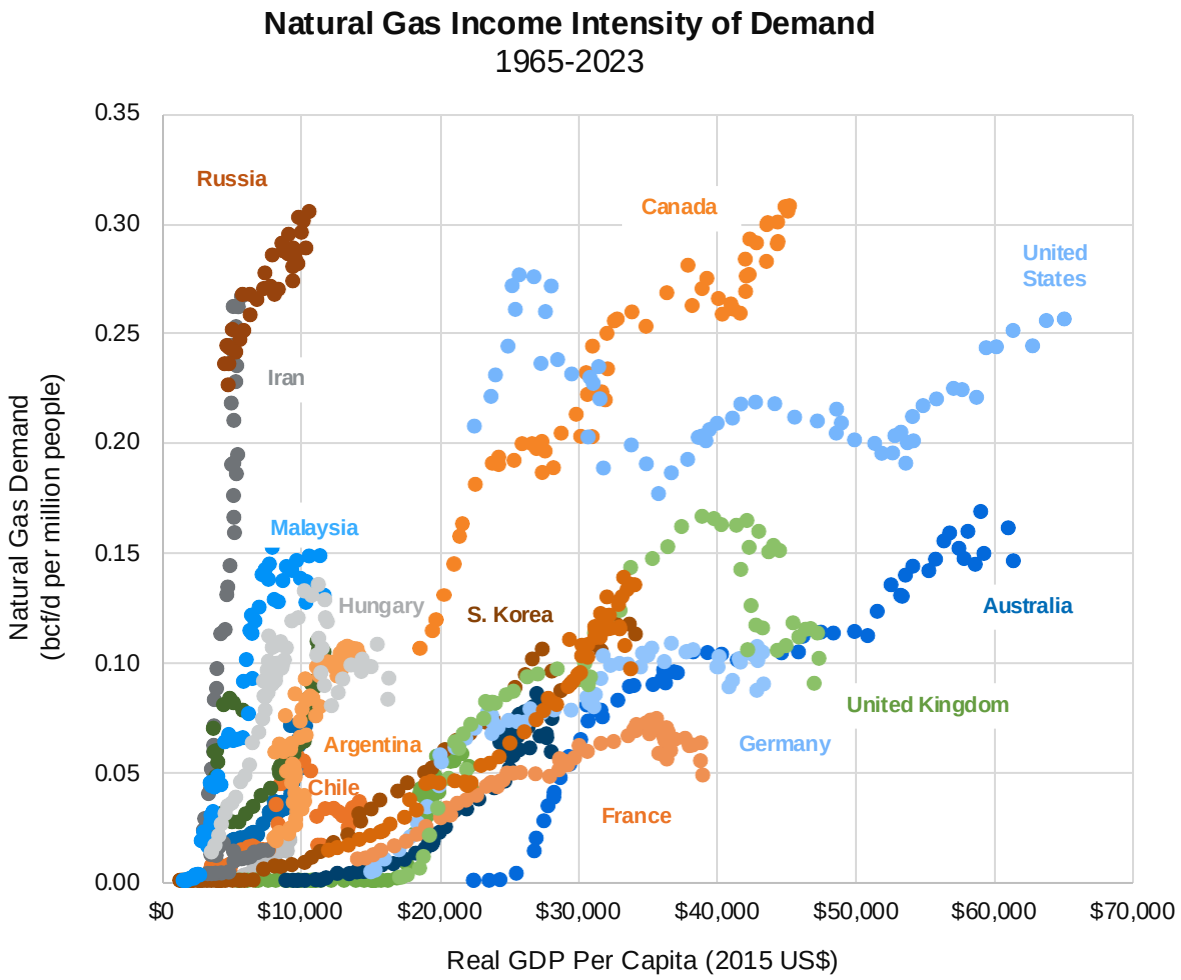
Commodities

Surplus: Bcf/d	1994	2008	2023	Deficit: Bcf/d	1994	2008	2023
United States	-6.07	-7.99	14.40	China	0.00	-0.10	-16.50
Qatar	-0.49	5.69	13.23	Germany	-5.32	-7.32	-6.95
Russian Federation	16.75	18.21	12.87	Mexico	-0.09	-1.23	-6.00
Norway	2.28	9.16	10.92	Italy	-2.70	-6.95	-5.39
Australia	0.85	1.27	10.80	India	0.00	-1.02	-3.00
Canada	6.60	7.14	6.73	United Kingdom	-0.15	-2.42	-2.81
Algeria	3.41	5.62	5.35	Thailand	0.09	-0.69	-2.08
Turkmenistan	2.20	5.18	3.83	Poland	-0.58	-1.10	-1.55
Malaysia	1.21	2.48	3.39	Netherlands	2.89	2.94	-1.54
Azerbaijan	-0.16	0.57	1.98	United Arab Emirates	0.29	-0.87	-1.10
Indonesia	3.32	3.39	1.82	Pakistan	0.00	0.00	-0.97

Source: EI, EIA, 22V Research.

Gas demand tends to follow S-curves: key threshold at $5,000 GDP per cap (2015 US$)

Commodities



Countries Projected To Grow Thru $5K Per Capita GDP by 2039				
	Pop. (2039P)	Low Case	Base Case	High Case
Vietnam	105,672,878	$ 8,646	$ 8,910	$ 9,182
Uzbekistan	43,130,872	$ 7,729	$ 7,982	$ 8,243
Indonesia	306,842,611	$ 7,600	$ 7,901	$ 8,214
Philippines	143,584,902	$ 5,747	$ 6,247	$ 6,786
Guatemala	21,663,520	$ 5,961	$ 6,210	$ 6,468
Sri Lanka	22,361,816	$ 5,601	$ 6,165	$ 6,782
Egypt	141,589,905	$ 5,967	$ 6,155	$ 6,349
Algeria	54,398,757	$ 5,419	$ 5,679	$ 5,950
Lao PDR	9,071,242	$ 5,285	$ 5,545	$ 5,818
Iraq	62,695,913	$ 4,523	$ 5,155	$ 5,868

Note: for this table, we exclude countries whose population is projected to be less than 7 million persons in 2039. This filter knocks out: El Salvador, Mongolia, Namibia, Moldova, and Bhutan.

Source: EI, EIA, World Bank, 22V. Note: in 2023, Indonesia's natural gas consumption averaged 4.4 Bcf/d. Domestic production averaged 6.2 Bcf/d, leaving the domestic market in a 1.8 Bcf/d surplus. However, domestic production is on a declining trend, contracting at an average rate of 1.9% per year for the past decade.

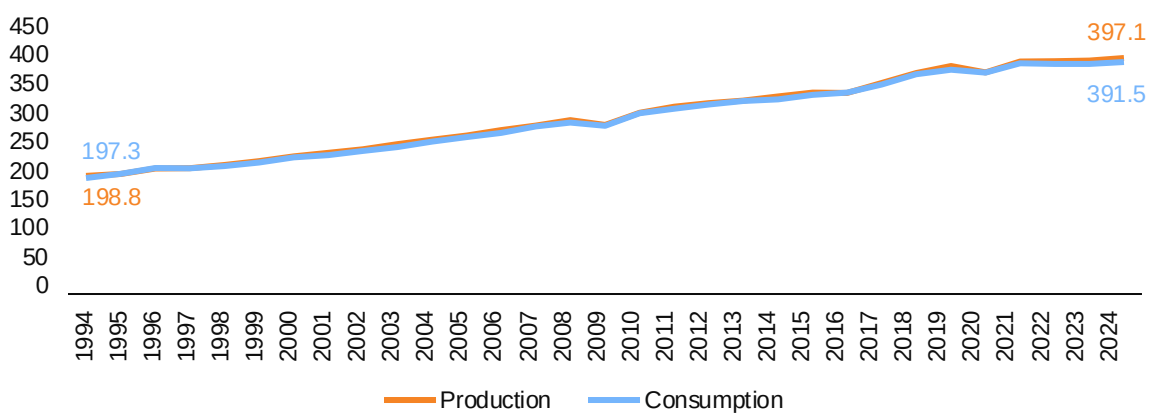
22V | RESEARCH

Philippines' domestic production and consumption have been flat at 0.3 Bcf/d for a decade. Demand will likely pick up appreciably as the country's per capita income compounds in coming years.

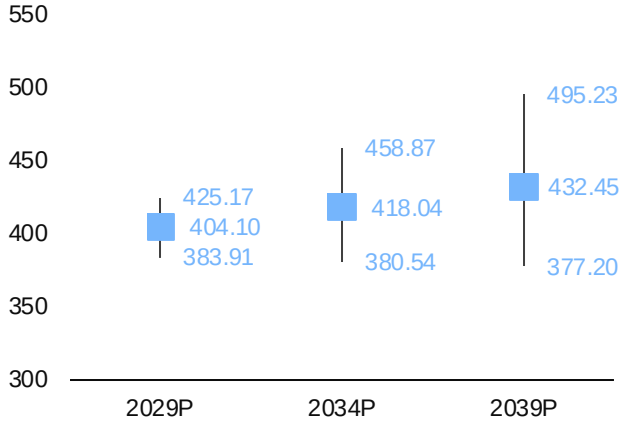
World Gas SND*: a strong upward trend through the projection horizon

Commodities

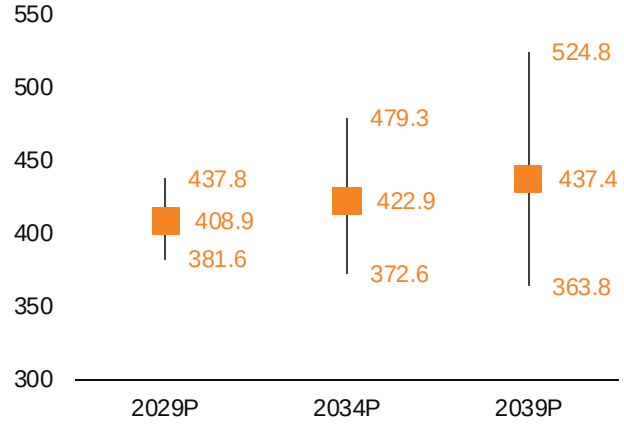
World Natural Gas Production & Consumption, 1994-2024E
bcf/d



Projected World Gas Consumption
95% confidence interval in bcf/d



Projected World Gas Production
95% confidence interval in bcf/d



2023 Balance	Production Bcf/d (share)	Consumption Bcf/d (share)	Balance Bcf/d
North America	122.02 (31%)	106.89 (28%)	+15.13
S & C America	15.68 (4%)	15.65 (4%)	+0.03
Europe & CIS	94.61 (24%)	102.50 (26%)	–7.89
Africa & Mideast	93.50 (24%)	72.46 (19%)	+21.04
Asia	66.94 (17%)	90.50 (23%)	–23.56

Key Observations

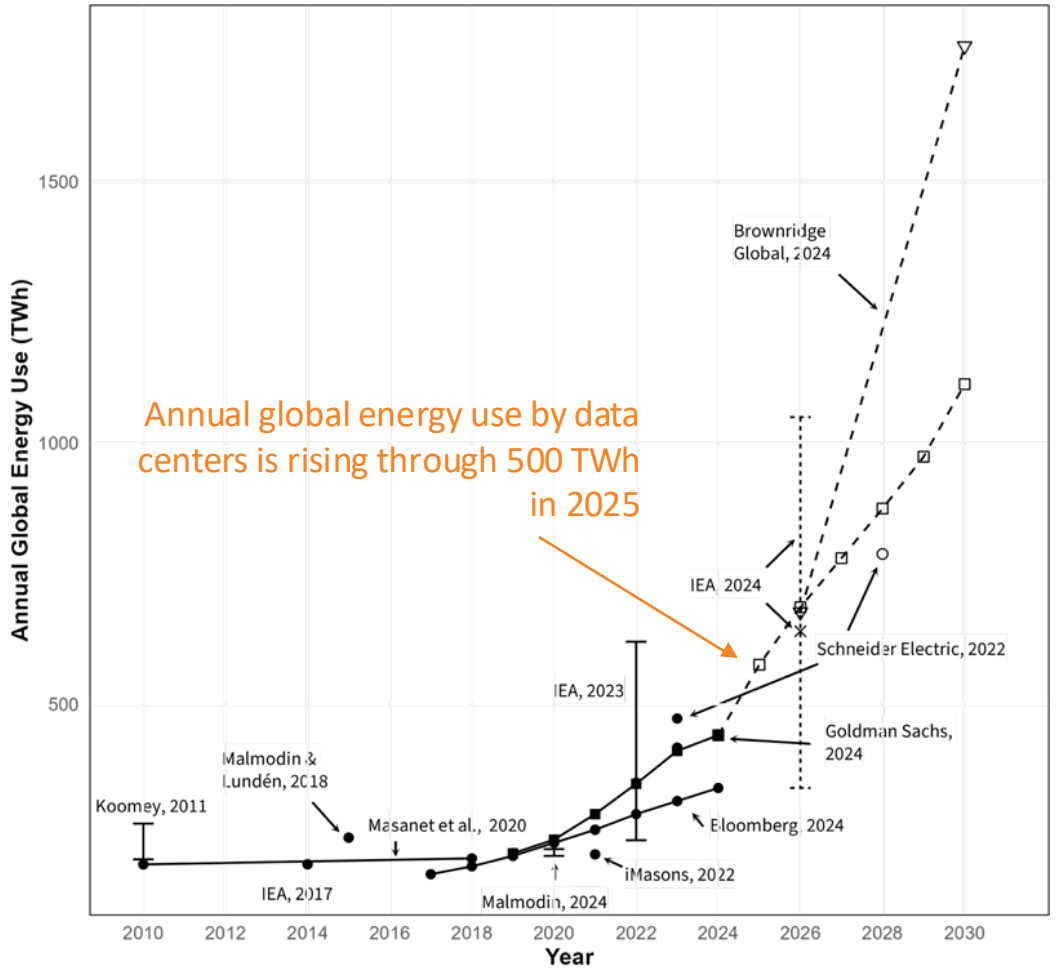
- **Supply:** world gas output has doubled in the past 30 years and remains on a solid uptrend. We project nearly another 10% increase by 2039.
- **Demand:** substitution against coal remains a potent opportunity. Use as a petchem feedstock is also likely to expand as a key demand channel.
- **Trade:** North American LNG is rewiring how gas demand is met and priced in Europe and Asia, esp. as Russia/Ukraine conflict persists.

Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.
*SND = supply and demand

22V | RESEARCH

Data processing needs worldwide offer huge uplift for strategies based on gas-fired power

Commodities



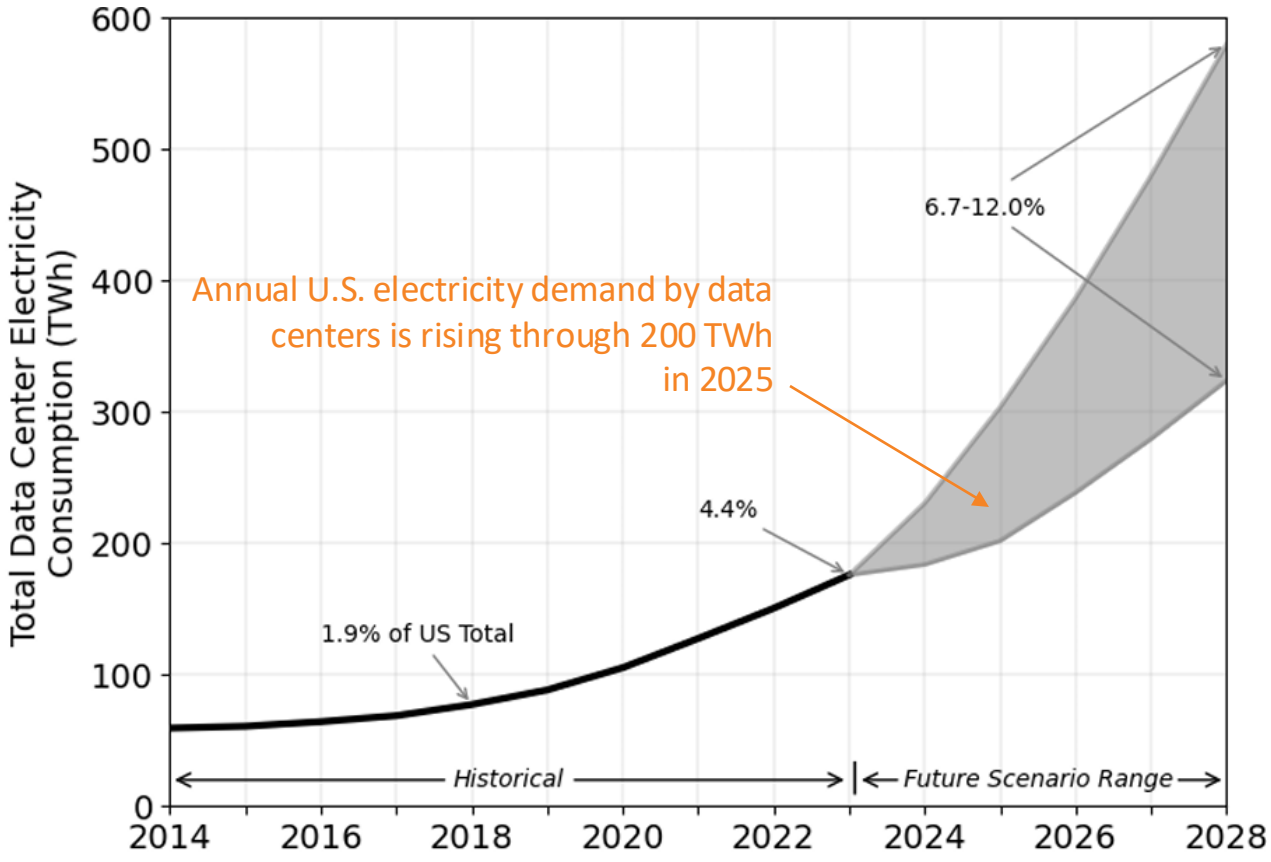


Figure ES-1. Total U.S. data center electricity use from 2014 through 2028.

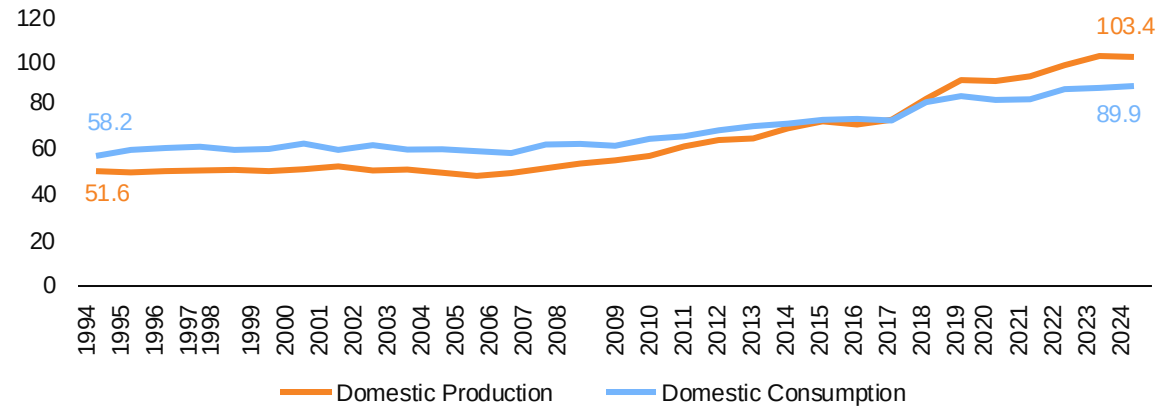
Source: U.S. Department of Energy.
Note: DOE projects data center electricity usage will increase to between 325 and 580 TWh by 2028.

22V | RESEARCH

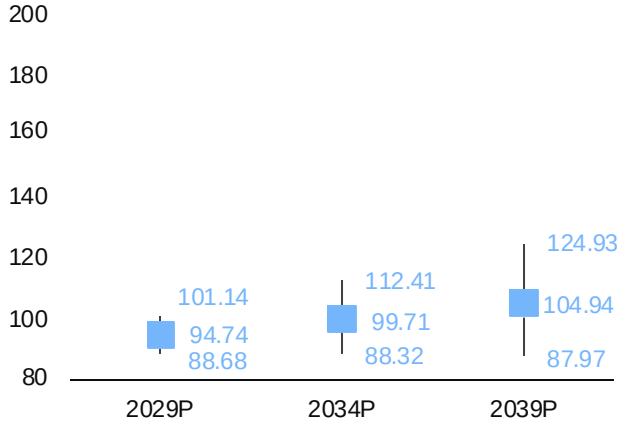
U.S. Gas: a production boom increasingly has outlets to share molecules with the world

Commodities

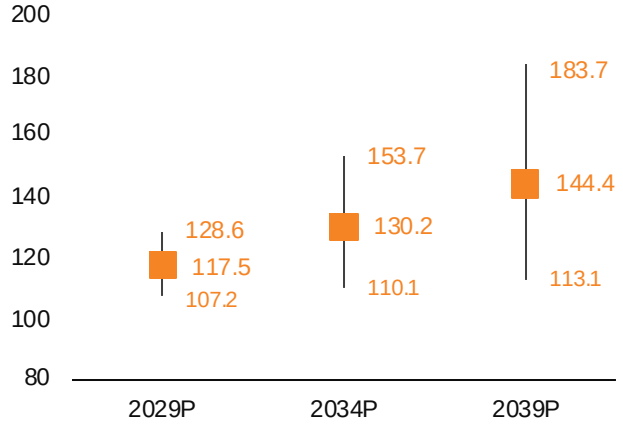
U.S. Natural Gas Production and Consumption, 1994-2024E
bcf/d



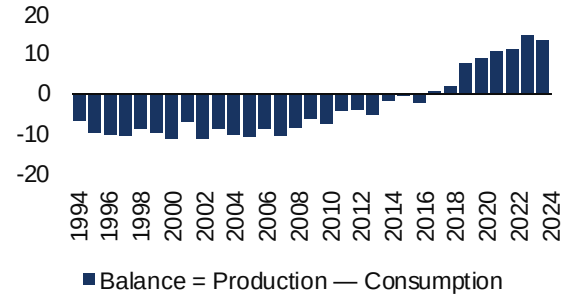
Projected U.S. Gas Consumption
95% confidence interval in bcf/d



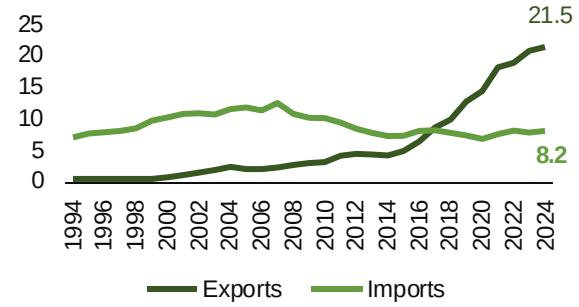
Projected U.S. Gas Production
95% confidence interval in bcf/d



U.S. Balance, Natural Gas
bcf/d



U.S. Trade, Natural Gas
bcf/d



Key Observations

- **Supply:** the U.S. is the world's largest producer of natural gas and now its largest supplier through trade. Deeper integration is highly likely.
- **Demand:** export is the main channel for growth. But domestic data are picking up incremental demand tied to power-intensive generative AI.
- **Trade:** booming LNG capacity on the Gulf Coast has opened new export markets for domestic producers previously constrained to Mexico.

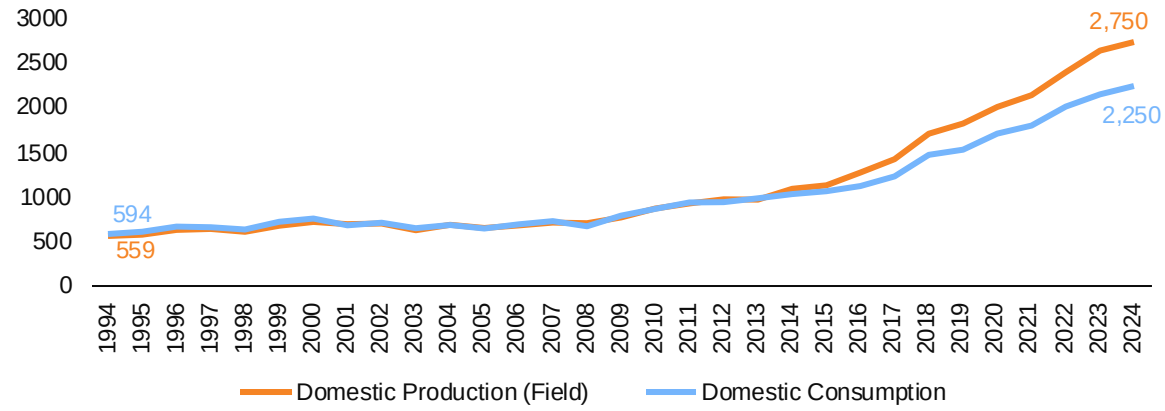
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.

22V | RESEARCH

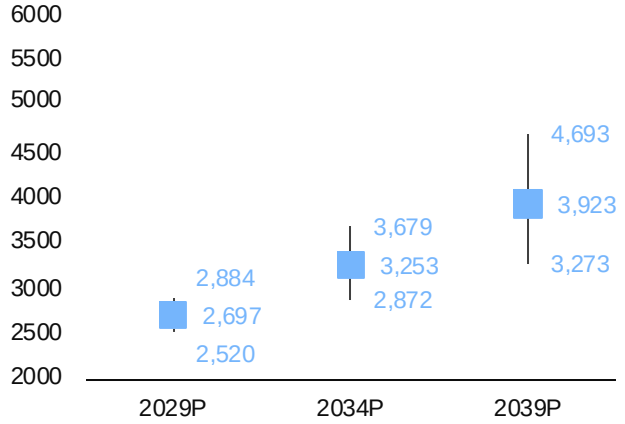
Ethane: necessity is the mother of invention

Commodities

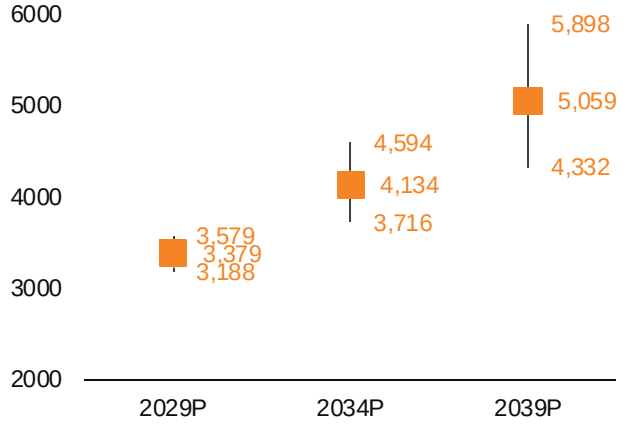
U.S. Ethane Production and Consumption, 1994-2024E
thousand b/d



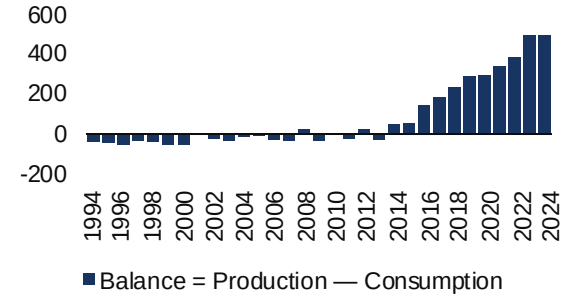
Projected U.S. Ethane Consumption
95% confidence interval in thousand b/d



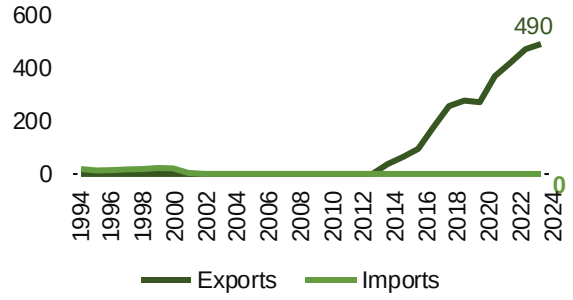
Projected Ethane Production (Field)
95% confidence interval in thousand b/d



U.S. Balance, Ethane
thousand b/d



U.S. Trade, Ethane
thousand b/d



Key Observations

- **Supply:** the shale drilling boom spurred huge growth in NGL field production. Ethane production tripled from 2010. Likely to keep going.
- **Demand:** domestic consumption has more than doubled since 2010, as price directed supply to productive use, but not enough to erase surplus.
- **Trade:** the domestic balance is in a structural surplus of about 500 thousand b/d and growing. This has opened the export solution.

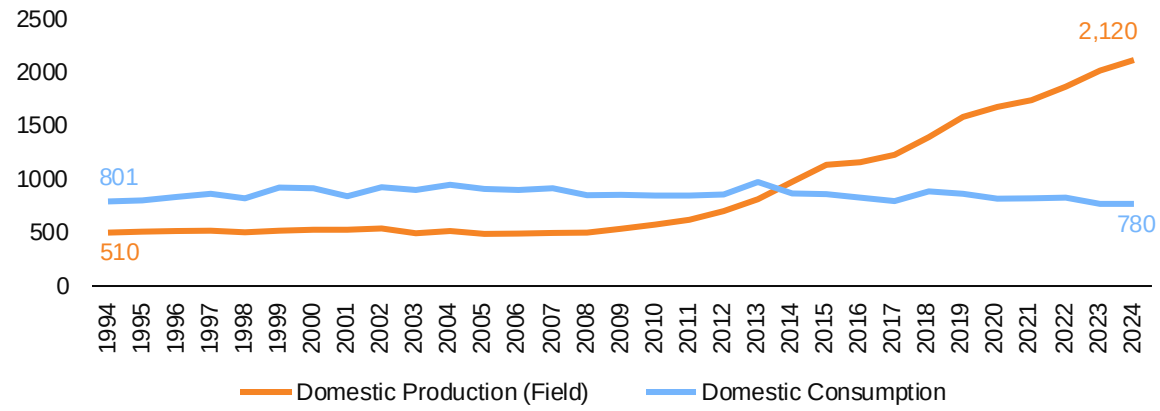
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.
Note: data are for field production of ethane. Refiner/blender production of ethane has declined from 21 thousand b/s in 1993 to 7 thousand b/d in 2023.

22V | RESEARCH

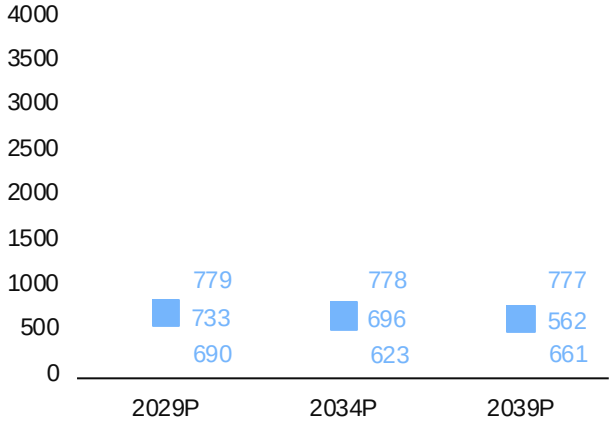
Propane: lack of domestic demand spurs more intense pressure to move via exports

Commodities

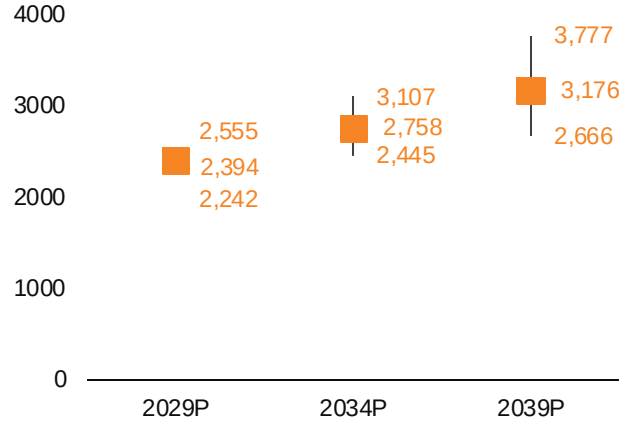
U.S. Propane Production and Consumption, 1994-2024E
thousand b/d



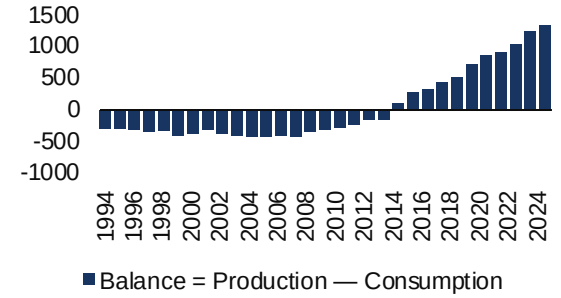
Projected U.S. Propane Consumption
95% confidence interval in thousand b/d



Projected Propane Production (Field)
95% confidence interval in thousand b/d



U.S. Balance, Propane
thousand b/d



U.S. Trade, Propane
thousand b/d

Key Observations

- **Supply:** the shale drilling boom spurred huge growth in NGL field production. Production more than tripled from 2010. Likely to keep going.
- **Demand:** unlike ethane, greater supply availability has not translated to higher domestic demand for propane, which is lower than 30 years ago.
- **Trade:** the structural surplus now exceeds 1.3 million b/d. In 2024, the boom in propane exports is likely to reach 1.75 million b/d.

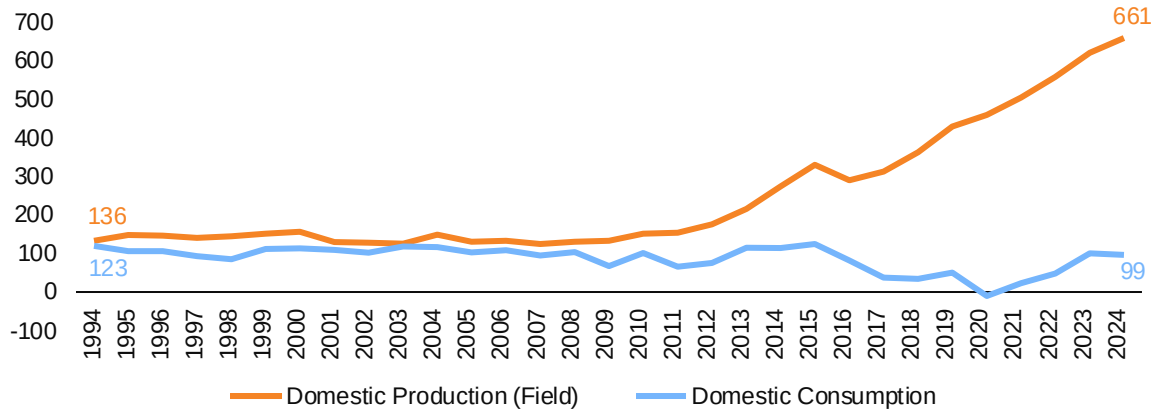
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research. Note: data are for field production of propane. Refiner/blender net production of propane has been relatively flat for the past 15 years. From 2008 through 2023, it averaged 288 thousand b/d in a range from 264 thousand b/d (2020) to 312 thousand b/d (2008). Refiner/blender net production of propane was 278 thousand b/d in 2023.

22V | RESEARCH

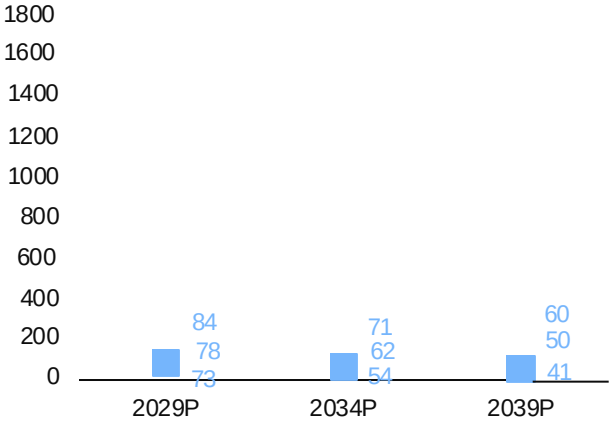
Normal butane: another export story, as booming output meets soft domestic demand

Commodities

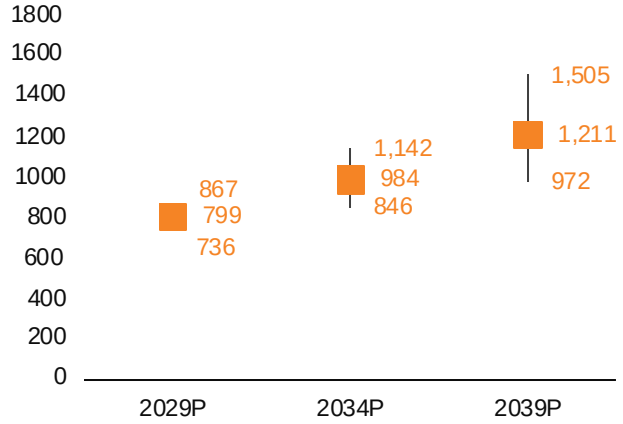
U.S. Butane Production and Consumption, 1994-2024E
thousand b/d



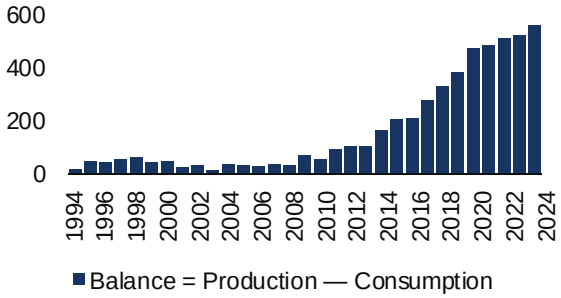
Projected U.S. Butane Consumption
95% confidence interval in thousand b/d



Projected Butane Production (Field)
95% confidence interval in thousand b/d



U.S. Balance, Butane
thousand b/d



U.S. Trade, Butane
thousand b/d

Key Observations

- **Supply:** again, the shale drilling boom spurred huge growth in NGL field production. Normal butane production could double again by 2039.
- **Demand:** like propane, greater supply availability has not translated to greater demand, which is lower than 30 years ago.
- **Trade:** the structural surplus in normal butane surged to 560 thousand b/d in 2024. Data suggest export channel is struggling to move 20% of it.

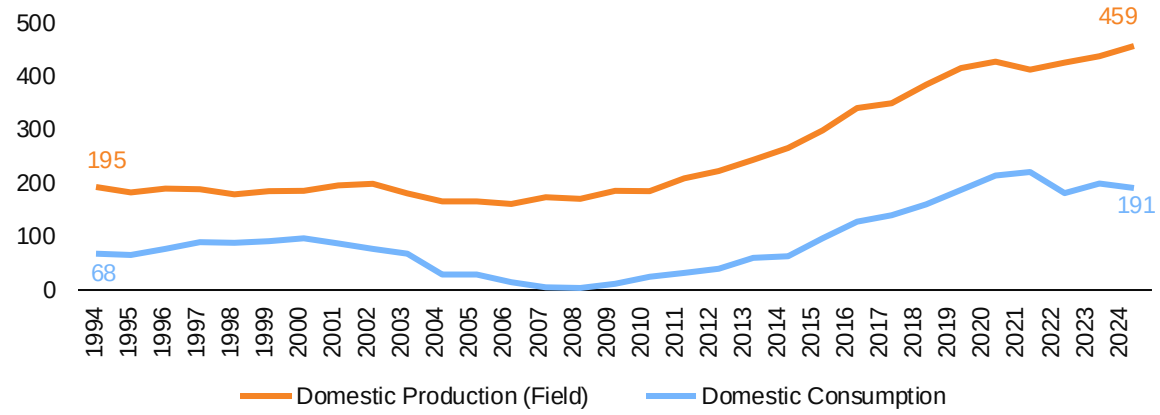
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research. Note: data are for field production of normal butane. From 2008 through 2023, refiner/blender net production of normal butane has averaged 62 thousand b/d in a range from 40 thousand b/d (2020) to 90 thousand b/d (2008). Refiner/blender net production of normal butane was 85 thousand b/d in 2023.

22V | RESEARCH

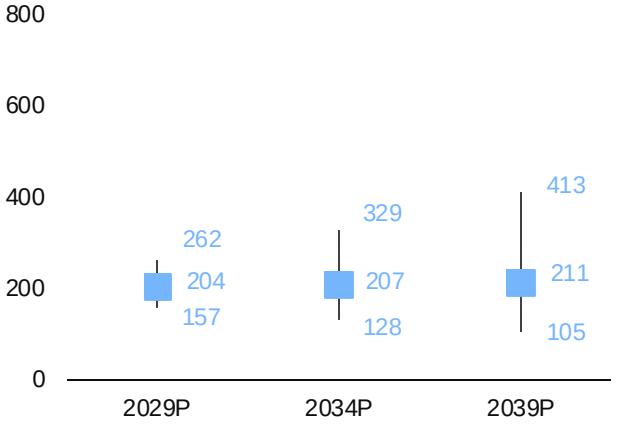
Isobutane: surplus is getting managed through domestic refinery operations

Commodities

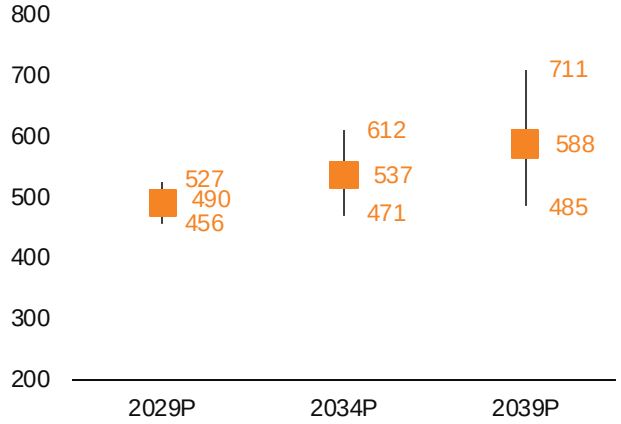
U.S. Isobutane Production and Consumption, 1994-2024E
thousand b/d



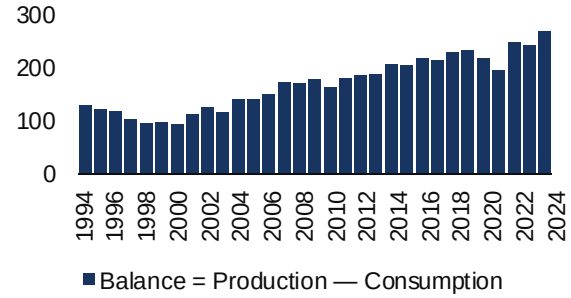
Projected U.S. Isobutane Consumption
95% confidence interval in thousand b/d



Projected Isobutane Production (Field)
95% confidence interval in thousand b/d



U.S. Balance, Isobutane
thousand b/d



U.S. Trade, Isobutane
thousand b/d

Key Observations

- **Supply:** a far smaller market than either ethane or propane, field output of isobutane reached 459 thousand b/d in 2024.
- **Demand:** has hooked lower since the pandemic. Down about 30 thousand b/d versus 2021.
- **Trade:** given the utility of this product in refinery operations, there has been less urgency to export the surplus. About 13 thousand b/d in 2024.

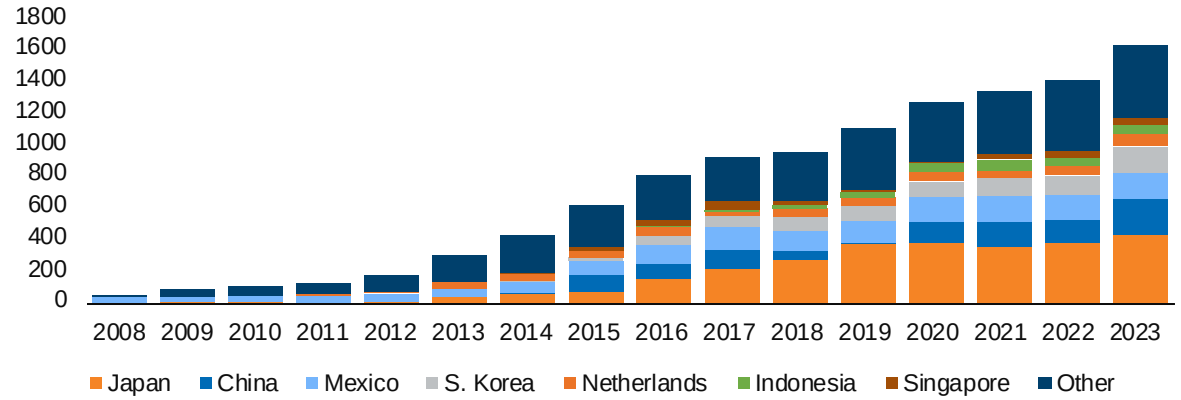
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research. Note: data are for field production of isobutane. From 2008 through 2023, refiner/blender net production of isobutane has averaged –7 thousand b/d in a range from –21 thousand b/d to +6 thousand b/d. Refiner/blender net production of isobutane was –15 thousand b/d in 2023.

22V | RESEARCH

U.S. NGL exports by destination country

Commodities

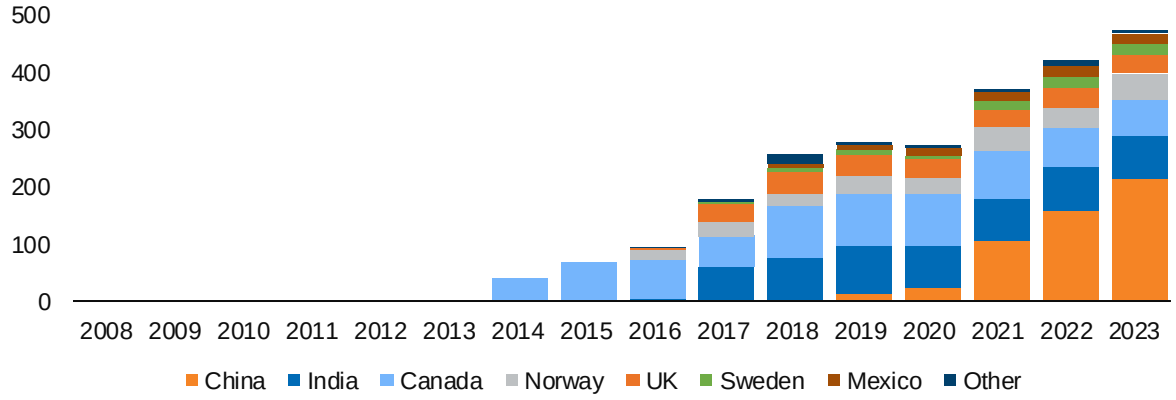
U.S. Propane Exports By Destination
thousand b/d (n=53 countries in 2023)



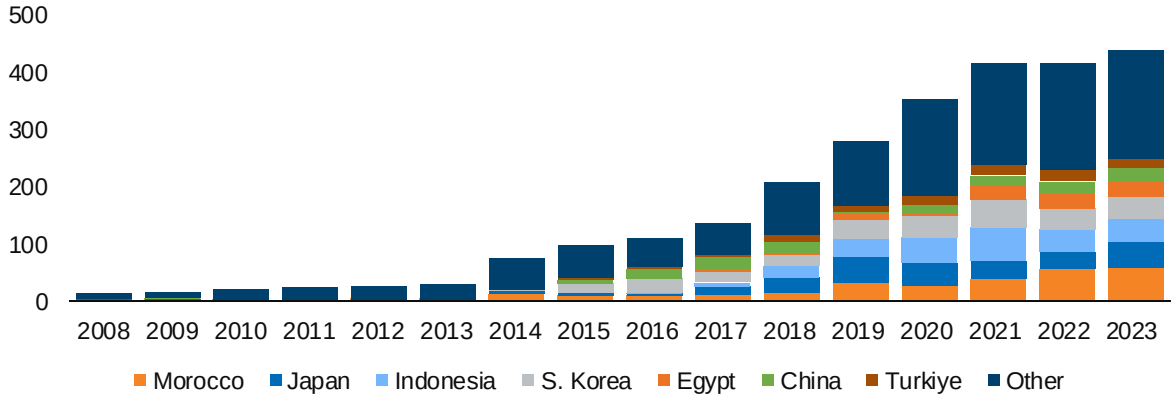
Key Observations

- **China: only country to rank as a Top 7 destination in all three markets:** Propane: 223 kbd (14%). Ethane: 213 kbd (45%). Butane: 21 kbd (5%).
- **Japan and Korea are top destinations for propane and normal butane.** Propane: 591 kbd (37%). Normal Butane: 84 kbd (19%).
- **Diversity of demand:** Propane has the most destination countries (n=53), but normal butane is the least concentrated ("Other" share is 43%).
- **Mexico:** propane (168 kbd), ethane (17 kbd), normal butane (1 kbd).

U.S. Ethane Exports By Destination
thousand b/d (n=9 countries in 2023)



U.S. Normal Butane Exports By Destination
thousand b/d (n=41 countries in 2023)



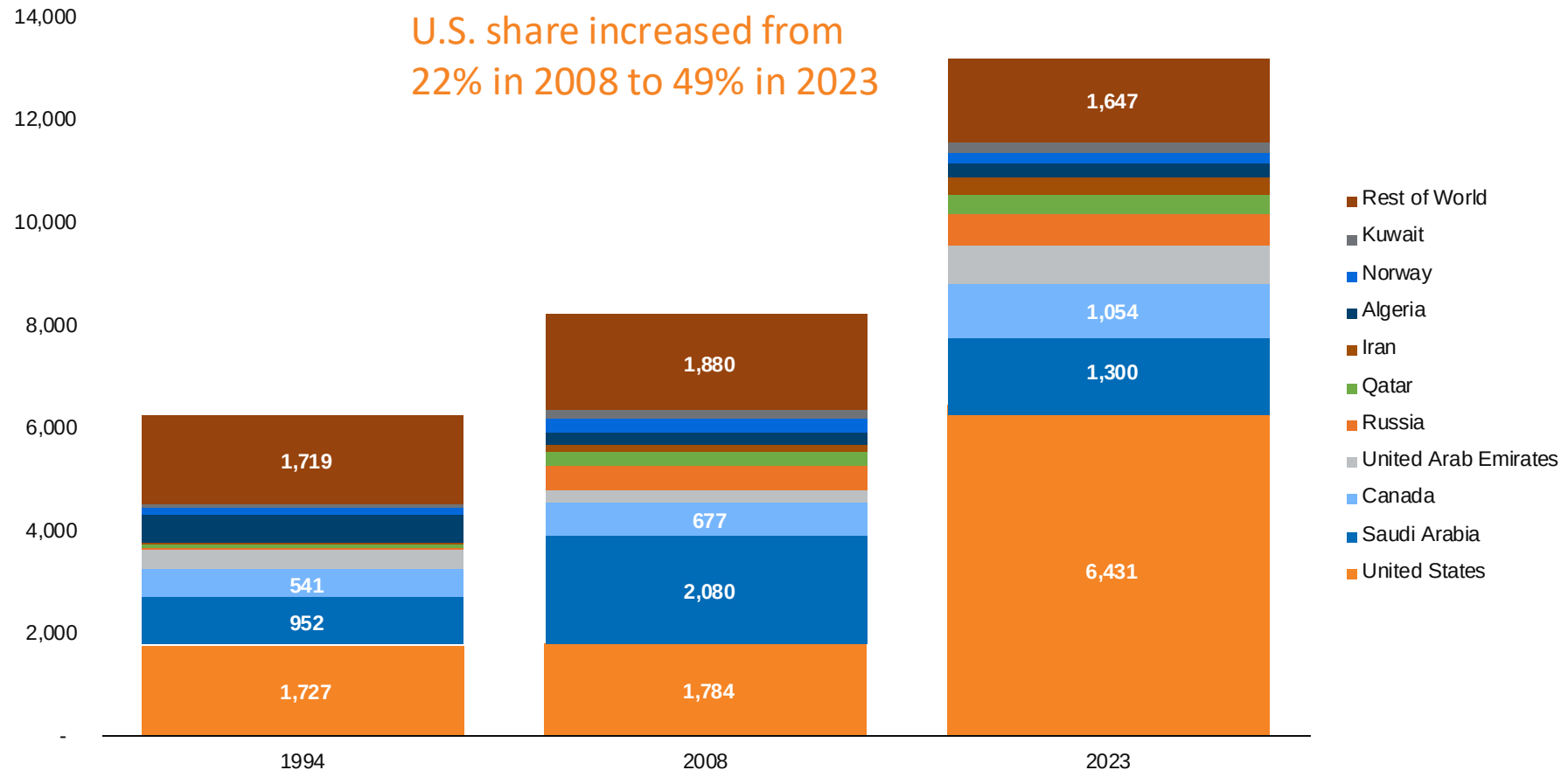
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research. Note: U.S. isobutane exports (not charted above) averaged 3 thousand b/d in 2003. Mexico was the only destination.

22V | RESEARCH

U.S. holds solid command of NGPL production and growth

Commodities

Natural Gas Plant Liquids Production: 1994, 2008, and 2023
thousand b/d



Key Observations

- The United States is the single largest driver of world NGPL production growth. Over the past 15 years, the U.S. accounts for **93%** of the world's net increase.
- UAE is the second largest contributor to NGPL world net production growth on that horizon, accounting for **11%**.
- Canada is third largest contributor to the net increase, accounting for **8%**.
- Among the top 10 producers in 2023, two show net declines in their five-year CAGRs for NGPL output: Saudi Arabia (**–1.3%**) on its idling of upstream capacity and Norway (**–7.4%**) on environmental policy.
- Rest of world has been flat for 30 years at about 1.7 million b/d.

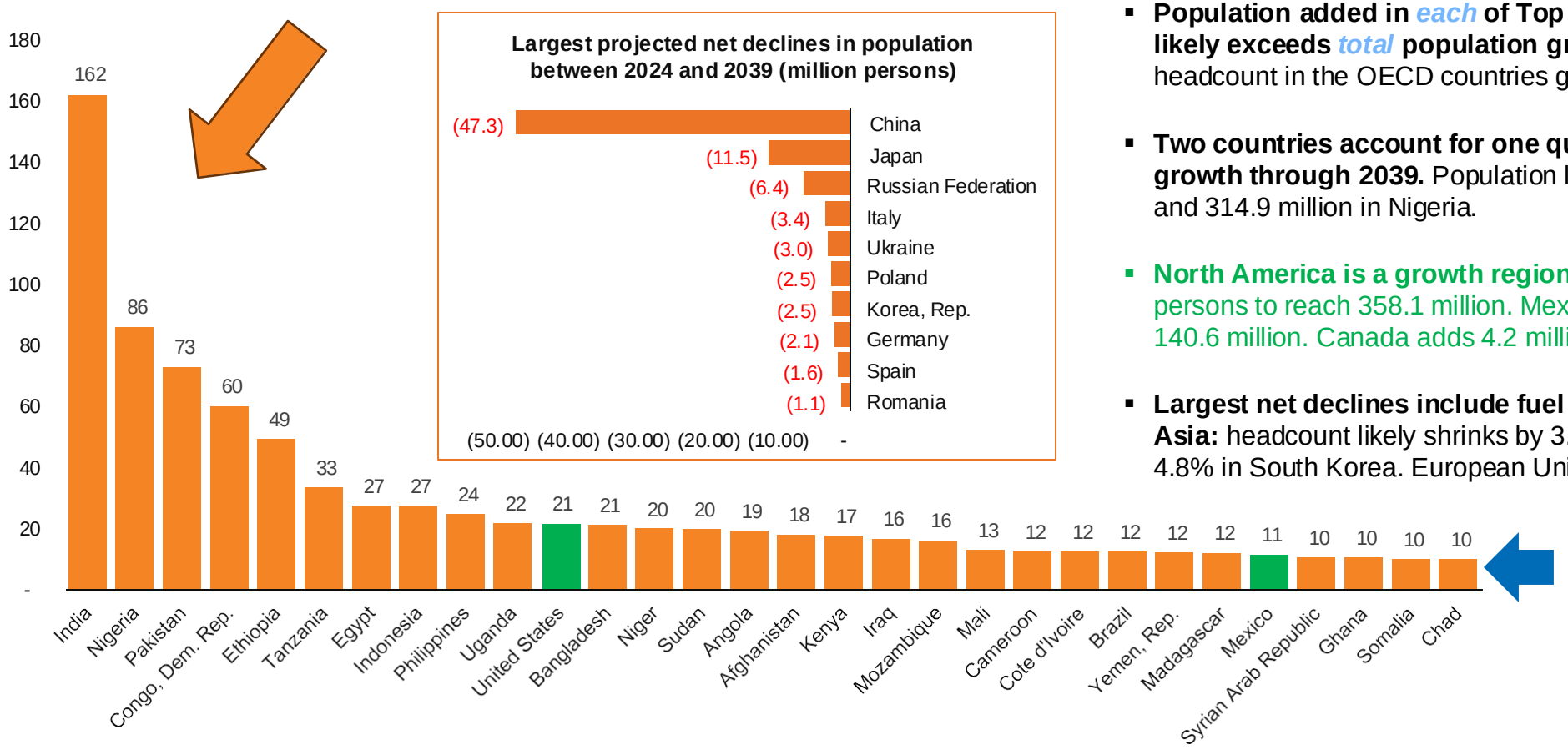
Source: EIA, EI, 22V Research.

22V | RESEARCH

Population growth is geared toward South Asia, Africa, and the Middle East

Commodities

Largest contributions to human population by 2039
million persons, net population growth from 2024



Key Observations

- **Population added in *each* of Top 5 largest-growth countries likely exceeds *total* population growth across all OECD:** headcount in the OECD countries grows by 34.0 million (+2.5%).
- **Two countries account for one quarter of world population growth through 2039.** Population likely reaches 1.60 billion in India and 314.9 million in Nigeria.
- **North America is a growth region:** the U.S. likely adds 21.5 million persons to reach 358.1 million. Mexico adds 11.2 million to reach 140.6 million. Canada adds 4.2 million to reach 44.6 million.
- **Largest net declines include fuel import-intensive nations in Asia:** headcount likely shrinks by 3.4% in China, 9.3% in Japan, and 4.8% in South Korea. European Union population shrinks by 2.6%.

These 30 nations account for 86% of projected net population growth by 2039.

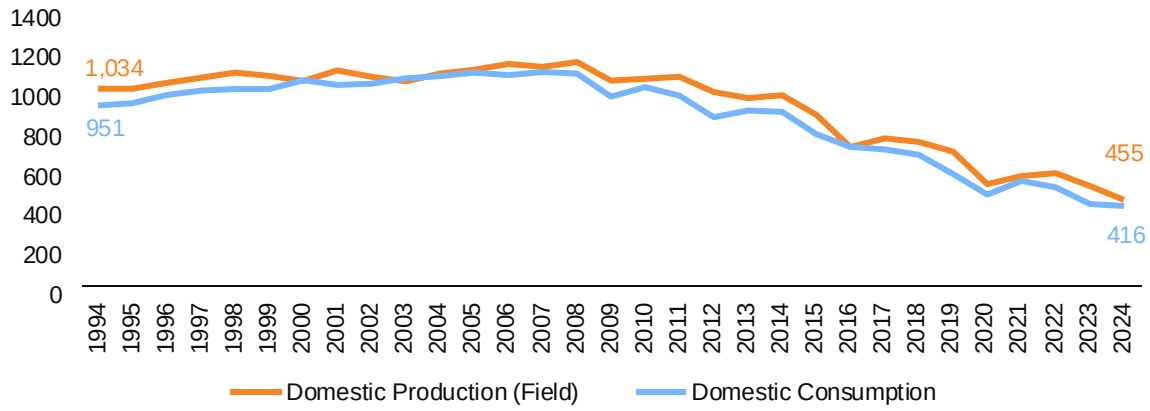
Source: United Nations, 22V Research.
Note: our baseline projects world population will grow by 998 million persons to reach 9.096 billion by 2039.

22V | RESEARCH

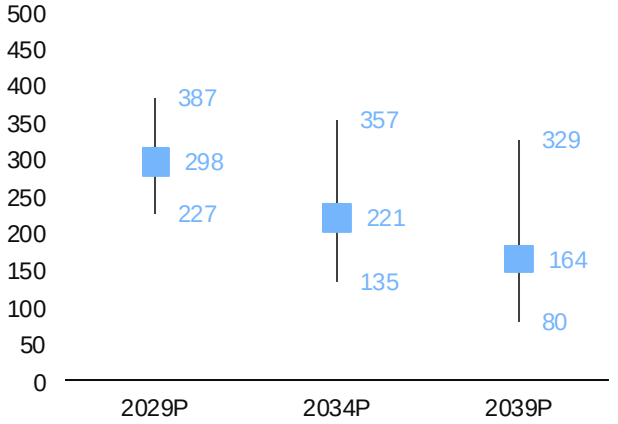
Coal: domestic disappearance but also an export awakening and revived policy support

Commodities

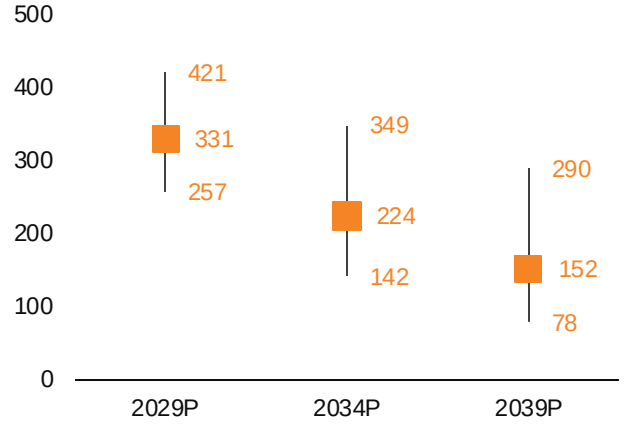
U.S. Coal Production and Consumption, 1994-2024E
million metric tonnes



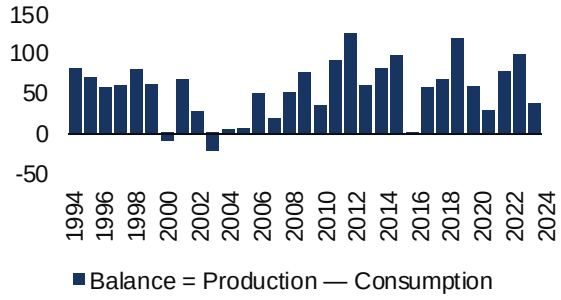
Projected U.S. Coal Consumption
95% confidence interval in million tonnes



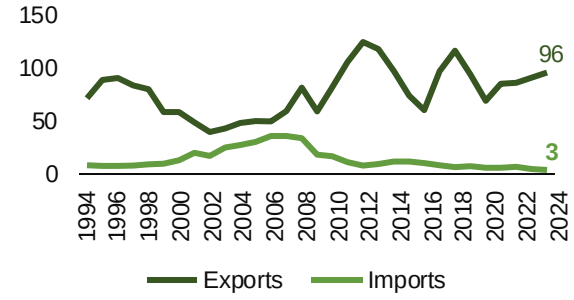
Projected Coal Production
95% confidence interval in million tonnes



U.S. Balance, Coal
million metric tonnes



U.S. Trade, Coal
million metric tonnes



Key Observations

- **Supply:** the U.S. coal market has shrunk by more than half in the past 15 years. We project it will shrink by another two thirds by 2039.
- **Demand:** U.S. environmental policy and consumer sentiment are strong headwinds against domestic coal demand for power generation.
- **Trade:** ironically, this is sustaining a bull market for exports to countries that are still coal-intensive. U.S. coal exports have doubled since 2010.

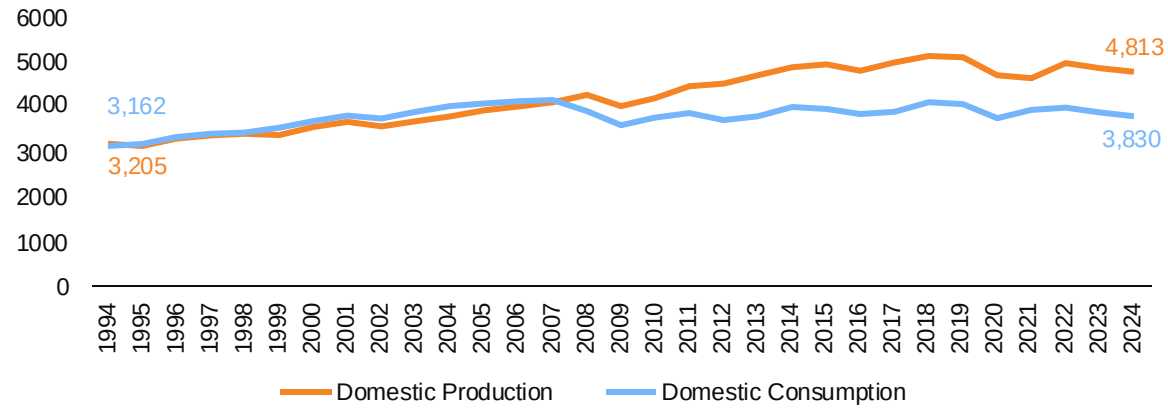
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research. Note: U.S. coal data are usually reported in short tons. We use metric tonnes for all coal data in this deck for easier comparison of the U.S. and rest of world coal numbers.

22V | RESEARCH

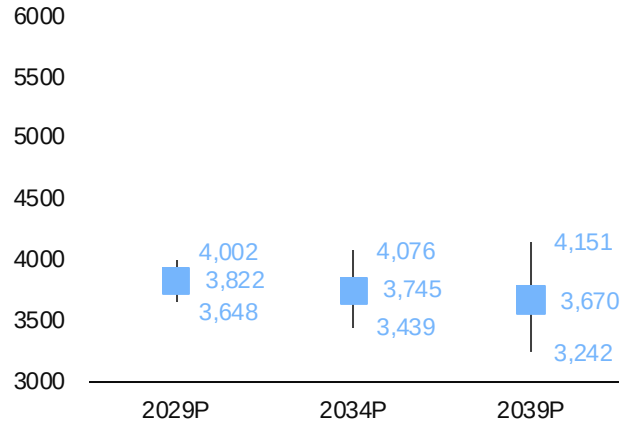
Distillate fuel in the U.S.: declining slowly and finding support in intermodal systems

Commodities

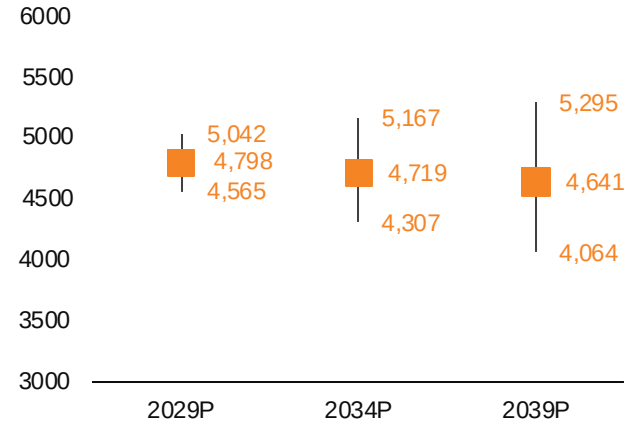
U.S. Distillate Production and Consumption, 1994-2024E
thousand b/d



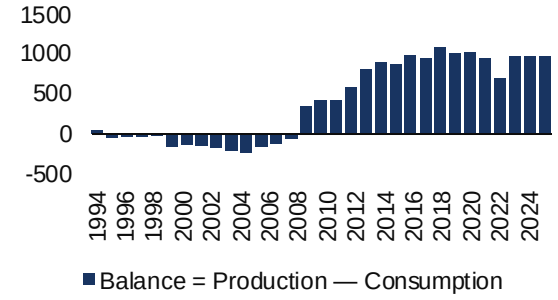
Projected U.S. Distillate Consumption
95% confidence interval in thousand b/d



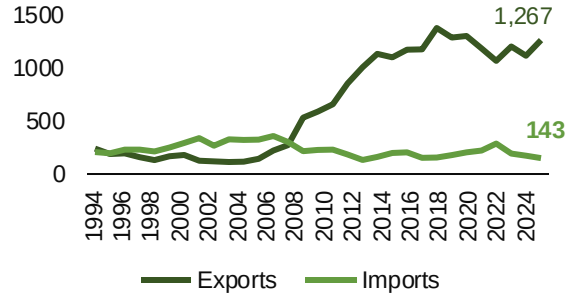
Projected U.S. Distillate Production
95% confidence interval in thousand b/d



U.S. Balance, Distillate Fuel
thousand b/d



U.S. Trade, Distillate Fuel
thousand b/d



Key Observations

- **Supply:** the U.S. balance is in a structural surplus of about one million barrels per day. Supply decline is likely to track slow decline in demand.
- **Demand:** domestic use of diesels for heating fuel is in structural decline, losing share to natural gas.
- **Trade:** Latin America is the primary destination for exports. Top buyers are Mexico, Chile, Panama, Peru, Ecuador, Guatemala, and Argentina.

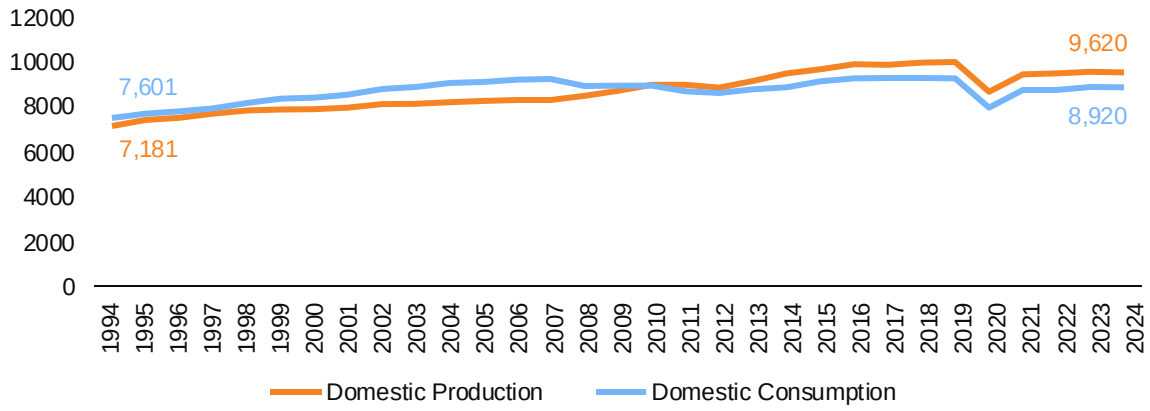
Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.

22V | RESEARCH

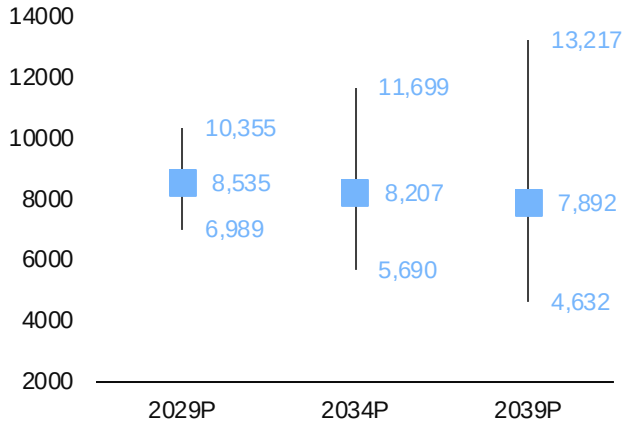
Gasoline: much longer goodbye than widely assumed, in part on longer ICE vehicle lives

Commodities

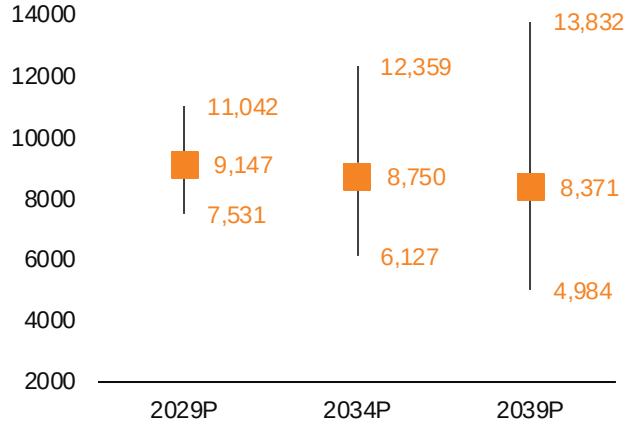
U.S. Gasoline Production and Consumption, 1994-2024E
thousand b/d



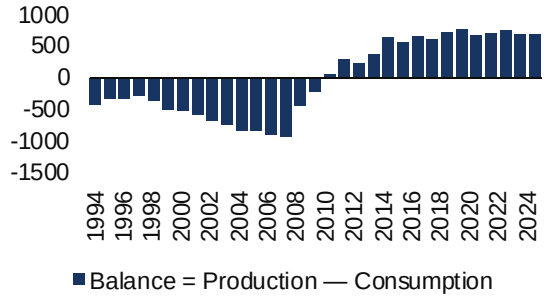
Projected U.S. Gasoline Consumption
95% confidence interval in thousand b/d



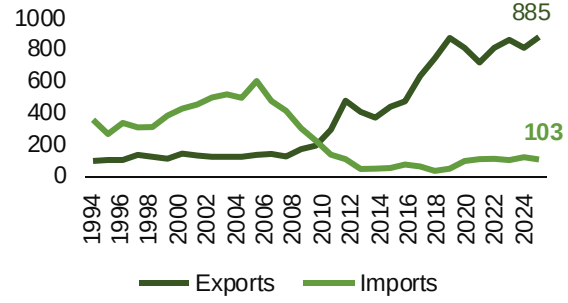
Projected U.S. Gasoline Production
95% confidence interval in thousand b/d



U.S. Balance, Gasoline
thousand b/d



U.S. Trade, Gasoline
thousand b/d



Key Observations

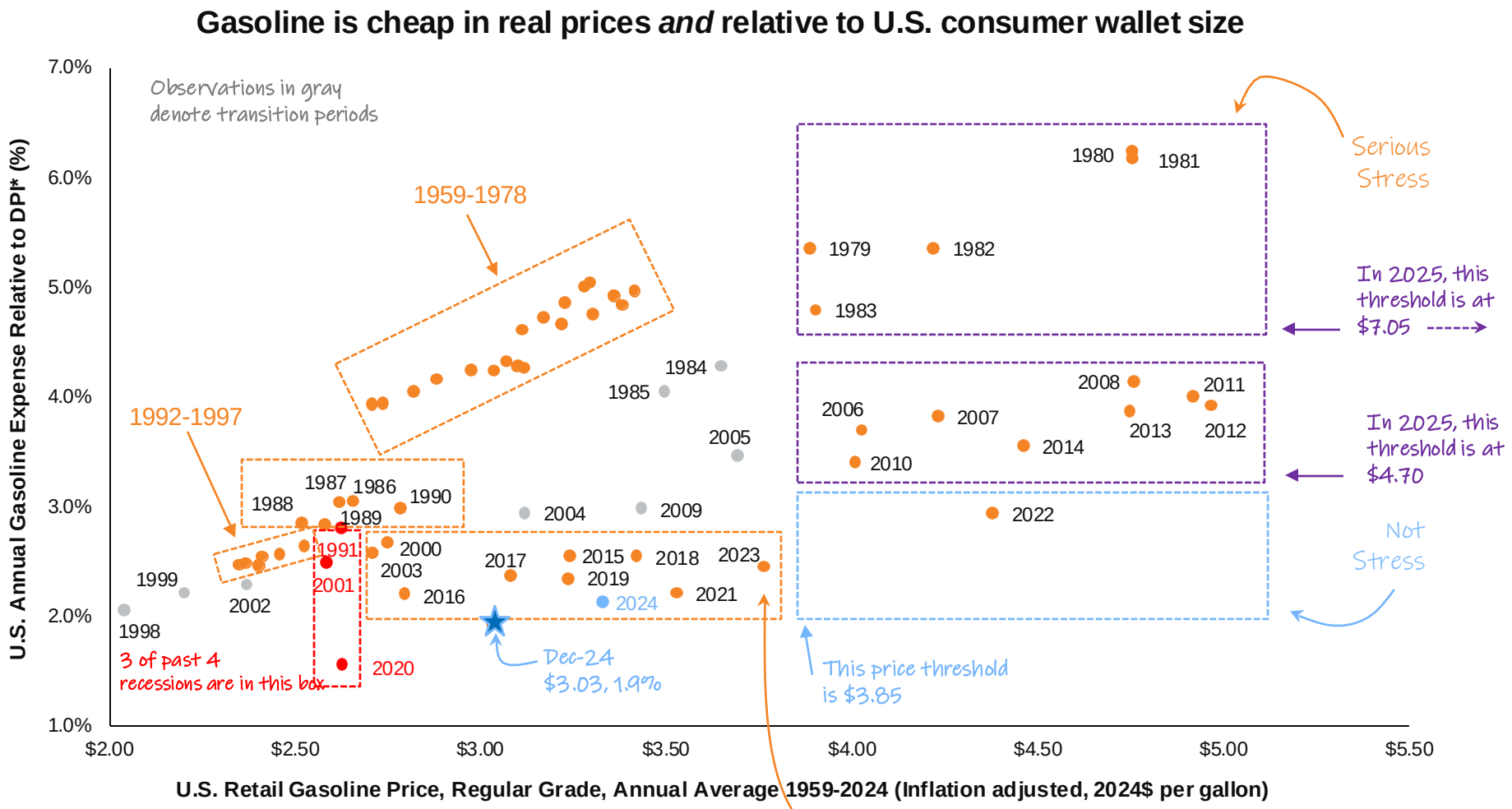
- **Supply:** The U.S. balance is in a structural surplus of more than 700 thousand b/d. Import demand collapsed 15 to 20 years ago.
- **Demand:** Fuel efficiency mandates and competition from electric vehicles are structural headwinds. Demand likely peaked in 2018. However, the slide will be far slower than commonly assumed.
- **Trade:** Surplus finished gasoline is finding a ready home in Mexico, where fuel subsidies exacerbate tough economics for refinery ops.

Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.
Note: all data are for finished motor gasoline.

22V | RESEARCH

Average U.S. pump price at $3.12 is not burdening wallets in the way many assume

Commodities



Source: AAA, BEA, BLS, BLR, EIA, Federal Reserve, 22V Research. * DPI = Disposable Personal Income. Note: in 2024, an average retail price of **$7.06 per gallon** would have been required to lift gasoline expense to 4.5% of DPI (an annual value last exceeded forty-one years earlier, in 1983). In real terms, the 2024 observation marks the third lowest for share of DPI since our sample begins in 1959 (n=66 years). The only lower years are 1998 (Asian Financial Crisis) and 2020 (COVID-19 pandemic). And the Dec-24 share is *below* 1998's.

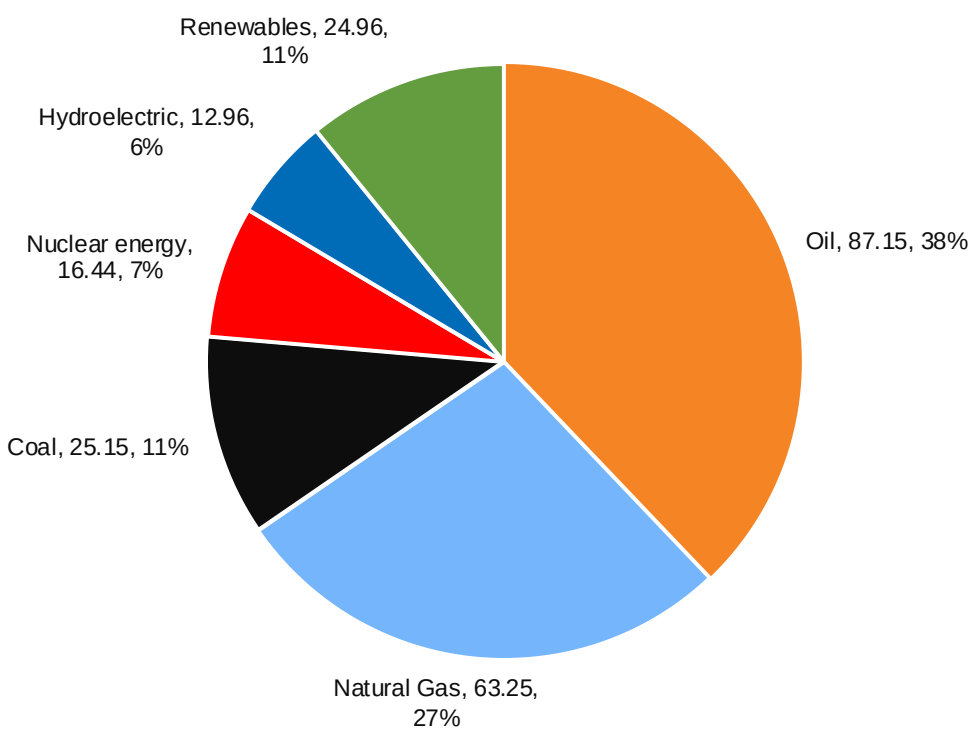
22V RESEARCH

Normal economic regime in 2025 will tend to send gasoline prices to here, w/o stress

World Primary Demand Mix: in EM*, coal is 27% bigger than oil, 71% bigger than gas

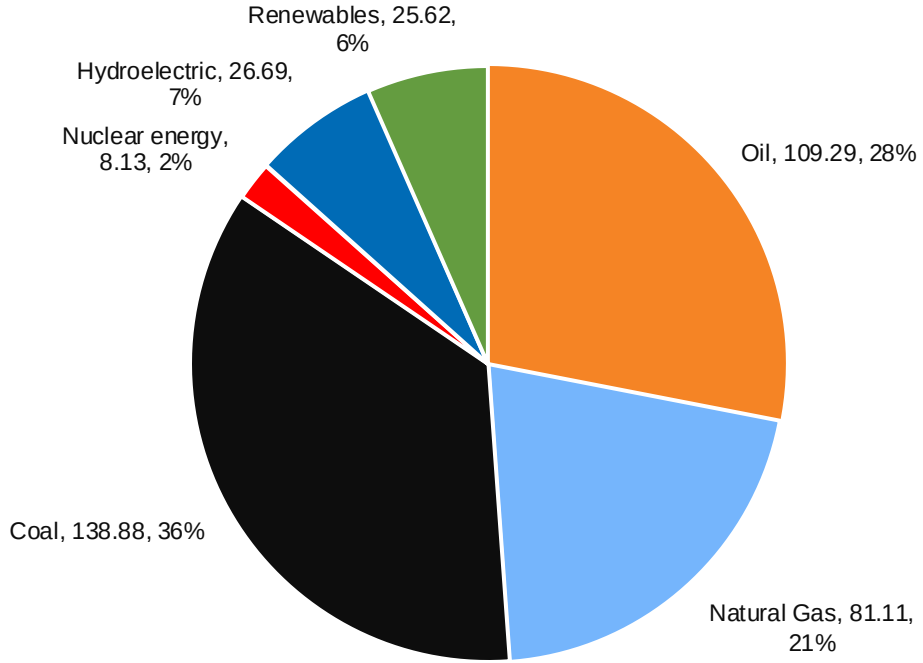
Commodities

Primary Energy Consumption (2023): OECD
exajoules, percentage share of mix



Total Demand: **229.9 EJ**

Primary Energy Consumption (2023): Non-OECD
exajoules, percentage share of mix



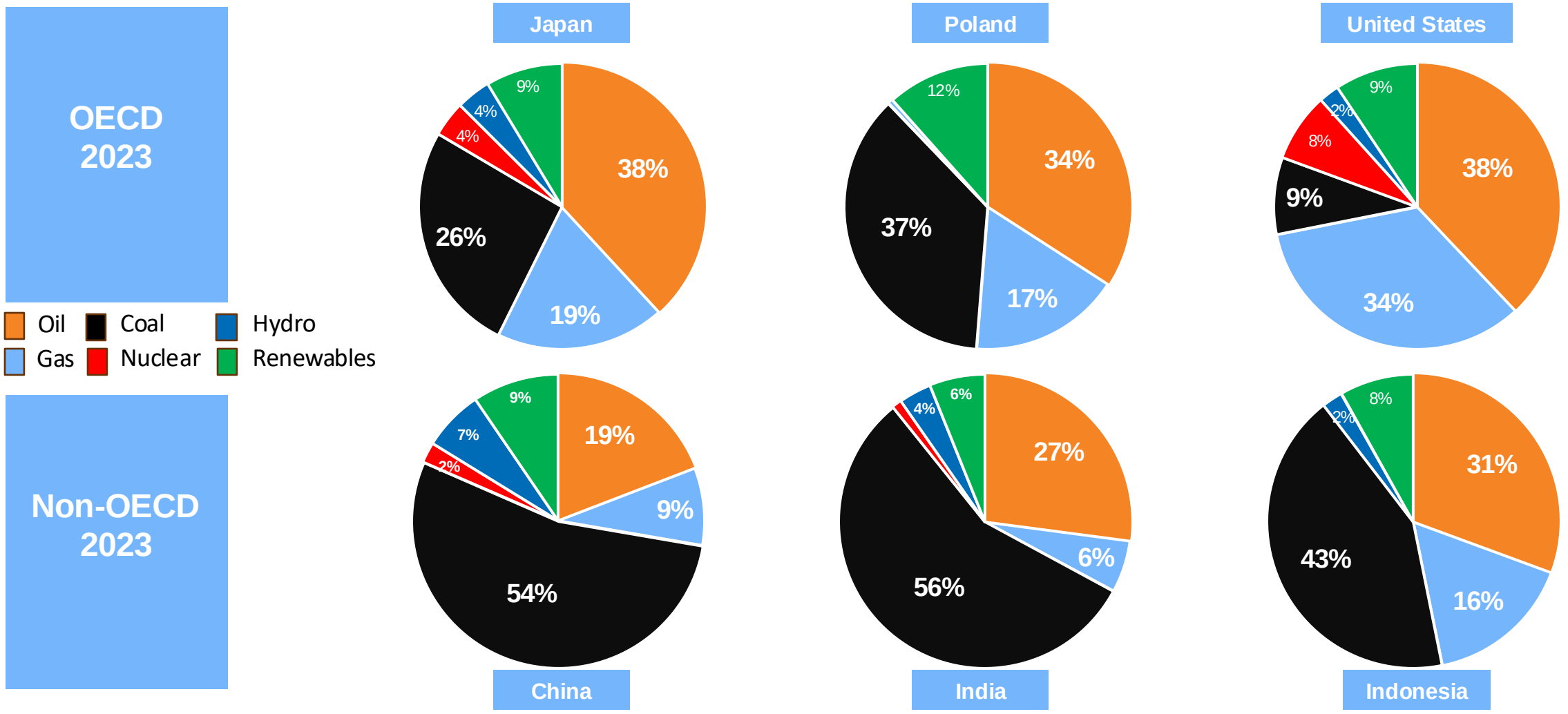
Total Demand: **389.7 EJ**

Source: EIA, EI, 22V Research.
*EM = Emerging Markets

22V | RESEARCH

Energy demand mix changes are slow, even over long intervals (25 to 30 years)

Commodities



Source: EIA, EI, 22V Research.

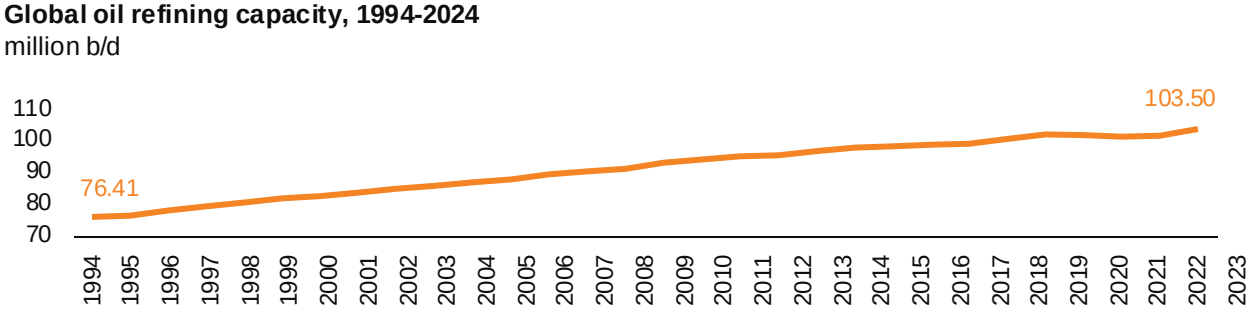
22V | RESEARCH

New Infrastructure: oil refinery additions worldwide by 2028 = +4.9 million b/d

Commodities

Country	Refinery operator (site location)	Estimated crude distillation unit capacity	Estimated startup year	Capacity type
China	Yulong (Shandong)	400,000	2025	New
China	Ningbo Daxie (Zhejiang)	120,000	2025	Expansion
China	Sinopec Zhenhai (Zhejiang)	250,000	2026	Expansion
China	Huajin Aramco (Liaoning)	300,000	2027	New
China	Sinopec Yueyang (Hunan)	40,000	2027	New
India	Indian Oil (Gujarat)	86,000	2025	Expansion
India	Indian Oil (Barauni)	60,000	2024	Expansion
India	Indian Oil (Bongaigon)	37,000	2028	Expansion
India	Indian Oil (Guwahati)	4,000	2024	Expansion
India	Indian Oil (Panipat)	200,000	2027	Expansion
India	Hindustan Petroleum (Visakhapatnam)	150,000	2024	Expansion
India	Hindustan Petroleum (Barmer)	180,000	2026	New
India	Chennai Petroleum (Nagapattinam)	180,000	2027	New
India	Numaligarh Refinery Ltd (Assam)	120,000	2027	Expansion
India	Indian Oil (Paradip)	200,000	2027	Expansion
India	Ratnagiri Refinery and Petrochemicals (Ratnagiri)	1,200,000	2028	New
Bahrain	Bahrain Petroleum (Sitra)	110,000	2025	Expansion
Iran	National Iranian Oil Refining and Distribution Company (Bandar Abbas)	120,000	2025	Expansion
Iran	National Iranian Oil Refining and Distribution Company (South Adish, Siraf)	60,000	2025	New
Iraq	Iraqi Ministry of Oil (Haditha)	20,000	2024	Expansion
Jordan	Jordan Petroleum Refinery Company (Zarqa)	50,000	2027	Expansion
Oman	Oman Oil Company, Kuwait Petroleum International (Duqm)	17,000	2024	Expansion
Saudi Arabia	Saudi Aramco Total Refining and Petrochemical Company - SATORP (al Jubail)	40,000	2026	Expansion
Nigeria	Dangote Group (Lagos)	650,000	2024	New
Mexico	Pemex Olmeca Refinery (Dos Bocas)	340,000	2025	New

Source: Evaluate Energy, EIA. (1) Saudi Aramco investment data begin in 2017. (2) Global majors include companies with geographically diverse refining assets (bp, Chevron, ExxonMobil, Shell, and TotalEnergies).



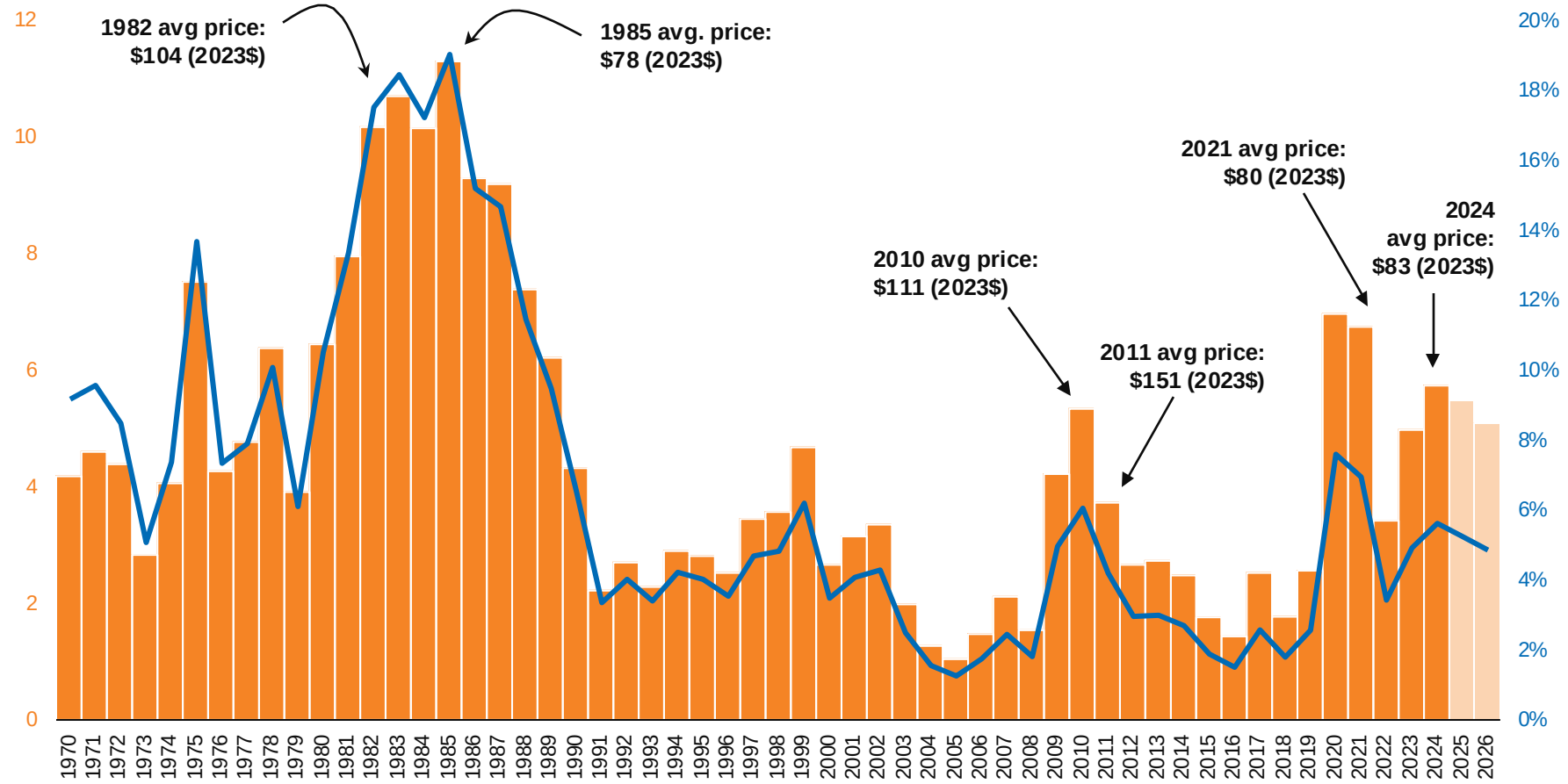
Source: EIA, Evaluate Energy, 22V Research.

22V | RESEARCH

Spare capacity is decreasing and vulnerable to rushed use and unplanned outages

Commodities

World Spare Oil Production Capacity, 1970-2026P
million b/d (left), as % of world consumption



Key Observations

- Current world spare oil production capacity is not ample. At 5.43 million b/d (and falling), it will be less than 5% of world consumption in 2026.
- Spare capacity has been significantly higher in the past, including the recent past. In 2021, spare capacity was 6.75 million b/d (7% of demand) and the annual average real price for Dated Brent was $80. In 2010, spare capacity was 6% of demand and average real price was $111.
- Looking even further back, the world's spare oil production capacity was 17% of world oil demand in 1982 and 19% in 1985. Real Dated Brent prices averaged $104 and $78 in those years, higher than today's price.

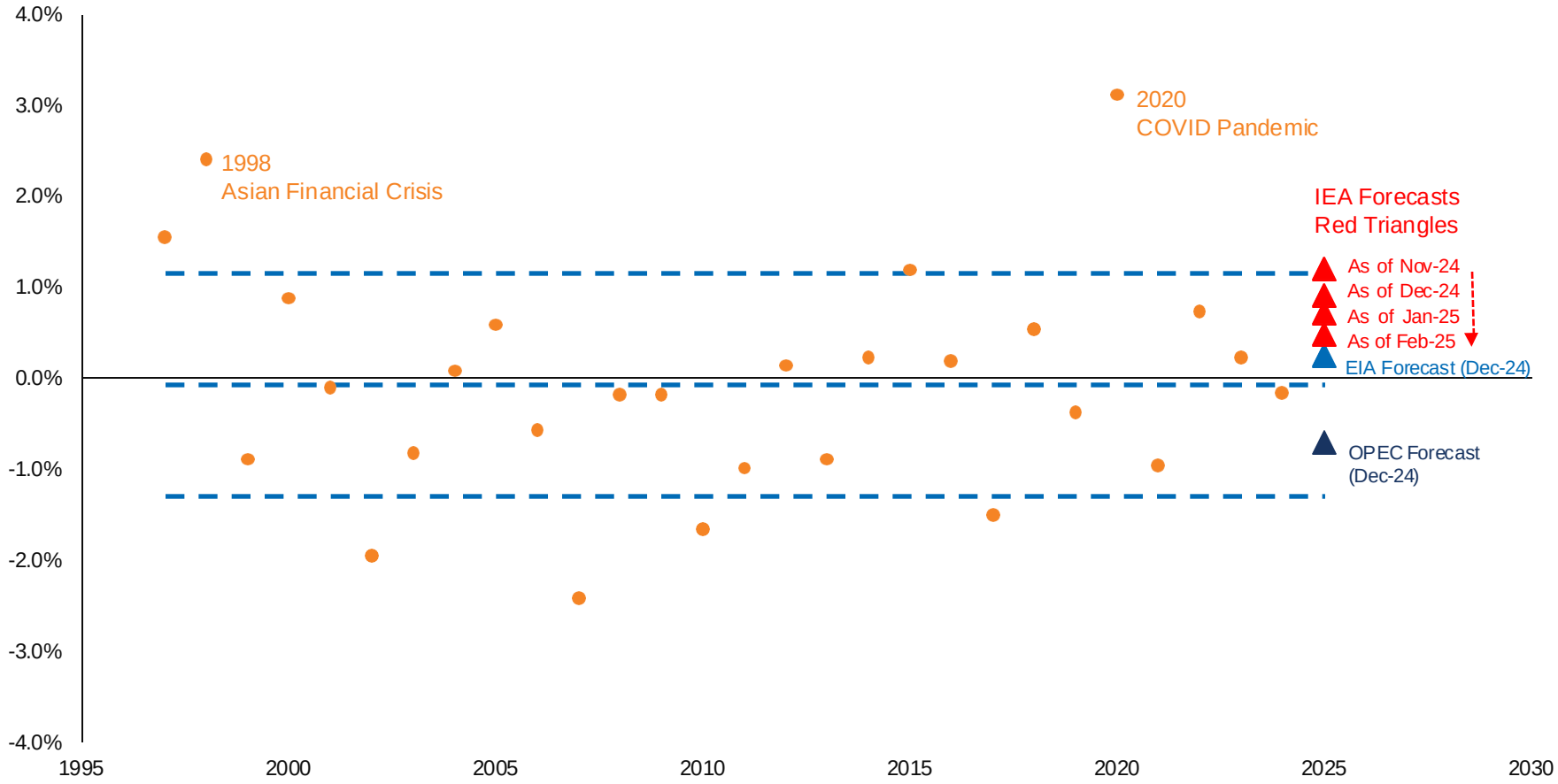
Source: EIA, OPEC, BLR, 22V Research. Note: oil price is Dated Brent. Spare capacity in 2025 assumes a 300 thousand b/d production increase from OPEC. A larger increase would diminish spare capacity

22V | RESEARCH

What glut?

Commodities

World Liquids Balance, 1997 through 2025F
Annual balance as % of world liquids consumption



Key Observations

- In October, the IEA was forecasting a large supply glut in the 2025 global liquids balance.
- In fact, if realized it would have been exceeded only by the gluts that accompanied the 1998 Asian Financial Crisis and the 2020 COVID Pandemic. Our research ('*What glut?*') found this forecast unlikely to come to fruition.
- IEA has subsequently come around to our view. They've now tightened this balance for four consecutive months and are essentially in alignment with the EIA's assessment.
- OPEC's balance forecast continues to look too tight on expectations for global demand that look too rosy.

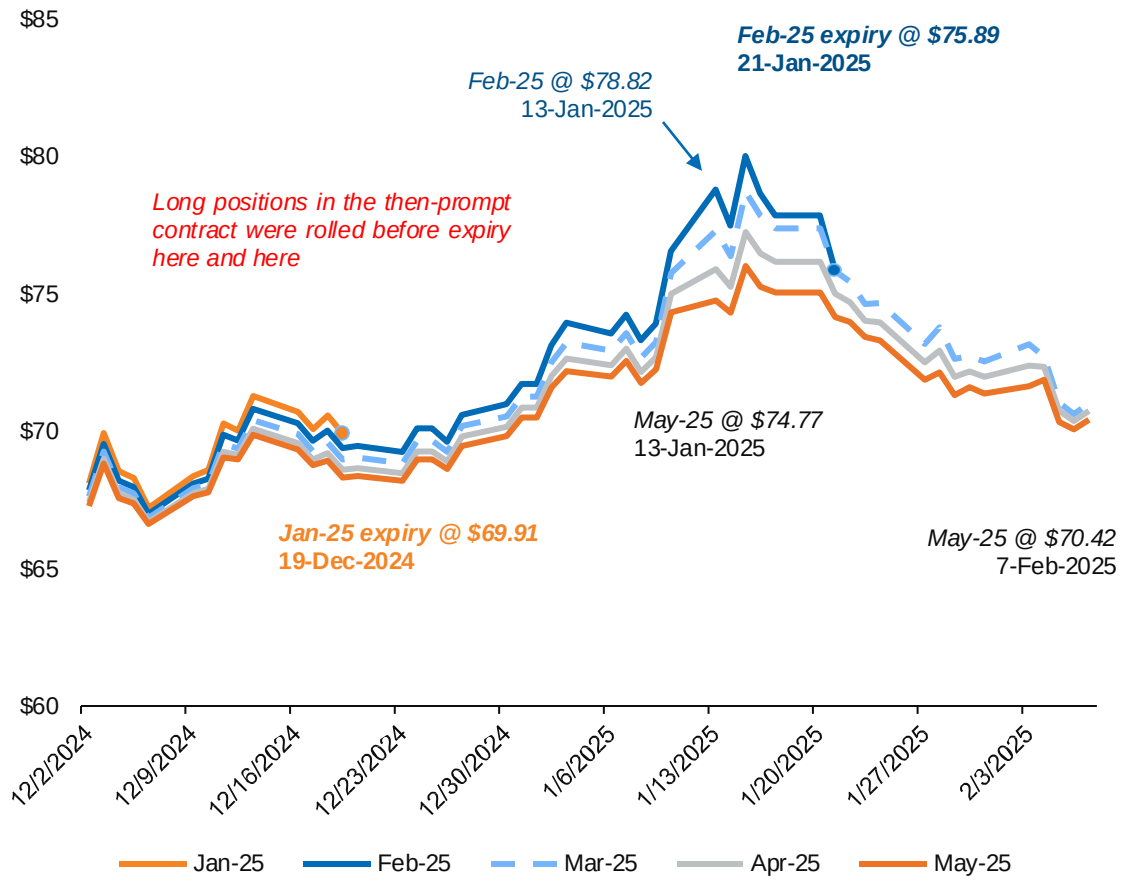
Source: EIA, IEA, OPEC, 22V Research.
See our research note *What glut?* (8-Dec-2024)

22V | RESEARCH

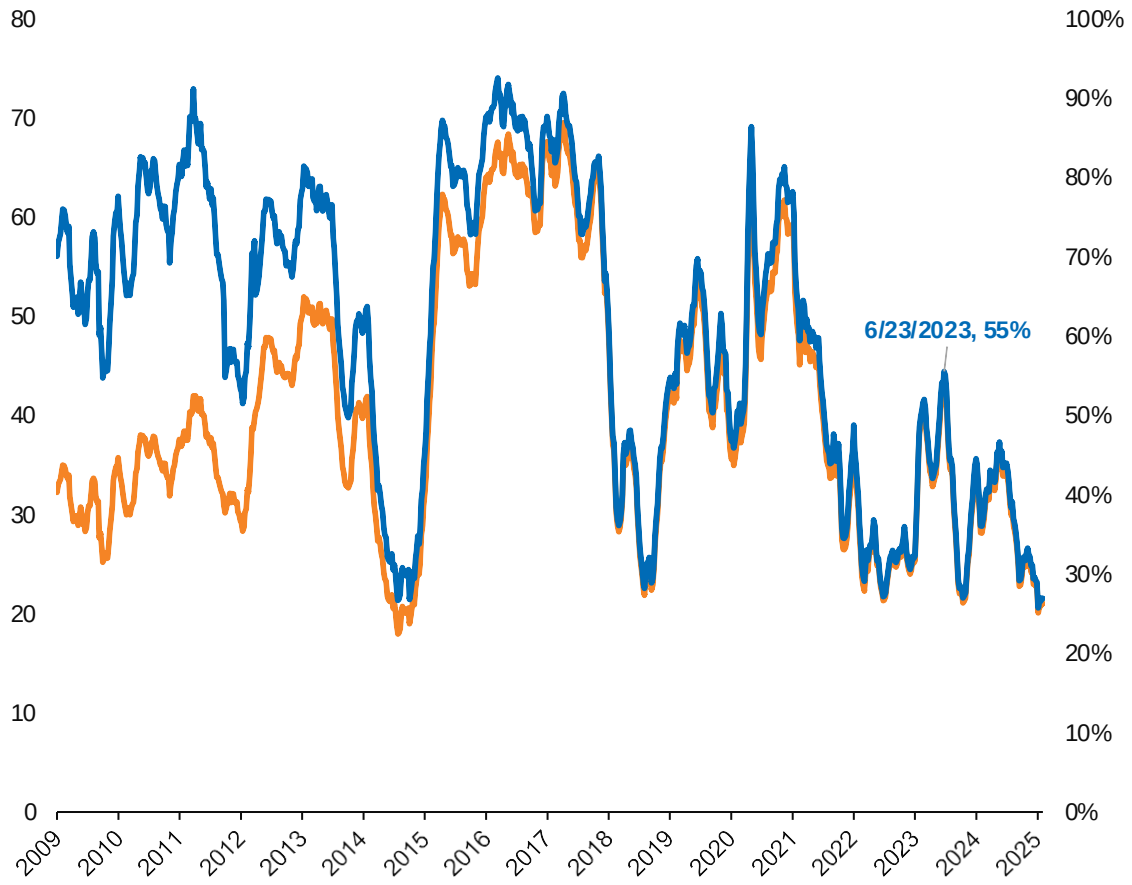
Imminent scarcity in crude supply requires higher cash crude prices to ration demand

Commodities

NYM WTI crude oil futures prices
$ per barrel



Crude oil inventory at Cushing, Oklahoma
(left) million barrels, (right) % of storage capacity



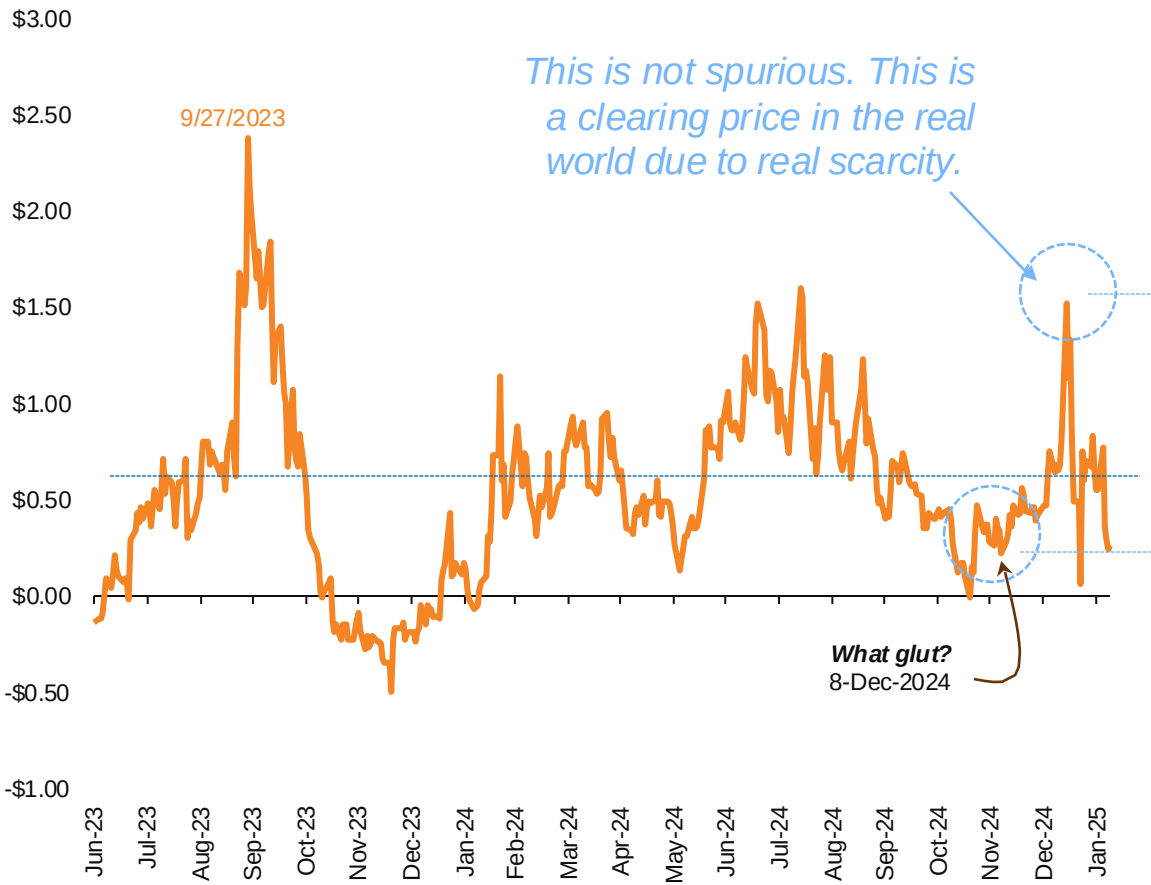
Source: SFE, BLR, 22V Research.
Note: in the two months between 22V's *What glut?* note and closing prices on 7-Feb-2025, the price for May-25 NYM WTI (CLK5) advanced by +5.7%, or +37.4% annualized.

22V | RESEARCH

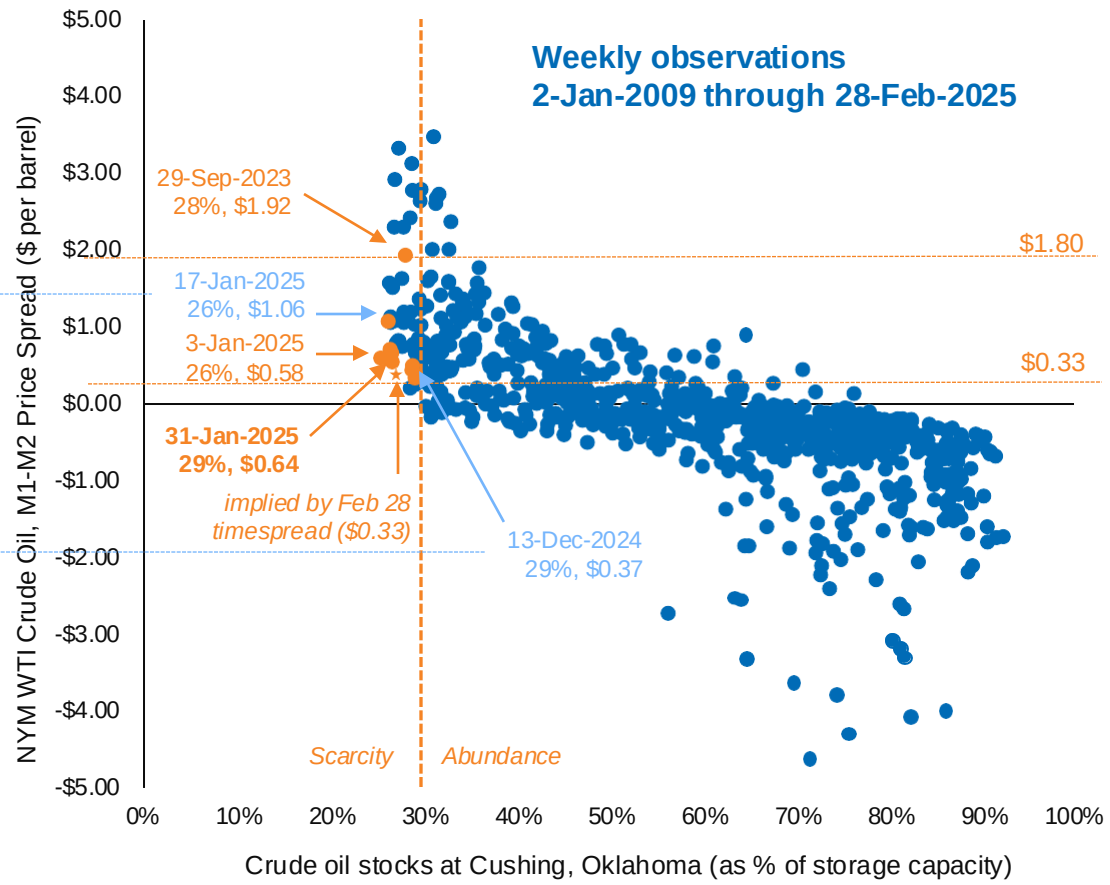
Cash prices must rise to resolve scarcity: they are pricing physical fact, not opinion

Commodities

NYM WTI crude oil M1-M2 timespread
$ per barrel



NYM timespreads husband low stocks at Cushing
Basis stocks are below the 30%=low threshold



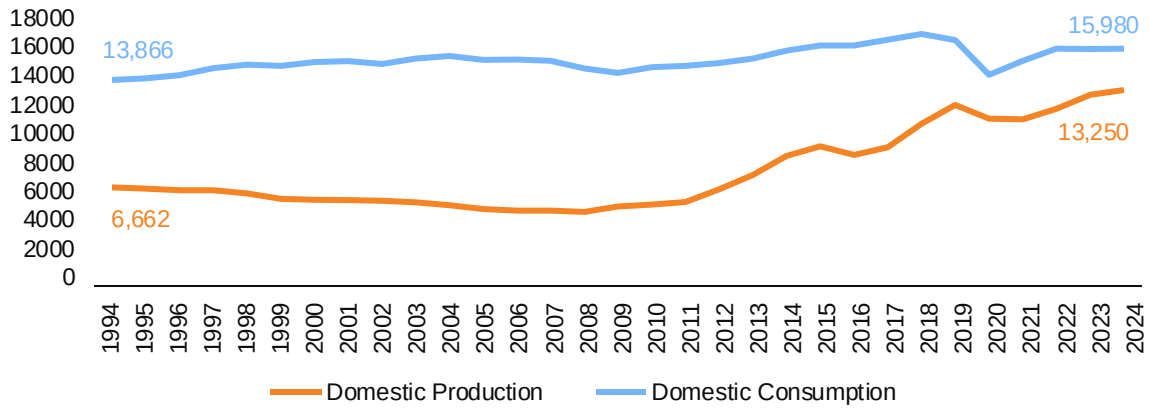
Source: EIA, BLR, 22V Research. Note: the scatter chart at right is scaled for clarity but thereby excludes five observations that fall in the opposite storage environment from today's (i.e., they are in the zone of high stocks and exceptionally weak timespreads). Two of the excluded observations occurred in 1Q2009 during the Great Recession. The three others occurred during the extraordinary pandemic-driven events of April 2020 at storage levels between 72% and 84% of capacity.

22V | RESEARCH

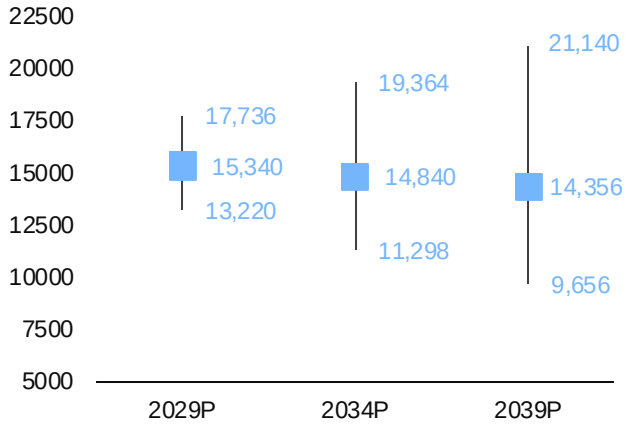
U.S. crude production could land between 15 and 18 million b/d by 2035

Commodities

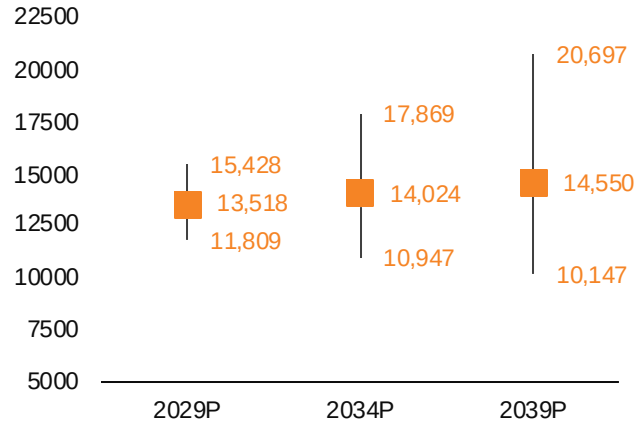
U.S. Crude Oil Production and Consumption, 1994-2024E
thousand b/d



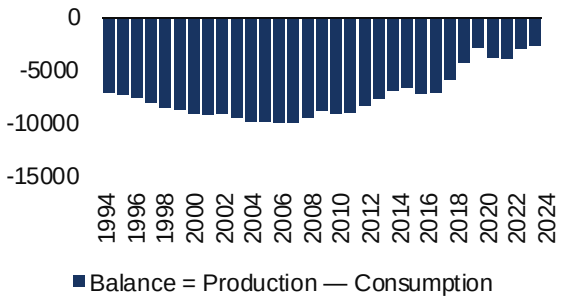
Projected U.S. Crude Oil Consumption
95% confidence interval in thousand b/d



Projected U.S. Crude Oil Production
95% confidence interval in thousand b/d



U.S. Balance, Crude Oil
thousand b/d



U.S. Trade, Crude Oil
thousand b/d

Key Observations

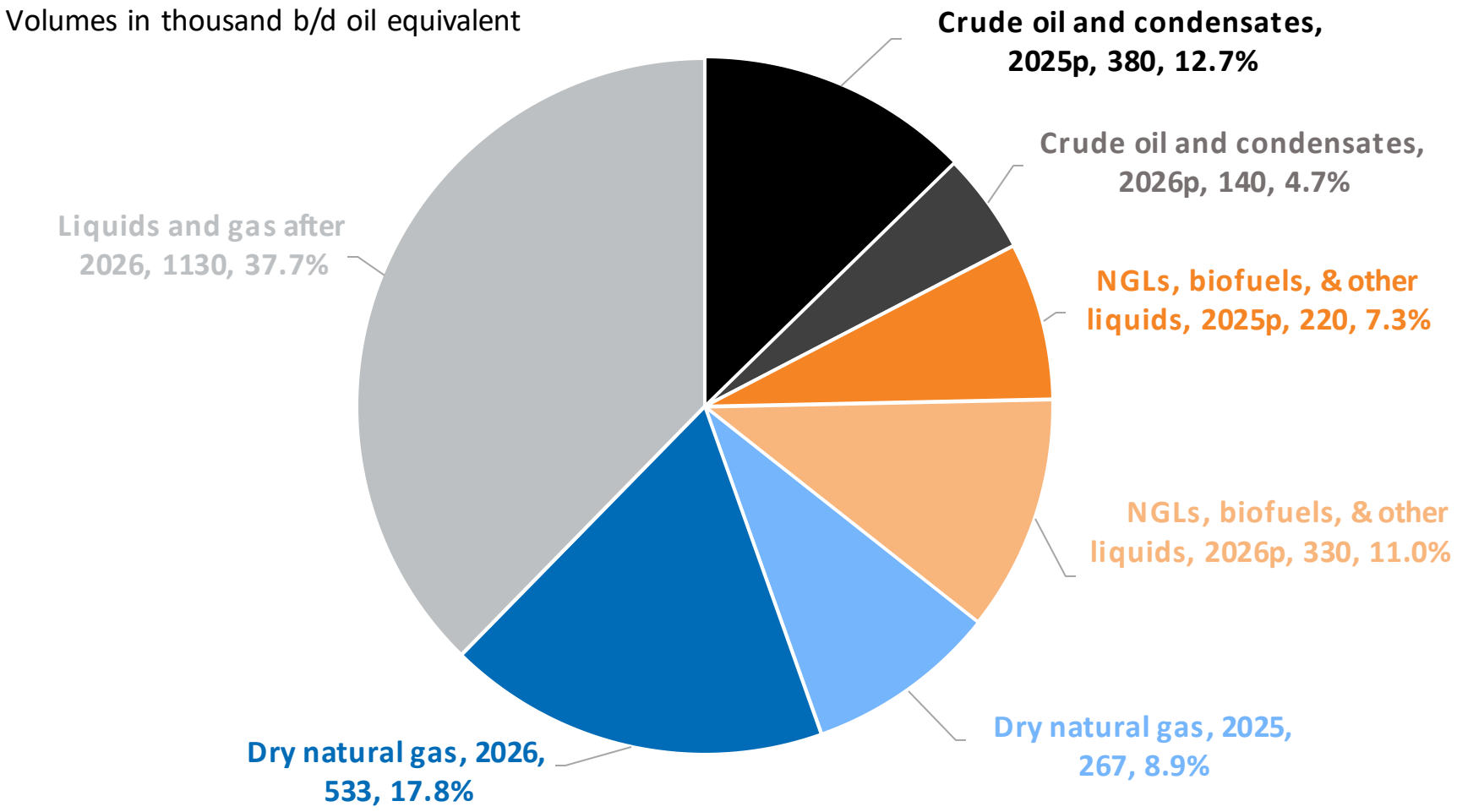
- **Supply:** the key constraint on growth is the pace of overall international demand and opportunities to take share of mix in China, India, etc.
- **Demand:** though the U.S. balance is technically still in deficit, it's in a stable equilibrium with Canadian supply to fill gaps most efficiently.
- **Trade:** U.S. trend exports are now 4.5 million b/d. Incremental supply growth will be priced into global markets, esp. as WTI Midland sets Brent.

Source: EI, EIA, World Bank, United Nations, BLR, 22V Research.
Note: data are for crude oil, including condensate

22V | RESEARCH

Projected contribution to the U.S. energy supply growth plank in Bessent's 3-3-3 Plan*

Commodities



Source: EIA, BLR, 22V Research. Note: numbers are EIA projections as of 11-Feb-2025. Chart shows each projected tranche's share of +3 million b/d oil equivalent supply growth. *U.S. Treasury Secretary Scott Bessent aims to increase U.S. energy production by 3 million b/d oil equivalent.

22V | RESEARCH

Commodity Condition Indices (CCIs)

Commodities

March 3, 2025

Global scores rank ordered from strongest (30) to weakest (0)

No.	Market	CCI	No.	Market	CCI	No.	Market	CCI	No.	Market	CCI
1	Gold	17.5 ↑	10	Corn	13.1 ↓	19	White sugar	10.9 ↑	28	Spring wheat	9.1 ↑
2	Gas, USA	16.6 ↑	11	Copper	12.8 ↑	20	Winter wheat	10.5 ↑	29	Diesel	8.9 ↑
3	Coffee	16.2 ↓	12	Iron ore	12.5 ↑	21	Platinum	10.4 ↓	30	Nickel	8.5 ↓
4	Silver	15.8 ↑	13	Cocoa	12.3 ↓	22	Soybeans	10.0 ↓	31	Gasoline	8.4 ↓
5	Aluminum	15.6 ↑	14	CO2 Permits	12.1 ↑	23	Lead	10.0 ↑	32	Sweet crude	7.5 ↑
6	Cattle	15.2 ↓	15	Raw sugar	12.1 ↑	24	Sour crude	9.9 ↑	33	Cotton	5.8 ↓
7	Soy oil	15.1 ↑	16	Zinc	11.5 ↓	25	Steel	9.7 ↓	34	Thermal coal	5.6 ↓
8	Tin	13.9 ↑	17	Hogs	11.3 ↓	26	Met coal	9.5 ↑	35	Cobalt	4.0 ↓
9	Gas, ex-USA	13.4 ↓	18	Soy meal	11.2 ↓	27	Palladium	9.3 ↓	36	Lithium	3.4 ↓

Note: the directional arrows beside each CCI score indicate whether that index is presently showing *accumulating* or *deteriorating* strength heading into next week.

Key Observations

- In October, the IEA was forecasting a large supply glut in the 2025 global liquids balance.
- In fact, if realized it would have been exceeded only by the gluts that accompanied the 1998 Asian Financial Crisis and the 2020 COVID Pandemic. Our research ('*What glut?*') found this forecast unlikely to come to fruition.
- IEA has subsequently come around to our view. They've now tightened this balance for four consecutive months and are essentially discounting the EIA's opinion.

Source: BLR, 22V Research.

CCIs: producers should mind the spread in the scores for gas and steel

Commodities

No.	26-Jan-25	CCI	3-Feb-25	CCI	10-Feb-25	CCI	17-Feb-25	CCI	24-Feb-25	CCI	3-Mar-25	CCI
1	Gold	19.1	Coffee	20.5	Coffee	21.3	Coffee	20.3	Gold	19.8	Gold	17.5
2	Coffee	18.7	Gold	19.3	Gold	19.7	Gold	20.1	Coffee	18.9	Gas, USA	16.6
3	Cattle	18.7	Gas, ex-USA	18.1	Gas, ex-USA	19.1	Gas, ex-USA	18.2	Silver	18.6	Coffee	16.2
4	Gas, ex-USA	17.7	Cattle	18.0	Silver	17.6	Silver	18.0	Gas, USA	17.5	Silver	15.8
5	Corn	17.7	Corn	16.8	Corn	17.1	Corn	17.3	Aluminum	17.3	Aluminum	15.6
6	Gas, USA	17.3	Silver	16.7	Cattle	15.9	Gas, USA	16.4	Corn	16.3	Cattle	15.2
7	Aluminum	16.3	Cocoa	16.1	Aluminum	15.8	Aluminum	16.0	Gas, ex-USA	15.6	Soy oil	15.1
8	Silver	16.3	Aluminum	15.2	CO2 Permits	15.5	CO2 Permits	15.0	Soy oil	14.8	Gas, ex-USA	13.4
9	Cocoa	15.6	CO2 Permits	14.6	Soy oil	14.5	Soy oil	15.0	Cattle	14.7	Corn	13.1
10	Crude oil	14.6	Gas, USA	14.1	Cocoa	14.0	Copper	15.0	Copper	14.5	Copper	12.8
11	Copper	12.9	Crude oil	14.0	Gas, USA	13.9	Cattle	14.5	Sugar	14.0	Iron ore	12.5
12	CO2 Permits	12.8	Soy oil	12.8	Copper	13.7	Winter wheat	13.8	Winter wheat	13.8	Cocoa	12.3
13	Soy oil	12.5	Copper	12.2	Winter wheat	13.6	Cocoa	13.5	Iron ore	13.6	CO2 Permits	12.1
14	Zinc	12.3	Iron ore	11.3	Iron ore	13.0	Iron ore	13.4	CO2 Permits	13.5	Sugar	12.1
15	Diesel	12.2	Winter wheat	11.2	Crude oil	12.8	Sugar	12.2	Zinc	13.2	Zinc	11.5
16	Soybeans	11.8	Soybeans	11.2	Soybeans	11.8	Crude oil	11.7	Cocoa	13.1	Hogs	11.3
17	Gasoline	11.3	Diesel	11.0	Gasoline	11.7	Zinc	11.6	Crude oil	12.5	Winter wheat	10.5
18	Iron ore	10.9	Zinc	10.9	Zinc	11.4	Gasoline	11.5	Hogs	11.3	Soybeans	10.0
19	Winter wheat	10.0	Sugar	10.0	Hogs	11.0	Soybeans	11.3	Diesel	10.4	Crude oil	9.9
20	Nickel	10.0	Gasoline	10.0	Sugar	10.3	Hogs	11.0	Gasoline	10.4	Steel	9.7
21	Steel	9.3	Steel	9.8	Diesel	10.2	Diesel	10.1	Lead	9.6	Coal	9.5
22	Hogs	8.8	Hogs	9.6	Steel	9.5	Steel	7.8	Steel	9.4	Diesel	8.9

Key Observations

- The softening in global commodity conditions persists. Gold's CCI is now under 18.
- Markets are on edge about the threat of U.S. tariffs against major trading partners, the risk of retaliation and escalation, and the waning of prospects for peace in Ukraine and the Middle East.
- Gas has consistently scored at the top of this league table in recent months, with leadership bouncing between USA and ex-USA. This week U.S. gas (16.6) has the second strongest fundamentals on a relative basis, as a dose of winter cold hits the Northeast.
- Meanwhile, OFS firms should note that steel is firming.

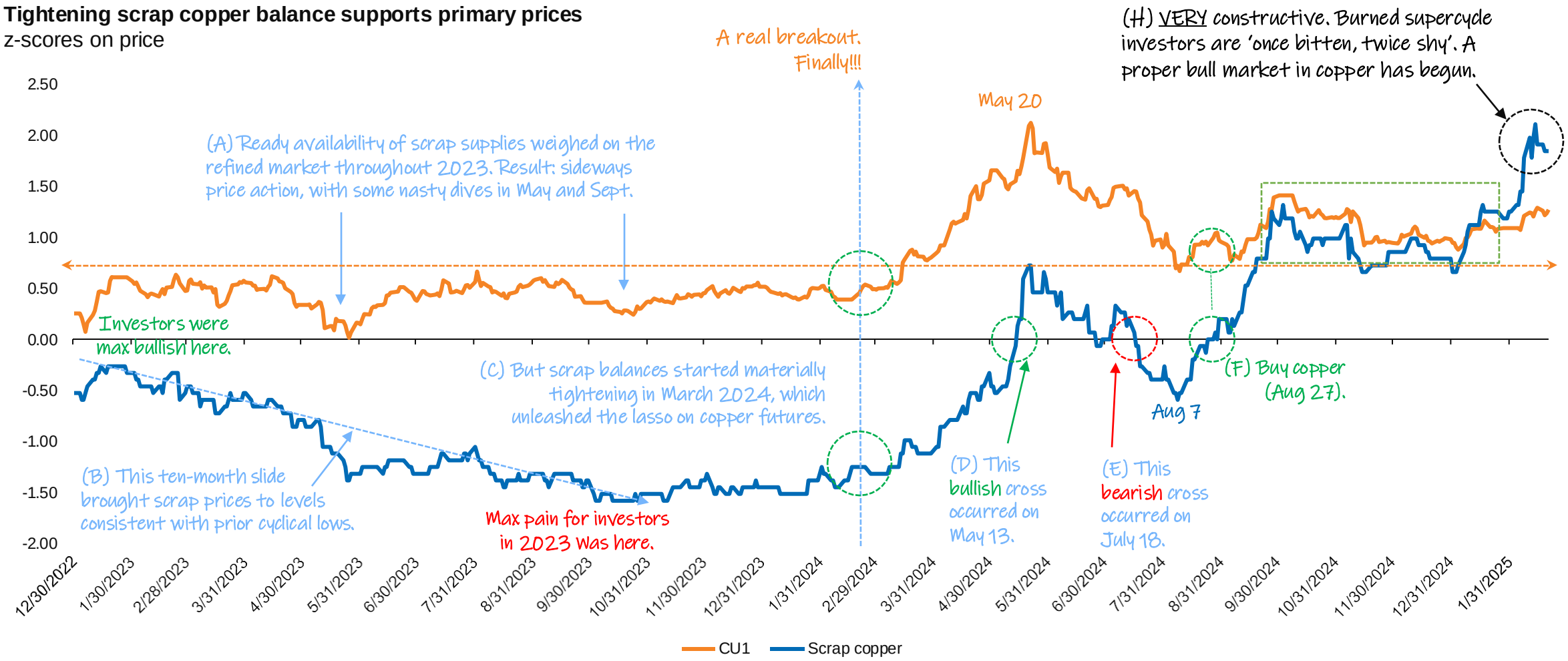
Source: BLR, 22V Research.

22V | RESEARCH

Red Lasso: unlike 2023/24, scrap supply is unlikely to constrain copper prices in 2025/26

Commodities

Tightening scrap copper balance supports primary prices
z-scores on price



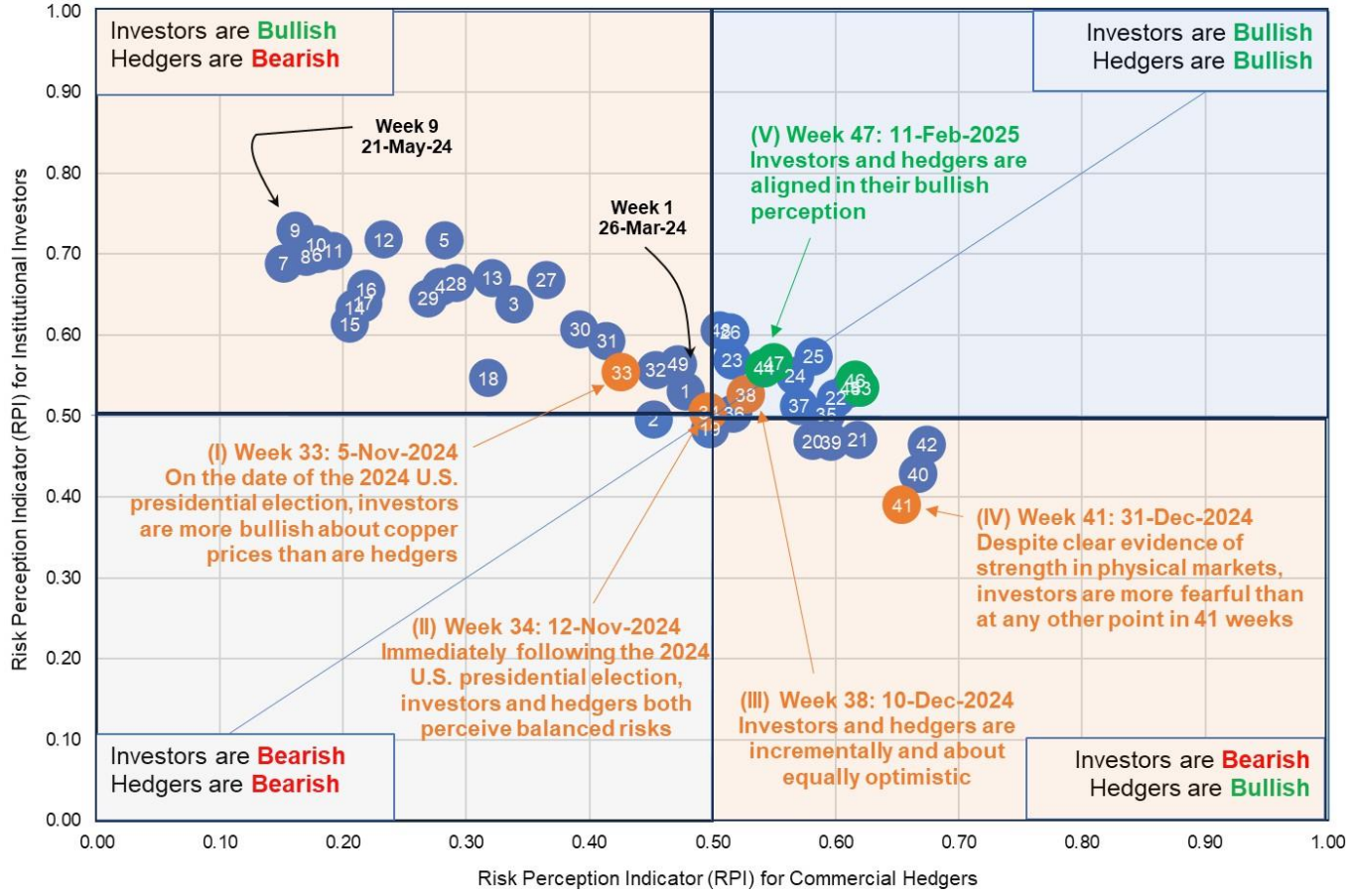
Source: SFE, BLR, 22V Research.

22V | RESEARCH

Investors' fears of downside risks led them to resist reality of copper's physical tightness

Commodities

Path of Evolving Risk Perceptions in Copper: 26-Mar-2024 to 25-Feb-2025
A mapping of investors' risk management decisions relative to commercials'



Source: BLR, 22V Research.

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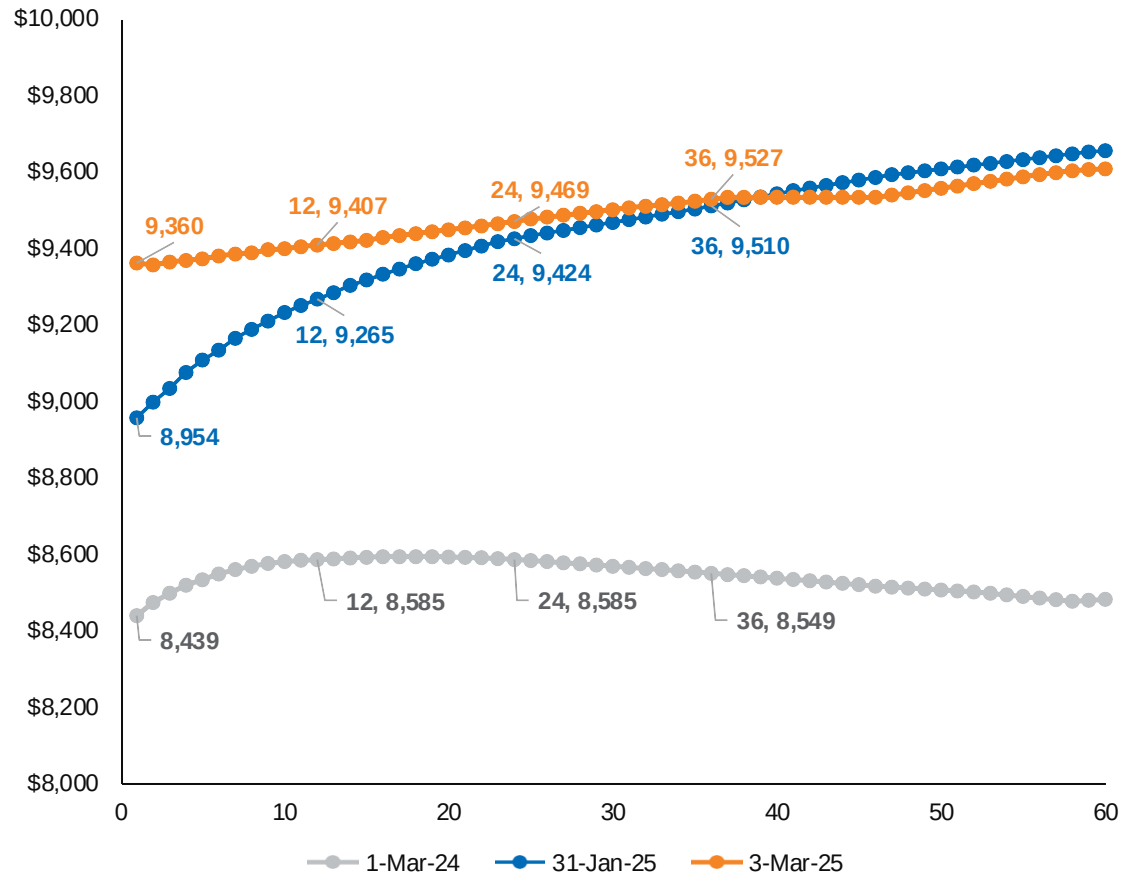
U.S. merchants are squirreling away copper stocks ahead of pledged U.S. tariffs

Commodities

CMX Copper M1 price
US cents per lb.

LME Copper Forward Curve
US$ per mt



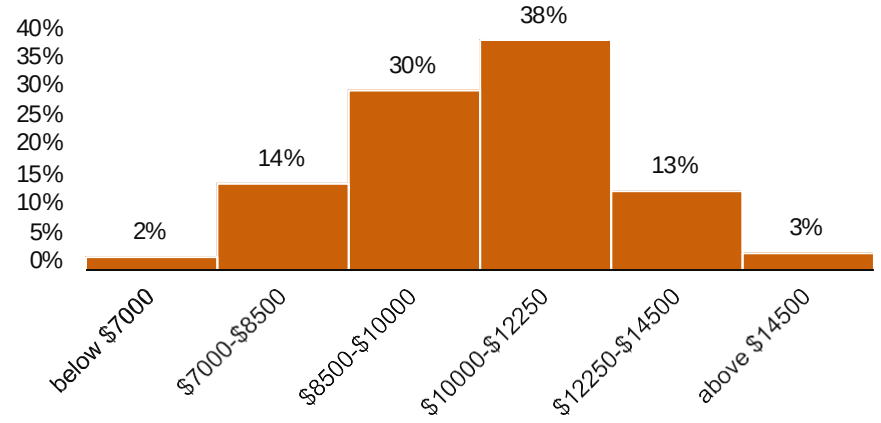
Source: Bloomberg, CMX, LME, 22V Research.
Prices as of February 28, 2025.

22V | RESEARCH

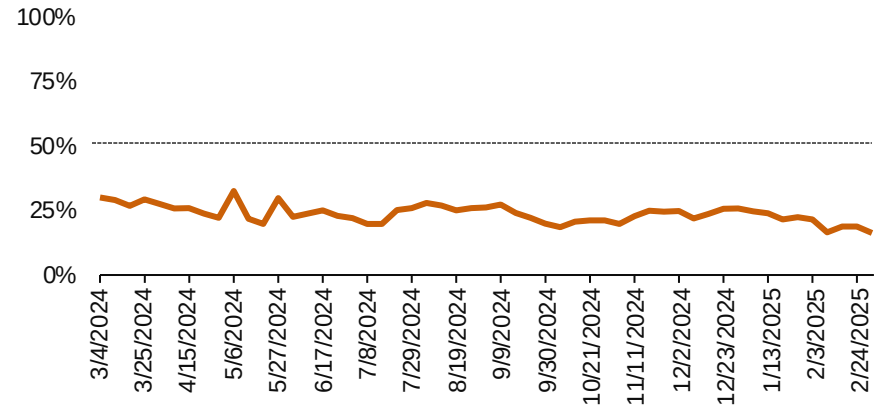
Copper cash price risk assessment: yearend base case is $10,250 per mt ($4.65 per lb.)

Commodities

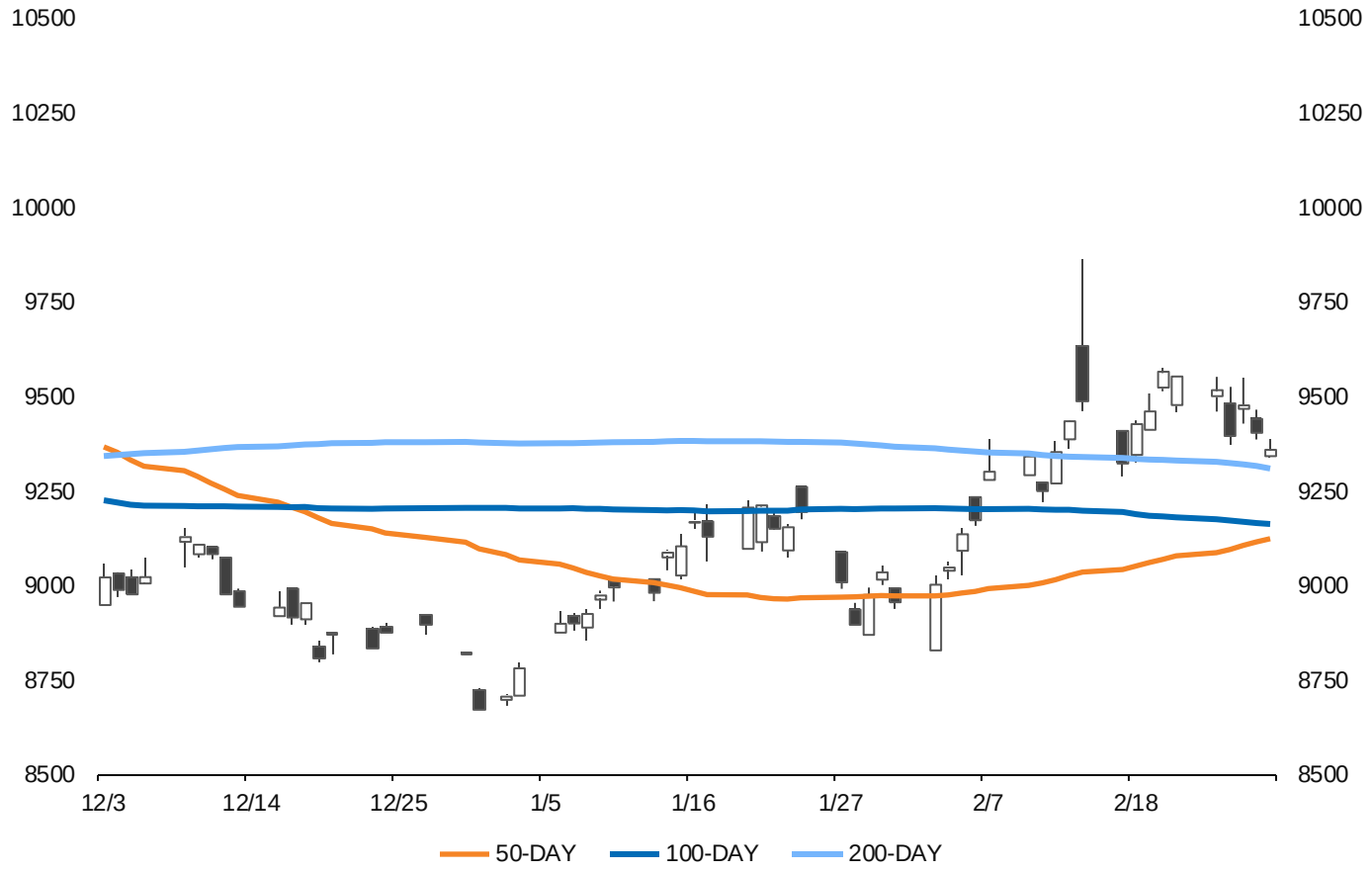
2025 Year-End Copper Spot Price Risk
% probability by price bucket (US$ per mt)



2025 Year-End Copper Cash Price Risk
% probability below $8,500 per mt



LME Copper M1 price
US$ per mt



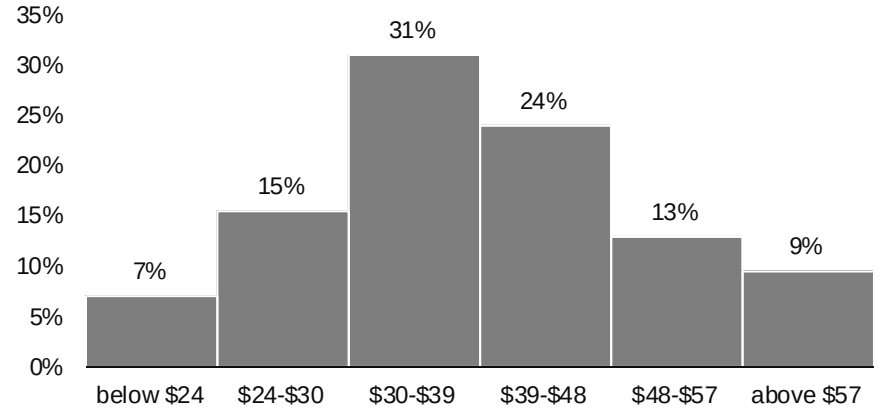
Source: BLR, 22V Research.
Note: as of 28-Feb-2025. Latest close for cash copper is $9,338.

22V | RESEARCH

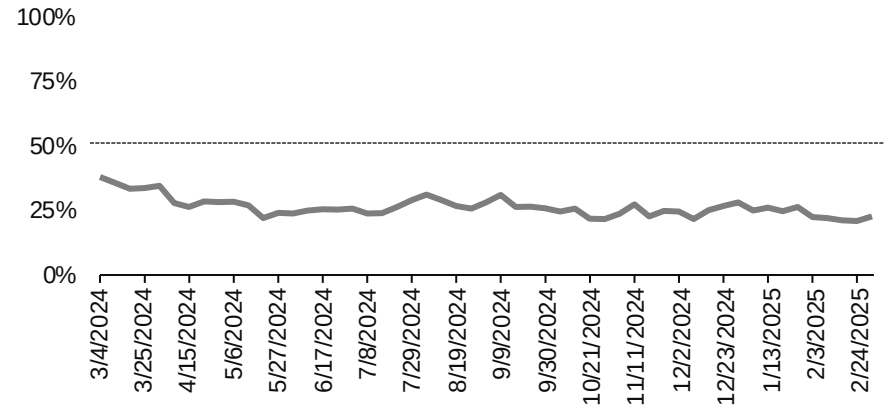
Silver cash price risk assessment: yearend base case is $39 per oz, with 22% odds of >$48

Commodities

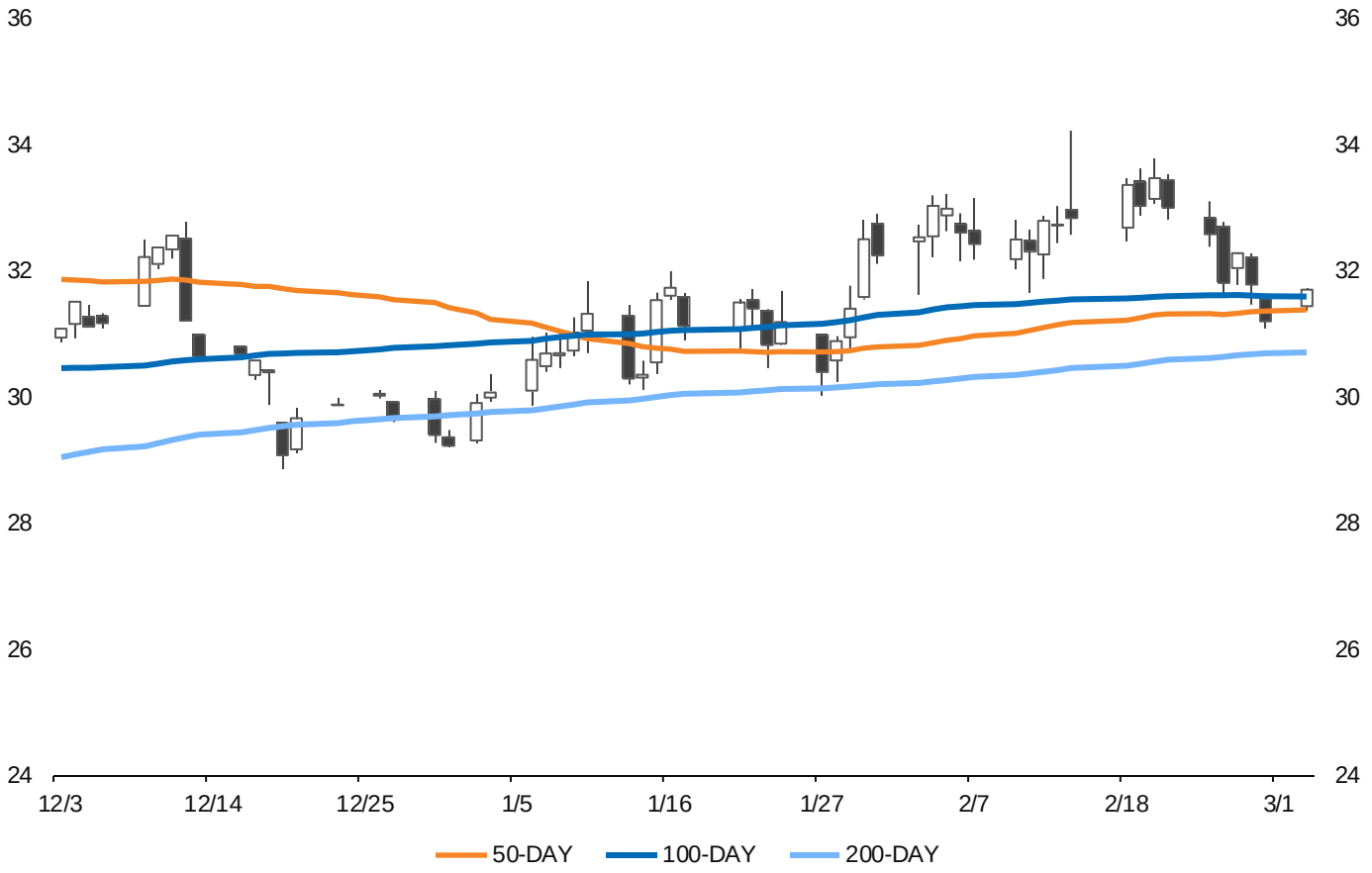
2025 Year-End Silver Cash Price Risk
% probability by price bucket (US$ per troy ounce)



2025 Year-End Silver Cash Price Risk
% probability below $30 per troy ounce



CMX Silver M1 price
US$ per troy ounce



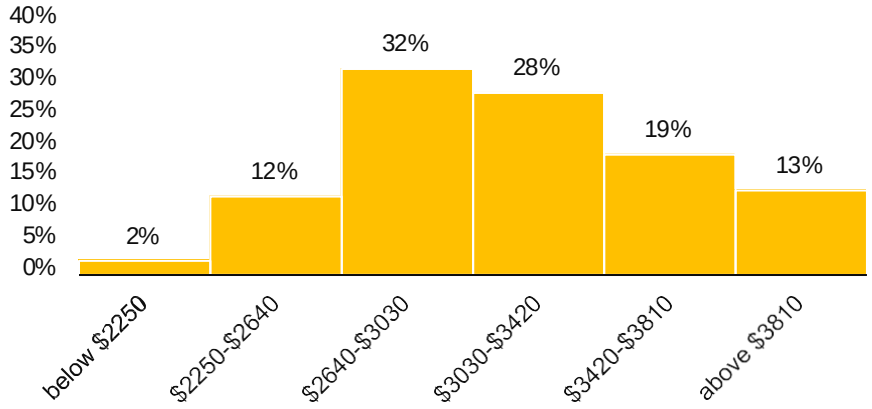
Source: BLR, 22V Research.
Note: as of 28-Feb-2025. Latest close for cash silver is $31.15.

22V | RESEARCH

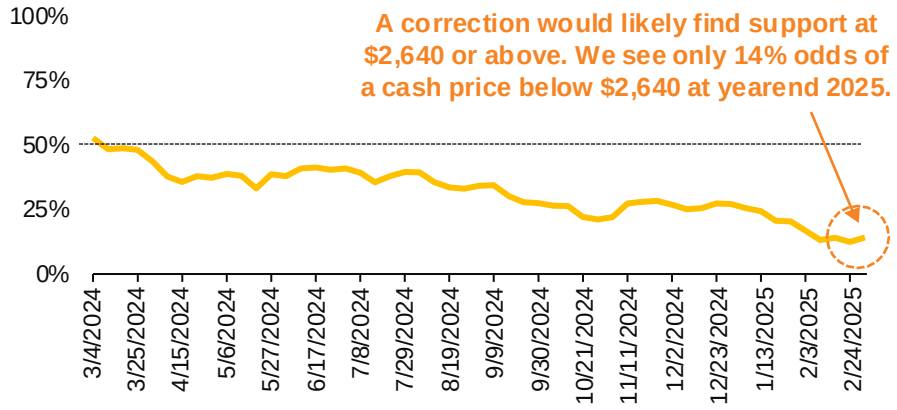
Gold cash price risk assessment: yearend base case is $3,150 per oz

Commodities

2025 Year-End Gold Cash Price Risk
% probability by price bucket (US$ per troy ounce)



2025 Year-End Gold Cash Price Risk
% probability below $2,640 per troy ounce



CMX Gold M1 price
US$ per troy ounce

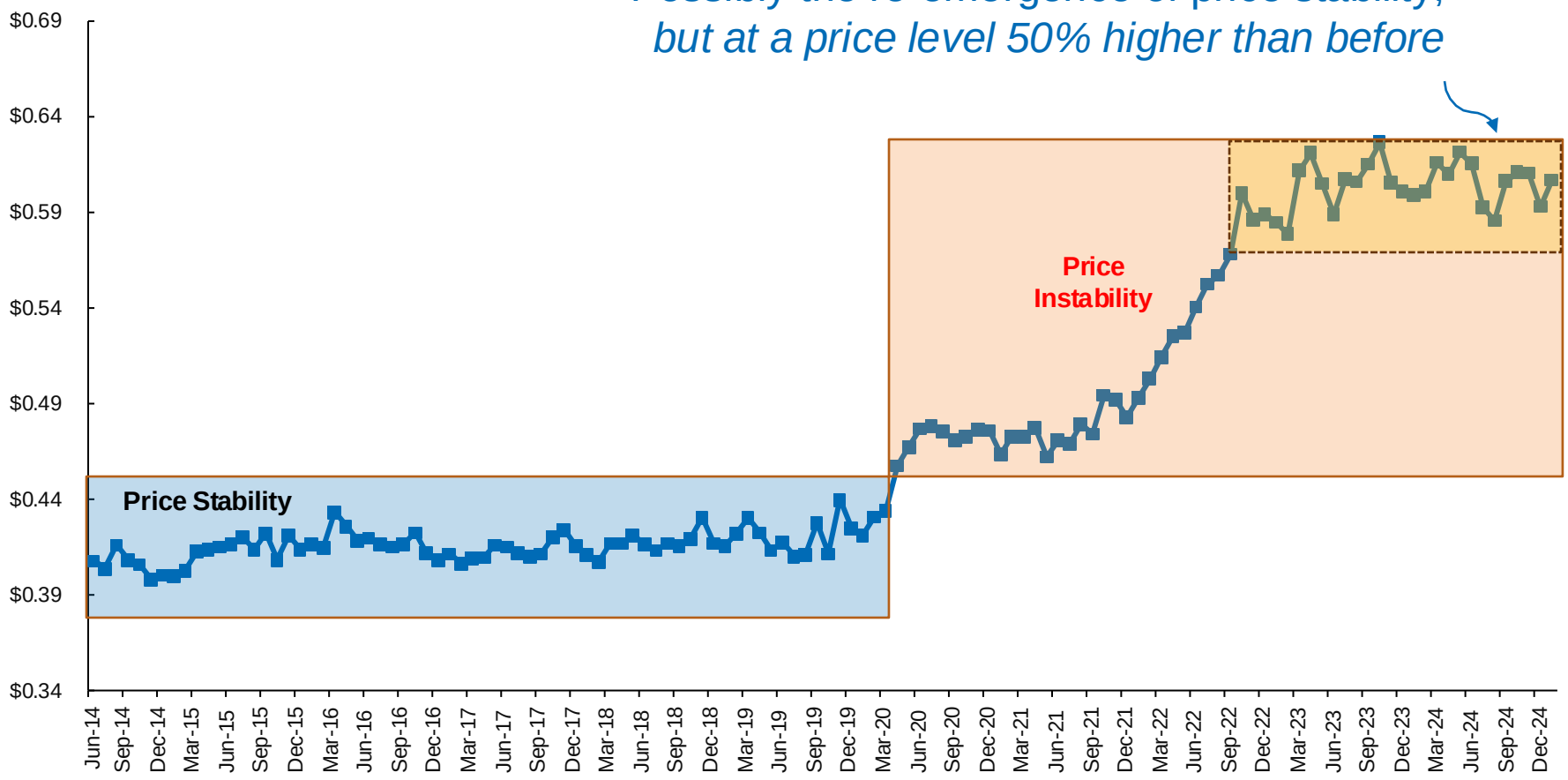
Source: BLR, 22V Research.
Note: as of 28-Feb-2025. Latest close for cash gold is $2,858.

22V | RESEARCH

Inflation: price level matters too

Commodities

U.S. average price for potato chips
$ per 1.5-oz bag



Fun Fact

The first recorded recipe for potato chips appears in an 1817 cookbook (*The Cook's Oracle*) authored by the aptly-named chef William Kitchiner. Frito-Lay Inc. (formed in a 1961 merger of two predecessor firms, each founded in 1932) merged with Pepsi-Cola to form PepsiCo. in 1965.

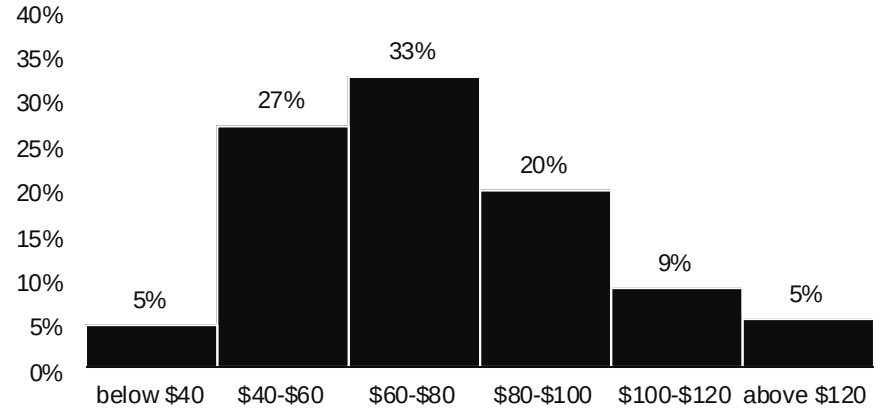
Production costs for a bag of potato chips include expenses for biaxially oriented polypropylene (inside lining of the bag), low-density polyethene (a middle layer), Surlyn® (a branded thermoplastic resin for the bag's outer layer), nitrogen, potatoes, salt, spices, sunflower oil, water, natural gas, and diesel fuel.

Source: BLS, BLR, 22V. Note: updated on 12-Feb-2025 with data through Jan. 2025 (latest available).

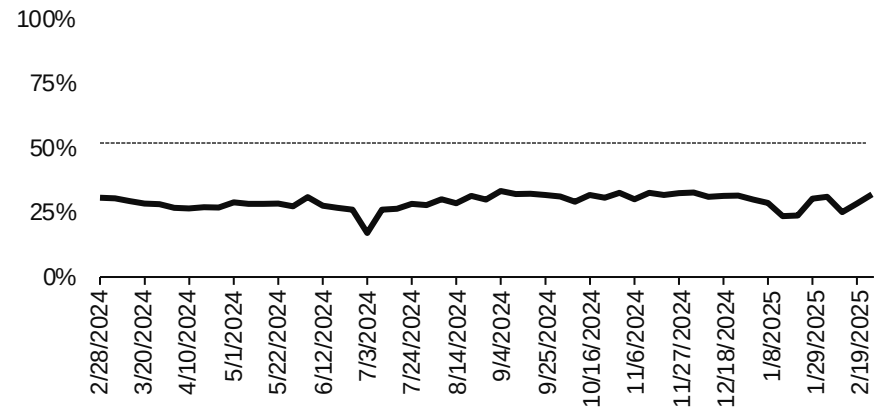
WTI cash price risk assessment: yearend base case is $70 per bbl, with 35% odds of >$80

Commodities

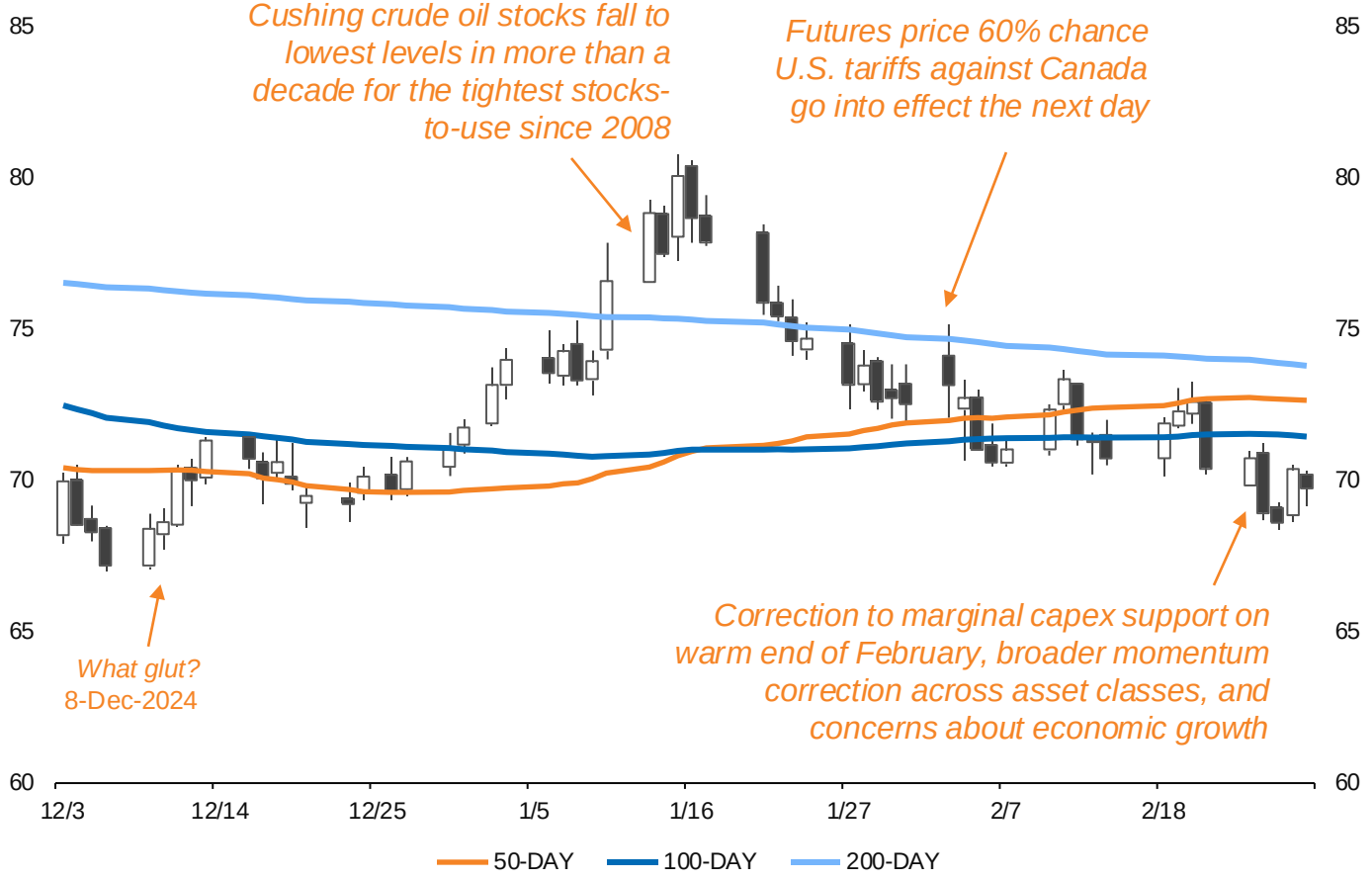
2025 Year-End WTI Crude Cash Price Risk
% probability by price bucket (US$ per bbl)



2025 Year-End WTI Cash Price Risk
% probability below $60



NYM WTI Crude Oil M1 price
US$ per bbl



Source: BLR, 22V Research.
Note: as of 26-Feb-2025. Latest close for cash WTI (Cushing) is $69.26.
The baseline thus projects spot price to end 2025 near current levels.

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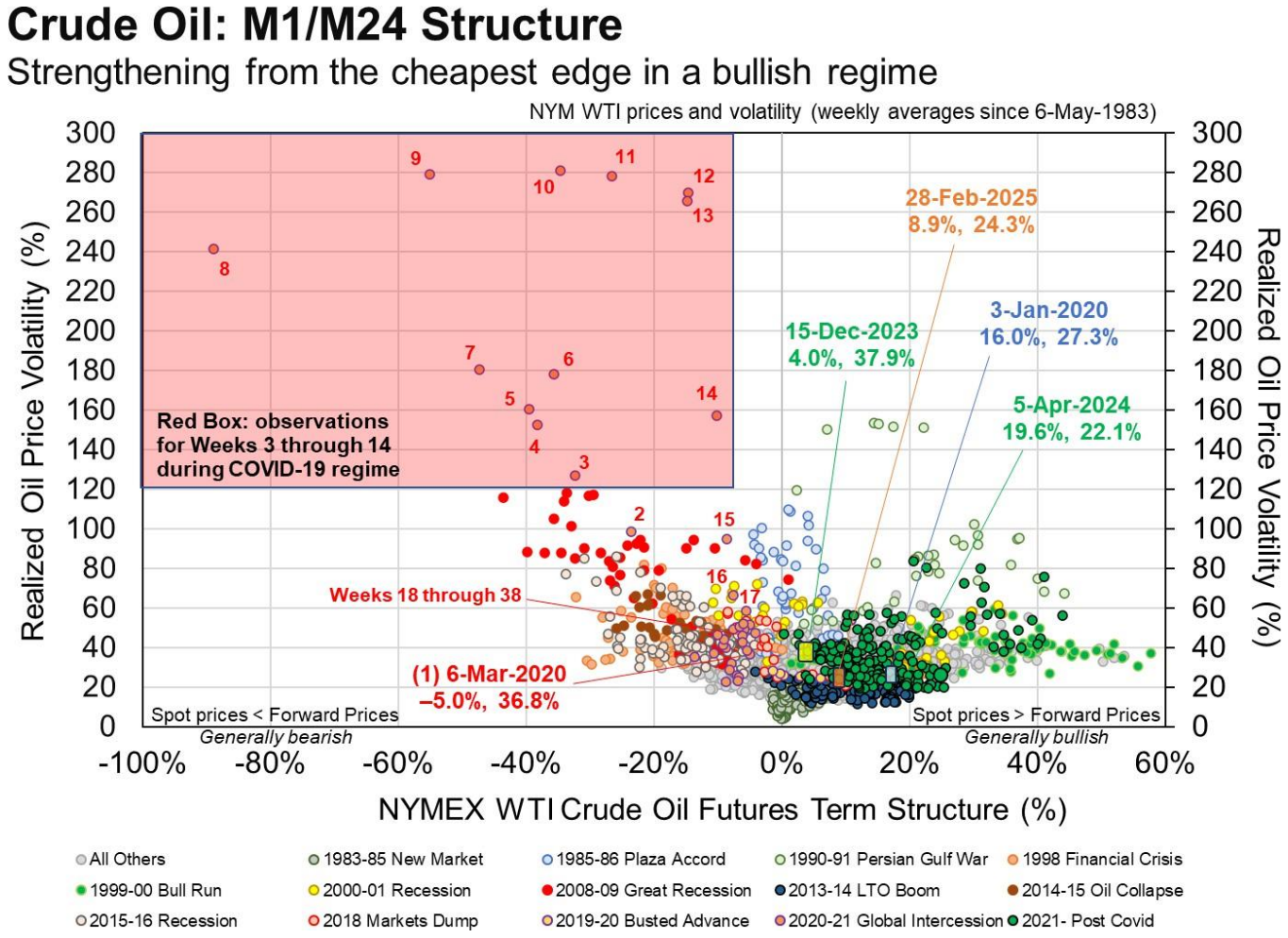
Crude oil futures indicate world oil markets are in a bullish regime at low vol

Commodities



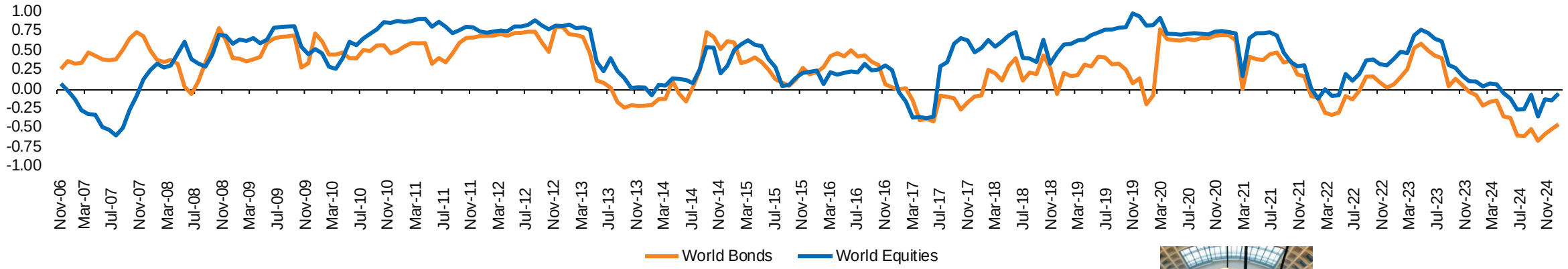
Source: NYM, Bloomberg, BLR, 22V Research.
Note: coordinates on 27-Dec-2024 were 8.1% and 24.8%.
Comparably placid conditions in equities would have VIX at <10%.

22V | RESEARCH

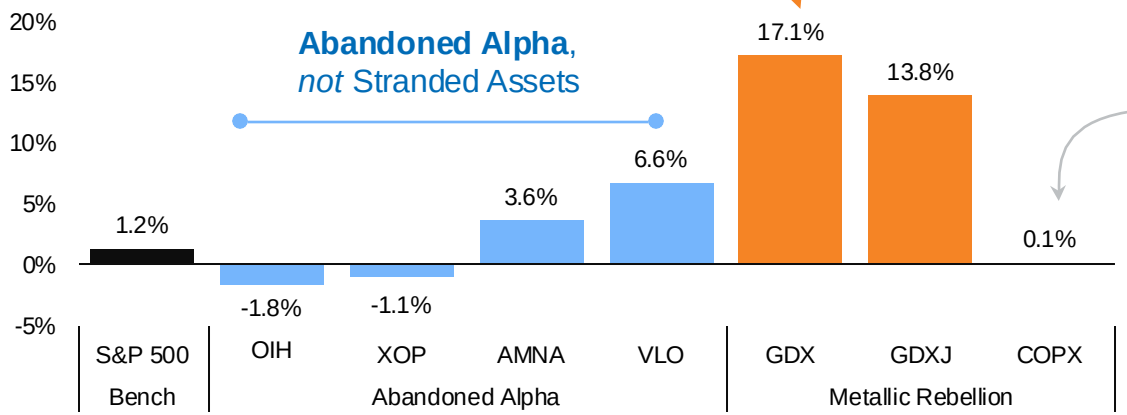
Commodities are outperforming equities, but select commodity equities are best of all

Commodities

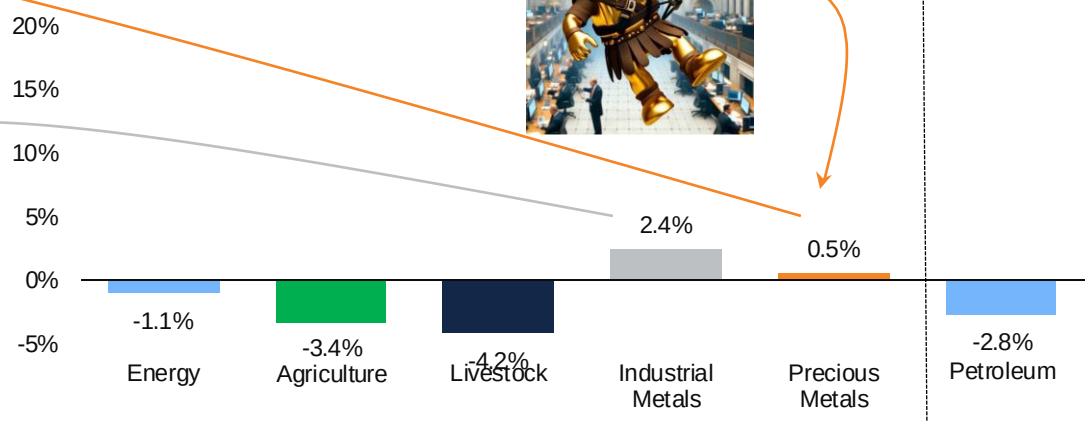
Rolling 2-year correlation with S&P GSCI
correlation coefficient (total returns)



Equity Price Returns
% YTD as of 28-Feb-2025



S&P GSCI Total Returns
% YTD as of 28-Feb-2025



Source: BLR, Bloomberg, S&P Global, 22V Research.
Note: chart at top shows monthly observations through 31-Jan-2025. *Abandoned Alpha* and *Metallic Rebellion* are 22V investment strategy themes introduced on 8-Jan-2025 and 15-Mar-2024, respectively.

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Commodities

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