



Houlihan Lokey

# Oil and Gas

INDUSTRY UPDATE | Q2 2023





01	HOULIHAN LOKEY SNAPSHOT	9
02	CRUDE OIL	13
03	NATURAL GAS AND NGLS	24
04	LNG	36
05	REFINING	38
06	PUBLIC EQUITY MARKETS OVERVIEW	45
07	M&A AND FINANCING ACTIVITY	47
08	RIGS	55

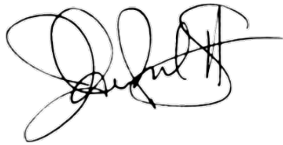
# Houlihan Lokey Oil and Gas Update

Dear Clients and Friends,

Houlihan Lokey is pleased to present its Oil and Gas Industry Update for Q2 2023.

We have included an overview of trends in the oil and gas industry, commodity pricing, public capital markets, M&A, A&D, and financing activity, along with key data to help you stay ahead in our dynamic and constantly evolving industry. We hope you find this quarterly update to be informative and that it serves as a valuable resource to you in staying abreast of the market. If there is additional content you would find useful for future updates, please don't hesitate to call or email us with your suggestions. We look forward to staying in touch with you.

Regards,



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# Key Quarterly Trends

## Oil Supply/Demand Dynamics

- WTI prices through Q2 '23 remained volatile on a daily basis and range bound on a quarterly basis between ~\$65–85/bbl as market participants weighed competing factors, including: (i) relatively tight global inventories in the immediate term and the implications of longer-term underinvestment in exploration and development, (ii) the increase in global demand, including from China, notwithstanding uncertainty regarding the Chinese economy, and (iii) the probability (and depth) of a global recession on the horizon and the resulting impacts on capital availability
  - More recently, WTI prices have strengthened to ~\$80/bbl driven by (i) further production cuts from Saudi Arabia and Russia, (ii) increased oil exports to China (gain YoY of ~12% given the 2022 Chinese zero-COVID-19 lockdown policy), and (iii) expectations of a shallow (if any) recession in the U.S.
- On July 3, 2023, Saudi Arabia and Russia announced plans to voluntarily cut exports by 1 MMBbl/d and 0.5 MMBbl/d, respectively.
  - Saudi Arabia effectively extended its cut of 1 MMBbl/d, which began in July into August.
  - These actions were in addition to a previous surprise cut of ~1.2 MMBbl/d, announced by Saudi Arabia in April 2023, which will run until December 2023.
- China's crude petroleum demand<sup>(1)</sup> and diesel demand increased 17% and 26%, respectively, in May on a year-over-year basis, and June's 12.67 mbpd were the second highest on record.<sup>(2)</sup>
- Underinvestment in exploration and development globally has derived from (i) relatively depressed oil prices during the last down cycle and (ii) the upstream sector's broad current focus on returning capital to shareholders.
  - As a result of the tight inventories and long-term view that demand will outpace supply, the majority of commodity analysts are currently bullish on future oil prices, including forecasting YE 2023 +/- \$80/bbl WTI.
- Russian oil supply dynamics continue to have a material effect on global crude prices.
  - On July 25, 2023, the differential between Urals and Brent decreased to ~\$15/bbl from ~\$27/bbl since January 31, 2023, as Urals traded above economic-sanctions-imposed cap of \$60/bbl.<sup>(3)</sup>
  - Previously on December 5, 2022, the European Union, G7, and Australia instituted a price cap of \$60/bbl on each cargo of seaborne Russian oil.
    - As such, businesses are barred from shipping, financing, and insuring Russian oil cargoes, unless it is below the prevailing price cap.
  - Narrowing Brent-Ural differentials suggest Russia has found at least some level of success in shifting crude oil trade flows, including its push to assemble an alternative network of transportation to avoid sanctions.
- For the week ending May 23, 2023, Russian crude flows fell by 0.4 MMBbl/d to the lowest year-to-date levels despite China accounting for large year-over-year increases.<sup>(2)</sup>
  - Russian crude flows have generally shifted to those countries that have not imposed financial sanctions; China, India, and Turkey have emerged as key destinations for Russian crude, somewhat mitigating the intended effect of the Western sanctions.

(1) Defined as refinery runs plus net oil product imports.

(2) The Wall Street Journal.

(3) Bloomberg.

# Key Quarterly Trends (cont.)

## Natural Gas Supply/Demand Dynamics

- Title Transfer Facility (TTF, the European benchmark) spot prices have declined ~90%<sup>(4)</sup> from their peak of \$90 experienced on August 26, 2022, largely due to (i) a relatively warm winter, (ii) the ramp-up of LNG imports to replace Russian pipeline gas, and (iii) alternative power generation fuel sources (coal, wood, nuclear, renewables), which combined to result in a rebuilding of natural gas inventories closer to full capacity.
  - Europe experienced its third warmest January on record in 2023.<sup>(5)</sup> As a result, EU natural gas inventories are currently at ~84.0% capacity, ~15% higher than the five-year average.<sup>(6)</sup>
  - In July 2022, in order to reduce its member states' reliance on Russian energy, the EU unveiled a European Gas Demand Reduction Plan to cut members' gas usage by 15% during the period from August 2022 through March 2023 vs. 2017–2021's average consumption levels.
- While a prolonged heat wave in the southern U.S. has driven strong demand for natural gas this summer, Henry Hub (HH) gas prices have declined significantly (~24.6%) since January 1, 2023, due to rising U.S. storage inventories resulting from a combination of (i) a relatively mild winter and (ii) temporary partial closure of the Freeport LNG terminal.
  - Per the EIA, as of July 14, 2023, U.S. gas inventories stood at 2.9 Tcf, which was ~14% greater than the five-year average at this time of the year.
  - Analysts expect drilling activity to decline most sharply in active gas-weighted basins (Appalachia, MidCon, Eagle Ford, and the Haynesville/ArkLaTex).
  - On March 8, 2023, Freeport LNG received Federal Energy Regulatory Commission (FERC) and Pipeline and Hazardous Materials Safety Administration (PHMSA) approval to resume the third of its three LNG trains at its ~2 bcf/d liquefaction facility.
  - Available renewable-electricity generation has supplemented gas-fired power plants, particularly in certain of the hottest parts of the country, including California and Texas.
- Despite the recent decline in HH natural gas prices noted above, continued global demand and regional price differentials have incentivized U.S. LNG exporters to expand current capacity and consider constructing new export terminals.
  - The most recent commissioned U.S. LNG export facility, Calcasieu Pass LNG, placed all of its liquefaction trains (~1.3 bcf/d) in service in August 2022.
  - In addition to Golden Pass LNG, which started construction in 2019, two more projects (Plaquemines LNG and Corpus Christi Stage III) on the U.S. Gulf Coast have recently begun construction.
    - Once completed, the three export projects under construction will expand U.S. LNG peak export capacity by a combined ~5.7 bcf/d by 2025.<sup>(7)</sup>
  - As per Reuters, about a dozen developers hope to make final investment decisions this year.

(4) S&P Capital IQ, as of July 25, 2023.

(5) EU's Copernicus Climate Change Service.

(6) GIE Aggregated Gas Storage Inventory, as of July 24, 2023.

(7) EIA.

# Key Quarterly Trends (cont.)

## M&A&D Markets

- Based on what we are directly experiencing across Houlihan Lokey oil and gas deal volume, M&A&D buyers and sellers both remain highly interested in transacting, despite the difficult market factors mentioned above, including commodity price volatility and macroeconomic uncertainty that have resulted in prolonged times to closing and/or “paused” processes.
  - ~\$24.0 billion of transaction value has been reported in Q2 '23 (~276% QoQ increase vs. ~\$8.7 billion in Q1 '23); notable transactions included Chevron/PDC (\$7.6 billion), Ovintiv/Black Swan (\$4.3 billion), Civitas/Tap Rock (\$2.4 billion), and Earthstone/Novo (\$1.5 billion).
  - That said, while transaction value increased, total transaction volume declined ~25% compared to Q1 '23.
- Significant transaction backlog would suggest a rebound in M&A&D activity is likely in the near-term as both (i) commodity prices and (ii) the macroeconomic environment stabilize.
  - As we enter Q3 '23, we are experiencing the M&A&D window opening, particularly among public-to-public M&A and public-to-private A&D.
    - In the Q3 '23 period to date of publication, this appears to be the case for both total transaction value and transaction volume.
- Cash-flow multiples are becoming more reflective of an “output” of value rather than an “input” to or limit on value.
  - Public gas operator NTM’s EBITDA multiples<sup>(8)</sup> have increased, which implies that investors are (i) valuing those companies at a gas price reflective of the strip being in contango, and (ii) gas-weighted assets are gaining relative favor in this environment as demand remains consistent, drilling activity moderates, and full-capacity U.S. LNG export has resumed.
- Oil-and-gas-related continuation funds and other industry-dedicated secondary transaction activity show increasing signs of activity. Concurrently, there are discussions with interested parties (particularly family offices) regarding the possible formation of dedicated, energy-focused secondaries investment vehicles.

## Selected Upstream Metrics

(\$ in billions)

	Q2 '22	Q1 '23	Q2 '23	Percent Change (Q2 '23 vs.)	
				Q2 '22	Q1 '23
<b>A&amp;D</b>					
Amount	\$6.1	\$4.4	\$12.6	107.1%	184.1%
Transactions	73	49	36	-50.7%	-26.5%
<b>M&amp;A</b>					
Amount	\$6.0	\$4.2	\$11.4	89.5%	170.5%
Transactions	6	6	5	-16.7%	-16.7%

<sup>(8)</sup> Refers to next 12 months.



# Key Quarterly Trends (cont.)

## Debt Capital Markets

- While high-yield activity continues to be muted due to macroeconomic uncertainty, energy has led recent issuance, indicating increasing institutional appetite/green shoots for E&P issuers.
  - Energy High Yield index OAS spreads have remained significantly tighter compared to the broader High Yield index.
    - As of July 26, 2023, the Energy High Yield index spread was 316 bps compared to the broader High Yield index spread of 408 bps.
- Following the collapses of Silicon Valley Bank, Signature Bank, and First Republic and the resultant deposit drain witnessed at regional banks, RBL banks have voiced concerns over the macroeconomic impact on capital ratios/capital availability and therefore continue to remain highly selective.
  - Conservative commodity price decks are generally being utilized for RBLs, which has resulted in lower relative advance rates compared to strip-based PDP values.
- Private credit providers remain highly active across numerous products.
- The oil and gas securitization market continues to mature, especially with respect to improving time to completion and hedging requirements.
- VPPs are emerging as an attractive alternative to securitizations in many similar circumstances, thereby accessing a differentiated and broader capital provider universe.
- Drilling capital is available, and an expanding universe of interest has increased the range of available alternatives.

## Equity Capital Markets

- A growing portion of the broader LP universe is bullish E&P given the attractive cash returns and is therefore once again seeking to deploy more capital into the industry.
  - While capital formation remains selective, the upstream sector cash-on-cash returns are expanding the LP universe.
  - Certain sponsors with top-tier track records are continuing to raise funds with success, although the latest funds are generally smaller than previous vintages and taking longer to close.
  - Sponsors are concentrating capital into a smaller number of teams/assets, “re-upping” with proven and historically successful players.
- Energy’s contribution to the S&P 500 on a market cap basis has been increasing (~4.4%) but remains materially below energy’s contribution on a levered cash-flow basis (~16%).
  - This highlights the potential for generalist capital to rotate back into E&P equities and for E&P valuation metrics to improve as a result.

# Key Quarterly Trends (cont.)

## Other Trends

- Recent geopolitical events and attractive industry returns have shifted the dialogue gradually from ESG to energy security in a more balanced manner.
  - This has further expanded given relatively attractive investment returns and cost of energy development and delivery, so long as the mindset of returning capital to shareholders remains consistent.
- Inventory scarcity is driving M&A&D, reflected in public operators focus on acquiring assets with significant quality undeveloped inventory and, in many instances, even reducing activity on the acquired acreage to “land bank” for the future.
  - Buyers are attributing meaningful value to quality, undeveloped locations and becoming increasingly comfortable leaning into strip prices.
- Robust commodity prices in 2022 have left majors/large public independents with record cash balances that they are encouraged by shareholders to (i) return via dividends and (ii) use to acquire companies/assets as opposed to expanding budgets for drilling programs.
- Despite the relatively strong price of WTI, since the start of the year, the U.S. oil rig count has declined by ~16% while gas rigs have dropped by ~25%.<sup>(9)</sup>
  - Frac spreads have declined to 256 after hitting a 2023 peak of 295 in late March.<sup>(10)</sup>
  - Operators have noted that service costs have begun to decline as drilling activity has declined and supply-chain-driven inflation has abated.

<sup>(9)</sup> Baker Hughes, as of August 18, 2023.

<sup>(10)</sup> American Oil & Gas Reporter, as of August 18, 2023.





01

HOULIHAN LOKEY  
SNAPSHOT



**Houlihan Lokey**



Houlihan Lokey is the trusted advisor to more top decision-makers than any other independent global investment bank.

## Energy and Power M&A

2020-2022 M&A Advisory Rankings  
All U.S. Energy & Power Transactions

	Advisor	Deals
1	<b>Houlihan Lokey</b>	<b>70</b>
2	Jefferies	59
3	Evercore Partners	57
4	Citi	56
5	JP Morgan	55

Source: Refinitiv

**No. 1** M&A Advisor for All U.S. Energy and Power Transactions Over the Past Three Years

## Financial and Valuation Advisory

1998 to 2022 Global M&A Fairness  
Advisory Rankings

	Advisor	Deals
1	<b>Houlihan Lokey</b>	<b>1,232</b>
2	JP Morgan	1,030
3	Duff & Phelps, A Kroll Business	938
4	Morgan Stanley	725
5	BofA Securities	710

Source: Refinitiv. Announced or completed transactions.

**No. 1** Global M&A Fairness Opinion Advisor Over the Past 25 Years

**1,000+** Annual Valuation Engagements

## Corporate Finance

2022 M&A Advisory Rankings  
Global Transactions Under \$1 Billion

	Advisor	Deals
1	<b>Houlihan Lokey</b>	<b>381</b>
2	Rothschild	369
3	JP Morgan	217
4	Lazard	206
5	Goldman Sachs	203

Source: Refinitiv. Excludes accounting firms and brokers.

**No. 1** Global M&A Advisor Under \$1 Billion  
**Leading** Capital Markets Advisor

## Financial Restructuring

2022 Global Distressed Debt & Bankruptcy  
Restructuring Rankings

	Advisor	Deals
1	<b>Houlihan Lokey</b>	<b>58</b>
2	PJT Partners	30
3	Lazard	29
4	Rothschild	25
5	Moelis	21

Source: Refinitiv.

**No. 1** Global Investment Banking  
Restructuring Advisor

**1,500+** Transactions Completed, Valued at  
More Than \$3.0 Trillion Collectively

# Global Oil and Gas Footprint:

## Fully Integrated Team

Houlihan Lokey's Oil & Gas Group provides global coverage via more than 70 dedicated financial professionals, including specialized bankers, A&D/technical advisory, valuation, and capital markets teams.

### J.P. Hanson: Global Head, Oil & Gas Group

#### New York

<b>Thomas Dippel</b> <i>Managing Director</i> Financial Sponsors	<b>Joshua Eaves</b> <i>Managing Director</i> Banking/Coverage	<b>Dylan Strode</b> <i>Financial Analyst</i> Banking/Coverage
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#### Houston

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#### Dallas

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<b>Ariel Berkowitz</b> <i>Associate</i> Banking/Coverage	<b>Micah Poag</b> <i>Associate</i> Banking/Coverage	<b>Robert Keathley</b> <i>Financial Analyst</i> Banking/Coverage		<b>Ashton Van Deventer</b> <i>Financial Analyst</i> Banking/Coverage	<b>Lance Hanse</b> <i>Financial Analyst</i> Banking/Coverage

#### Europe

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<b>James Berwick</b> <i>Financial Analyst</i>	<b>Martin Oliver</b> <i>Financial Analyst</i>
<b>Iñigo Llano</b> <i>Financial Analyst</i>	

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<b>MENA</b>		
<b>Rouzbeh Fazlinejad</b> <i>Managing Director</i>	<b>Arun Reddy</b> <i>Managing Director</i>	<b>Nicola Matteo Nigro</b> <i>Senior Vice President</i>
<b>Frederic Manket</b> <i>Associate</i>	<b>Wael Awad</b> <i>Financial Analyst</i>	

# Cross-Product Industry Team

## Technical/A&D

- More than \$50 billion in combined transactions
- Specialists in:
  - Technical advisory
  - Asset dispositions/swaps
  - Equity/working interest sales
  - JV structuring/partner identification

## Mergers and Acquisitions

- No. 1 Global M&A advisor under \$1 billion\*
- Corporate M&A/spinoff advisory, structuring, negotiation, and execution
- Extensive reach in market trends and relationships
- Specialize in tailored processes to maximize value for our clients

## Trusted Advisor

- During the past several years, Houlihan Lokey's fully integrated, cross-product Oil & Gas Group has advised on numerous capital-raise, M&A, corporate finance, and recapitalization assignments in the E&P industry.

## Recapitalization/Restructuring

- No. 1 global recapitalization/restructuring advisor
- We have been engaged in the most notable energy recapitalizations/restructurings of the recent and prior commodity downturn cycles



## Capital Markets

- ~\$25 billion of capital raised and \$12 billion advised on over the past two years
- Market leader in custom/bespoke structure
- Deep expertise in driving optimal positioning, structure/terms, and syndication

## Financial Advisory

- No. 1 global M&A fairness opinion advisor over the past 25 years\*\*
- 1,000+ annual valuation engagements
- Transaction advisory services, including ability to bundle due diligence and quality of earnings services

Source: Refinitiv.

\*Excludes accounting firms and brokers.

\*\*Announced or completed transactions.

## Veteran Leadership Team

- The Oil & Gas investment banking team is a cross-product, global, industry-dedicated team of more than 70 highly experienced professionals.
- They come from a diverse set of backgrounds, including E&P companies, midstream companies, other investment banks, investment funds, and research/brokerage shops.
- The A&D/technical group is led by a team of technically focused professionals from the industry, with an average of more than 25 years of industry experience.

## Selected Transactions<sup>(1)</sup>

 a portfolio company of <b>APOLLO</b> has been acquired by OneRock Energy Holdings, LLC, an investment vehicle of  Sellside Advisor	 has acquired 70% of the assets of  Buyside Advisor	 has acquired 30% of the assets of  Buyside Advisor	 has combined in an all-stock merger with  Financial Advisor	 has divested substantially all of its oil and gas assets to  Sellside Advisor	 has sold substantially all its assets, pursuant to Section 363 of the U.S. Bankruptcy code, to  Company Advisor
 has been acquired by <b>STONEPEAK</b> Financial Advisor & Fairness Opinion	 has been acquired by <b>CHESAPEAKE ENERGY</b> Financial Advisor & Fairness Opinion	 has been acquired by  Sellside Advisor	 has sold a 37.5% wellbore interest in certain Legacy PDP assets to  Sellside Advisor	 has acquired the assets of  Buyside Advisor	 has acquired  Company Advisor

Tombstones included herein represent transactions closed from 2021 forward.

(1) Please reach out to Manny Vedi at +1 832.319.5135 or MVEDi@HL.com for additional Oil & Gas Group qualifications.

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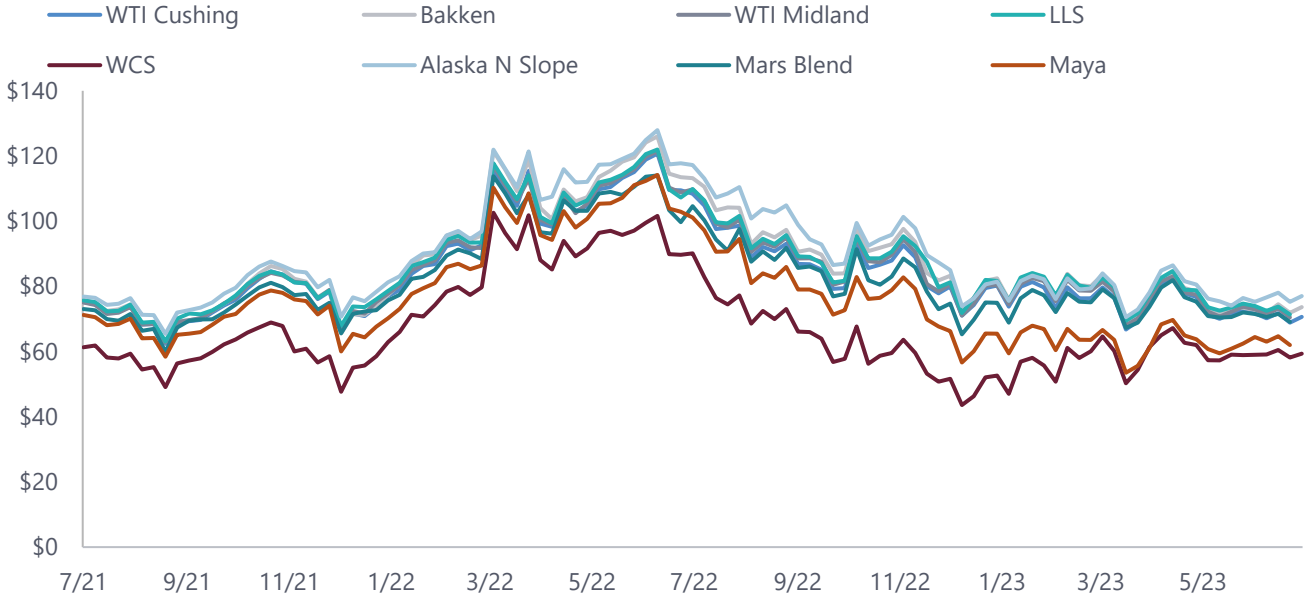
CRUDE OIL



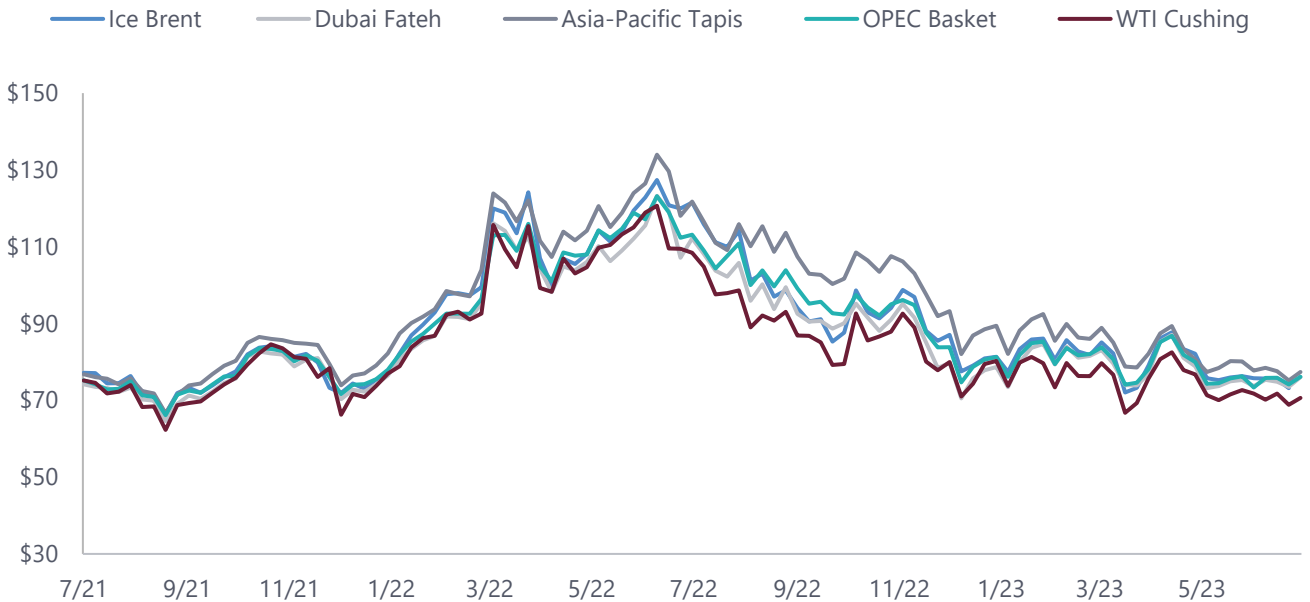
**Houlihan Lokey**

# Spot Pricing

## North American Spot Prices (\$/bbl)



## International Spot Prices (\$/bbl)

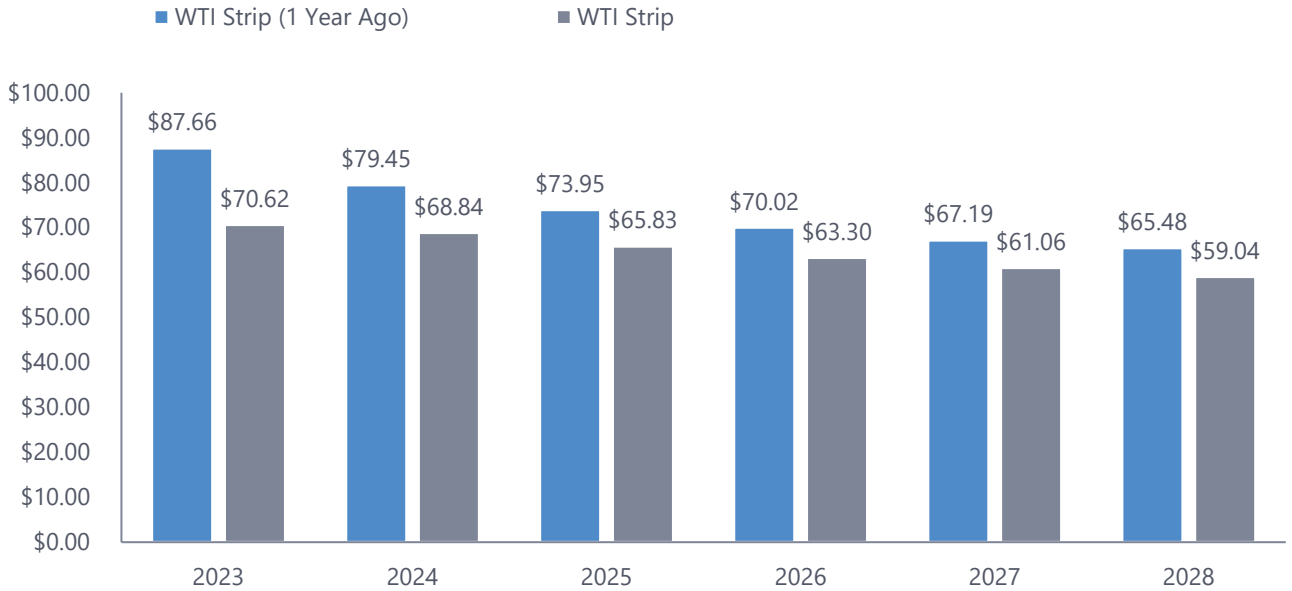


Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

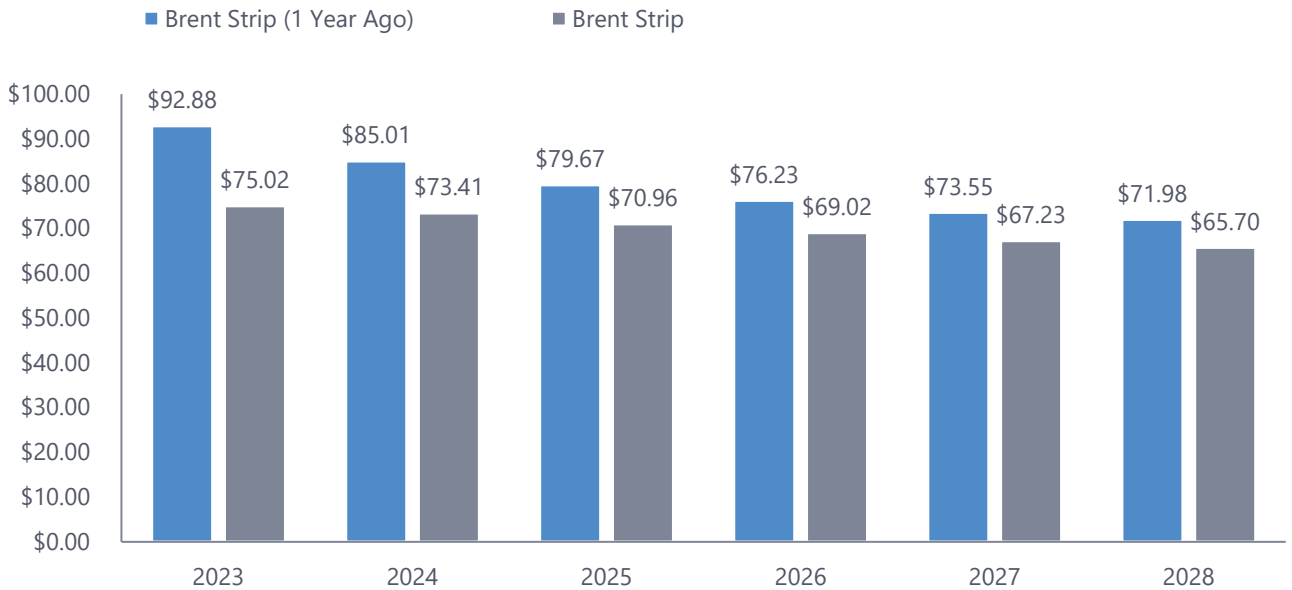


# Strip Pricing

## WTI Cushing Strip Pricing Comparison (\$/bbl)



## Brent Strip Pricing Comparison (\$/bbl)



Notes: All data as of June 30, 2023. Represents the average price for each year.  
Source: Capital IQ.

# Differentials

Region	6/30/2023	6/30/2022	3/31/2023	YoY % Change	QoQ % Change
<b>Brent</b>	\$75.0	\$120.5	\$79.1	-37.8%	-5.2%
<i>Brent - WTI Cushing</i>	\$4.3	\$14.7	\$4.0		
<b>WTI Cushing</b>	\$70.6	\$105.8	\$75.7	-33.2%	-6.6%
<i>WTI Cushing - Brent</i>	(\$4.3)	(\$14.7)	(\$4.0)		
<b>Bakken</b>	\$73.6	\$110.5	\$77.5	-33.4%	-5.0%
<i>WTI Cushing - Bakken</i>	(\$3.0)	(\$4.8)	(\$1.8)		
<b>Eagle Ford Light</b>	\$67.1	\$102.2	\$72.2	-34.4%	-7.0%
<i>WTI Cushing - Eagle Ford Light</i>	\$3.5	\$3.5	\$3.5		
<b>WCS</b>	\$59.3	\$87.6	\$61.4	-32.3%	-3.3%
<i>WTI Cushing - WCS</i>	\$11.3	\$18.2	\$14.3		

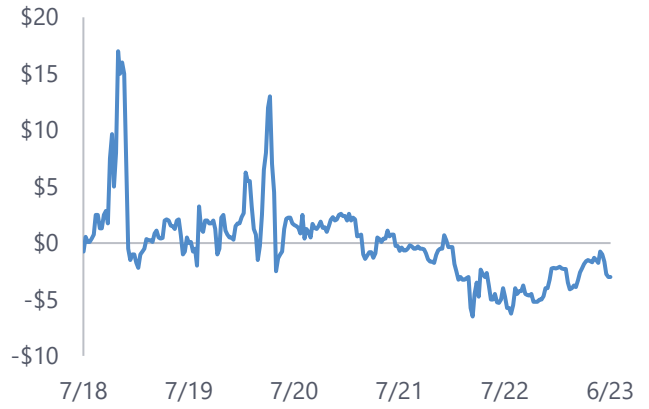
Notes: All data as of June 30, 2023. Data collected on a daily basis.  
Source: Bloomberg.

# Differentials (\$/bbl)

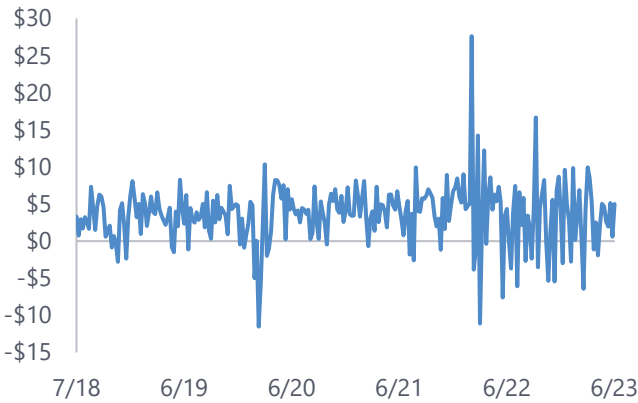
## Brent—WTI Cushing



## WTI Cushing—WTI Bakken Clearbrook



## WTI Cushing—Eagle Ford Light



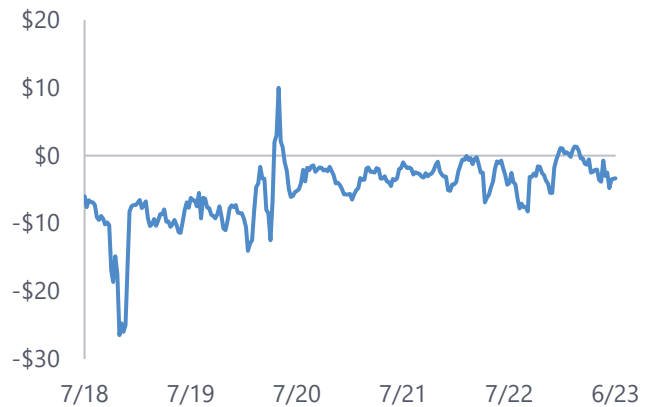
## WTI Cushing—WCS



## LLS—Mars



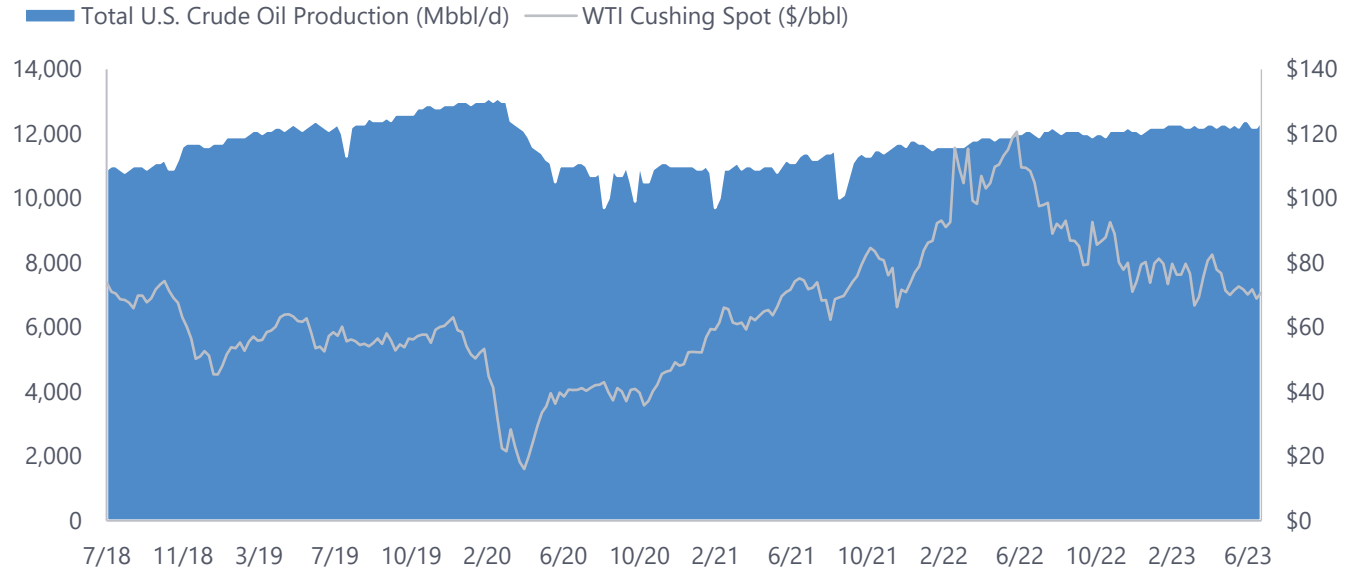
## Bakken—ANS



Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Sources: Bloomberg and Capital IQ.

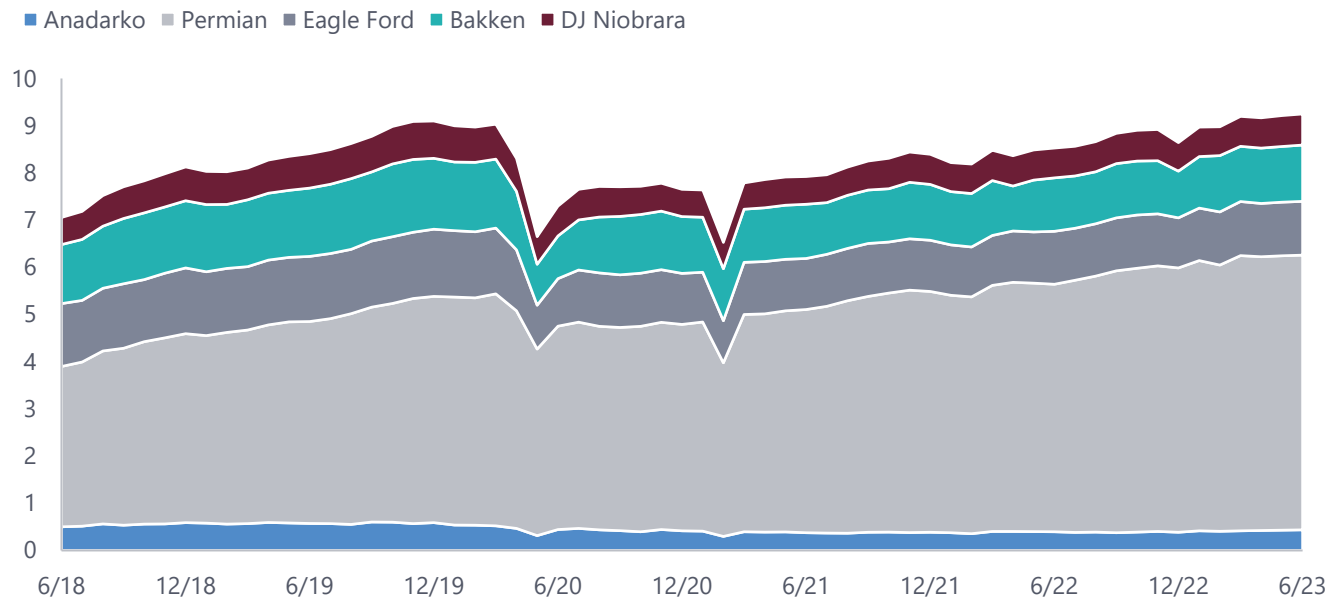
# Production

## U.S. Production (Mbb/d) vs. WTI (\$/bbl)



Note: Data collected on a weekly basis and subject to a one-week lag for production.

## Production in Select Regions (MMbbl/d)<sup>(1)</sup>



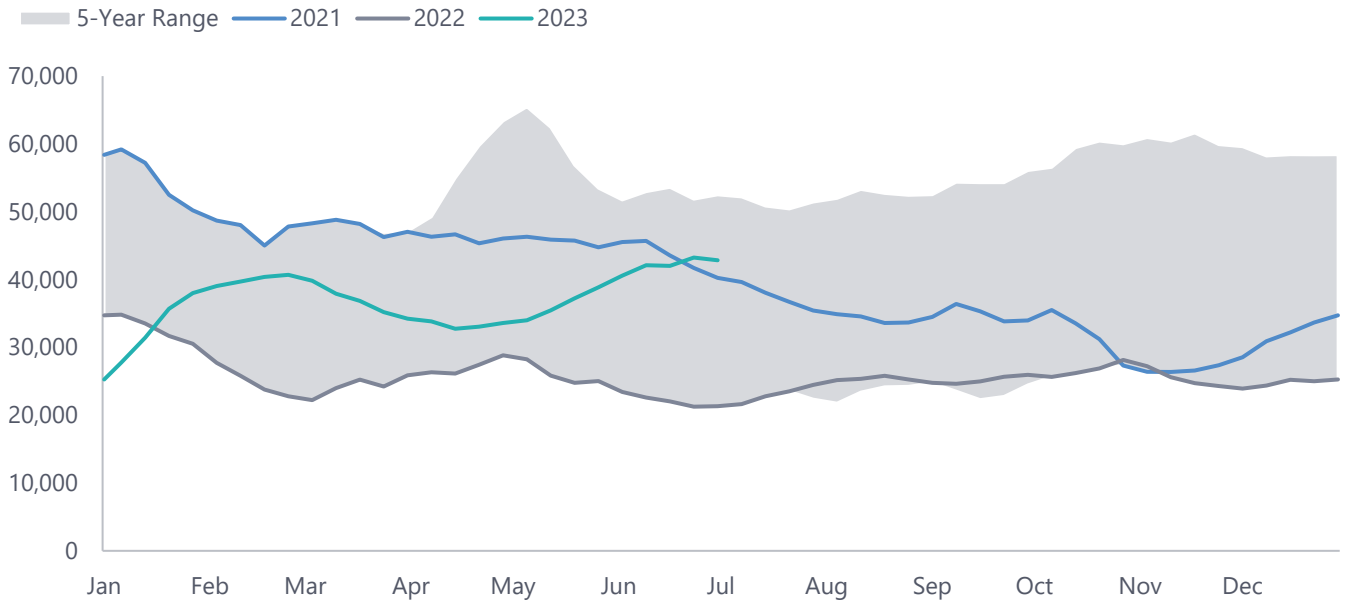
Notes: All data as of June 30, 2023. Data collected on a monthly basis.

Sources: Bloomberg, EIA.

(1) EIA's drilling productivity report uses recent data on the total number of drilling rigs in operation, along with estimates of drilling productivity and estimated changes in production from existing wells, to provide estimated changes in production for key regions.

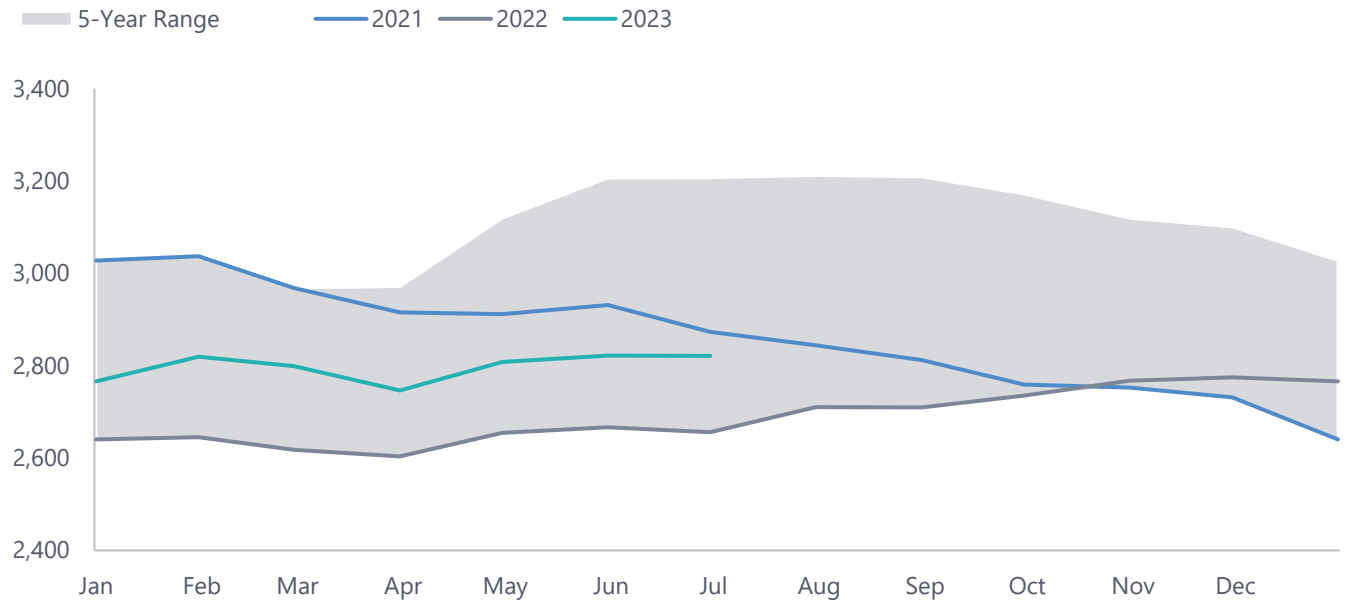
# Inventory

## U.S. Cushing Crude Inventory (Mbbbl)



Note: Data collected on a weekly basis.

## OECD Commercial Inventories (MMbbl)

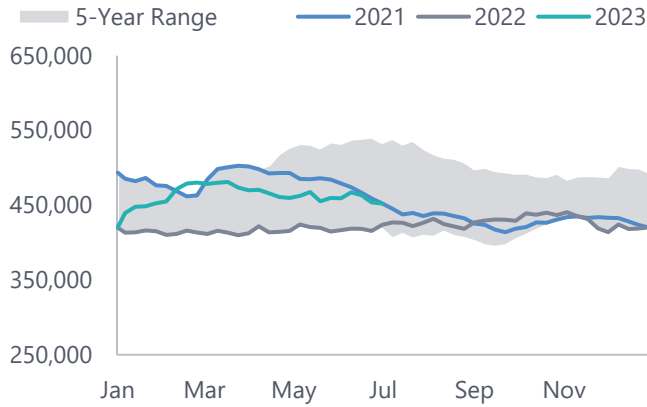


Note: All data as of June 30, 2023.

Source: Bloomberg

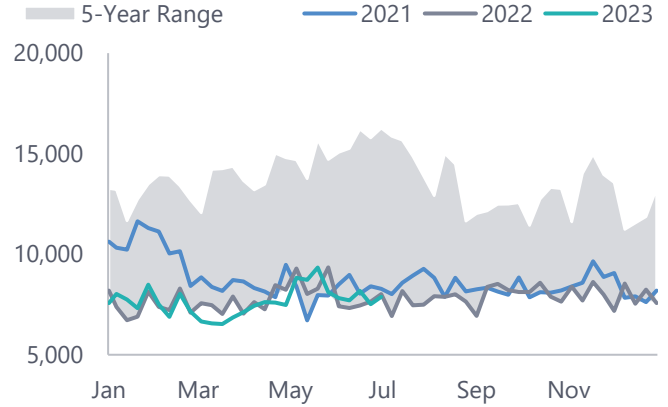
# Inventory (Mbbbl)

## Overall U.S. Crude Inventory

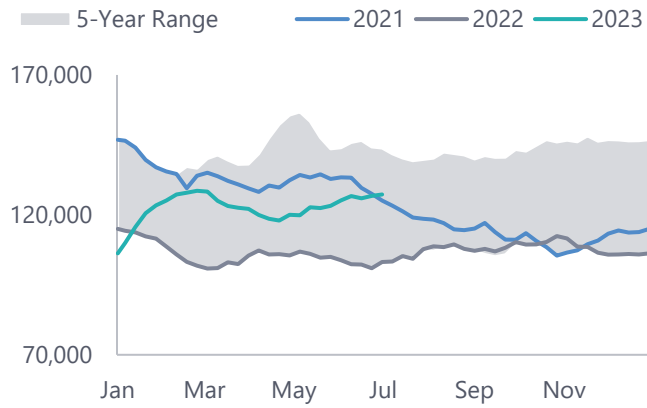


Note: Excludes strategic petroleum reserve (SPR).

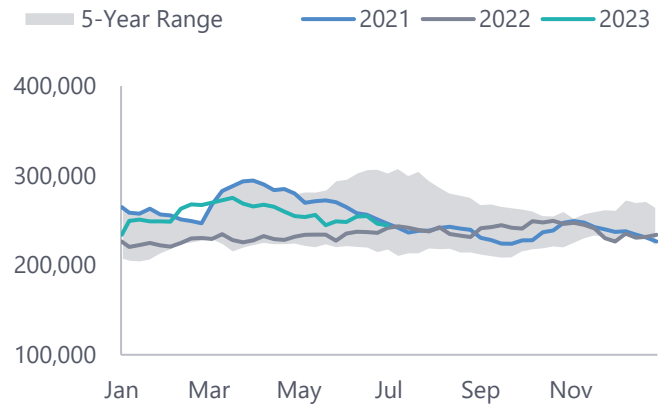
## PADD I



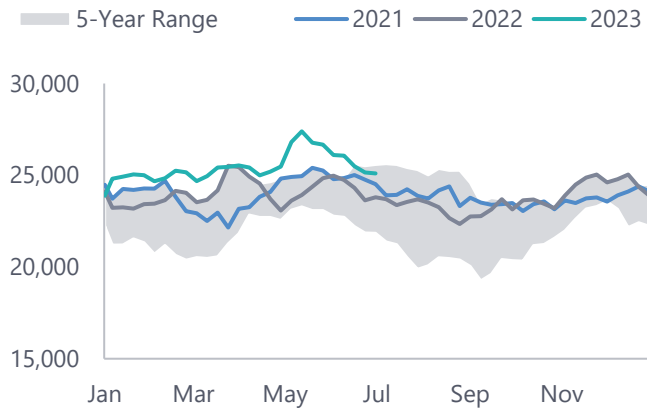
## PADD II



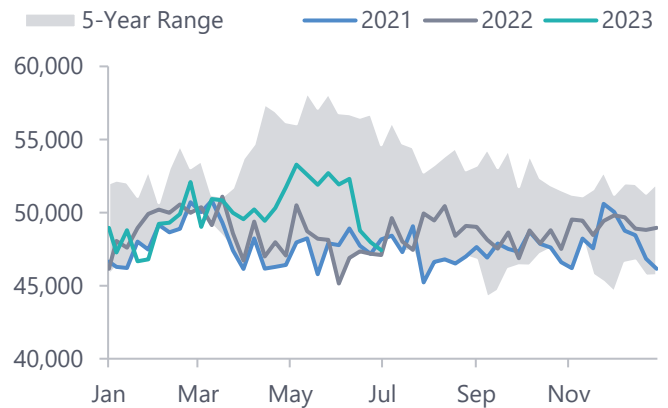
## PADD III



## PADD IV



## PADD V

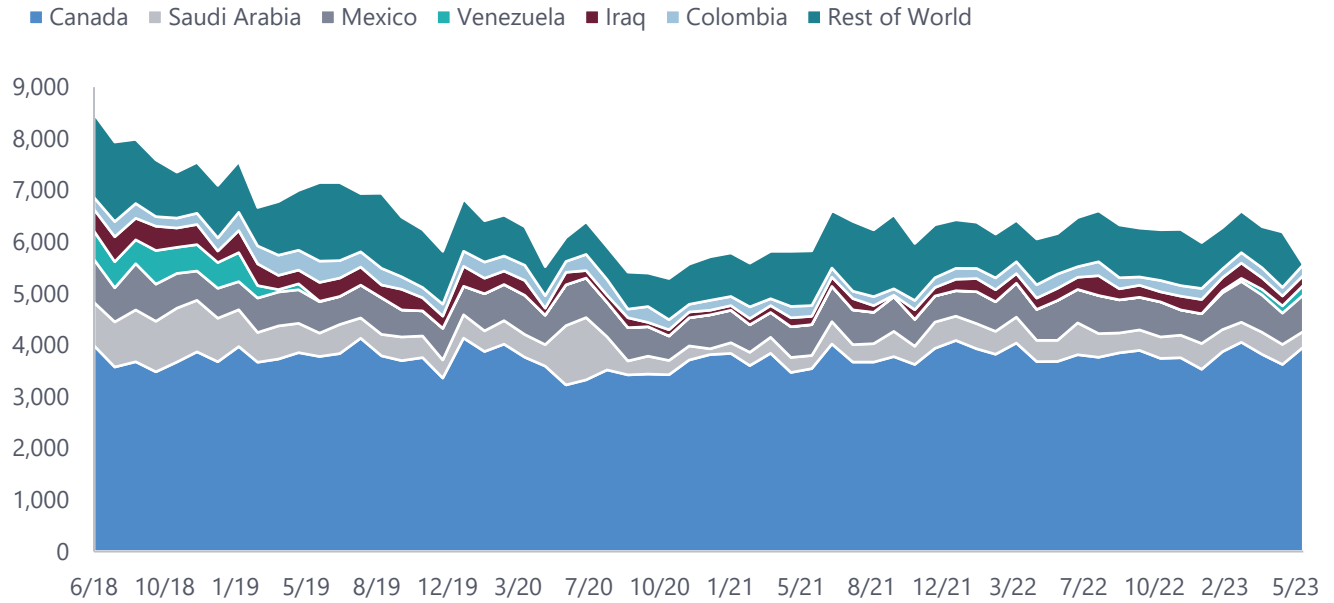


Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

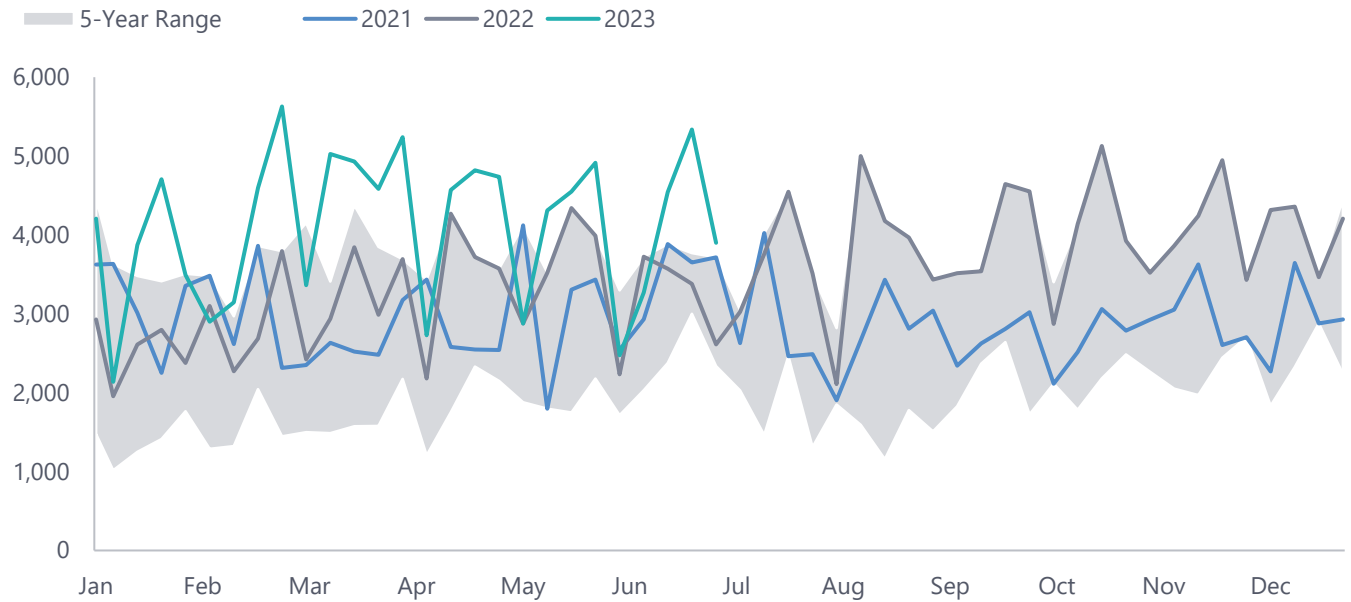


# Trade

## U.S. Crude Imports by Country (Mbbbl)



## Total U.S. Crude Exports (Mbbbl/d)



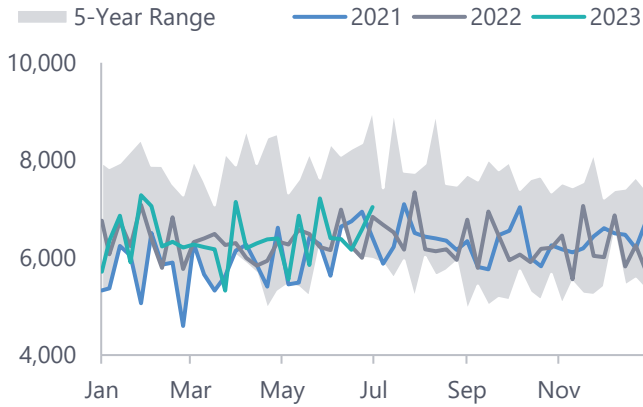
Note: Data collected on a weekly basis.

Note: All data as of June 30, 2023.

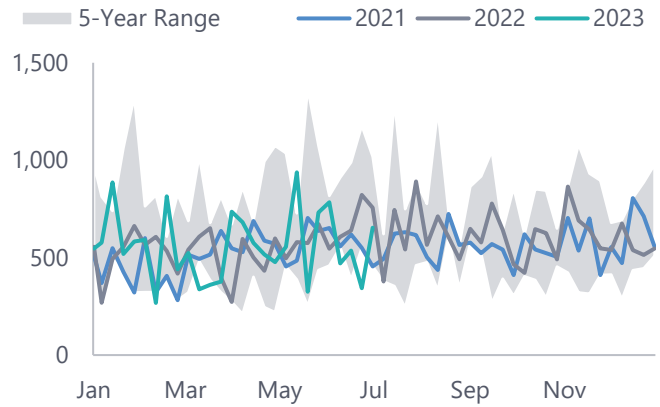
Source: Bloomberg.

# U.S. Commercial Crude Imports by Destination (Mbbbl/d)

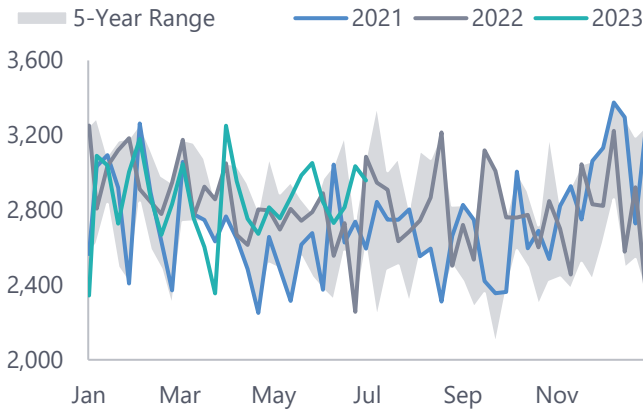
## Overall U.S. Commercial Crude Imports



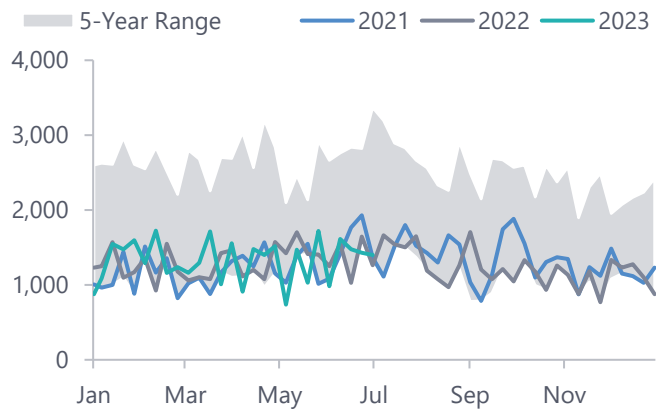
## Destination—PADD I



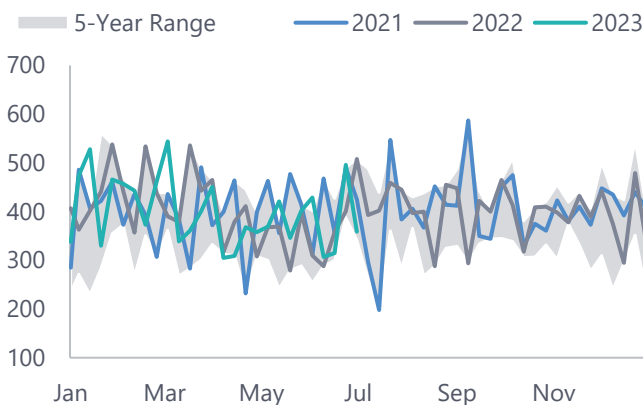
## Destination—PADD II



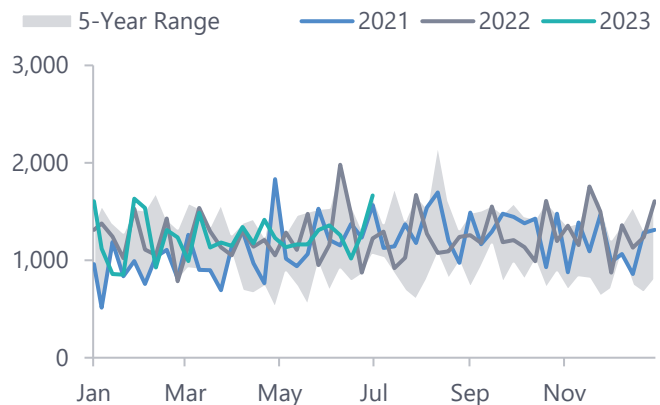
## Destination—PADD III



## Destination—PADD IV



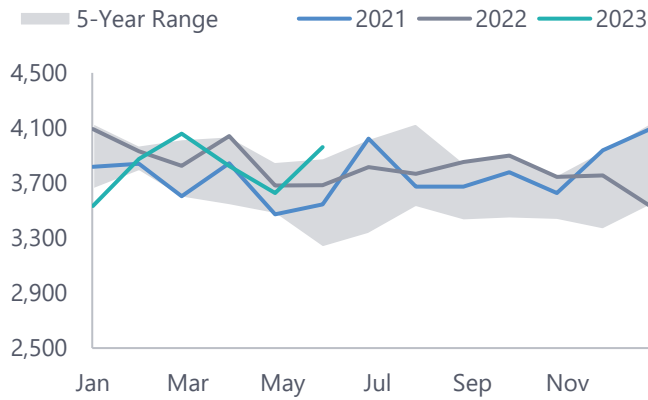
## Destination—PADD V



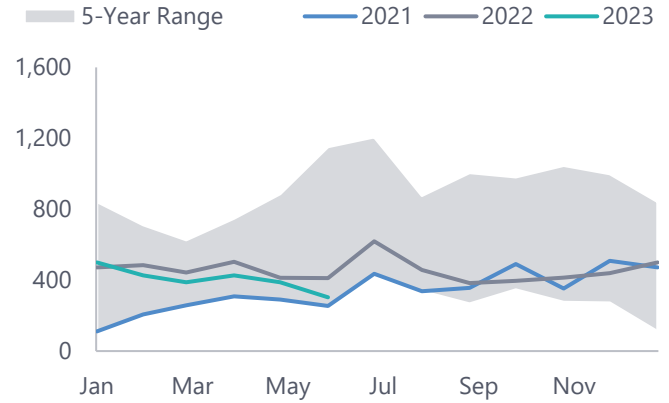
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# U.S. Imports by Country (Mbbbl/d)

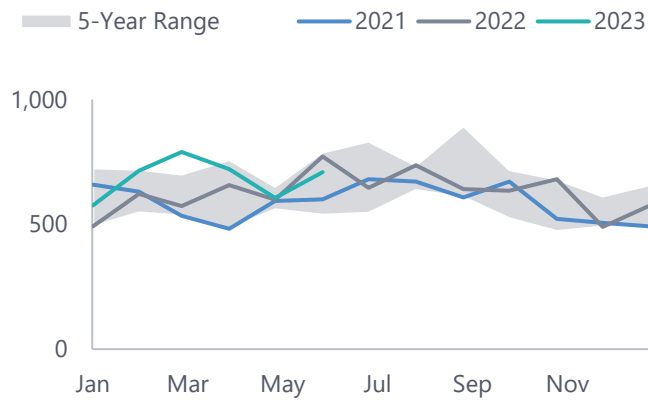
## Canada



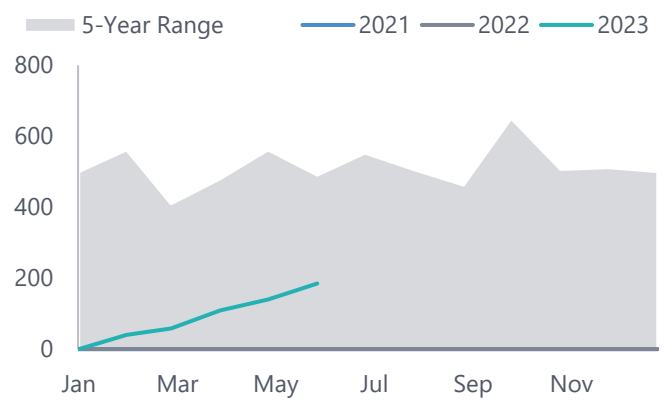
## Saudi Arabia



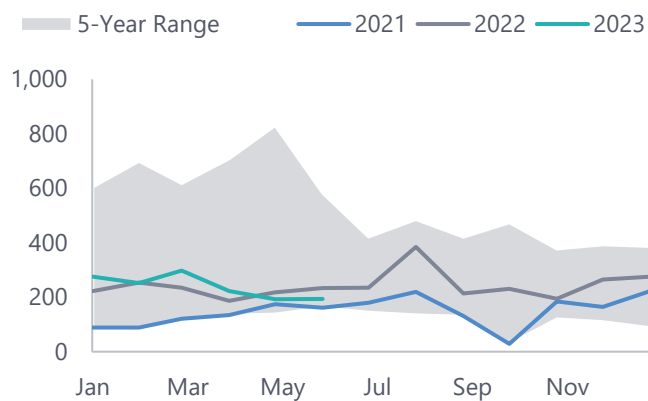
## Mexico



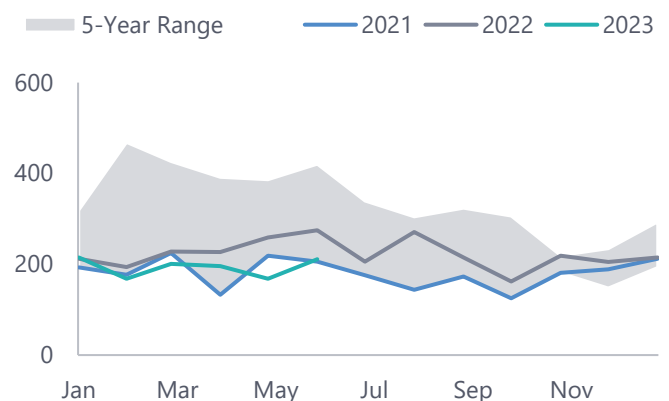
## Venezuela



## Iraq



## Colombia



Notes: All data as of June 30, 2023. Data collected on a monthly basis and subject to a two-month lag.  
Source: Bloomberg.

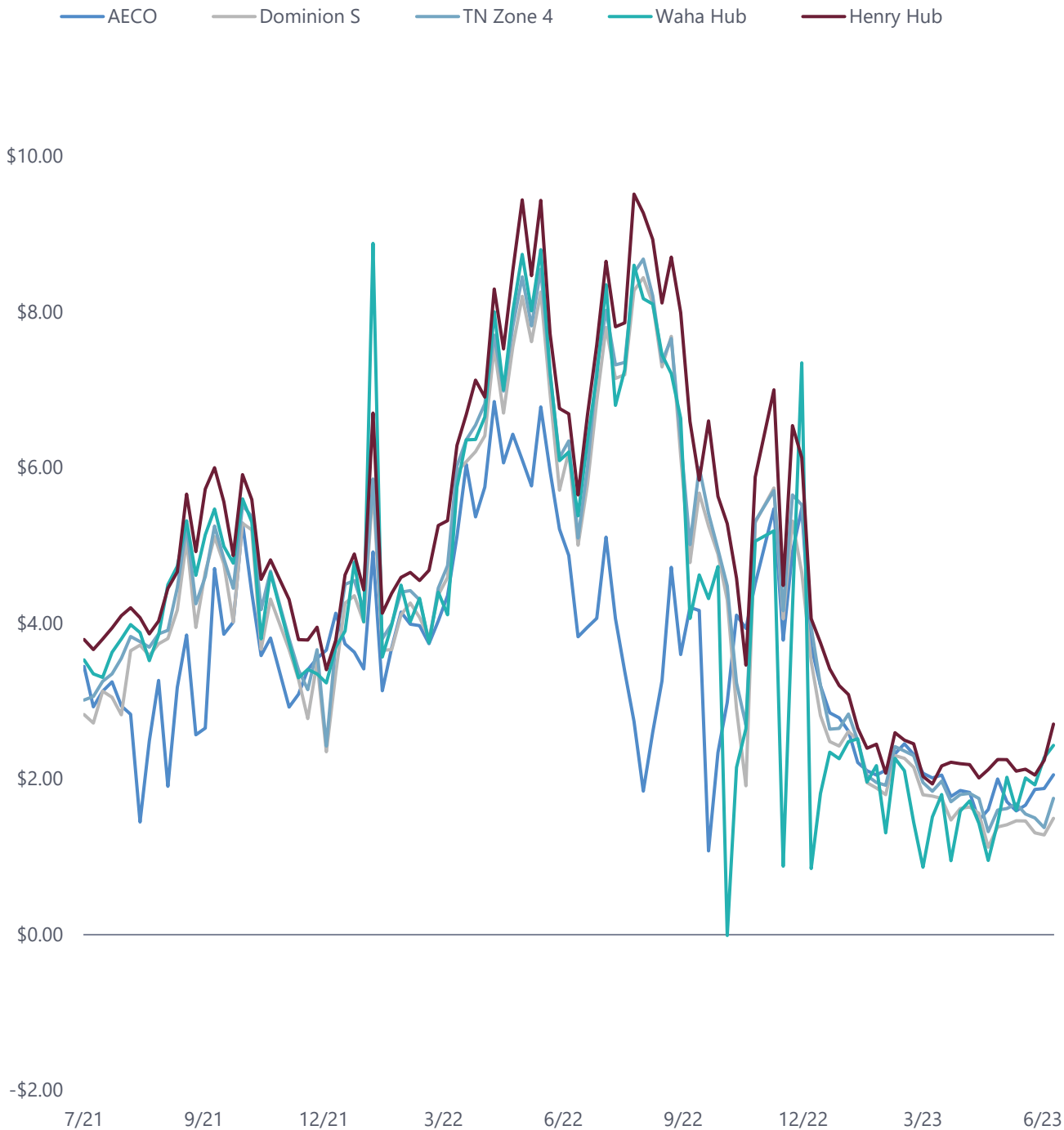
# 03

## NATURAL GAS AND NGLS



# Natural Gas Spot Pricing

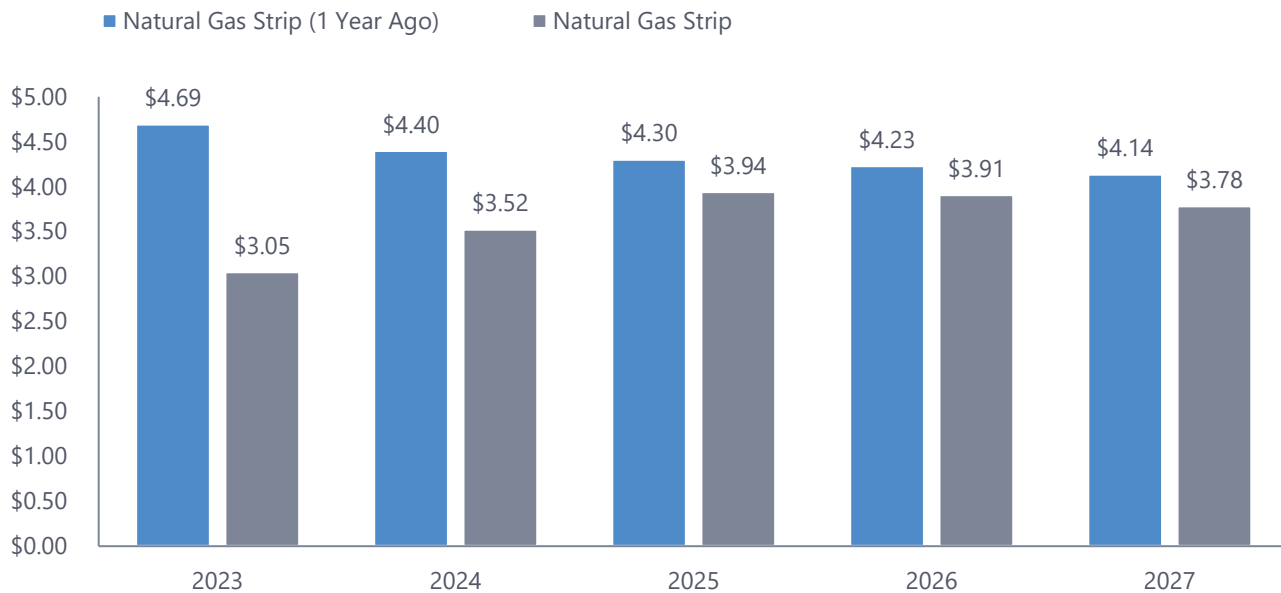
## Pricing (\$/MMBtu)



Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Capital IQ.

# Natural Gas Pricing

## Strip Pricing Comparison (\$/MMbtu)



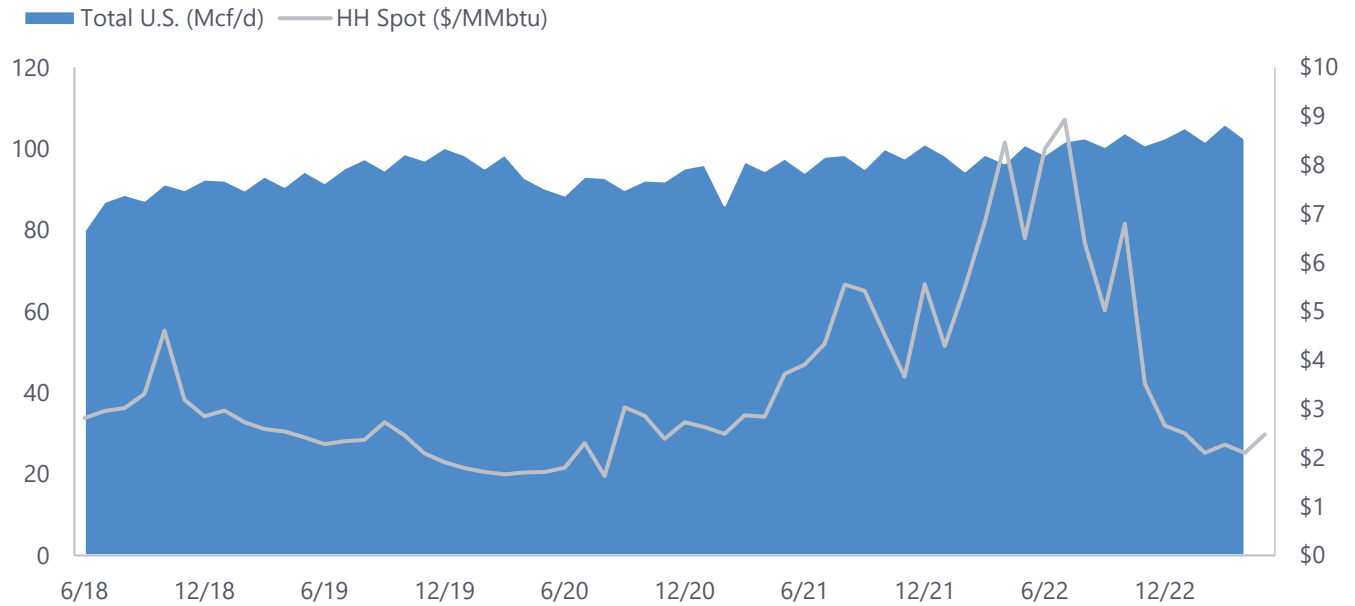
Notes: All data as of June 30, 2023. Represents the average price for each year.

Source: Capital IQ.



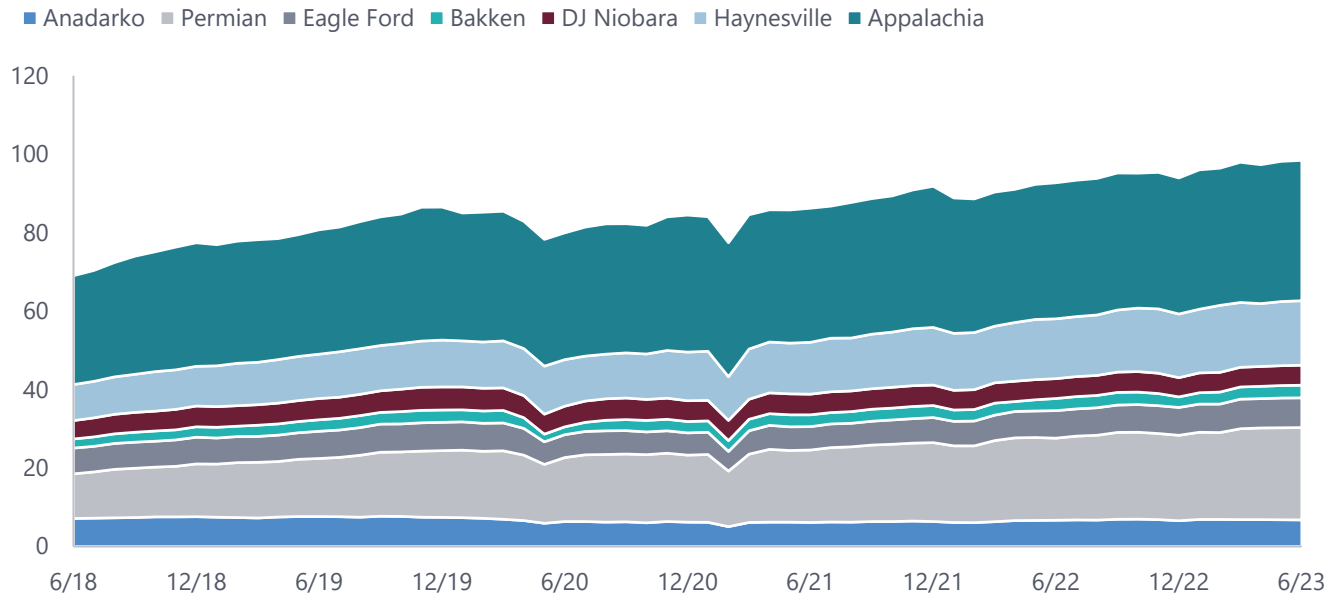
# Natural Gas Production

## Total U.S. Dry Natural Gas Production (Bcf/d)



Note: Data collected on a monthly basis and subject to a two-month lag for production.

## Select Dry Natural Gas Production by Regions (Bcf/d)(1)



Notes: All data as of June 30, 2023. Data collected on a monthly basis.

Sources: Bloomberg, EIA.

(1) EIA's drilling productivity report uses recent data on the total number of drilling rigs in operation, along with estimates of drilling productivity and estimated changes in production from existing wells, to provide estimated changes in production for key regions.

# Differentials

## Regional Natural Gas Spot Pricing (\$/MMbtu)

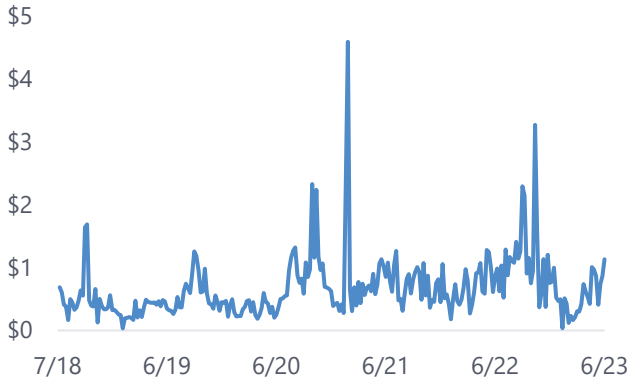
Region	6/30/2023	6/30/2022	3/31/2023	YoY % Change	QoQ % Change
<b>Henry Hub</b>	\$2.40	\$6.69	\$1.95	-64.1%	23.1%
<i>Benchmark</i>					
<b>Dominion South</b>	\$1.46	\$6.21	\$1.65	-76.5%	-11.6%
<i>Henry Hub - Dominion South</i>	\$0.94	\$0.49	\$0.30		
<b>TN Zone 4</b>	\$1.68	\$6.34	\$1.69	-73.5%	-0.5%
<i>Henry Hub - TN Zone 4</i>	\$0.72	\$0.35	\$0.26		
<b>AECO</b>	\$2.00	\$4.87	\$1.97	-59.0%	1.1%
<i>Henry Hub - AECO</i>	\$0.40	\$1.82	(\$0.02)		
<b>Waha hub</b>	\$2.30	\$6.20	\$1.54	-62.9%	49.7%
<i>Henry Hub - Waha</i>	\$0.10	\$0.49	\$0.41		

Notes: All data as of June 30, 2023.

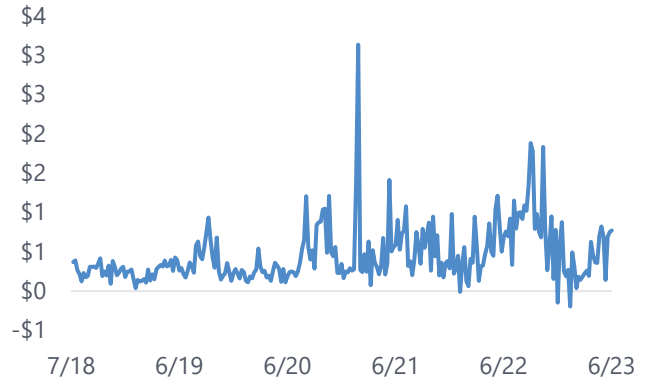
Source: Capital IQ.

# Natural Gas—Differentials (\$/MMbtu)

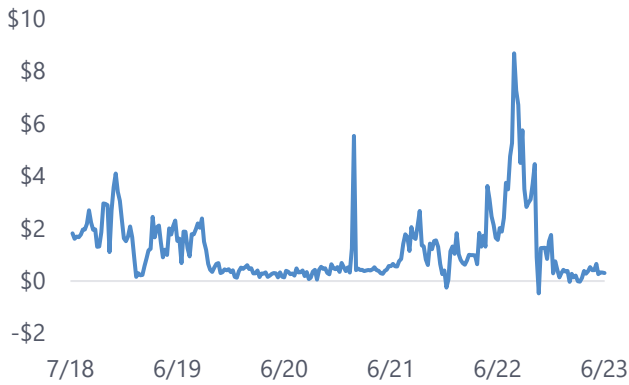
## HH—Dominion South



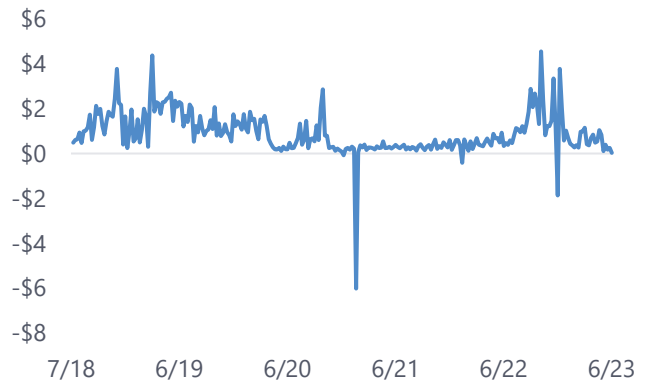
## HH—TN Zone 4



## HH—AECO



## HH—Waha Hub



Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Capital IQ.

# Natural Gas

## U.S. Natural Gas Withdrawal (Bcf)



Note: Data collected on a monthly basis and subject to irregular updates.

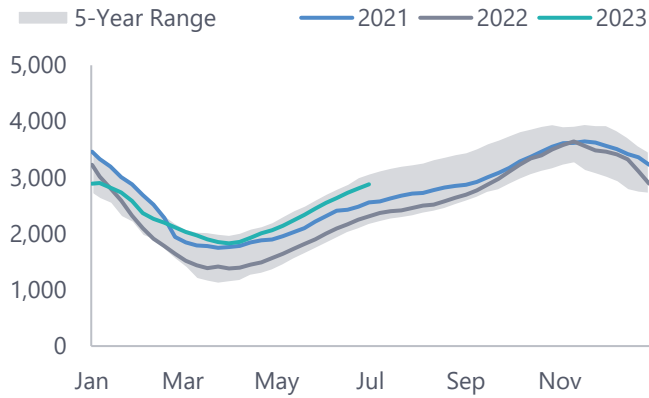
Note: All data as of June 30, 2023.

Source: Bloomberg.

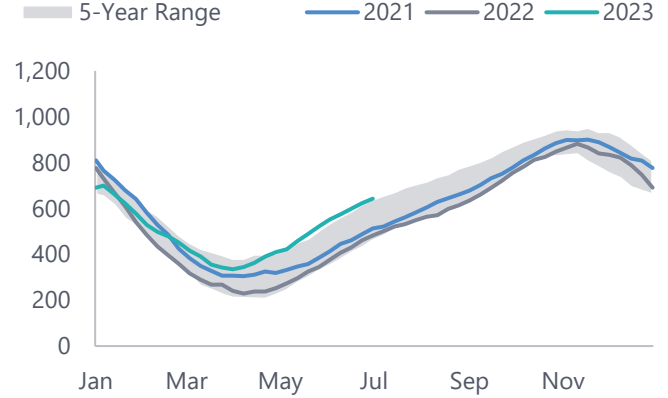


# Natural Gas Storage (Bcf)

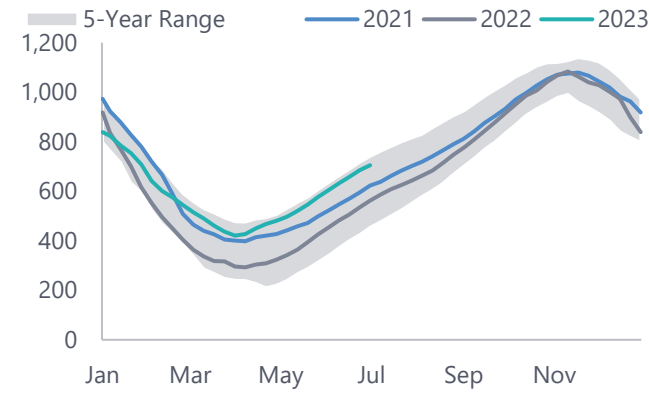
## Total U.S.



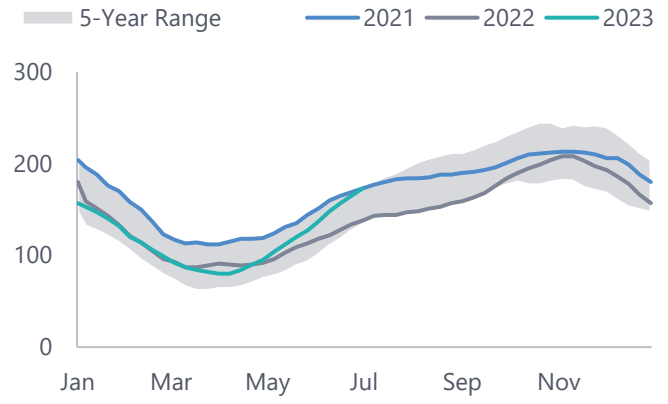
## East



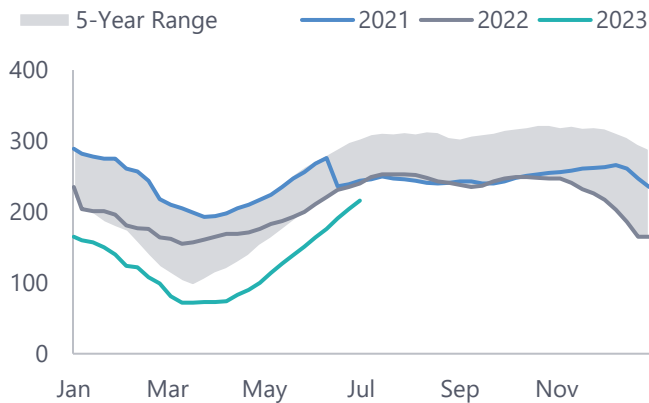
## Midwest



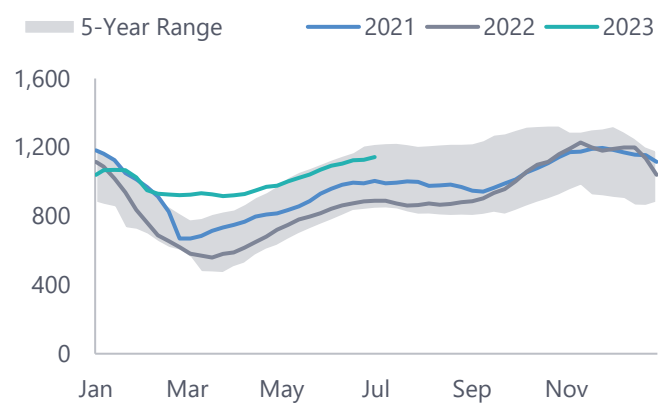
## Mountain



## Pacific



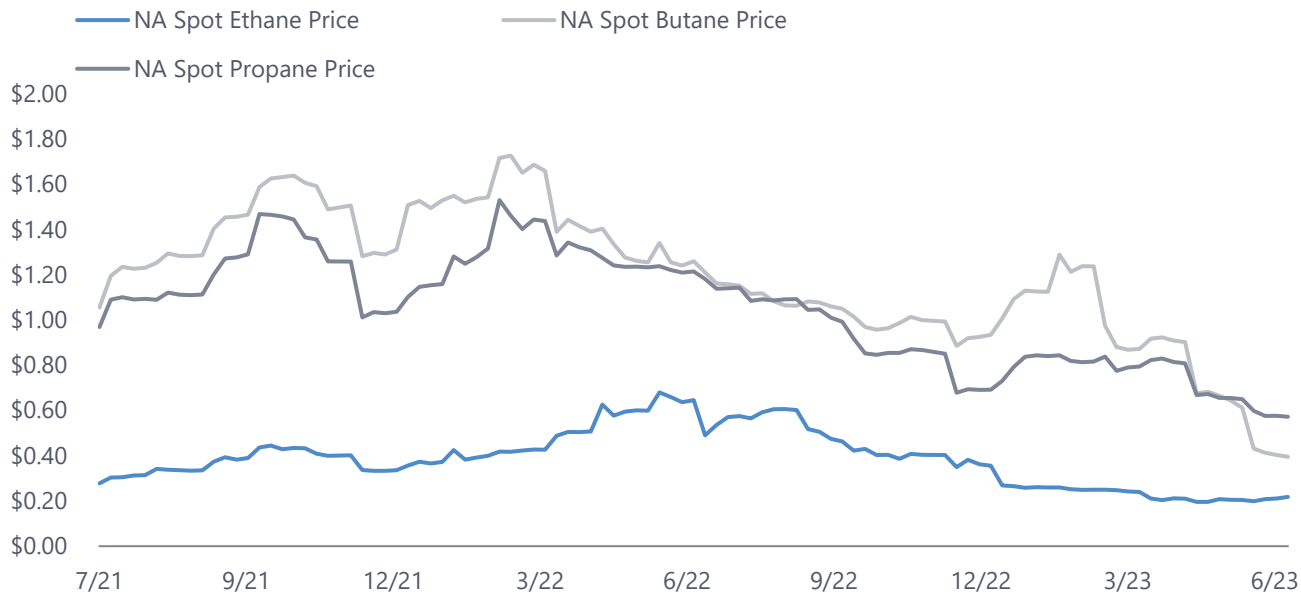
## South Central



Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# NGLs Spot Pricing

## Pricing (\$/gal)



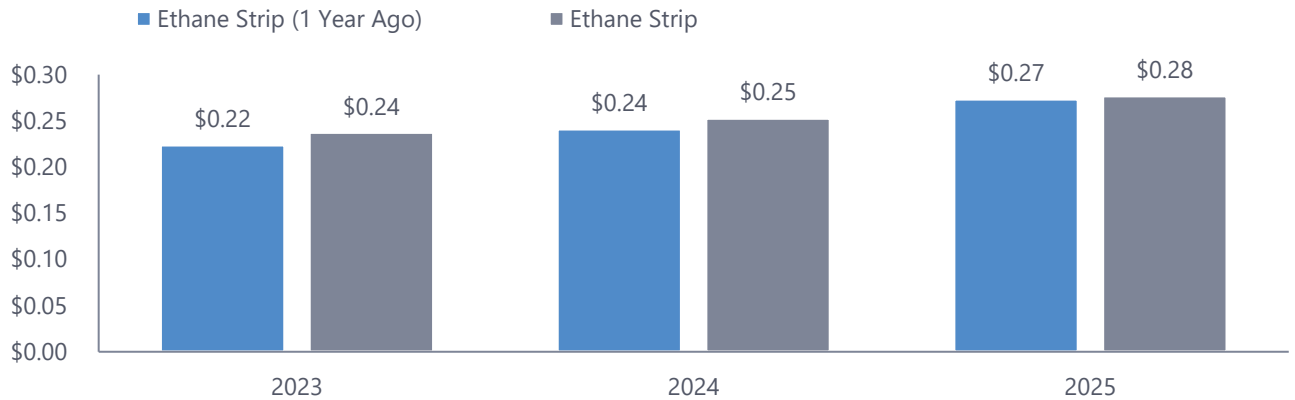
Notes: All data as of June 30, 2023. Data collected on a weekly basis.

Source: Capital IQ.

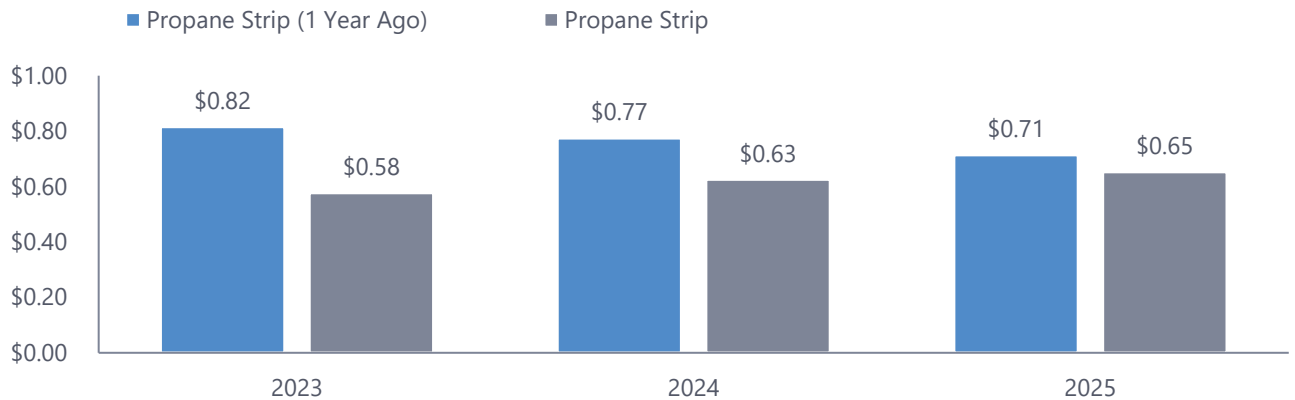


# NGLs Strip Pricing

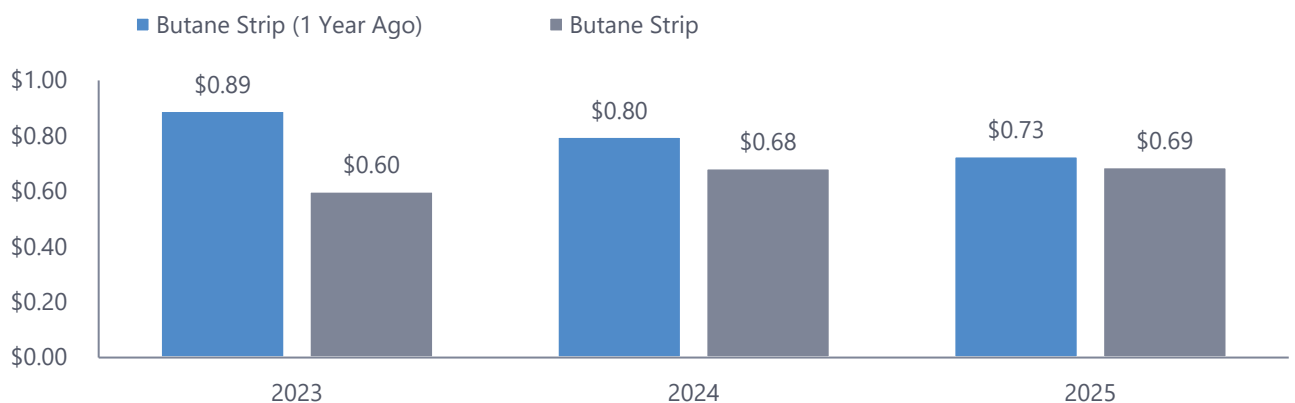
## Ethane Strip Pricing Comparison (\$/gal)



## Propane Strip Pricing Comparison (\$/gal)



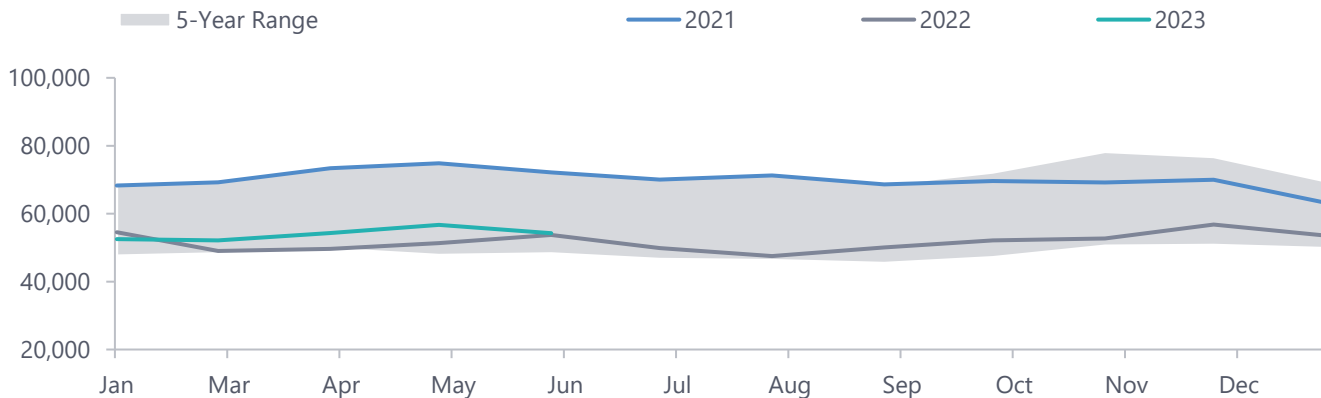
## Butane Strip Pricing Comparison (\$/gal)



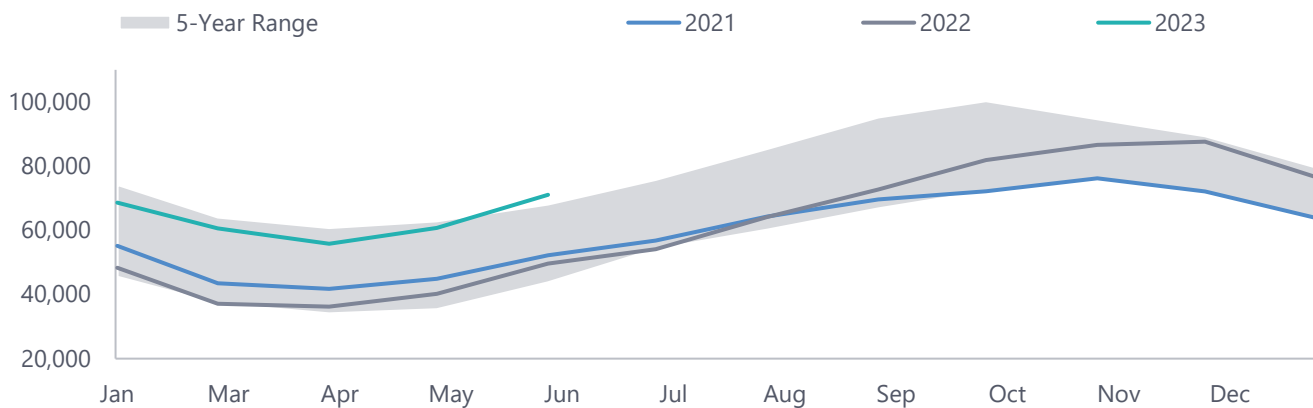
Notes: All data as of June 30, 2023. Represents the average price for each year.  
Source: Capital IQ.

# NGLs Inventory

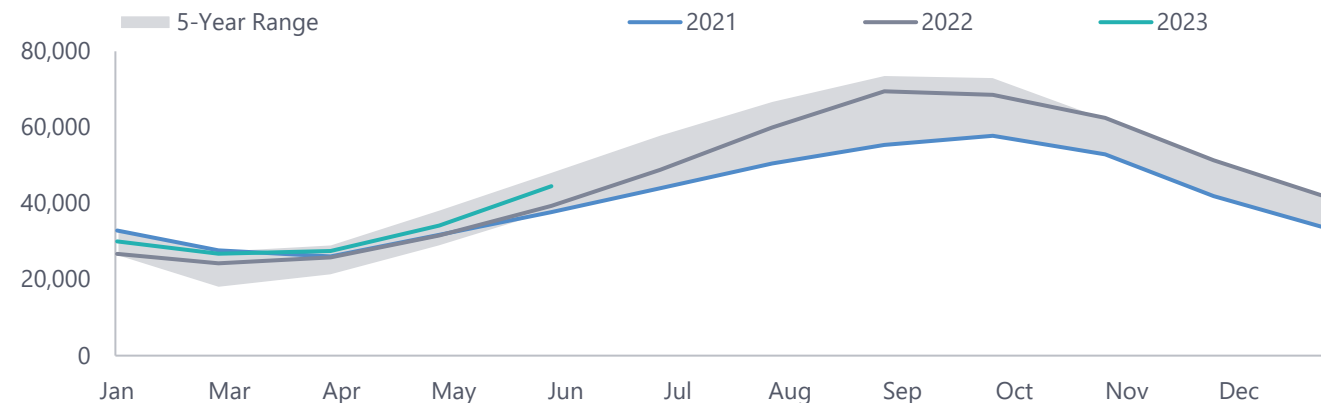
## U.S. Ending Stocks Ethane (Mbbbls)



## U.S. Ending Stocks Propane (Mbbbls)



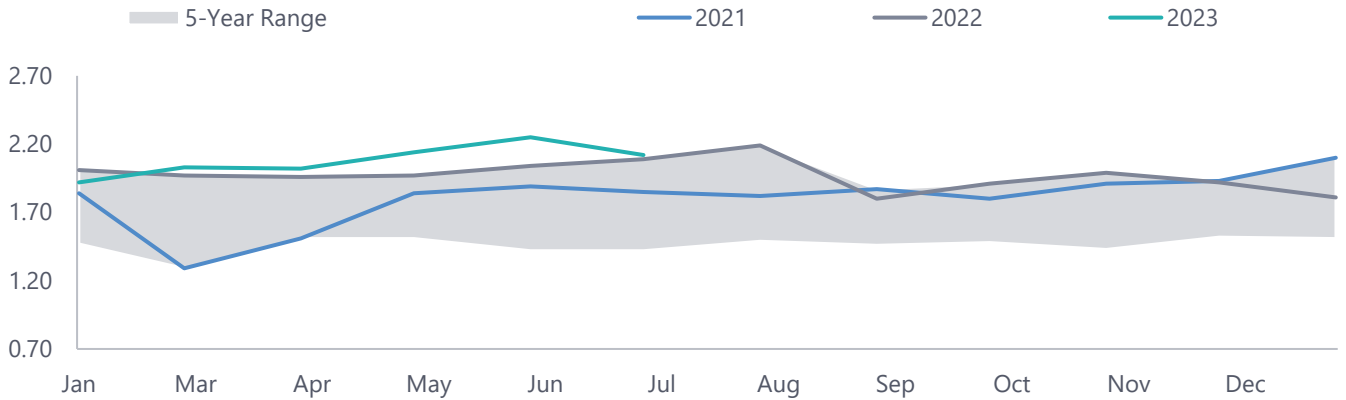
## Normal Butane/Butylene (Mbbbls)



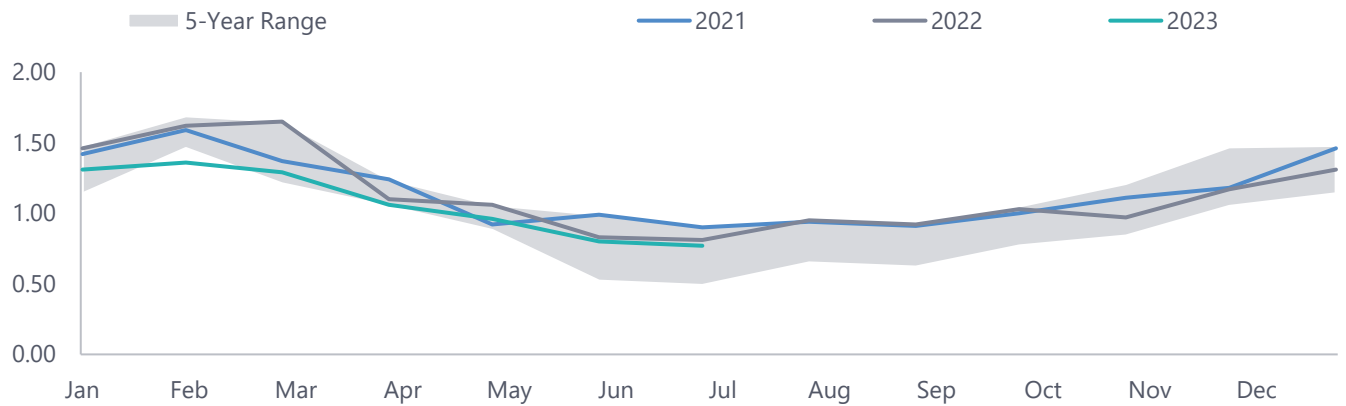
Notes: All data as of June 30, 2023. Data collected on a monthly basis and subject to a two-month lag.  
Source: Bloomberg.

# NGLs Consumption

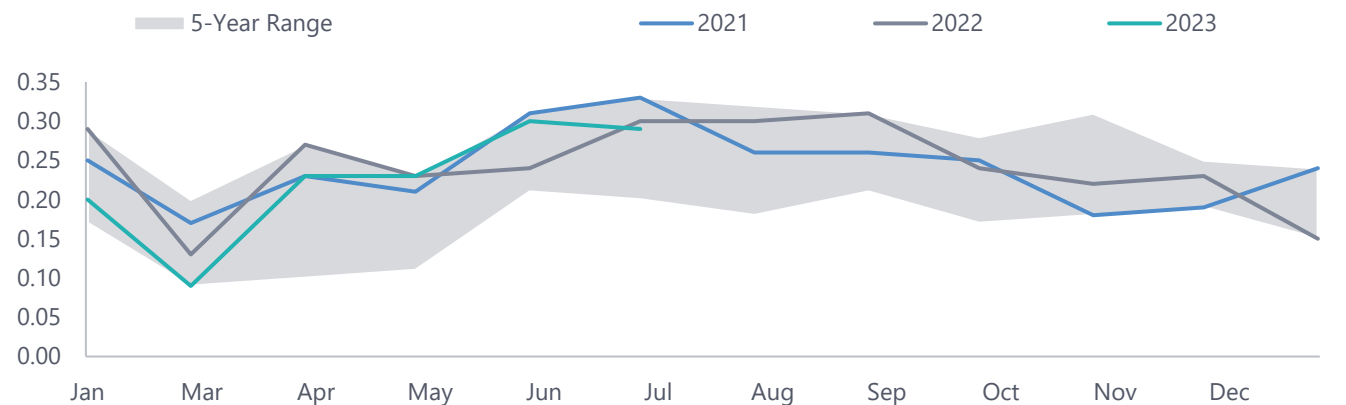
## U.S. Ethane/Ethylene Consumption (MMboe/d)



## U.S. Propane/Propylene Consumption (MMboe/d)



## U.S. Butane/Butylene Consumption (MMboe/d)



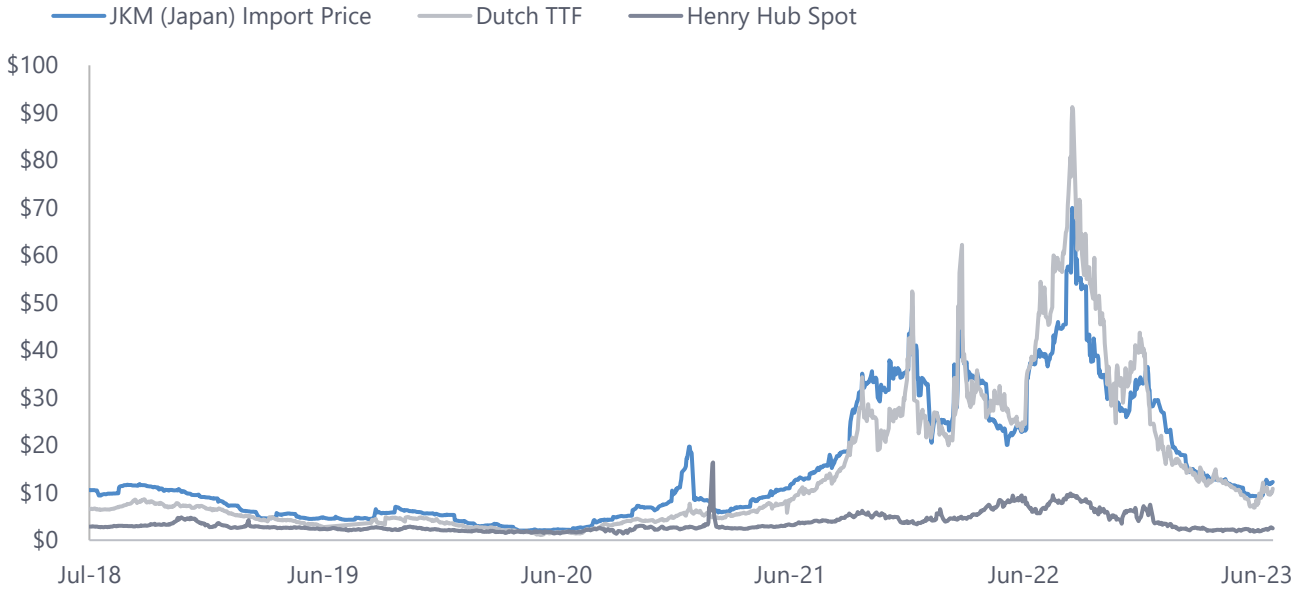
Notes: All data as of June 30, 2023. Data collected on a monthly basis and subject to a two-month lag.  
Source: Bloomberg.

# 04 LNG

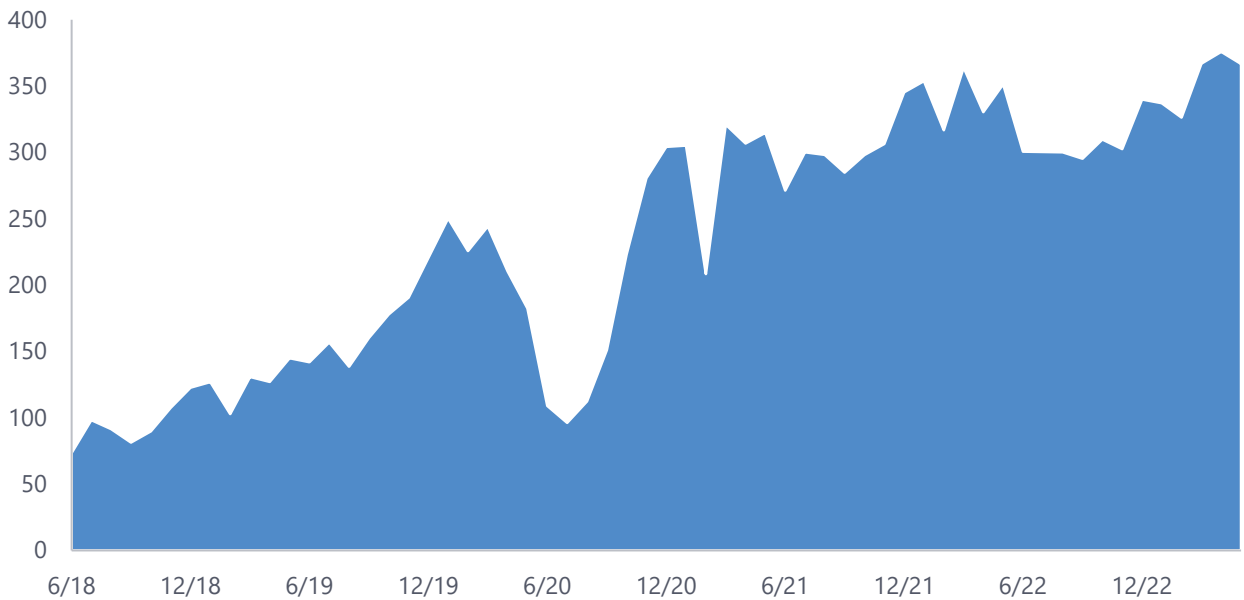


# LNG

## Spot Pricing (\$/MMbtu)



## U.S. LNG Exports (Bcf/month)



Note: Data collected on a monthly basis and subject to a two-month lag.

Notes: All data as of June 30, 2023. Spot pricing data collected daily. Exports data collected on a monthly basis.

JKM refers to Japan Korea Marker.

Dutch TTF refers to Dutch Title Transfer Facility.

Source: Bloomberg.

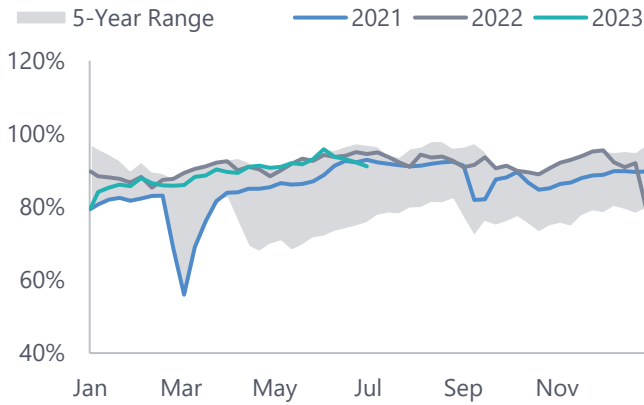
# 05

## REFINING

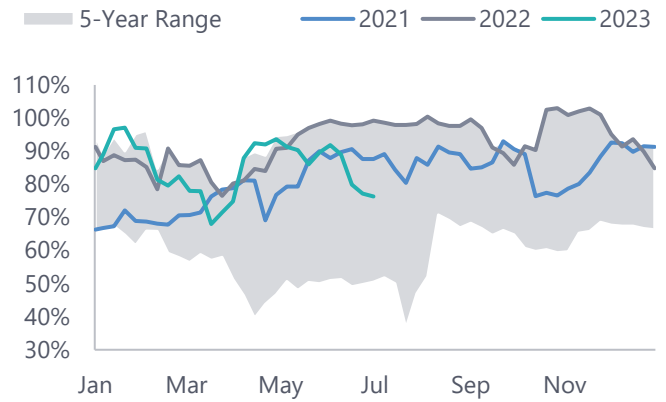


# Refining—Utilization (%)

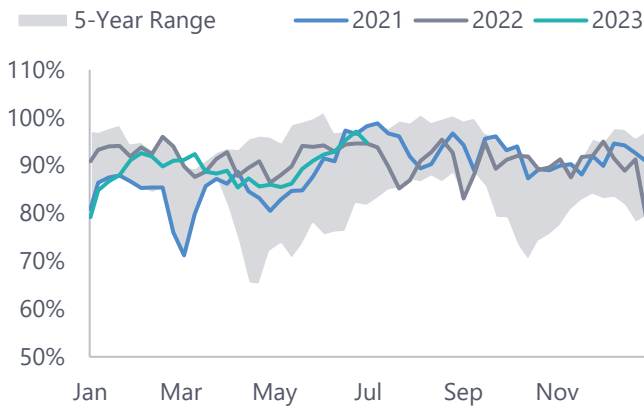
## Total U.S.



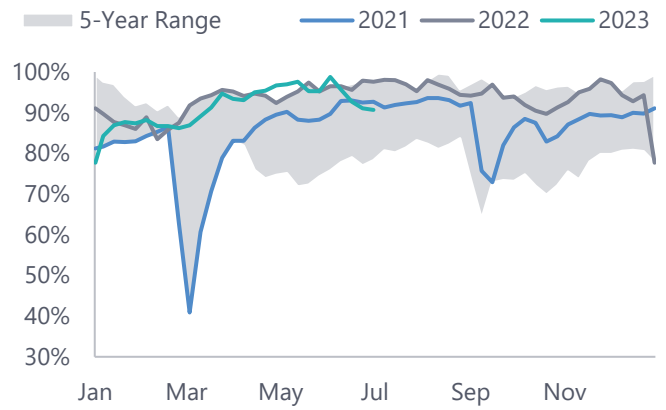
## PADD I



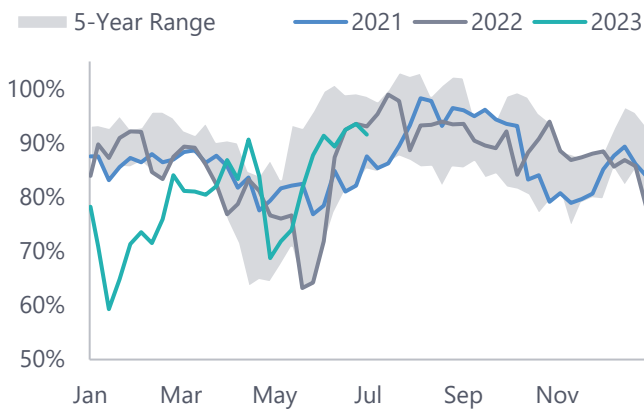
## PADD II



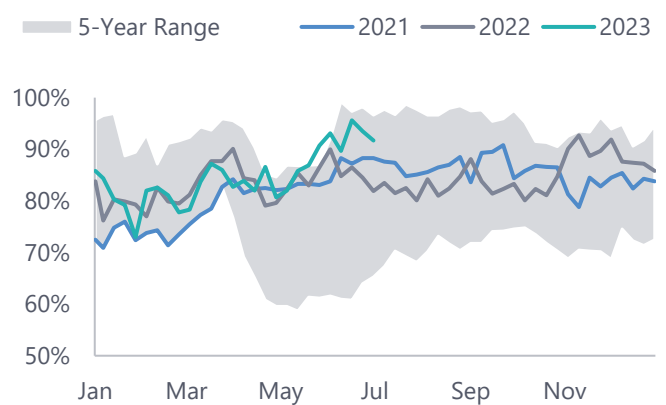
## PADD III



## PADD IV



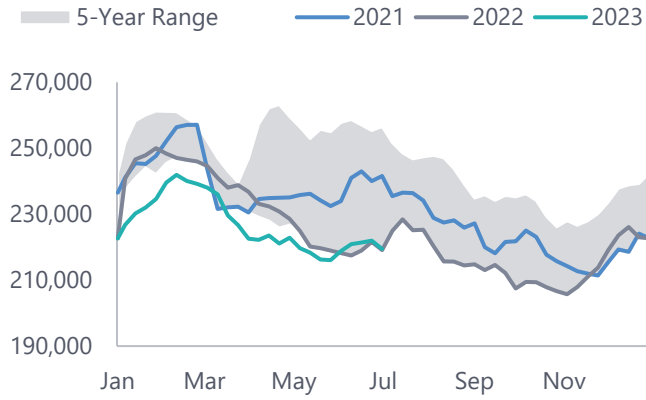
## PADD V



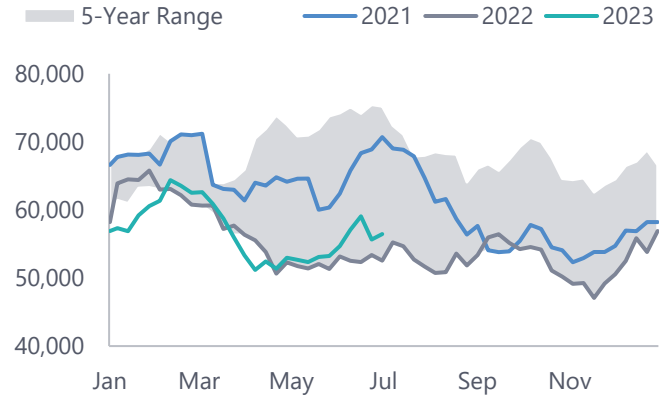
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# Refining—Motor Gasoline Inventory (Mbbbl)

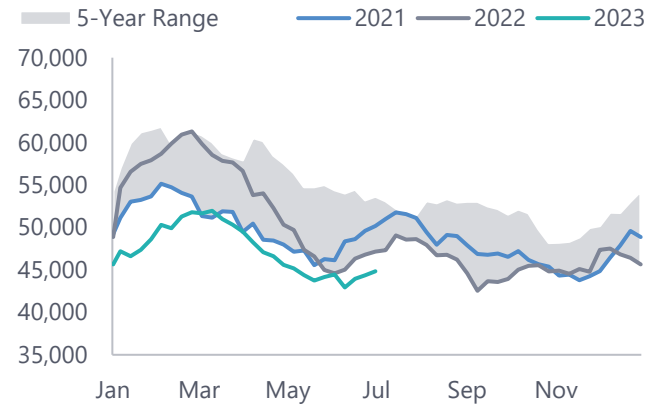
## Total U.S.



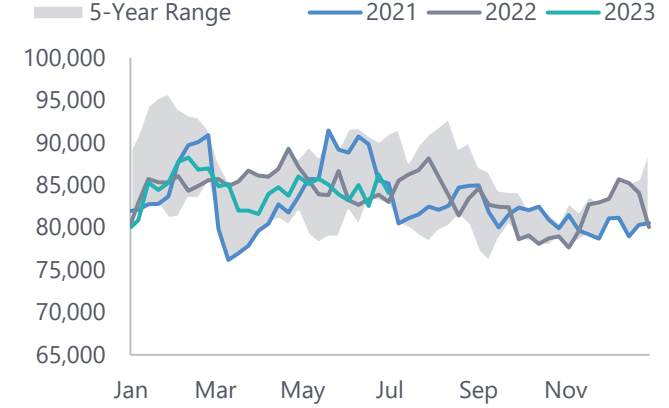
## PADD I



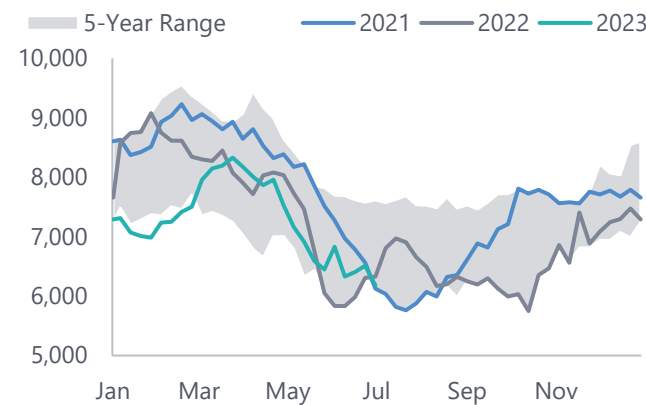
## PADD II



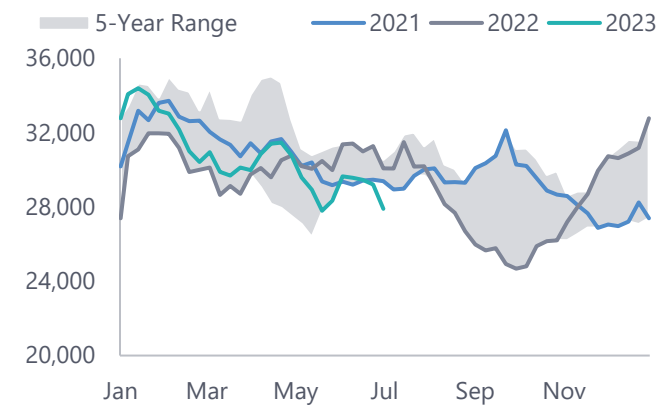
## PADD III



## PADD IV



## PADD V

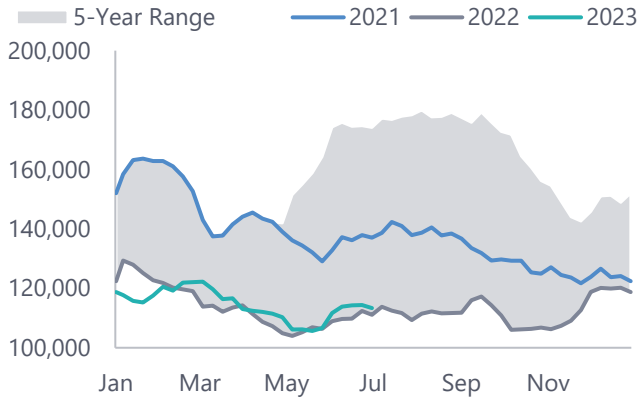


Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

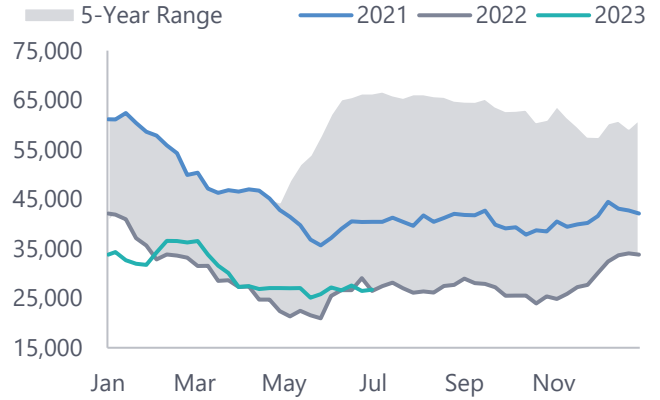


# Refining—Distillate Fuel Oil Inventory (Mbbbl)

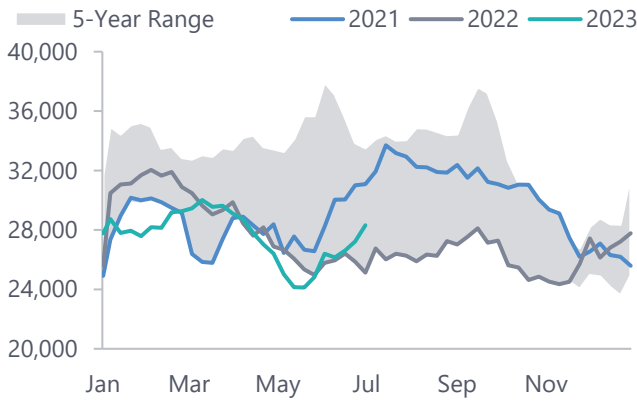
## Total U.S.



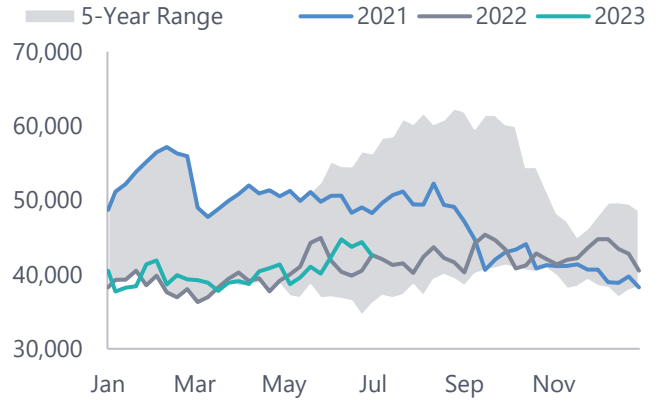
## PADD I



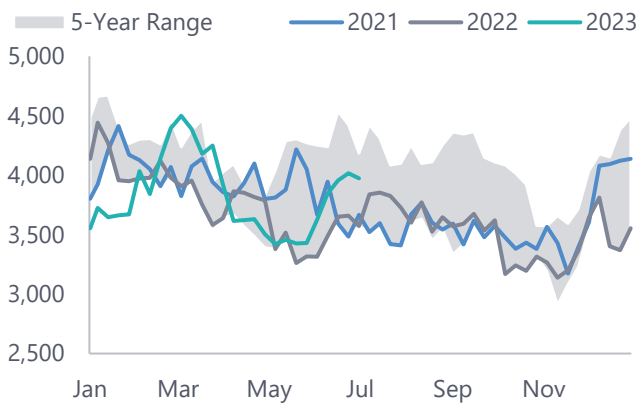
## PADD II



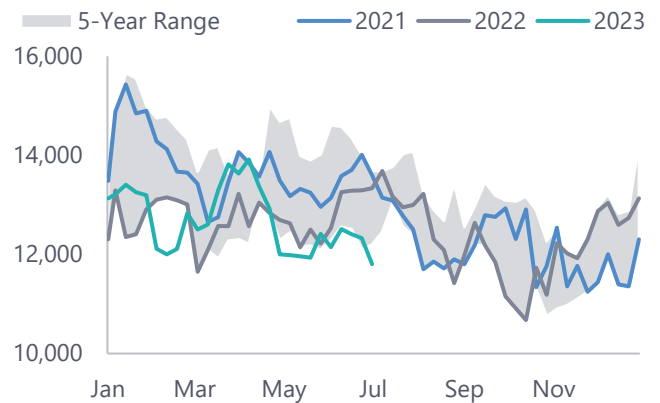
## PADD III



## PADD IV



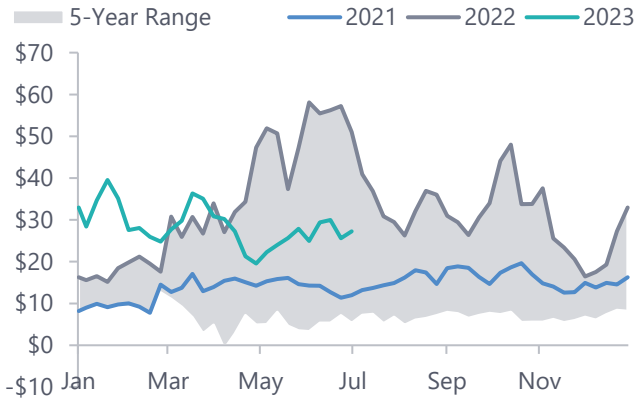
## PADD V



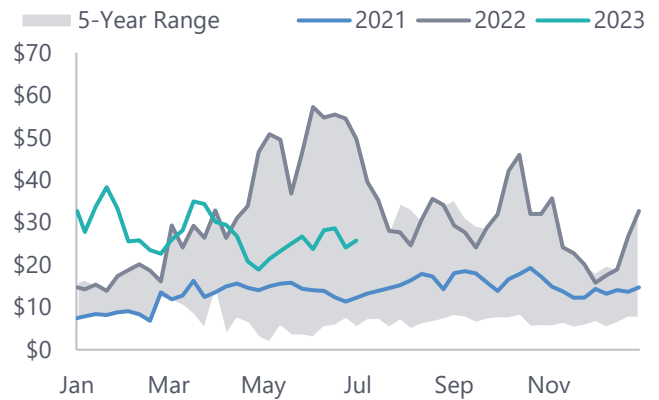
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# Refining—3:2:1 Crack Spreads (\$/bbl)

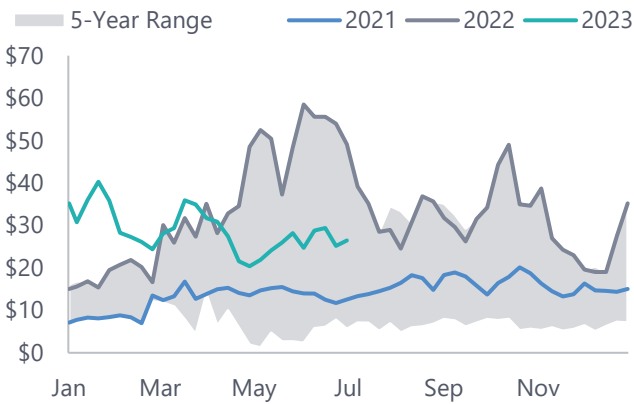
## WTI Cushing (U.S. Gulf Coast)



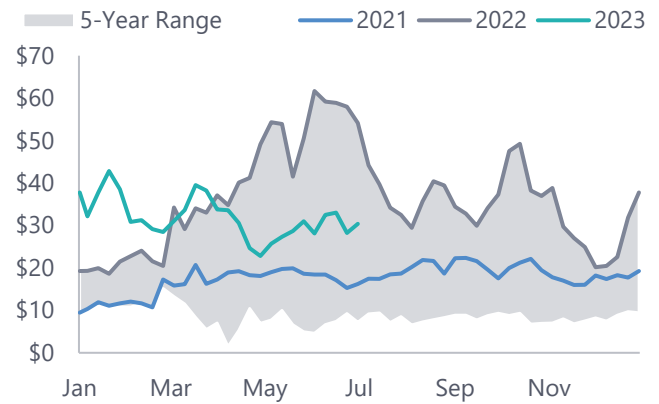
## WTI Midland (U.S. Gulf Coast)



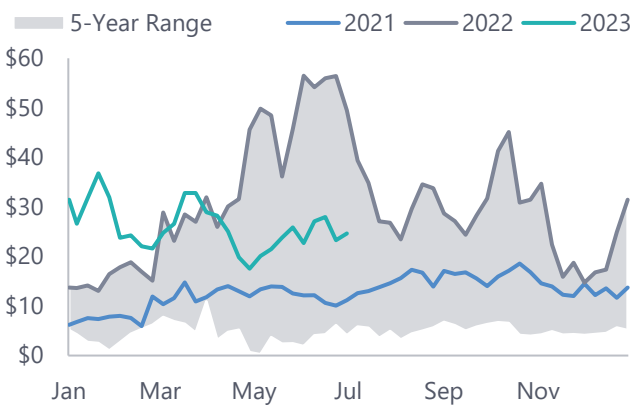
## WTS Midland (U.S. Gulf Coast)



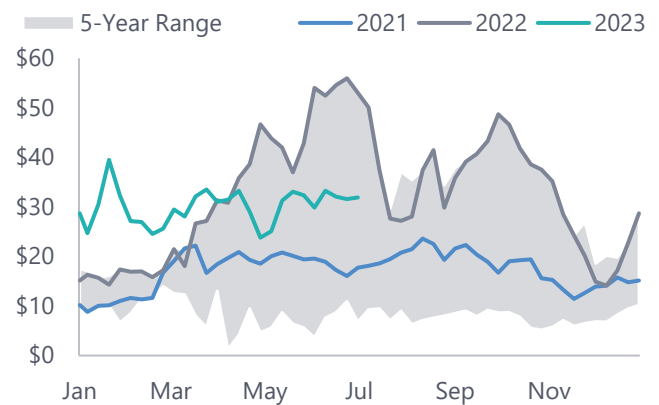
## WTI Cushing ULSD (U.S. Gulf Coast)



## LLS (U.S. Gulf Coast)



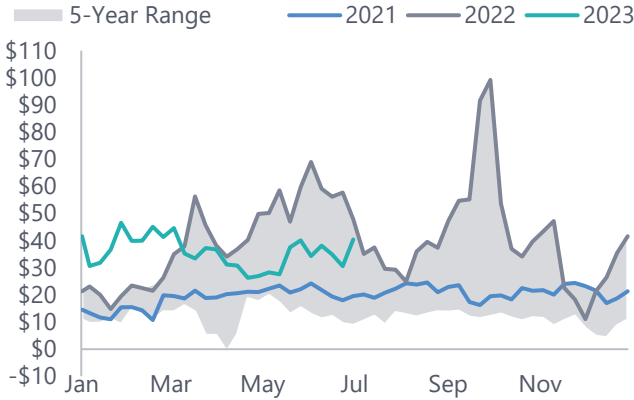
## WTI Midland ULSD (U.S. Mid-Continent)



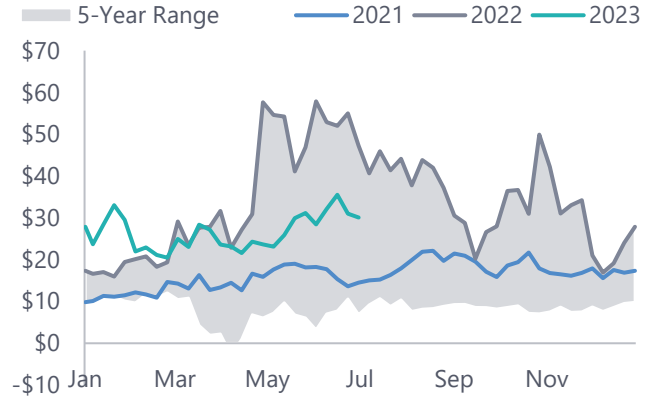
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# Refining—3:2:1 Crack Spreads (\$/bbl) (cont.)

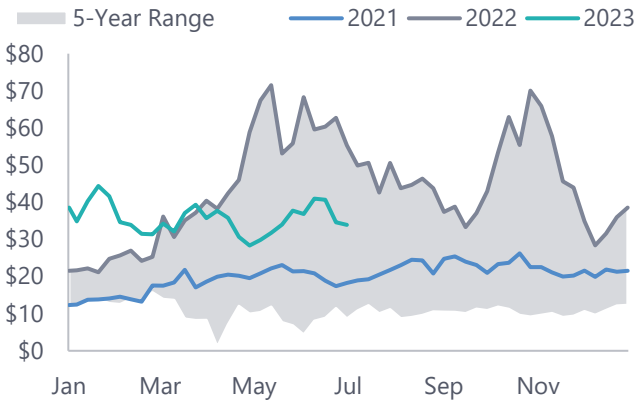
## ANS (U.S. West Coast)



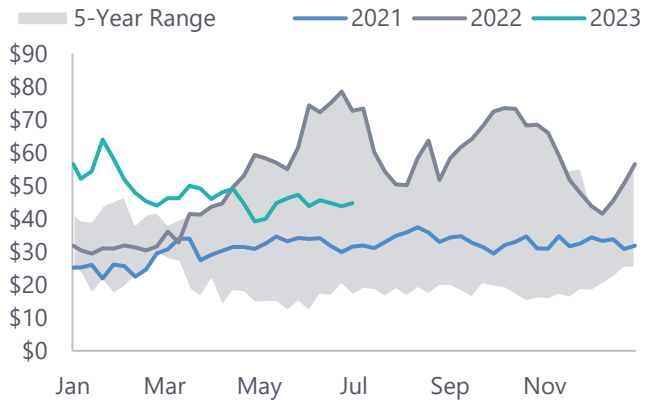
## WTI Cushing (NYH RBOB Gasoline)



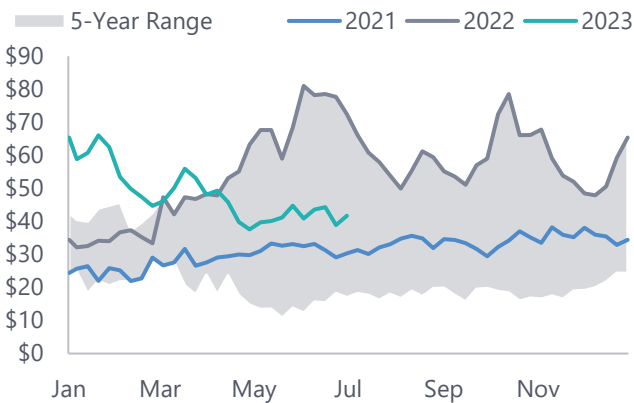
## WTI Cushing ULSD (NY Harbor)



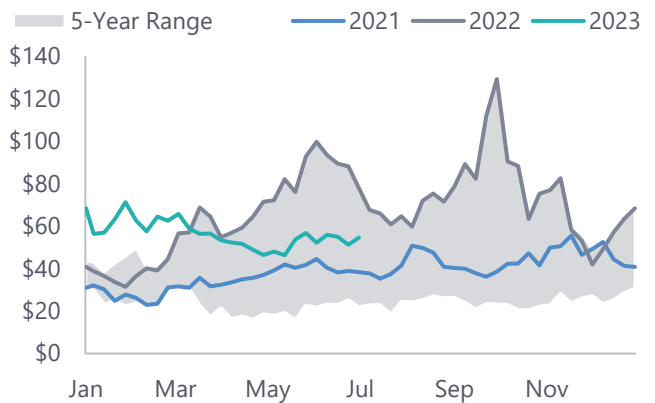
## WCS (U.S. Mid-Continent)



## WCS (U.S. Gulf Coast)



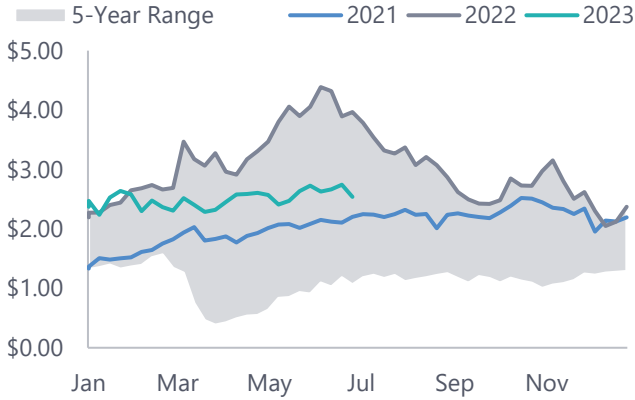
## WCS (San Francisco)



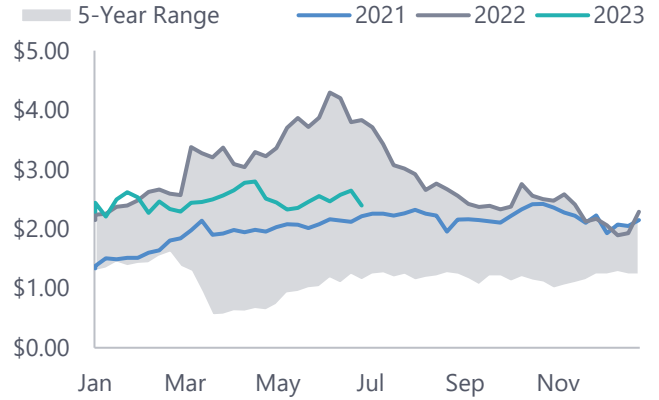
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

# Refining—Product Prices (\$/gal)

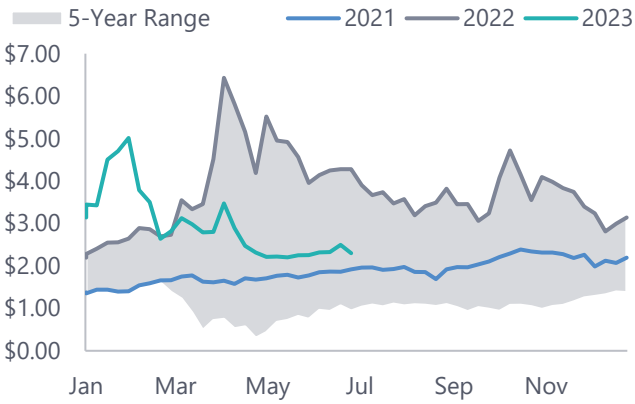
## 84 RBOB Gasoline (NY Harbor)



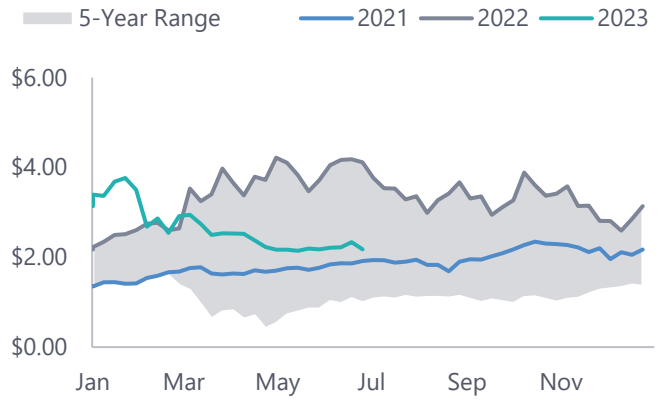
## 84 RBOB Gasoline (U.S. Gulf Coast)



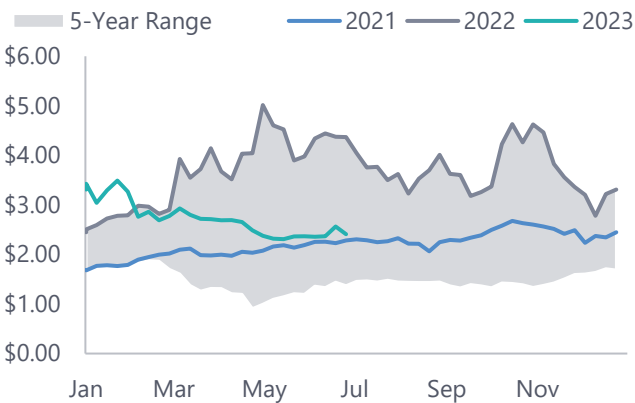
## 54-Grade Jet Fuel (NY Harbor)



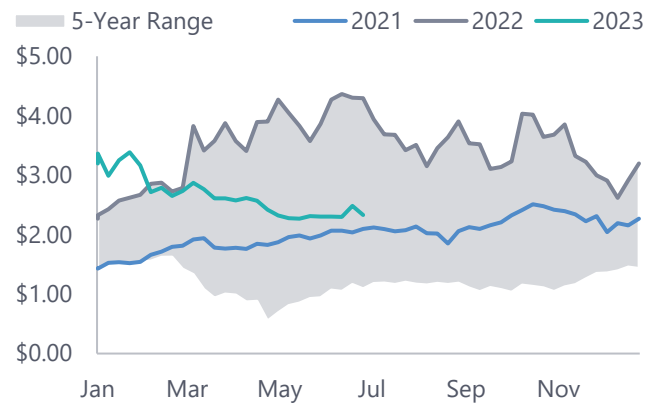
## 54-Grade Jet Fuel (U.S. Gulf Coast)



## ULSD (NY Harbor)



## ULSD (U.S. Gulf Coast)



Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Source: Bloomberg.

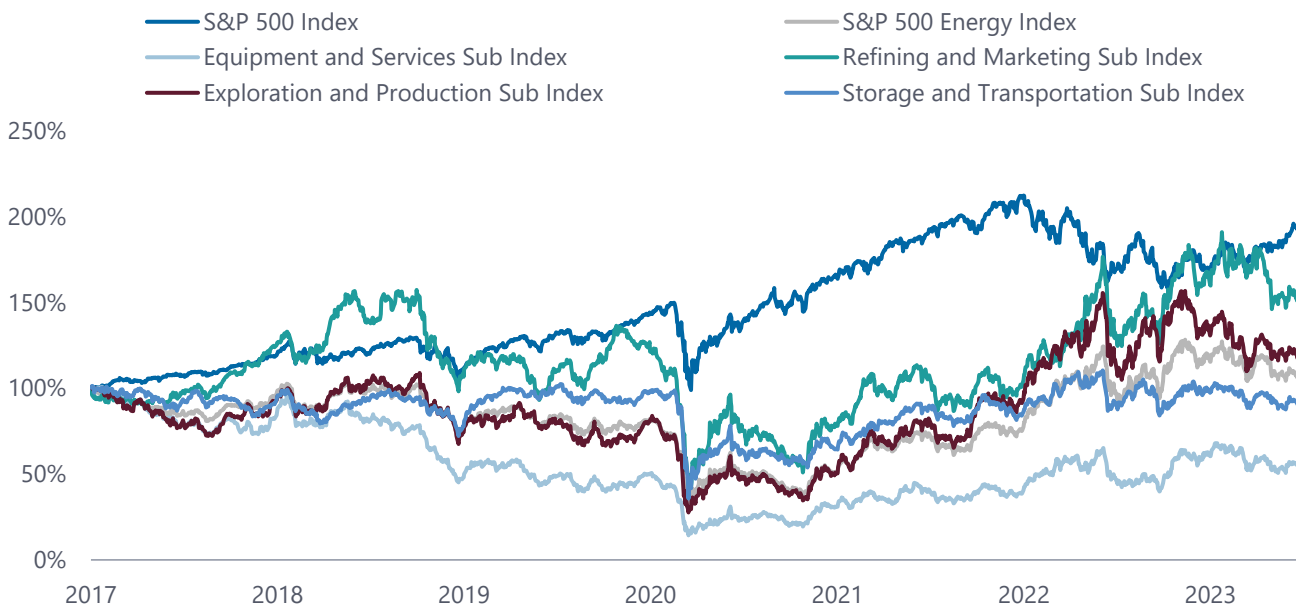
# 06

## PUBLIC EQUITY MARKETS OVERVIEW



# Public Equity Markets Overview

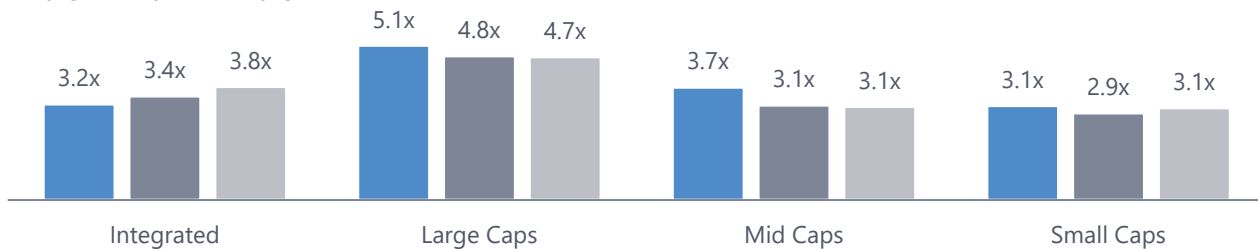
## Indexed Stock Price Performance (January 1, 2017 = 100%)



## Public E&P Company Trading Metrics

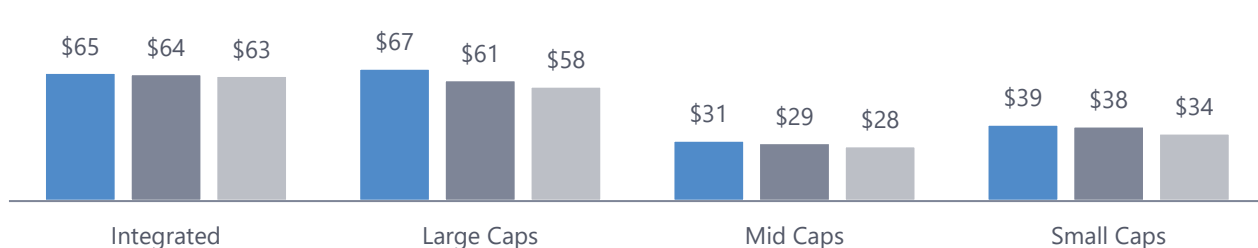
EV/EBITDA (x)

■ 2023E ■ 2024E ■ 2025E



EV/Production (\$000/boepd)

■ 2023E ■ 2024E ■ 2025E



Note: Trading multiples are based on share price and market data listed as of June 30, 2023, and broker consensus future earnings estimates from S&P Capital IQ as of June 30, 2023.

Source: S&P Capital IQ.

# 07

## M&A AND FINANCING ACTIVITY



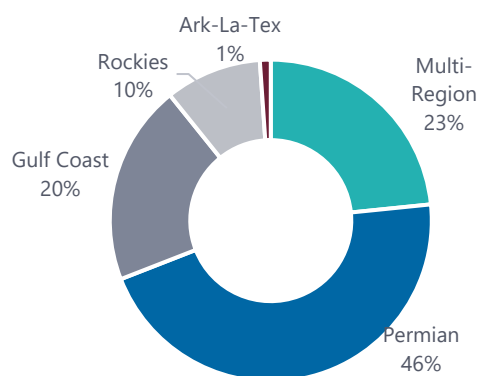
## M&A (\$ in billions)

U.S. Region	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Multi-Region	\$15.8	\$11.1	\$3.6	\$7.6	111%
Permian	26.5	14.6	9.3	14.9	60%
Gulf Coast	2.4	5.7	0.6	6.6	NMF
Rockies	7.7	8.8	8.6	3.2	-63%
Mid-Continent	1.1	1.0	0.8	0.0	NMF
Appalachia	4.0	8.3	2.8	0.0	NMF
Ark-La-Tex	8.1	0.3	0.1	0.4	183%
Gulf of Mexico	1.2	1.3	0.1	0.0	NMF
West Coast	0.2	4.8	0.3	0.0	NMF
Alaska	0.0	0.0	0.0	0.0	NMF
<b>Total</b>	<b>\$66.9</b>	<b>\$55.8</b>	<b>\$26.3</b>	<b>\$32.7</b>	<b>24%</b>

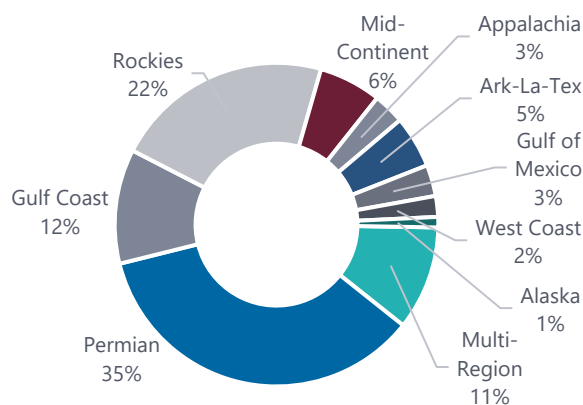
## M&A (Deal Count)

U.S. Region	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Multi-Region	43	23	14	10	-29%
Permian	141	66	34	34	0%
Gulf Coast	52	42	19	11	-42%
Rockies	67	50	29	21	-28%
Mid-Continent	102	56	31	6	-81%
Appalachia	28	14	7	3	-57%
Ark-La-Tex	32	17	10	5	-50%
Gulf of Mexico	10	14	9	3	-67%
West Coast	6	7	4	2	-50%
Alaska	5	2	0	1	NMF
<b>Total</b>	<b>486</b>	<b>291</b>	<b>157</b>	<b>96</b>	<b>-39%</b>

## M&A—2023 (\$ in billions)



## M&A—2023 (Deal Count)



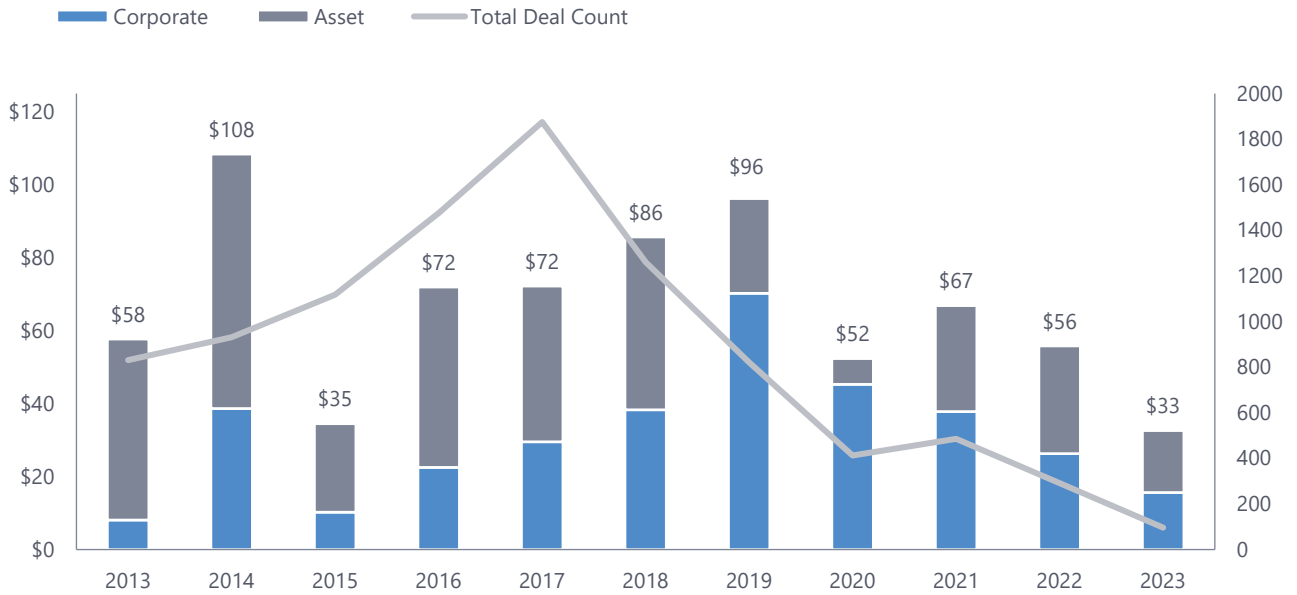
Note: All data as of June 30, 2023.

Source: Enverus based on selection criteria of seller assets being located in the U.S. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available.

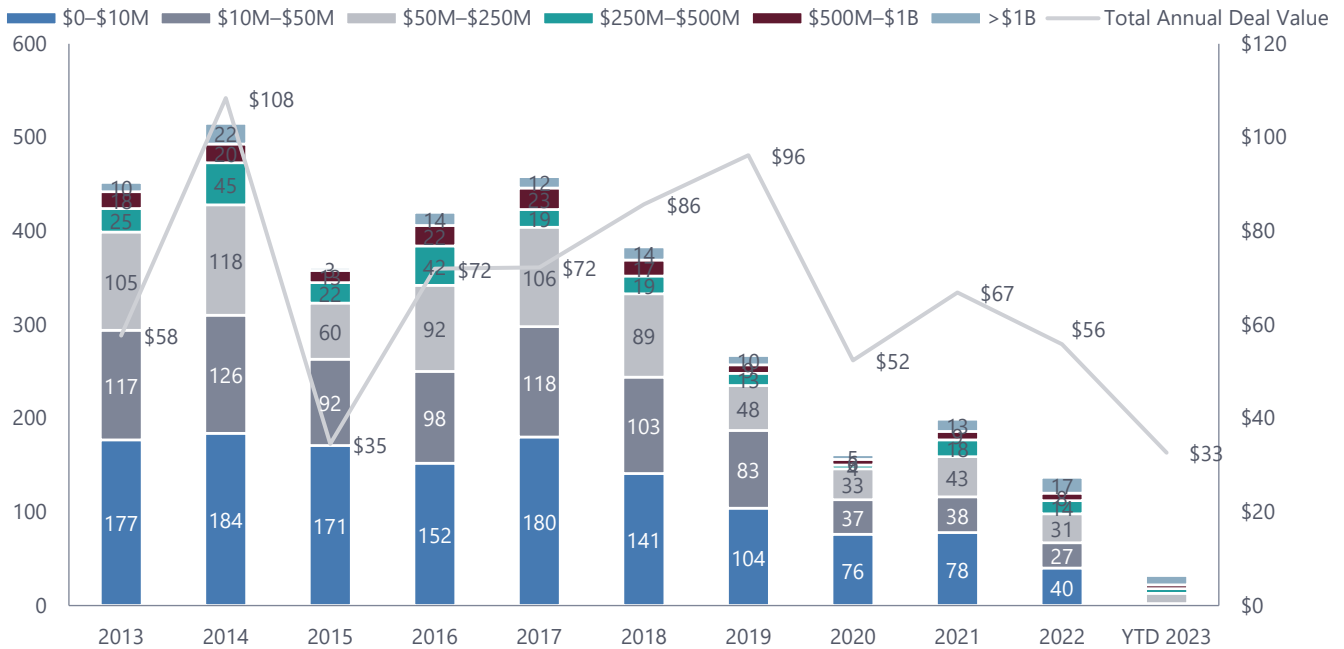


# Historical E&P Transaction Activity

## U.S. Transactions Since 2013 (\$ in billions)



## U.S. Transactions by Deal Size Since 2013(1) (\$ in billions)



Note: All data as of June 30, 2023.

(1) Deal count excludes transactions without a publicly disclosed deal value.

YTD refers to year-to-date.

Source: Enverus based on selection criteria of seller assets being located in the U.S.

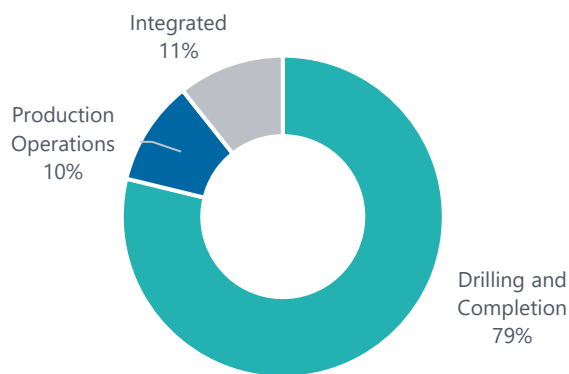
## M&A (\$ in billions)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Drilling and Completion	\$0.8	\$1.0	\$0.1	\$2.4	NMF
Production Operations	0.7	0.5	0.2	0.3	39%
Information Services	0.0	3.1	0.0	0.0	NMF
Integrated	0.8	0.2	0.2	0.3	96%
Other	0.0	0.0	0.0	0.0	NMF
<b>Total</b>	<b>\$2.3</b>	<b>\$4.8</b>	<b>\$0.5</b>	<b>\$3.0</b>	<b>502%</b>

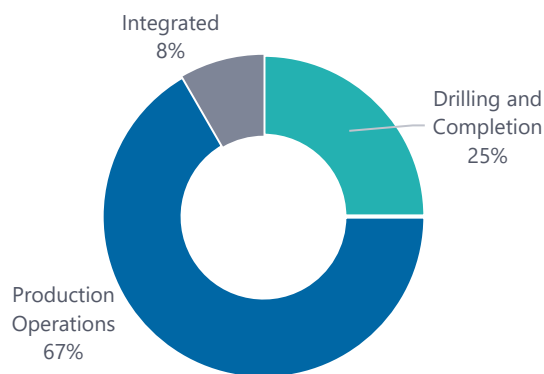
## M&A (Deal Count)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Drilling and Completion	13	20	9	3	-67%
Production Operations	34	31	12	8	-33%
Information Services	13	8	6	0	-100%
Integrated	9	8	4	1	-75%
Other	0	0	0	0	NMF
<b>Total</b>	<b>69</b>	<b>67</b>	<b>31</b>	<b>12</b>	<b>-61%</b>

## M&A—2023 (\$ in billions)



## M&A—2023 (Deal Count)



Note: All data as of June 30, 2023.

Source: Enverus based on selection criteria of seller headquarters being located in the U.S.

# Downstream

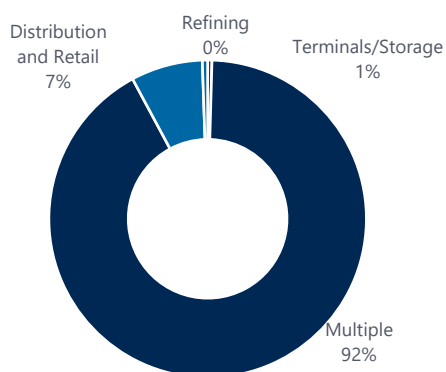
## M&A (\$ in billions)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Refining	\$0.1	\$0.2	\$0.2	\$0.1	-64%
Multiple	4.4	1.4	0.2	18.8	NMF
Distribution and Retail	6.2	3.8	0.8	1.5	81%
Terminals/Storage	1.5	0.4	0.4	0.1	-69%
Shipping	0.1	0.8	0.8	0.0	-100%
<b>Total</b>	<b>\$12.2</b>	<b>\$6.6</b>	<b>\$2.5</b>	<b>\$20.5</b>	<b>733%</b>

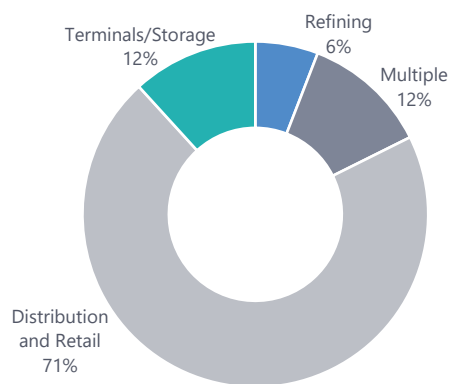
## M&A (Deal Count)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Refining	1	2	1	1	0%
Multiple	8	3	1	2	100%
Distribution and Retail	75	55	26	12	-54%
Terminals/Storage	12	6	4	2	-50%
Shipping	4	8	7	0	-100%
<b>Total</b>	<b>100</b>	<b>74</b>	<b>39</b>	<b>17</b>	<b>-56%</b>

## M&A—2023 (\$ in billions)



## M&A—2023 (Deal Count)



Note: All data as of June 30, 2023.

Source: Enverus based on selection criteria of seller headquarters being located in the U.S.

# Midstream

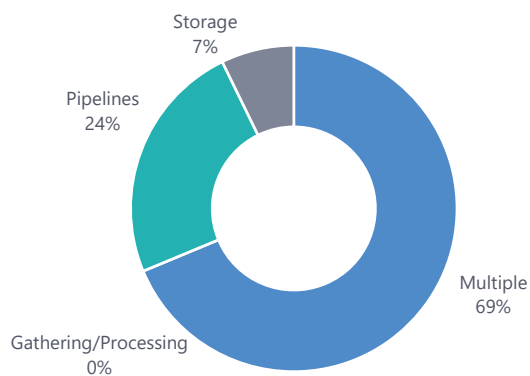
## M&A (\$ in billions)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Multiple	\$30.8	\$11.7	\$4.3	\$3.5	-18%
Gathering/Processing	2.9	11.6	9.7	0.0	-100%
Gas Processing	0.0	0.0	0.0	0.0	NMF
Pipelines	1.6	2.4	1.8	1.2	-31%
Oil Tankers	1.0	0.1	0.0	0.0	NMF
Storage	0.9	0.0	0.0	0.4	NMF
<b>Total</b>	<b>\$37.2</b>	<b>\$25.8</b>	<b>\$15.7</b>	<b>\$5.1</b>	<b>-68%</b>

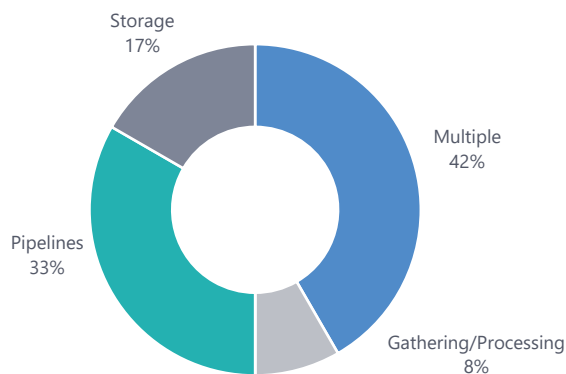
## M&A (Deal Count)

Segment	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Multiple	16	12	7	5	-29%
Gathering/Processing	17	23	16	1	-94%
Gas Processing	0	0	0	0	NMF
Pipelines	11	9	3	4	33%
Oil Tankers	2	1	0	0	NMF
Storage	2	0	0	2	NMF
<b>Total</b>	<b>48</b>	<b>45</b>	<b>26</b>	<b>12</b>	<b>-54%</b>

## M&A—2023 (\$ in billions)



## M&A—2023 (Deal Count)



Note: All data as of June 30, 2023.

Source: Enverus based on selection criteria of seller headquarters being located in the U.S.



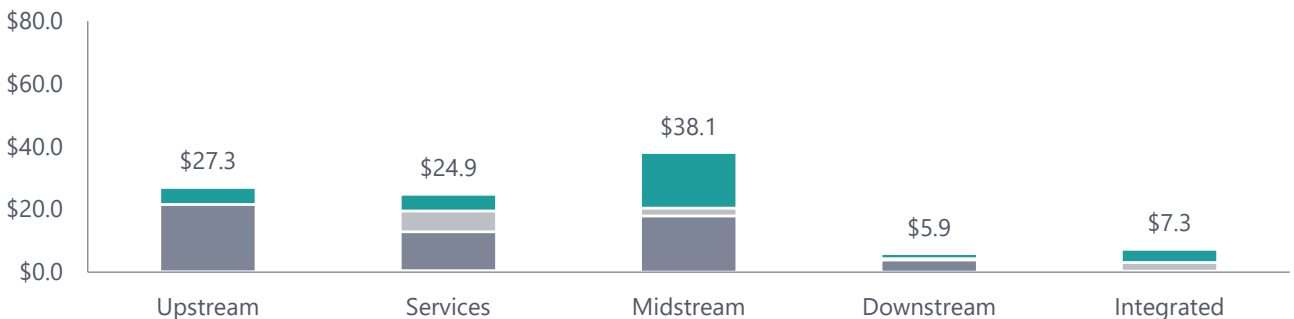
# Financing by Instrument

## Financing by Instrument (\$ in billions)

Capital	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
Upstream					
Equity	\$1.4	\$0.1	\$0.0	\$0.1	NMF
Credit Facility	45.0	59.9	22.3	21.5	-4%
Loan	2.5	1.5	0.3	0.0	NMF
Bond	30.3	9.0	5.3	5.5	3%
Other	0.5	0.1	0.1	0.2	NMF
<b>Total</b>	<b>\$79.6</b>	<b>\$70.6</b>	<b>\$27.9</b>	<b>\$27.3</b>	<b>-2%</b>
Services					
Equity	\$0.5	\$0.5	\$0.3	\$0.5	NMF
Credit Facility	7.5	19.2	10.4	12.4	19%
Loan	6.4	6.0	2.6	6.6	151%
Bond	7.3	0.3	0.2	5.4	NMF
Other	0.6	0.0	0.0	0.0	NMF
<b>Total</b>	<b>\$22.3</b>	<b>\$26.0</b>	<b>\$13.6</b>	<b>\$24.9</b>	<b>83%</b>
Midstream					
Equity	\$1.2	\$0.0	\$0.0	\$0.0	NMF
Credit Facility	41.0	53.5	30.7	17.9	-42%
Loan	2.4	9.1	6.8	2.5	-63%
Bond	29.4	23.5	11.5	17.7	55%
Other	1.7	1.0	1.0	0.0	-100%
<b>Total</b>	<b>\$75.7</b>	<b>\$87.1</b>	<b>\$49.9</b>	<b>\$38.1</b>	<b>-24%</b>
Downstream					
Equity	\$0.1	\$0.0	\$0.0	\$0.0	NMF
Credit Facility	4.7	28.8	13.3	3.9	-71%
Loan	0.9	1.1	0.0	0.4	NMF
Bond	6.4	1.0	1.0	1.6	NMF
Other	0.0	0.0	0.0	0.0	NMF
<b>Total</b>	<b>\$12.1</b>	<b>\$30.9</b>	<b>\$14.3</b>	<b>\$5.9</b>	<b>-59%</b>
Integrated					
Equity	\$0.8	\$0.6	\$0.6	\$0.0	NMF
Credit Facility	1.9	7.7	2.6	0.4	-87%
Loan	1.4	0.0	0.0	2.8	NMF
Bond	13.7	6.1	4.3	4.2	-2%
Other	0.2	0.0	0.0	0.0	NMF
<b>Total</b>	<b>\$18.0</b>	<b>\$14.3</b>	<b>\$7.4</b>	<b>\$7.3</b>	<b>-2%</b>
<b>Grand Total</b>	<b>\$207.9</b>	<b>\$228.9</b>	<b>\$113.1</b>	<b>\$103.4</b>	<b>-9%</b>

## Financing by Instrument—2023 (\$ in billions)

■ Equity ■ Credit Facility ■ Loan ■ Bond ■ Other



Notes: All data as of June 30, 2023. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available.

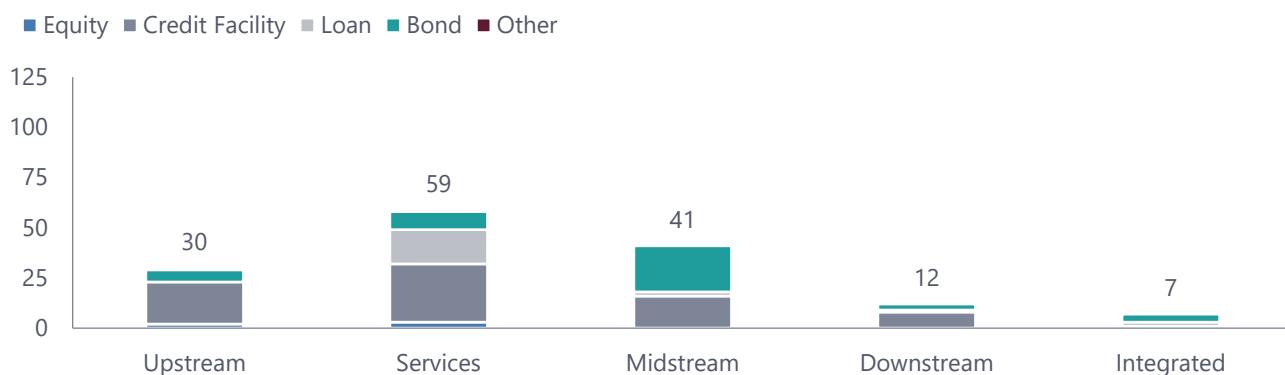
Source: Enverus.

# Financing by Instrument (cont.)

## Financing by Instrument (\$ in billions)

Capital	2021	2022	YTD June		%Δ vs. 2022
			2022	2023	
<b>Upstream</b>					
Equity	14	1	0	2	NMF
Credit Facility	48	68	29	21	-28%
Loan	9	4	1	0	NMF
Bond	49	13	7	6	-14%
Other	7	1	1	1	NMF
<b>Total</b>	<b>127</b>	<b>87</b>	<b>38</b>	<b>30</b>	<b>-21%</b>
<b>Services</b>					
Equity	9	6	4	3	NMF
Credit Facility	40	55	24	29	21%
Loan	23	18	10	17	70%
Bond	16	6	3	9	NMF
Other	10	2	2	1	NMF
<b>Total</b>	<b>98</b>	<b>87</b>	<b>43</b>	<b>59</b>	<b>37%</b>
<b>Midstream</b>					
Equity	5	0	0	0	NMF
Credit Facility	38	39	23	16	-30%
Loan	6	8	4	2	NMF
Bond	41	37	18	23	28%
Other	10	1	1	0	NMF
<b>Total</b>	<b>100</b>	<b>85</b>	<b>46</b>	<b>41</b>	<b>-11%</b>
<b>Downstream</b>					
Equity	1	0	0	0	NMF
Credit Facility	9	19	9	8	-11%
Loan	6	2	0	1	NMF
Bond	9	2	2	3	NMF
Other	0	0	0	0	NMF
<b>Total</b>	<b>25</b>	<b>23</b>	<b>11</b>	<b>12</b>	<b>9%</b>
<b>Integrated</b>					
Equity	1	2	2	0	NMF
Credit Facility	3	8	4	1	NMF
Loan	3	0	0	2	NMF
Bond	18	8	5	4	-20%
Other	1	0	0	0	NMF
<b>Total</b>	<b>26</b>	<b>18</b>	<b>11</b>	<b>7</b>	<b>-36%</b>
<b>Grand Total</b>	<b>376</b>	<b>300</b>	<b>149</b>	<b>149</b>	<b>0%</b>

## Financing by Instrument—2023 (Deal Count)



Notes: All data as of June 30, 2023. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available.

Source: Enverus.

08

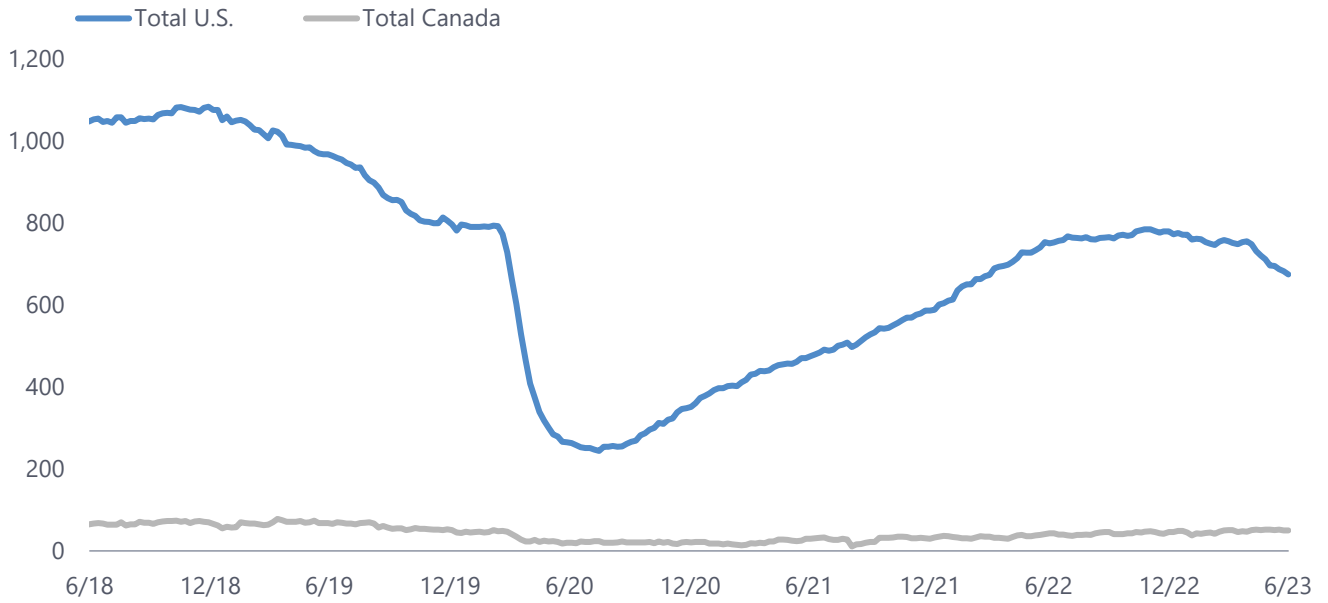
RIGS



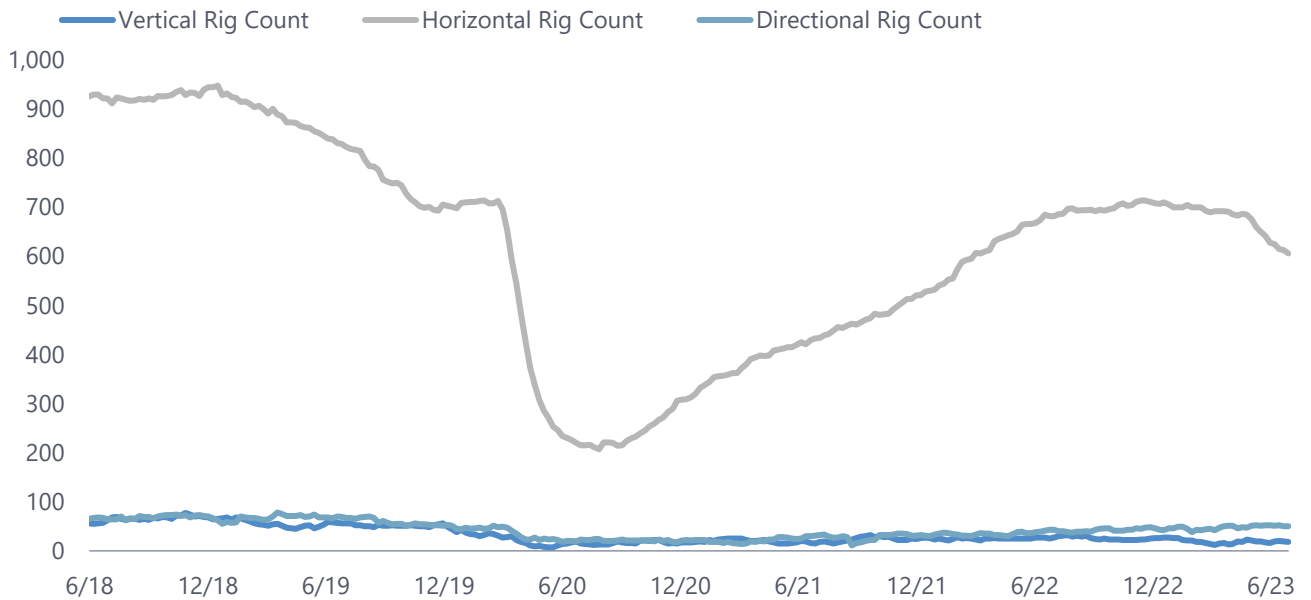
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# Rigs

## Total U.S. vs. Canada Rigs



## U.S. Rig Counts by Vertical, Horizontal, and Directional

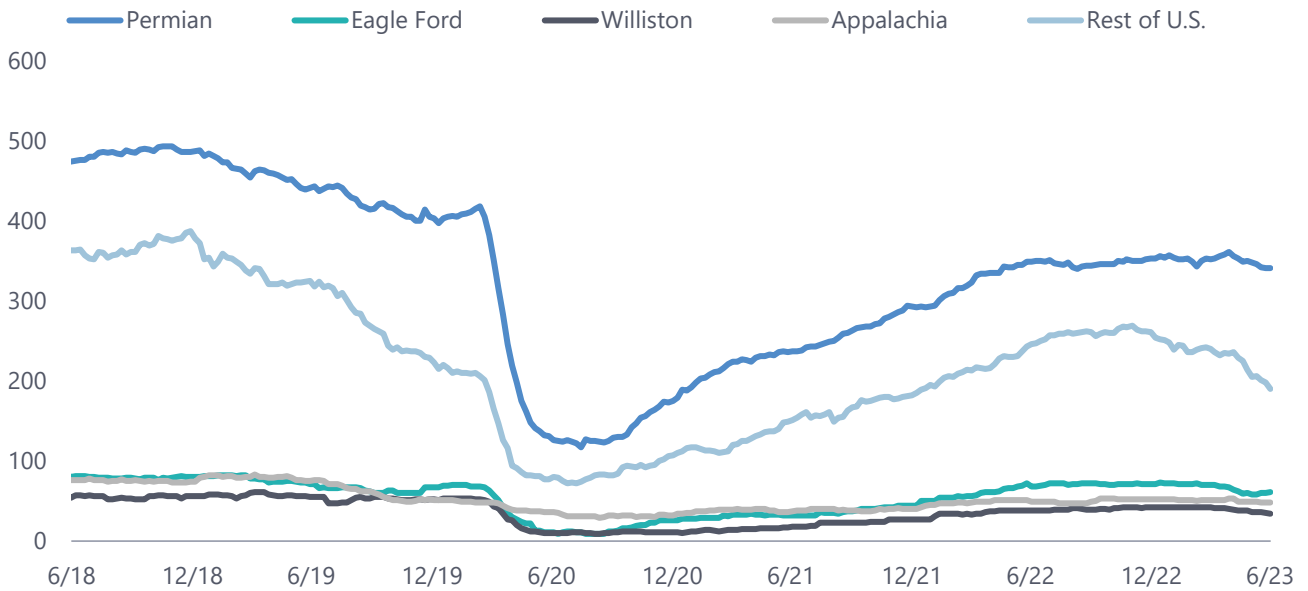


Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Sources: Bloomberg and Baker Hughes.



# Rigs (cont.)

## U.S. Rigs by Regions



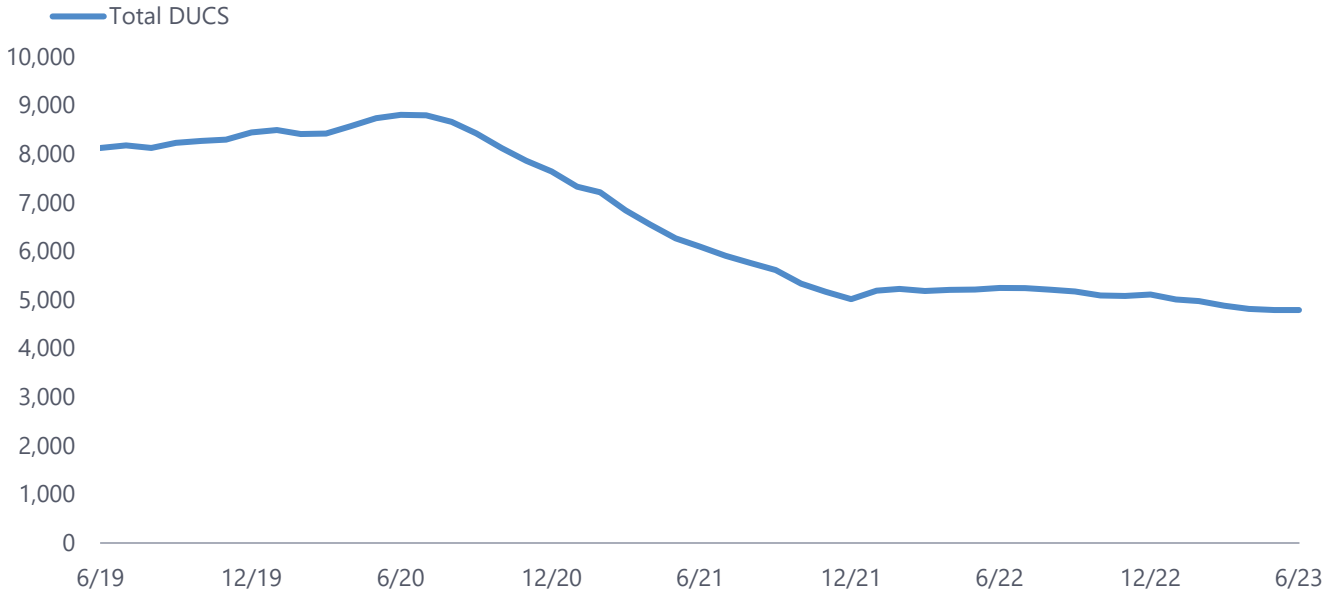
## Change in Rig Counts

Region	6/30/2023	6/30/2022	3/31/2023	YoY % Change	QoQ % Change
Permian	341	349	352	(2.3%)	(3.1%)
Eagle Ford	61	72	70	(15.3%)	(12.9%)
Williston	34	38	42	(10.5%)	(19.0%)
Marcellus	35	39	40	(10.3%)	(12.5%)
Cana Woodford	23	32	31	(28.1%)	(25.8%)
DJ Niobara	14	16	18	(12.5%)	(22.2%)
Granite Walsh	3	2	6	50.0%	(50.0%)
Haynesville	44	69	66	(36.2%)	(33.3%)
Utica	13	12	11	8.3%	18.2%
Rest of US	106	124	119	(14.5%)	(10.9%)
<b>Total</b>	<b>674</b>	<b>753</b>	<b>755</b>	<b>(10.5%)</b>	<b>(10.7%)</b>

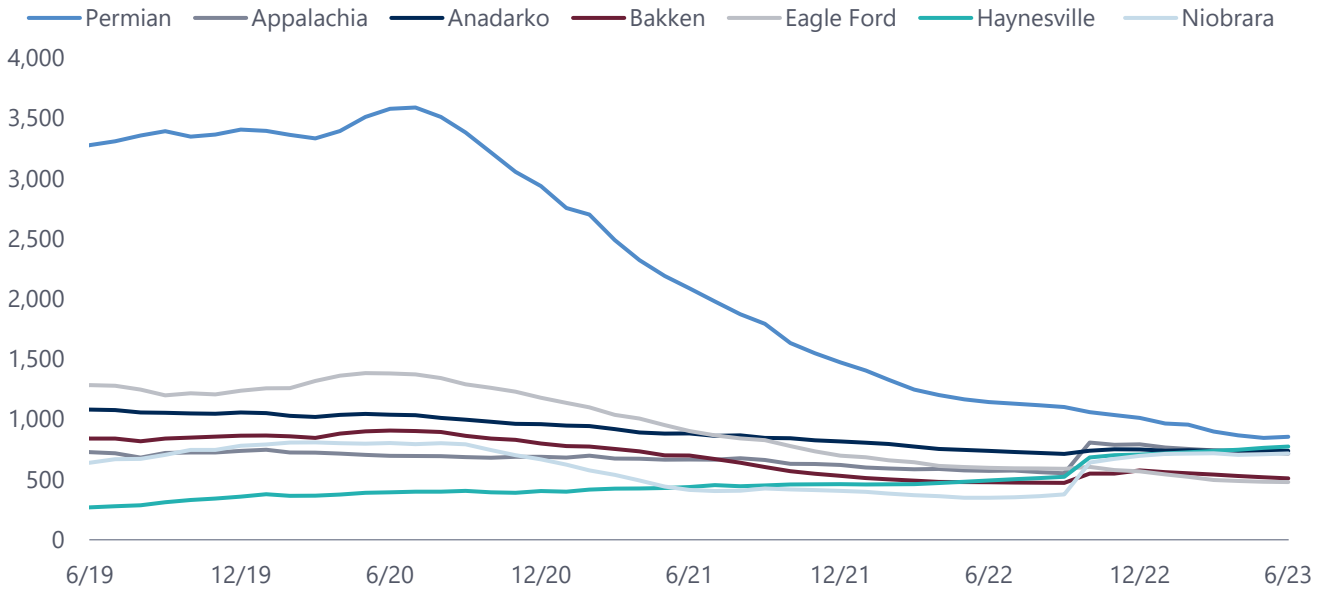
Notes: All data as of June 30, 2023. Data collected on a weekly basis.  
Sources: Bloomberg and Baker Hughes.

# Rigs (cont.)

## Total U.S. DUCs



## Total DUCs by Basin



Notes: All data as of June 30, 2023. Data collected on a monthly basis and subject to a one-month lag.  
Sources: Bloomberg and Baker Hughes.

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