



Houlihan Lokey

Oil and Gas

INDUSTRY UPDATE | Q3 2022



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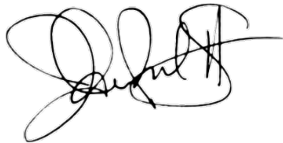
Houlihan Lokey Oil and Gas Update

Dear Clients and Friends,

Houlihan Lokey is pleased to present its Oil and Gas Industry Update for Q3 2022.

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 Q3 '22 continued to be volatile as market participants weigh the probability (and depth) of a global recession vs. tight global supply dynamics.
 - Recent volatility has largely affected the front of the curve, and tail prices have remained steadily above \$65, a level that still supports both production and upside development.
 - On October 5, 2022, OPEC+ agreed to cut oil production by 2 MMbbls/d, framing the decision as a technical response to a lackluster global economic outlook, especially in China, where COVID-19 restrictions have hurt oil demand.⁽¹⁾
 - Additionally, the cartel noted a disconnect between paper and physical markets that was sending erroneous signals to the broader market.
 - OECD inventory levels are well below historical five-year trend levels, particularly as OECD countries have released barrels from storage (e.g., U.S. SPR) in an effort to tame escalating gasoline prices.
 - Depressed oil prices during the last down cycle and the Upstream sector's broad current focus on returning capital to shareholders have contributed to an environment of underinvestment in exploration and development globally.
- Russian oil supply dynamics continue to have a material effect on global crude prices.
 - In 2021, European imports of Russian production averaged ~3.1 MMbbls/d of crude oil, natural gas liquids, and refinery feedstocks, plus ~1.3 MMbbls/d in diesel and other petroleum products.
 - On November 4, 2022, the European Union, G7, and Australia agreed to set a to-be-determined price cap on each cargo of seaborne Russian oil.
 - In effect starting December 5, 2022, a price cap of \$60/bbl was instituted; the impact on global trading flows and resulting prices are yet to be analyzed.
 - As such, businesses in each of the supporting countries are barred from shipping, financing, and insuring Russian oil cargoes, unless it is below the prevailing price cap.
 - Russian seaborne crude exports fell to a 12-month low in September⁽²⁾ as European buyers continued to wind down purchases as sanctions are being implemented.
 - Previously, on June 3, 2022, the EU adopted sanctions banning seaborne imports of Russian crude oil as of December 5, 2022, and petroleum product imports as of February 5, 2023, with certain exceptions.
 - Russian crude flows have generally shifted to those countries against sanctions (away from those in support); China, India, and Turkey have emerged as key destinations for Russian crude, somewhat muting the intended effect of the Western sanctions.

(1) *The Wall Street Journal*.

(2) Source: S&P Global.

Key Quarterly Trends (cont.)

Natural Gas Supply/Demand Dynamics

- Even prior to the Russian invasion of Ukraine, European natural gas supply was “tight to under-supplied” relative to demand.
- Despite Russia’s attempt to weaponize its natural gas supply, TTF prices have declined by 62.5%⁽³⁾ from their peak observed on August 26, 2022, largely driven by (i) alternative fuel sources identified (coal, wood, nuclear, renewables), (ii) the resulting build in natural gas inventories, and (iii) a weather forecast of moderate winter temperatures.
 - The EU has been focused on increasing its natural gas inventories in advance of winter demand and was ~94.7% full as of October 29, 2022.⁽⁴⁾
 - In order to reduce its member states’ reliance on Russian energy, in July 2022, the EU unveiled a European Gas Demand Reduction Plan to cut members’ gas use from August 2022 through March 2023 by 15% vs. their 2017–2021 average consumption levels.
 - Dozens of LNG tankers are floating offshore of European ports due to a lack of berths capable of offloading LNG and storage availability.
 - Weather is a key factor going forward, as a cold, dry, and windless European winter could deplete gas inventories and hinder wind-power generation, while a mild, wet, and windy winter could help moderate gas demand and boost wind power.
 - On September 26, 2022, explosions rocked the Nord Stream pipeline and one of the two Nord Stream 2 pipelines.
 - Previously, in August 2022, Gazprom halted all Nord Stream gas flows, citing technical problems and Western sanctions.
 - Nord Stream 2, a newer pipeline built alongside the older Nord Stream one, has been operational since last year but was never put to use as Germany refused to certify the pipeline in response to Russia’s invasion of Ukraine.
- Significant TTF and JKM vs. HH differentials have incentivized U.S. LNG exporters to max out current capacity and consider establishing new export terminals, which typically take five or more years to construct post permitting and FID.
 - As of July 2022, U.S. LNG liquefaction capacity averaged 11.4 Bcf/d, with a shorter-term peak capacity of 13.9 Bcf/d.
 - As further mentioned below, the June 2022 fire at Freeport LNG reduced daily U.S. LNG export by ~2 Bcf/d
 - Freeport LNG has reportedly postponed the expected restart of its ~2 Bcf/d terminal to Q1 '23 as it completes certain repairs, following which it will seek regulatory approvals.
 - Freeport LNG had previously aimed to restore greater than 85% of its capacity in November 2022.
 - The facility was closed in June 2022 due to an inbound pipeline rupture and subsequent fire.

⁽³⁾ Source: Bloomberg. As of November 1, 2022.

⁽⁴⁾ Source: GIE Aggregated Gas Storage Inventory.

Key Quarterly Trends (cont.)

Natural Gas Supply/Demand Dynamics (cont.)

- The most recent U.S. LNG export project, Calcasieu Pass LNG, placed all of its liquefaction trains (~1.3 bcf/d) in service in August 2022, ahead of schedule.
- 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.⁽⁵⁾

M&A&D Markets

- The M&A&D market remains very active, with ~\$16 billion of reported transaction value in Q3 '22 (vs. ~\$12 billion in Q2 '22).
- Transaction activity has been supported by (i) the “seasoning” of robust commodity price levels and (ii) the recent flattening of the forward curves.
 - However, commodity price volatility has recently negatively impacted closings such that YTD 2022 closings are materially behind 2021, notwithstanding higher relative activity levels.
- Public E&Ps have driven deal closings, accounting for ~78.5% of YTD acquisitions by deal value.
- Public equity markets have been receptive to M&A&D, including equity-funded consideration.
- An additional impediment to dealmaking includes producers’ large out-of-the-money hedge books (which negatively impacts net proceeds to sellers), many of which are rolling off in 1H '23.

Selected Upstream Metrics

(\$ in billions)

	Q3-21	Q2-22	Q3-22	Percent Change (Q3-22 vs.)	
				Q3-21	Q2-22
A&D					
Amount	\$13.0	\$6.1	\$9.1	-29.8%	49.9%
Transactions	112	73	59	-47.3%	-19.2%
M&A					
Amount	\$5.6	\$6.0	\$6.9	22.8%	14.0%
Transactions	8	6	6	-25.0%	0.0%

Debt Capital Markets

- E&P HY issuances reached record levels in 2021 and have reverted to more subdued levels YTD, due in large part to macroeconomic/recessionary concerns.
 - HY issuances were ~\$15.8 billion YTD 2021 vs. ~\$3.4 billion YTD 2022.
 - Energy High Yield index OAS spreads have remained significantly tighter compared to the broader High Yield index.
 - As of September 30, 2022, the Energy High Yield index spread was 466 bps (up 27.3% vs. Q3 '21) compared to the broader High Yield index spread of 573 bps (up 85.4% since Q3 '21).
- RBLs have become more constructive in recent quarters but remain highly selective.

Key Quarterly Trends (cont.)

Debt Capital Markets (cont.)

- Private credit markets have been very active, including with respect to dividend recaps (especially via securitizations and VPPs), development capital, and acquisition financing.
- Sellers have increasingly explored dividend recaps (e.g., via securitizations and VPPs) as a partial monetization mechanism in lieu of outright asset sales.

Equity Capital Markets

- As of November 15, 2022, the S&P E&P Index was the best-performing sector YTD, up ~71.5% vs. ~16.2% for the broader S&P 500.⁽⁶⁾
- Energy currently comprises ~5.4% of the S&P 500 market cap, up from <2.0% at the 2020 lows.
- Private equity fundraising has been challenging, but select sponsors have successfully raised funds and several others are in market.
 - The LP universe has bifurcated, with a notable portion actively seeking oil and gas exposure.

Other Trends

- Public operators are under substantial political pressure to increase development activities, but given (i) the constantly shifting political agendas in the face of capex cost and timing and (ii) shareholder demands and requirements to keep shareholder capital supportive, they have remained disciplined and focused on capital returns.
- Public operators have consistently reduced rig/development activity on acquired assets to preserve inventory (e.g., Diamondback/Firebird, Devon/Validus, Continental/Pioneer Delaware).
- In addition to material cost inflation, producers have faced substantial shortages in services/goods, which has limited their ability to increase production.
- In response to the significant cost inflation, many operators, including those in high production basins (Permian, Eagle Ford, Bakken, Appalachia), have moderated/reduced rig count.
- Robust commodity prices have driven many producers and integrated oil companies to record levels of earnings and cash flow.

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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

2021 M&A Advisory Rankings All U.S. Energy & Power Transactions

	Advisor	Deals
1	Houlihan Lokey	27
2	Citi	24
3	JP Morgan	23
4	Goldman Sachs	19
5	BofA Securities	17

Source: Refinitiv.

No. 1 M&A Advisor for All U.S.
Energy and Power Transactions

Corporate Finance

2021 Investment Banking Rankings All Global Transactions

	Advisor	Deals
1	Houlihan Lokey	549
2	Goldman Sachs	511
3	JP Morgan	508
4	Rothschild	437
5	Morgan Stanley	393

Source: Refinitiv. Excludes accounting firms and brokers.

No. 1 Global M&A Advisor
Leading Capital Markets Advisor

Financial and Valuation Advisory

2002 to 2021 Global M&A Fairness Advisory Rankings

	Advisor	Deals
1	Houlihan Lokey	952
2	JP Morgan	890
3	Duff & Phelps, A Kroll Business	882
4	Morgan Stanley	602
5	BofA Securities	531

Source: Refinitiv. Announced or completed transactions.

No. 1 Global M&A Fairness Opinion
Advisor Over the Past 20 Years

1,000+ Annual Valuation Engagements

Financial Restructuring

2021 Global Distressed Debt & Bankruptcy Restructuring Rankings

	Advisor	Deals
1	Houlihan Lokey	63
2	Rothschild	38
3	Moelis	34
4	PJT Partners	33
5	Lazard	24

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.

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Cross-Product Industry Team



**Houlihan Lokey
Oil & Gas
Group**

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 U.S. M&A advisor*
- 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

Capital Markets

- ~\$15 billion of capital raised and/or advised on in 2021
- Market leader in custom/bespoke structure
- Deep expertise in driving optimal positioning, structure/terms, and syndication

Recapitalization/Restructuring

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

Financial Advisory

- No. 1 global M&A fairness opinion advisor over the past 20 years**
- 1,000+ annual valuation engagements
- Transaction advisory services, including ability to bundle due diligence and quality of earnings services

*Source: Refinitiv.
**Source: Refinitiv. Announced or completed transactions.
























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.

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⁽¹⁾

 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 of its assets to  Company Advisor	 has been acquired by  Financial Advisor & Fairness Opinion	 has been acquired by  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	 a portfolio company of  Reserve-Based Lending Facility Refinancing \$500,000,000 Exclusive Placement Agent	 has acquired  Company Advisor	 has completed a "merger-of-equals" with  Sellside Advisor and Fairness Opinion	 has completed the refinancing of Senior Secured Notes through a combined issuance of Term Loan B and new Senior Secured Notes \$1,870,000,000 Joint Lead Arranger & Joint Lead Manager

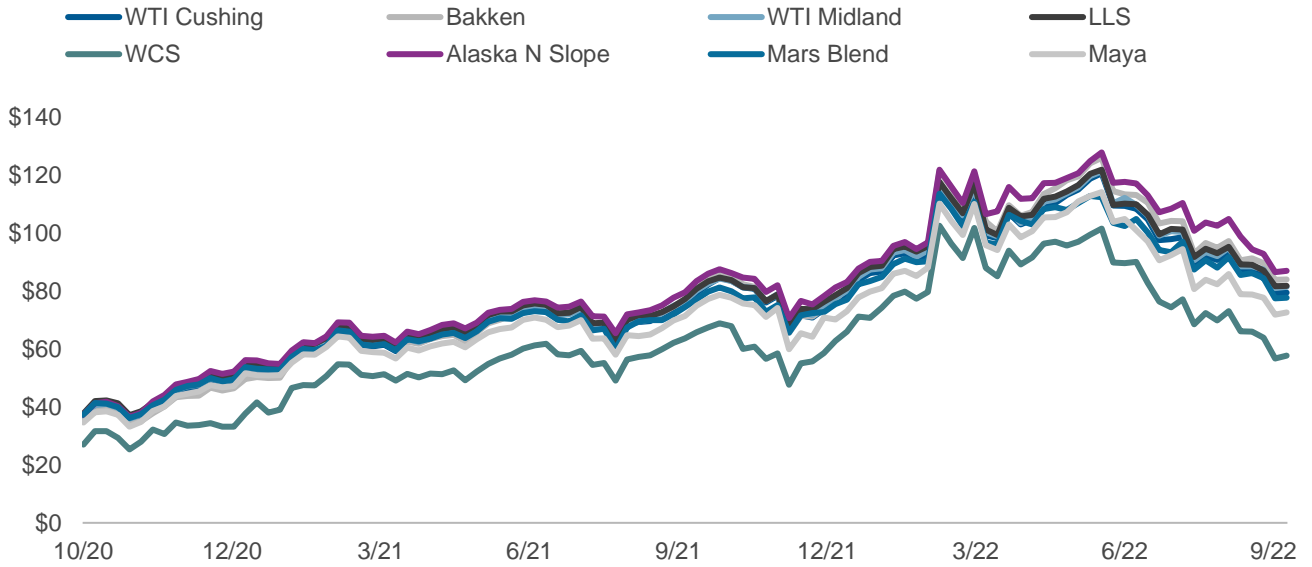
Tombstones included herein represent transactions closed from 2018 forward.

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

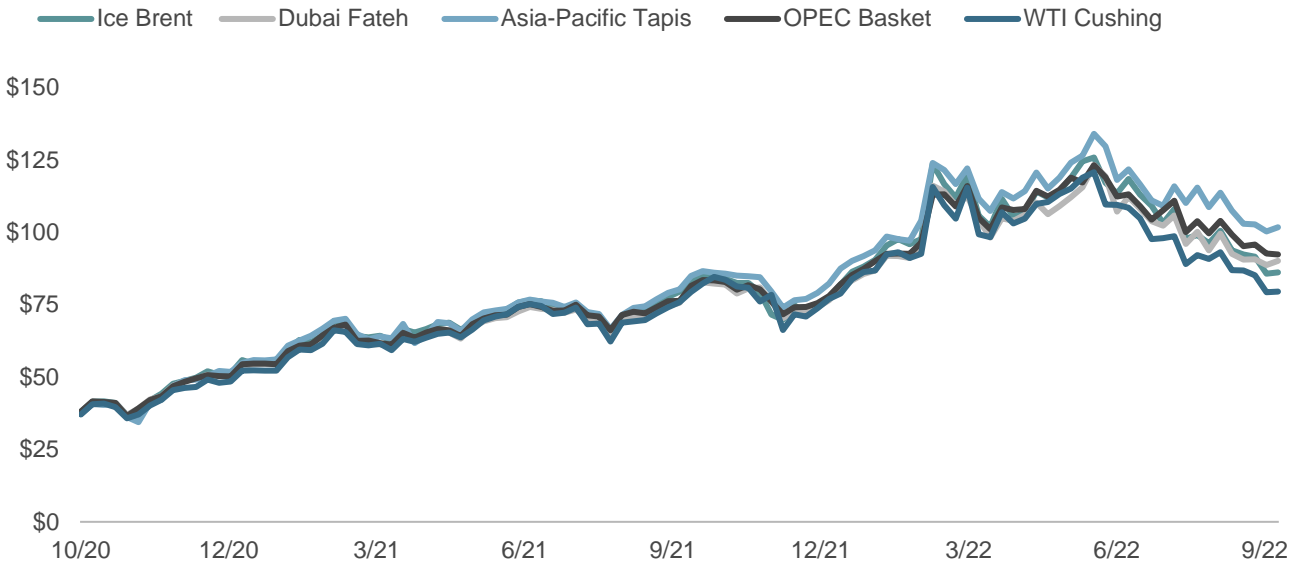
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Spot Pricing

North American Spot Prices (\$/bbl)

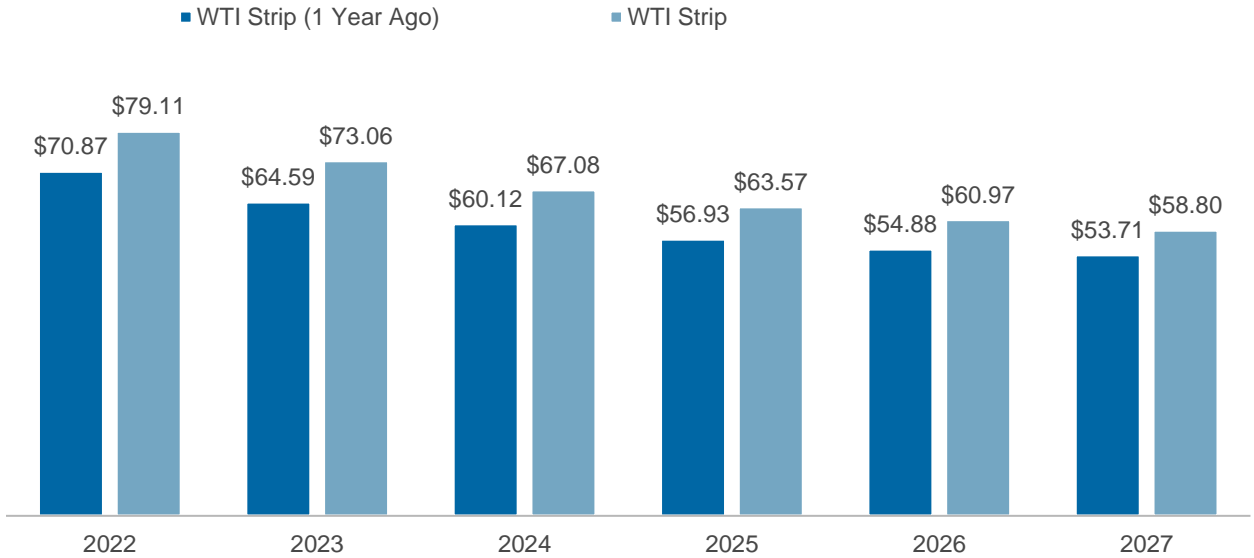


International Spot Prices (\$/bbl)

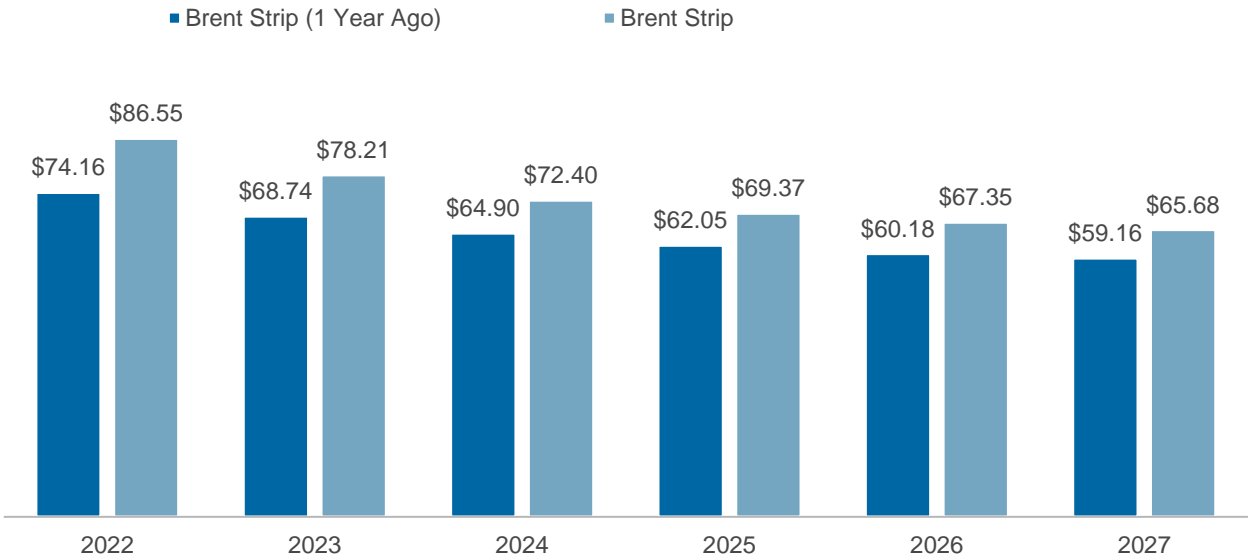


Strip Pricing

WTI Cushing Strip Pricing Comparison (\$/bbl)

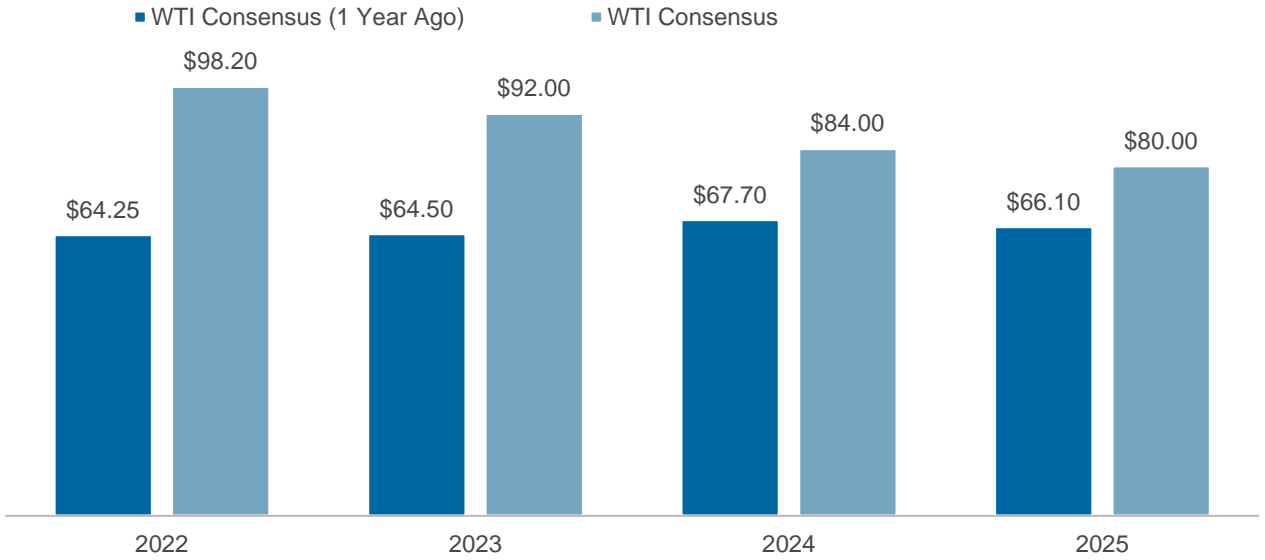


Brent Strip Pricing Comparison (\$/bbl)

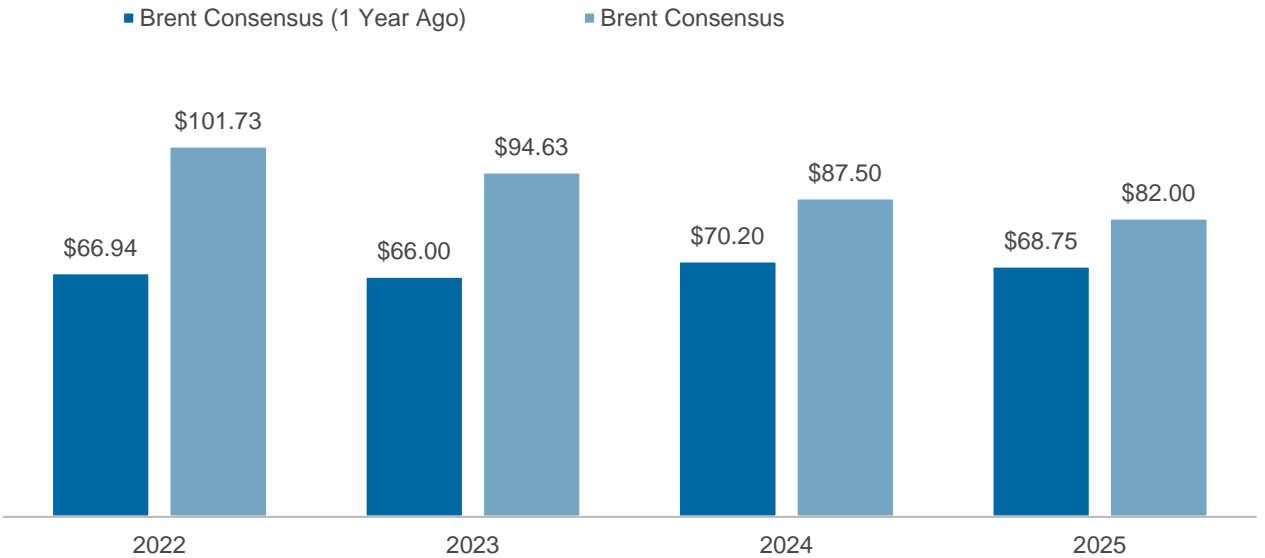


Consensus Pricing

WTI Cushing Consensus Pricing Comparison (\$/bbl)



Brent Consensus Pricing Comparison (\$/bbl)



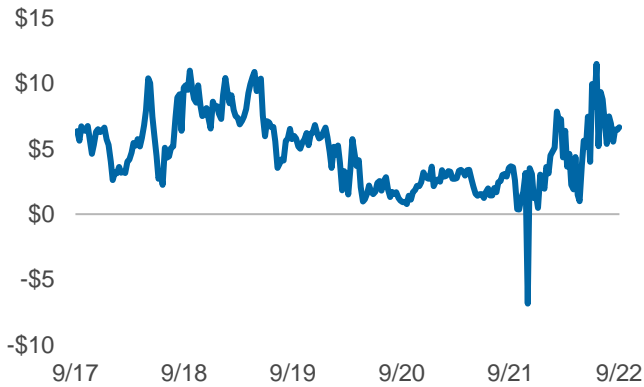
Differentials

Regional Crude Oil Spot Pricing (\$/bbl)

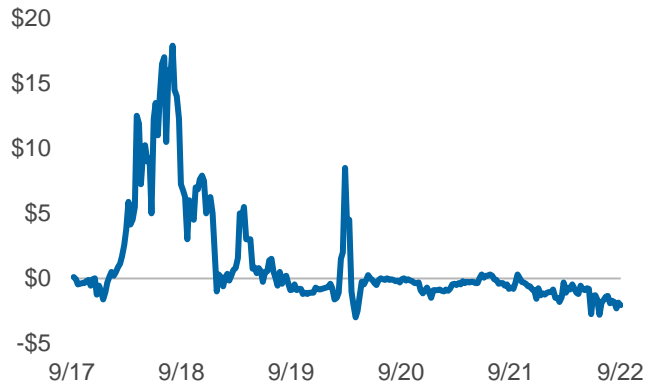
Region	9/30/2022	9/30/2021	6/30/2022	YoY % Change	QoQ % Change
Brent	\$86.2	\$78.8	\$115.0	9.4%	-25.1%
<i>Brent—WTI Cushing</i>	\$6.7	\$3.7	\$9.3		
WTI Cushing	\$79.5	\$75.0	\$105.8	5.9%	-24.8%
<i>WTI Cushing—Brent</i>	(\$6.7)	(\$3.7)	(\$9.3)		
WTI Midland	\$81.5	\$75.7	\$107.1	7.7%	-23.8%
<i>WTI Cushing—WTI Midland</i>	(\$2.1)	(\$0.7)	(\$1.3)		
Bakken	\$84.0	\$75.6	\$110.5	11.1%	-24.0%
<i>WTI Cushing—Bakken</i>	(\$4.5)	(\$0.6)	(\$4.8)		
Eagle Ford Light	\$76.0	\$71.5	\$102.2	6.2%	-25.7%
<i>WTI Cushing—Eagle Ford Light</i>	\$3.5	\$3.5	\$3.5		
WTS	\$79.2	\$75.8	\$107.6	4.5%	-26.3%
<i>WTI Cushing—WTS</i>	\$0.3	(\$0.8)	(\$1.8)		
WCS	\$57.8	\$63.4	\$87.6	-8.9%	-34.1%
<i>WTI Cushing—WCS</i>	\$21.7	\$11.6	\$18.2		
Maya	\$72.7	\$70.5	\$102.4	3.1%	-29.0%
<i>Maya—WCS</i>	\$14.9	\$7.1	\$14.8		
Mars	\$77.7	\$73.7	\$100.9	5.4%	-23.0%
<i>WTI Cushing—Mars</i>	\$1.8	\$1.3	\$4.9		
LLS	\$81.8	\$76.3	\$107.3	7.2%	-23.7%
<i>LLS—Maya</i>	\$9.1	\$5.8	\$4.9		
ANS	\$87.0	\$78.7	\$114.3	10.5%	-23.9%
<i>Brent—ANS</i>	(\$0.8)	\$0.0	\$0.8		

Differentials (\$/bbl)

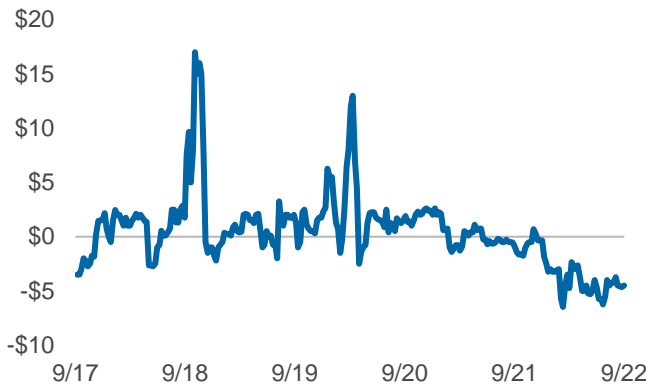
Brent—WTI Cushing



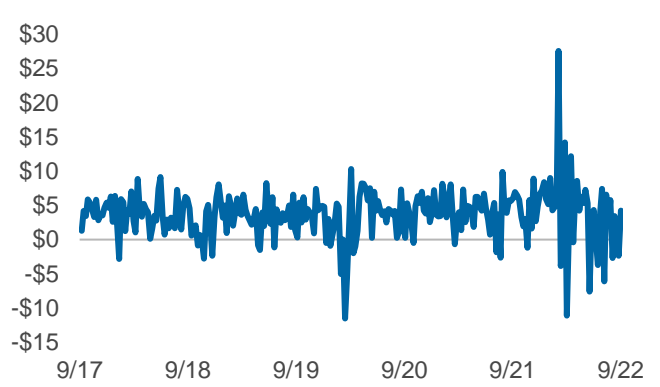
WTI Cushing—WTI Midland



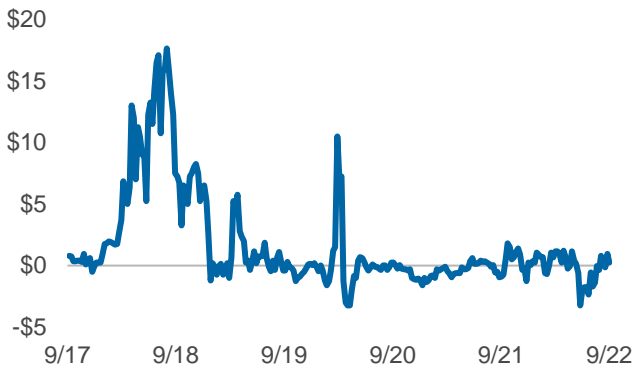
WTI Cushing—WTI Bakken Clearbrook



WTI Cushing—Eagle Ford Light



WTI Cushing—WTS



WTI Cushing—WCS



Differentials (\$/bbl) (cont.)

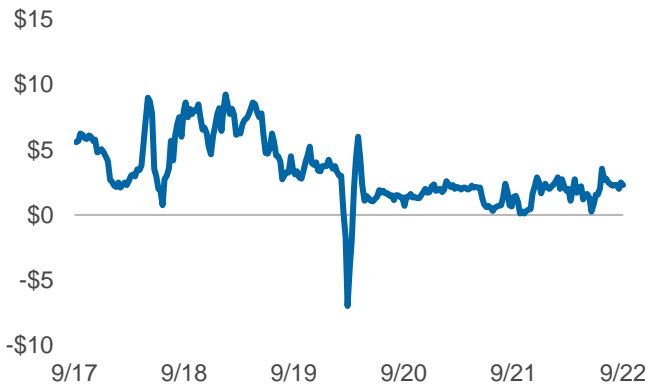
WTI Cushing—Maya



WTI Cushing—Mars



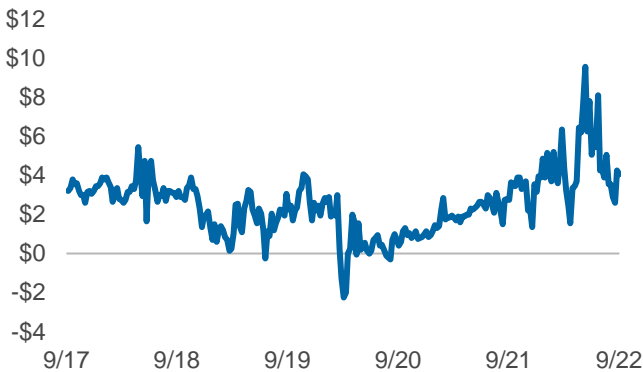
LLS—WTI Cushing



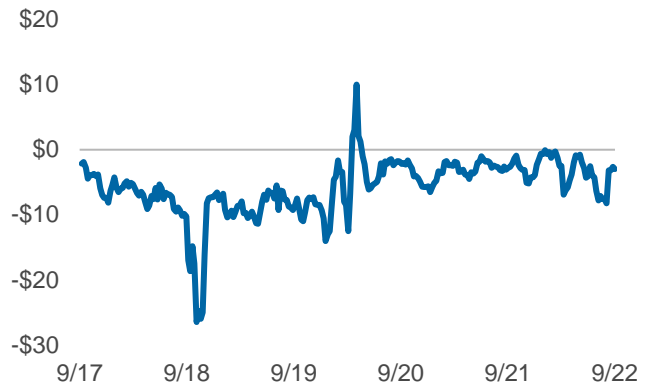
Brent—LLS



LLS—Mars



Bakken—ANS



Differentials (\$/bbl) (cont.)

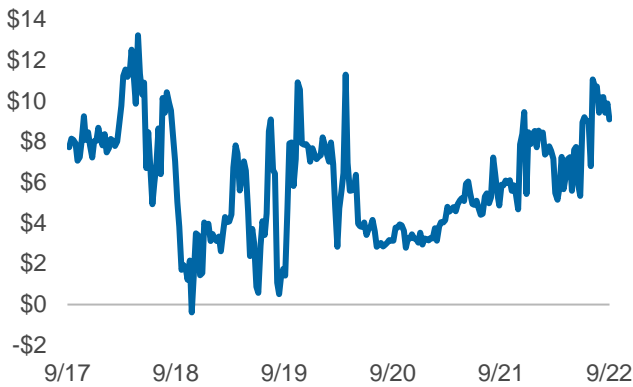
Brent—ANS



Maya—WCS

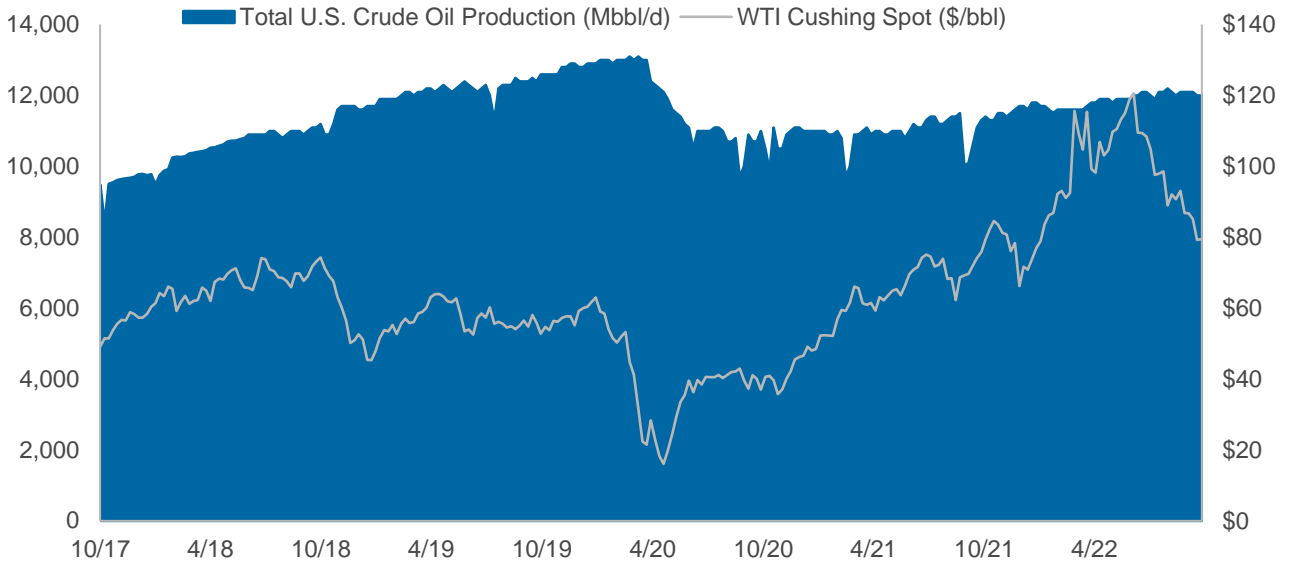


LLS—Maya



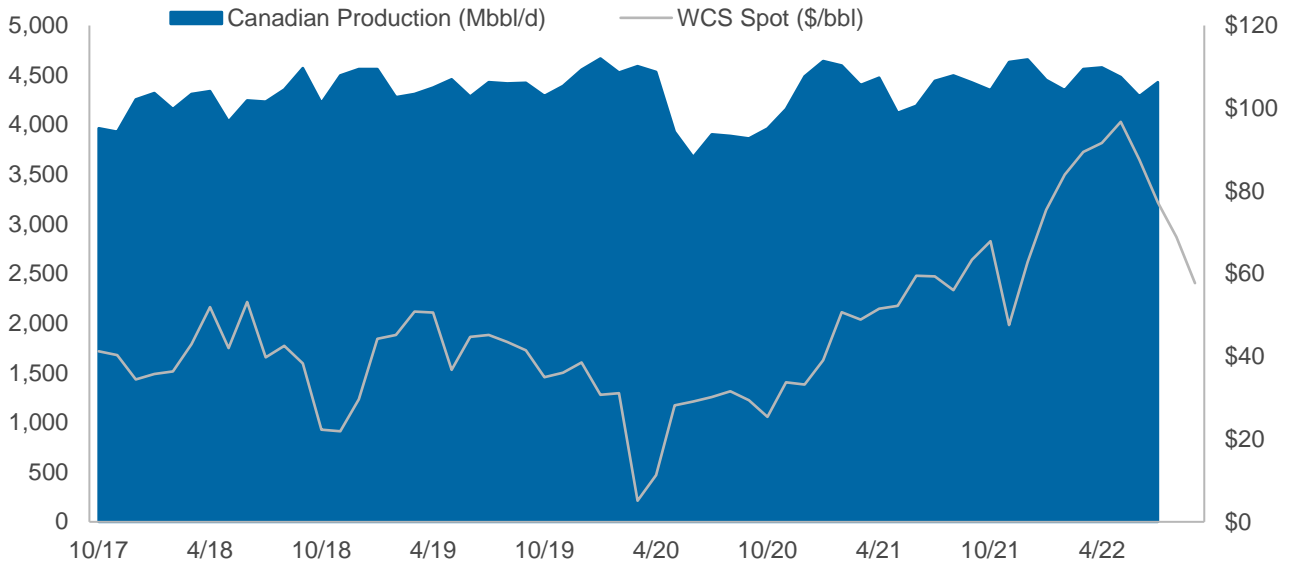
Production

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



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

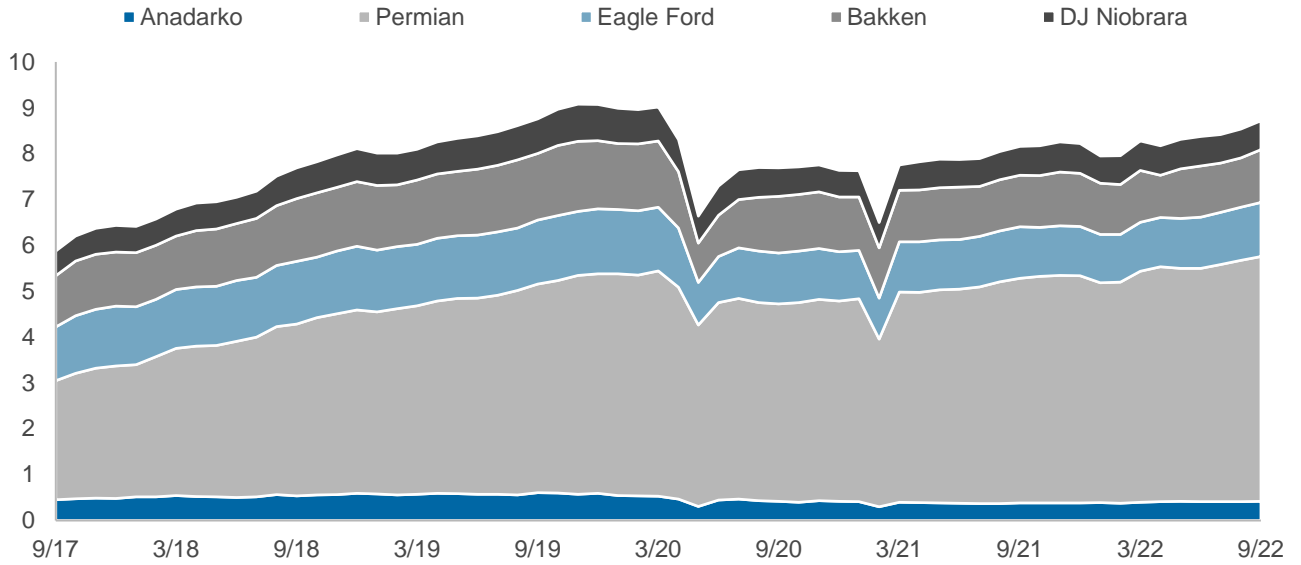
Canadian Production (Mbb/d) vs. WCS (\$/bbl)



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

Production (cont.)

Production in Select Regions (MMbbl/d)⁽¹⁾



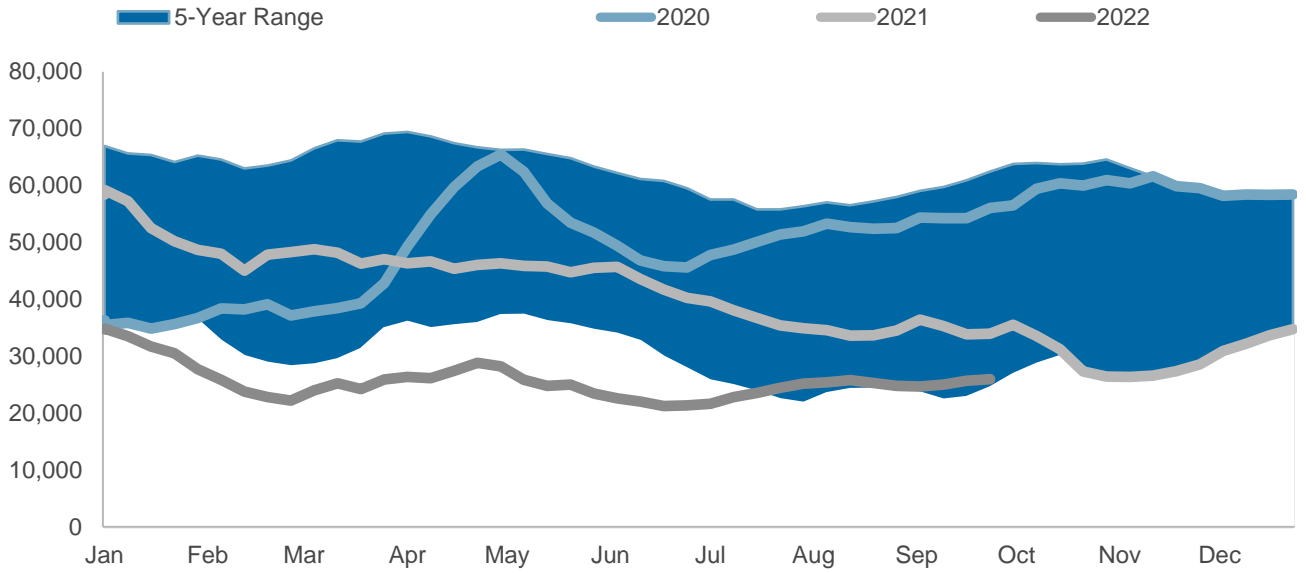
Notes: All data as of September 30, 2022. Data collected on a monthly basis.

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.

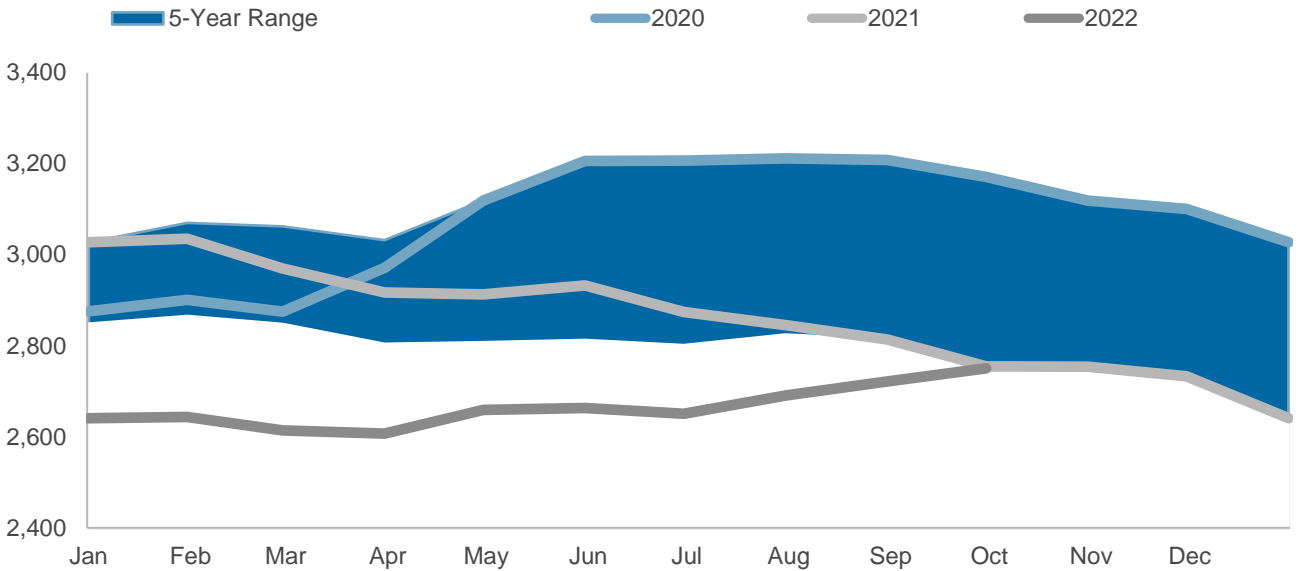
Inventory

U.S. Cushing Crude Inventory (Mbbl)



Note: Data collected on a weekly basis.

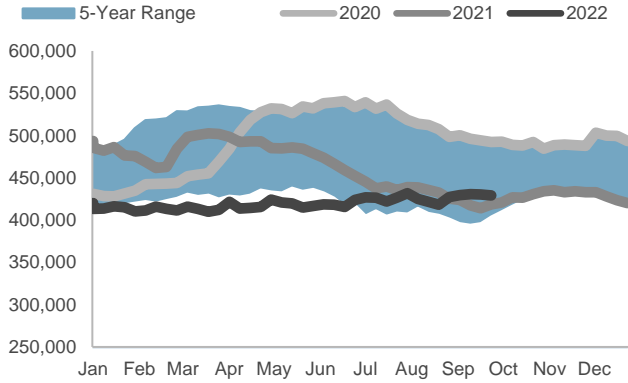
OECD Commercial Inventories (MMbbl)



Note: Data collected on a monthly basis.

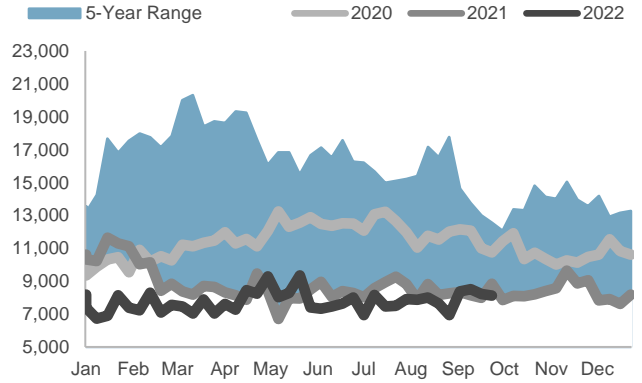
Inventory (Mbbl)

Overall U.S. Crude Inventory

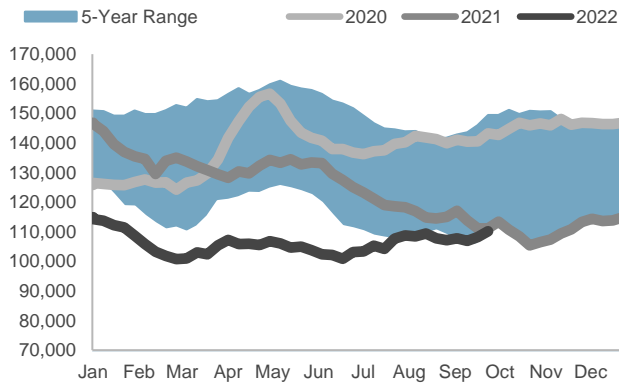


Note: Excludes strategic petroleum reserve (SPR).

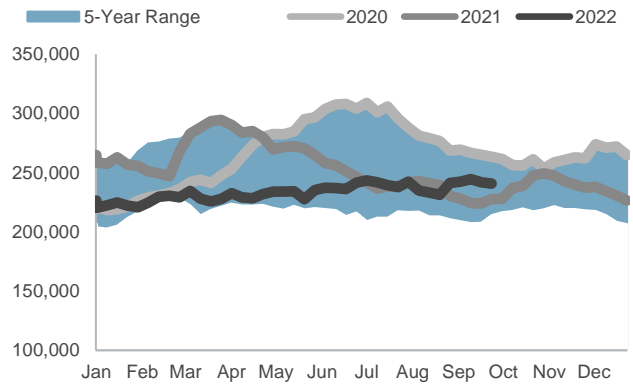
PADD I



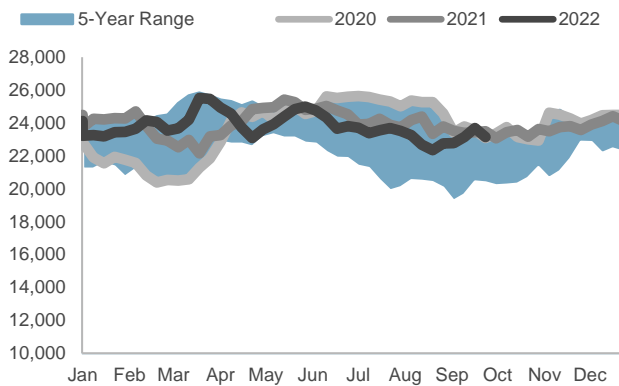
PADD II



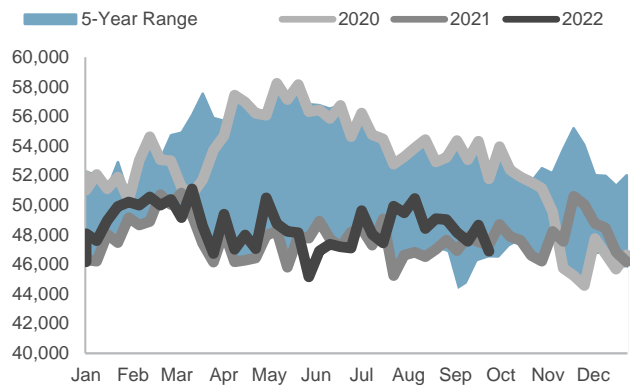
PADD III



PADD IV

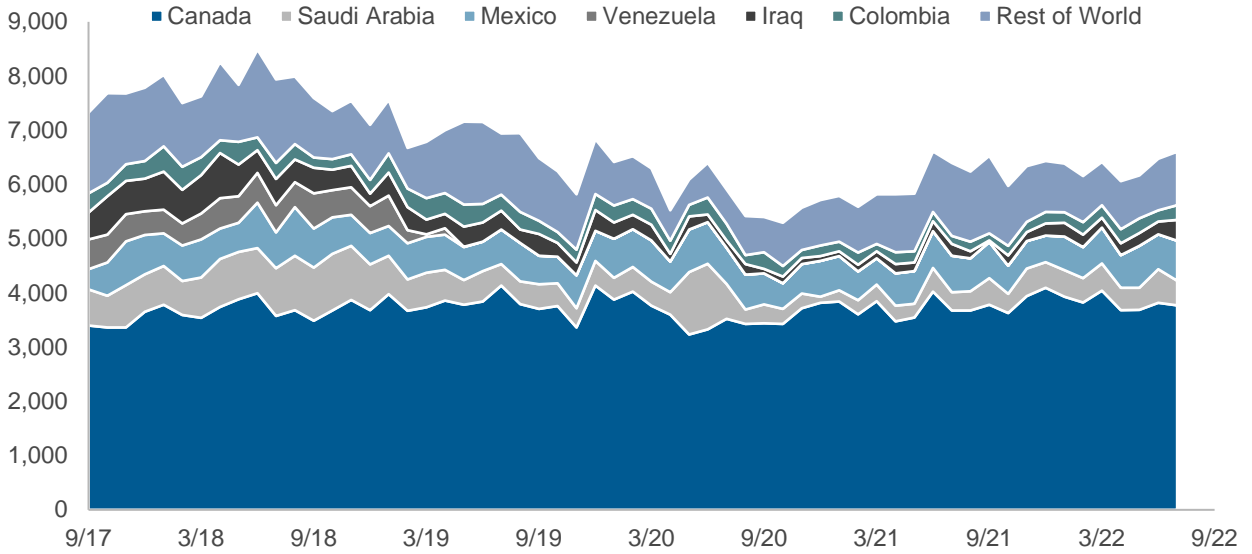


PADD V



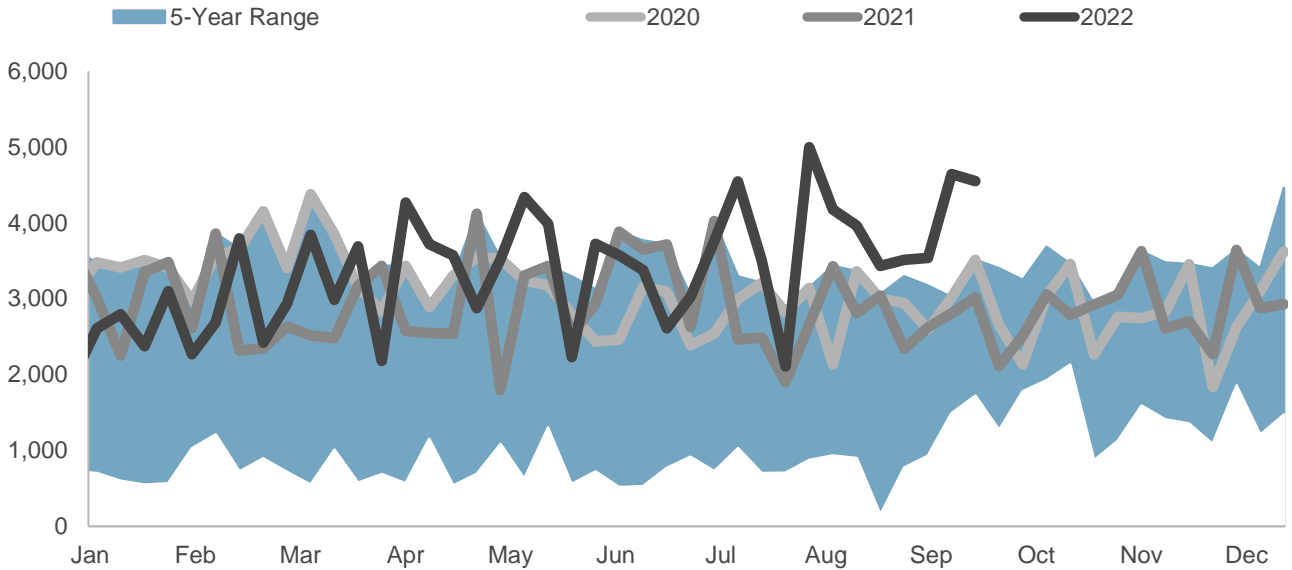
Trade

U.S. Crude Imports by Country (Mbb/d)



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

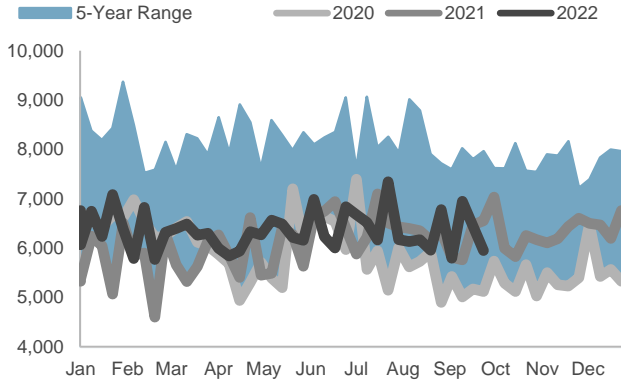
Total U.S. Crude Exports (Mbb/d)



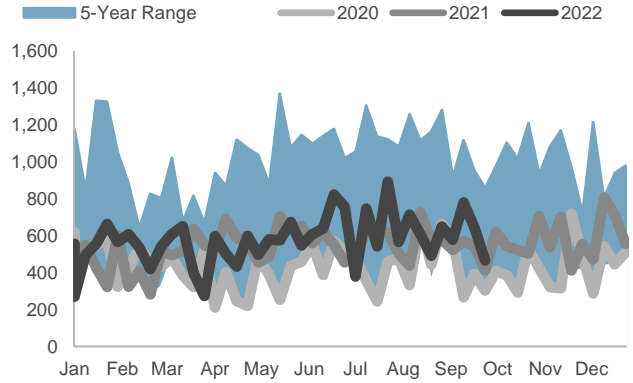
Note: Data collected on a weekly basis.

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

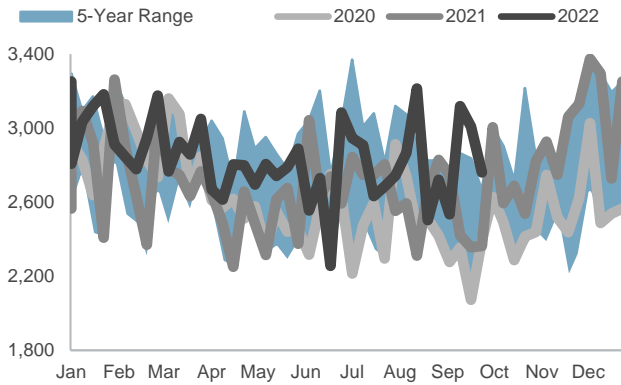
Overall U.S. Commercial Crude Imports



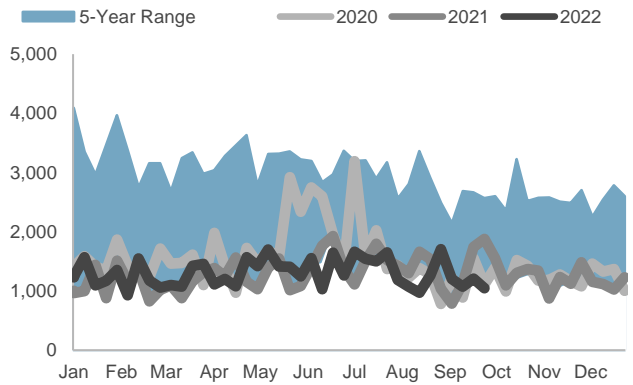
Destination—PADD I



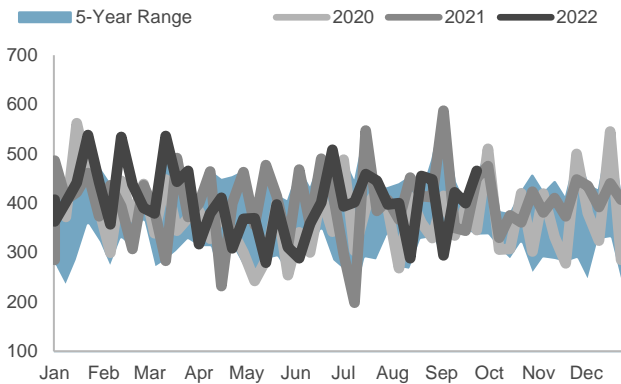
Destination—PADD II



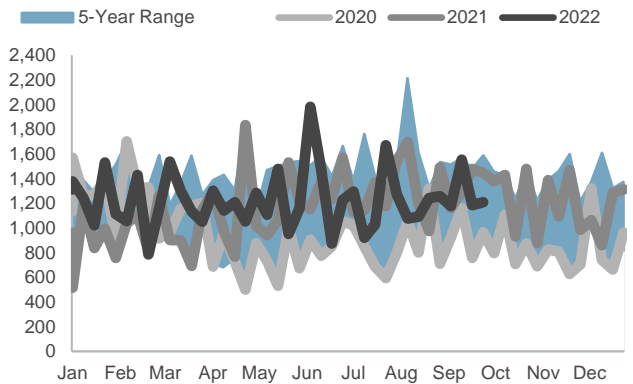
Destination—PADD III



Destination—PADD IV

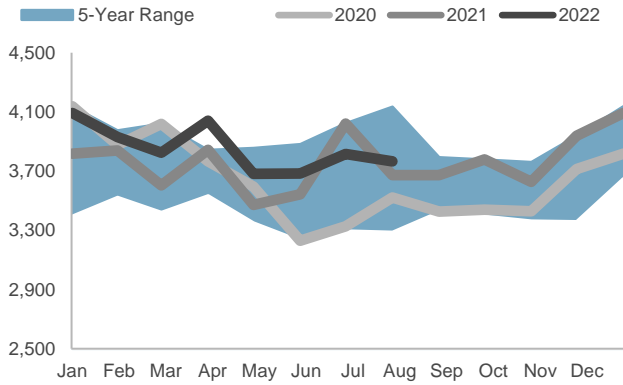


Destination—PADD V

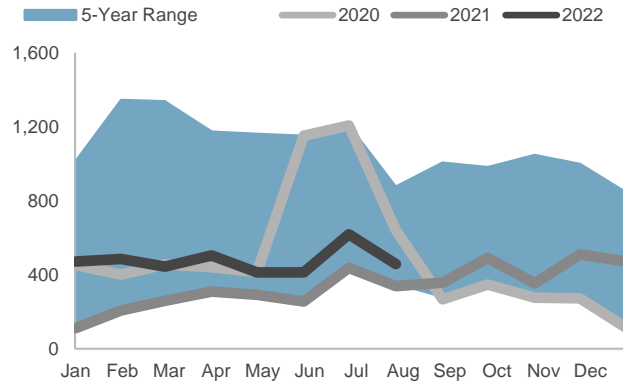


U.S. Imports by Country (Mbb/d)

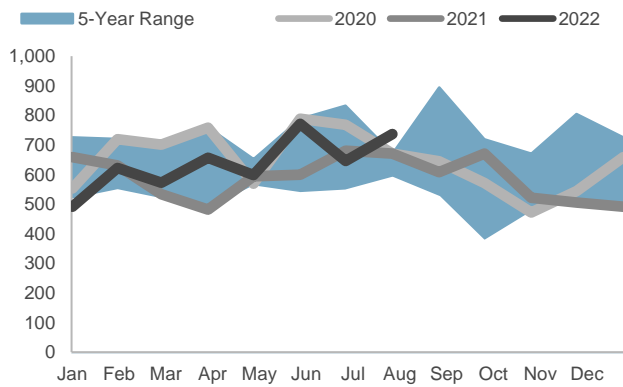
Canada



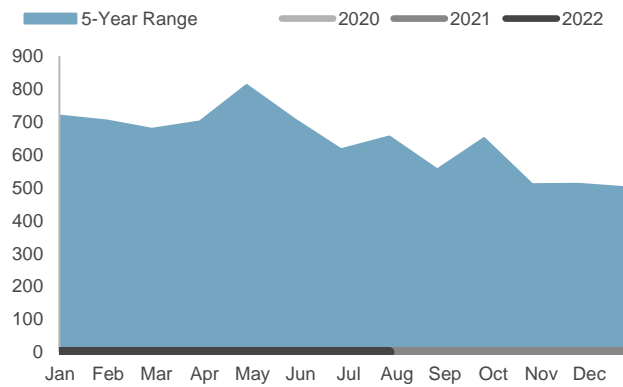
Saudi Arabia



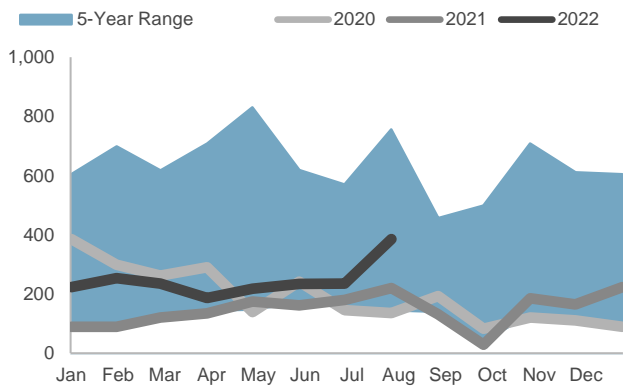
Mexico



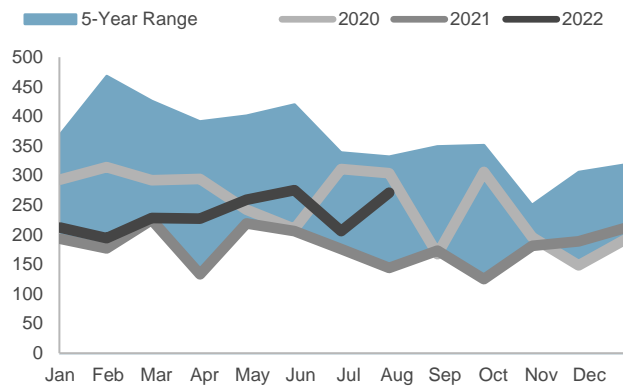
Venezuela



Iraq



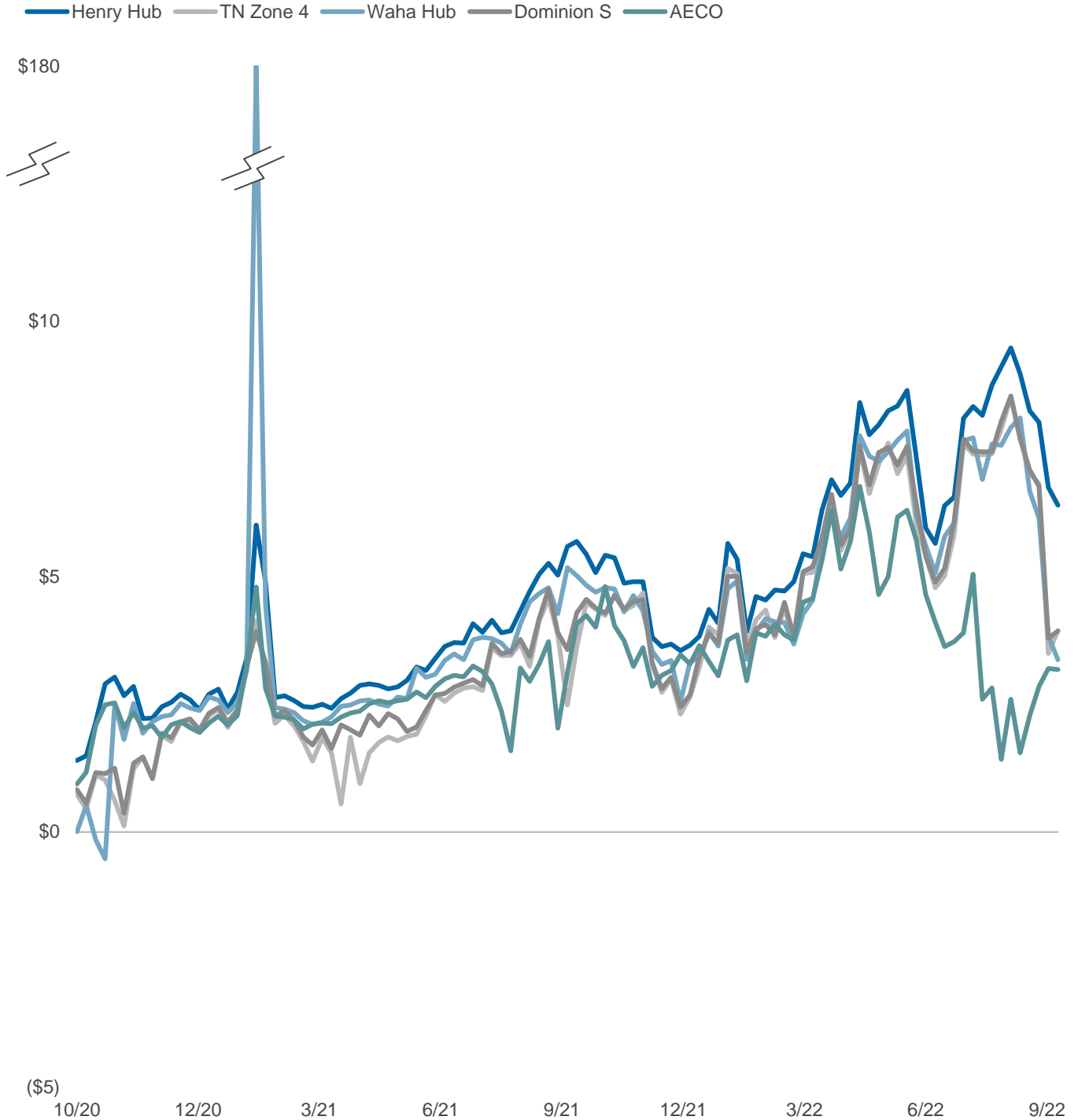
Colombia



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Natural Gas Spot Pricing

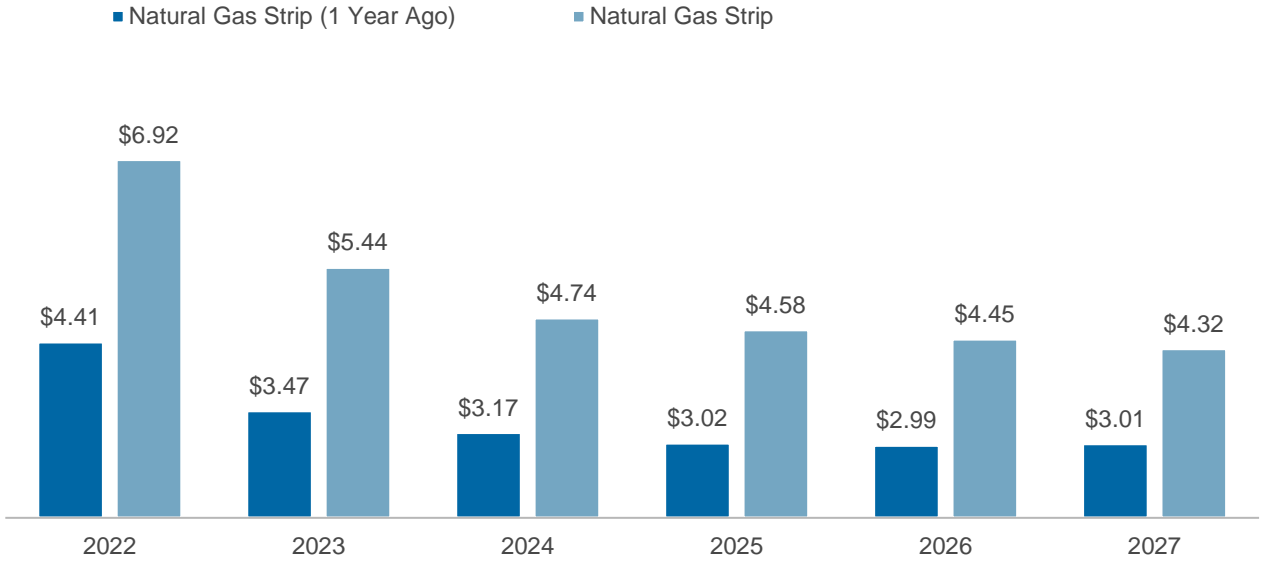
Pricing (\$/MMBtu)



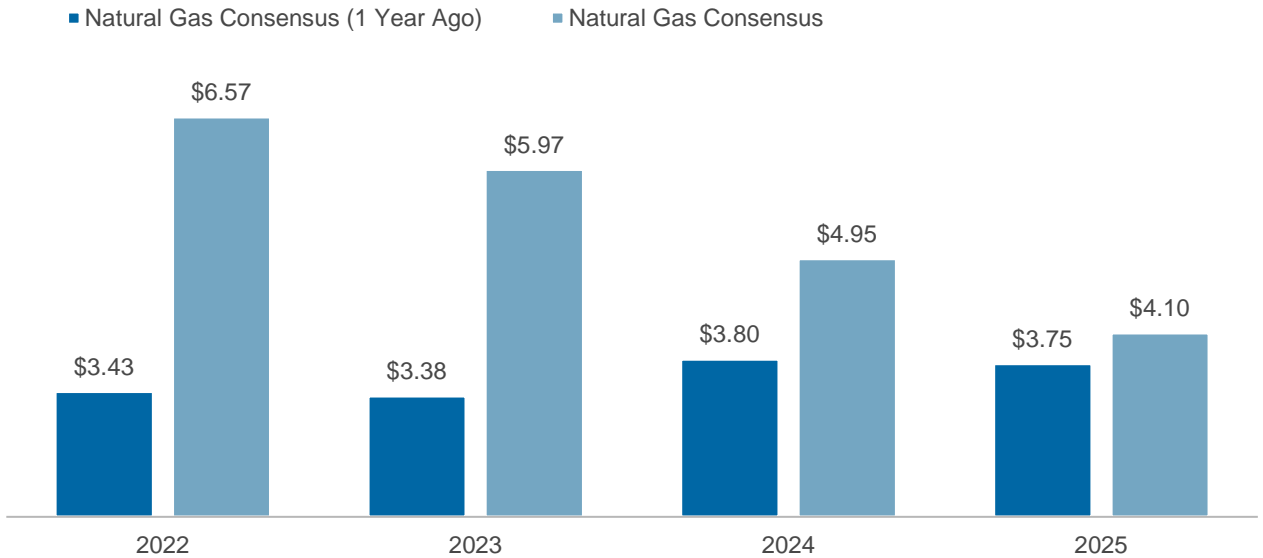
Notes: All data as of September 30, 2022. Data collected on a weekly basis. Source: Bloomberg.

Natural Gas Pricing

Strip Pricing Comparison (\$/MMbtu)

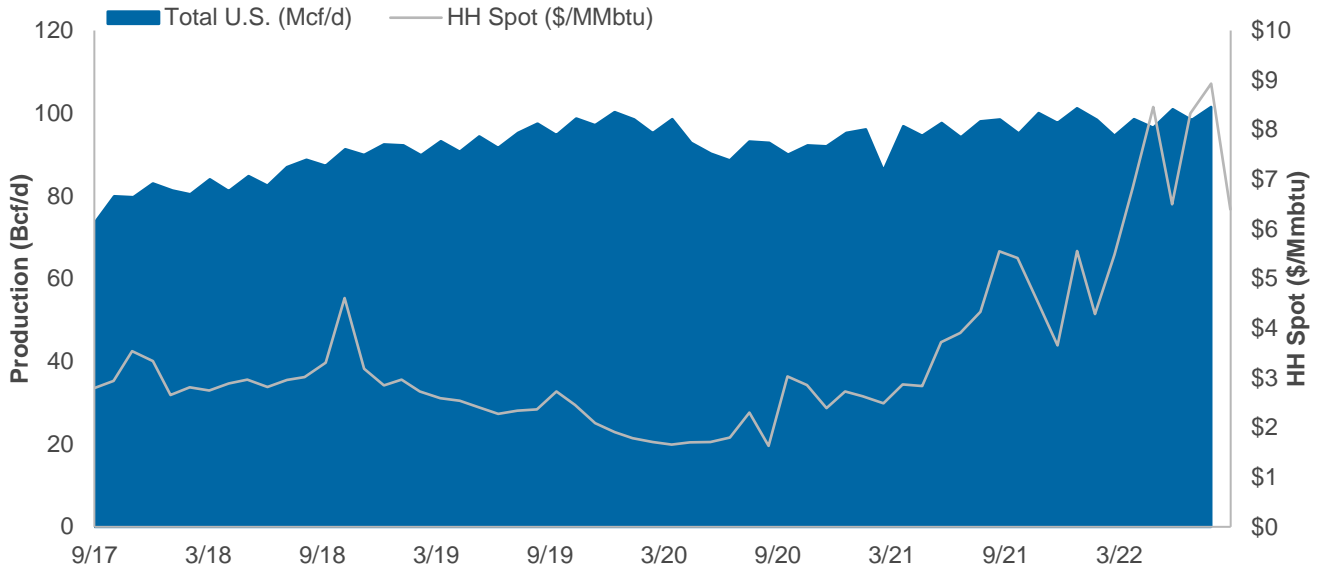


Consensus Pricing Comparison (\$/MMbtu)



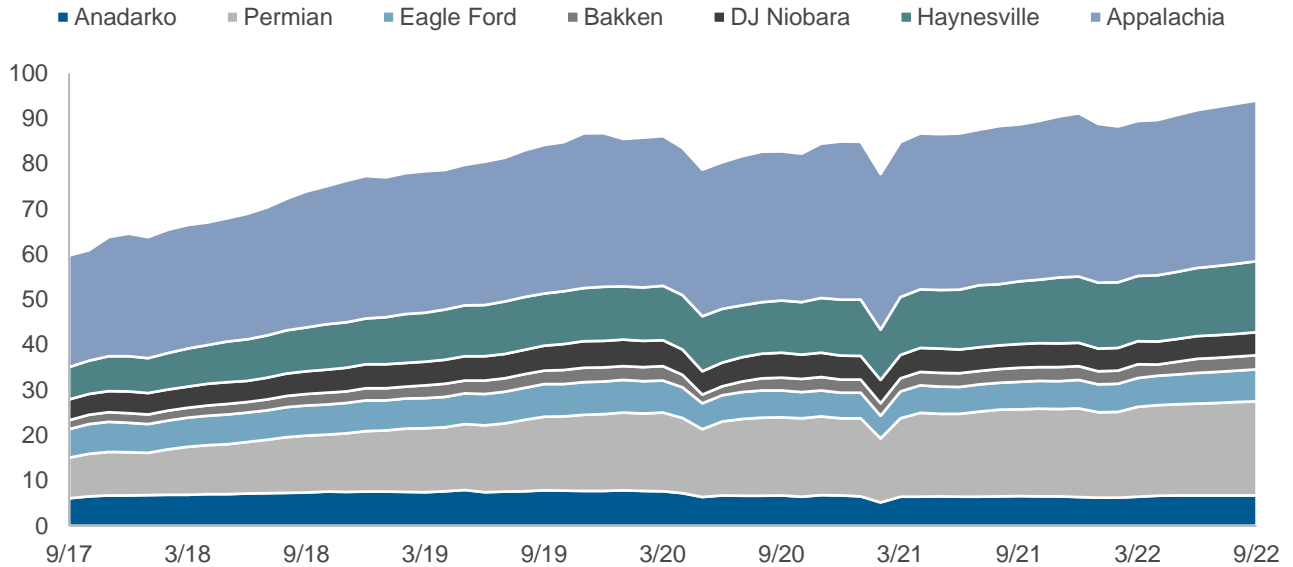
Natural Gas Production

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 September 30, 2022. 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.

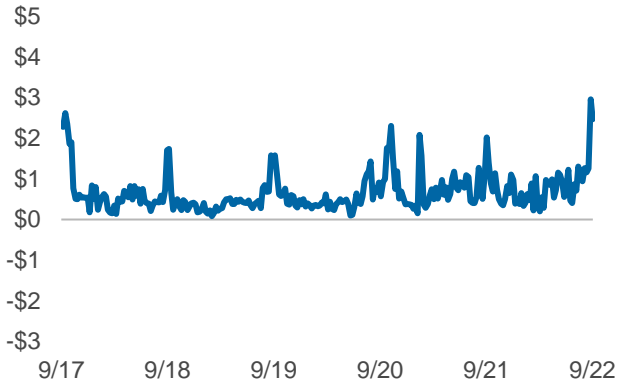
Differentials

Regional Natural Gas Spot Pricing (\$/MMbtu)

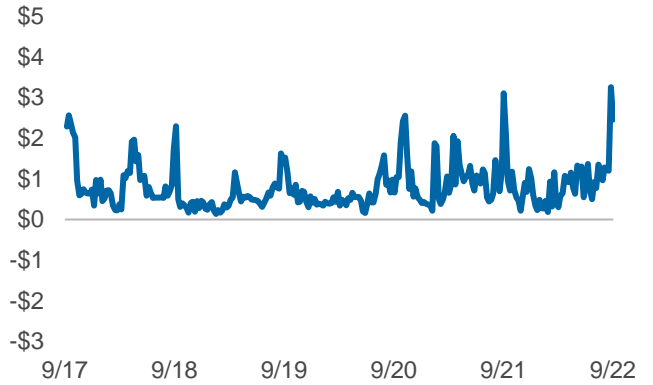
Region	9/30/2022	9/30/2021	6/30/2022	YoY % Change	QoQ % Change
Henry Hub	\$6.4	\$5.6	\$6.5	15.3%	-1.5%
<i>Benchmark</i>					
Dominion South	\$3.9	\$4.6	\$5.6	-15.1%	-29.3%
<i>Henry Hub—Dominion South</i>	\$2.5	\$0.9	\$0.9		
TN Zone 4	\$3.9	\$4.4	\$5.5	-10.5%	-27.9%
<i>Henry Hub—TN Zone 4</i>	\$2.5	\$1.1	\$1.0		
AECO	\$3.2	\$2.9	\$4.5	9.3%	-29.3%
<i>Henry Hub—AECO</i>	\$3.2	\$2.6	\$2.0		
Waha Hub	\$3.4	\$5.1	\$6.0	-33.7%	-43.6%
<i>Henry Hub—Waha</i>	\$3.0	\$0.5	\$0.5		

Natural Gas—Differentials (\$/MMbtu)

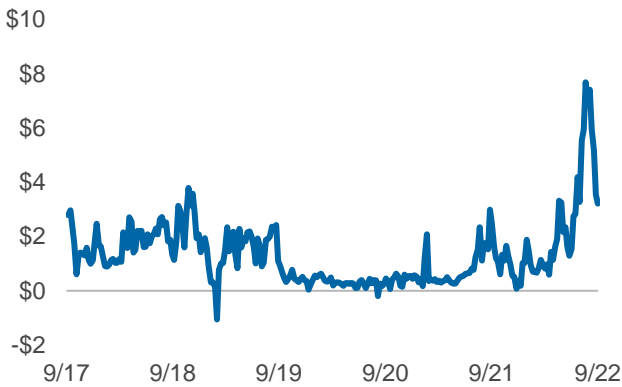
HH—Dominion South



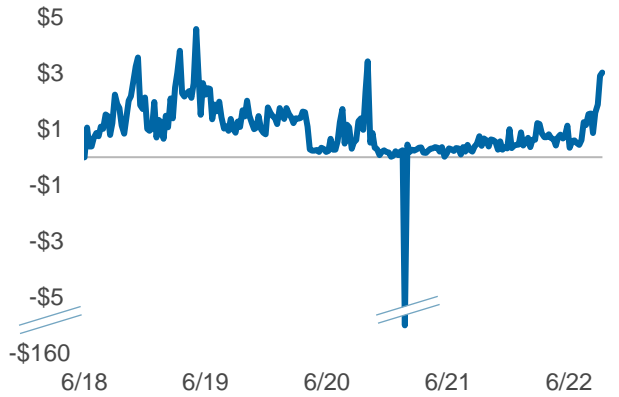
HH—TN Zone 4



HH—AECO



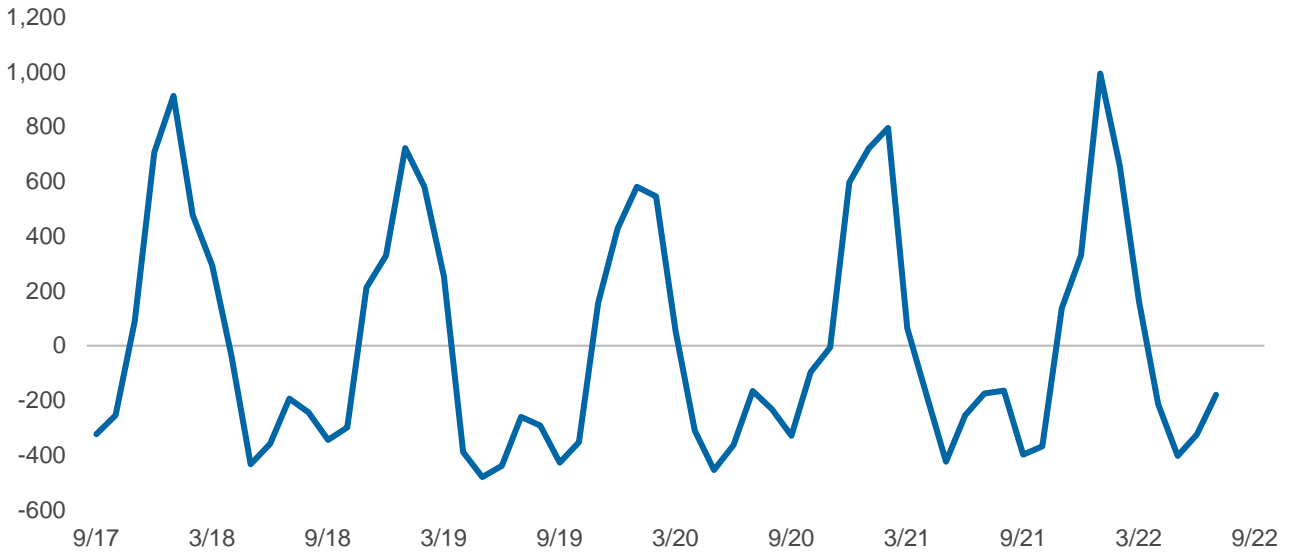
HH—Waha Hub



Note: Low of $-\$154.6$ on February 12, 2021, associated with winter storms.

Natural Gas

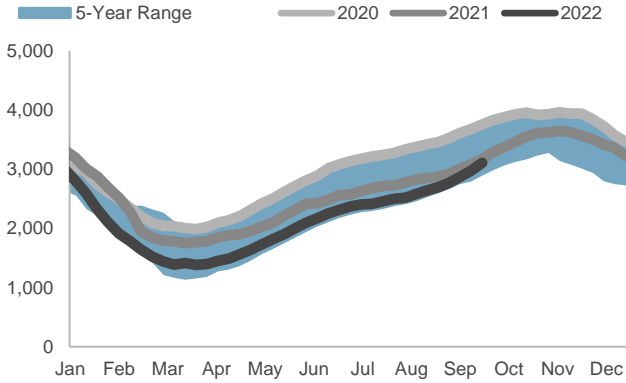
U.S. Natural Gas Withdrawal (Bcf)



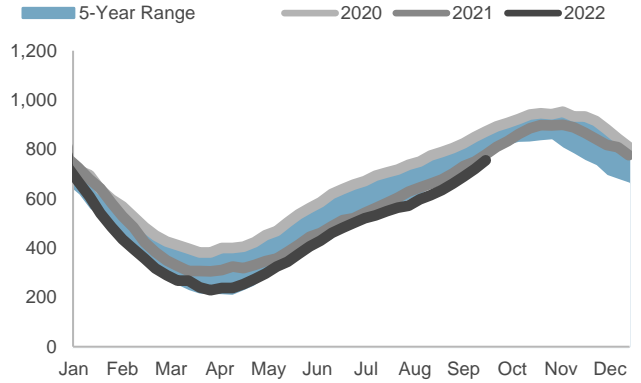
Note: Data collected on a monthly basis and subject to irregular updates.

Natural Gas Storage (Bcf)

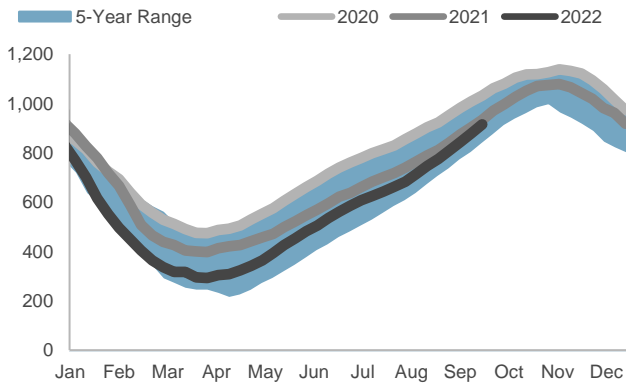
Total U.S.



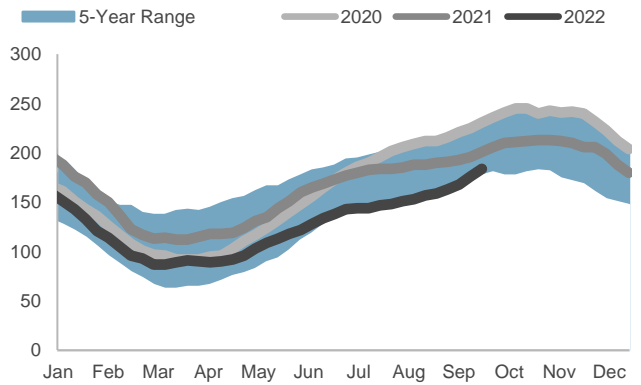
East



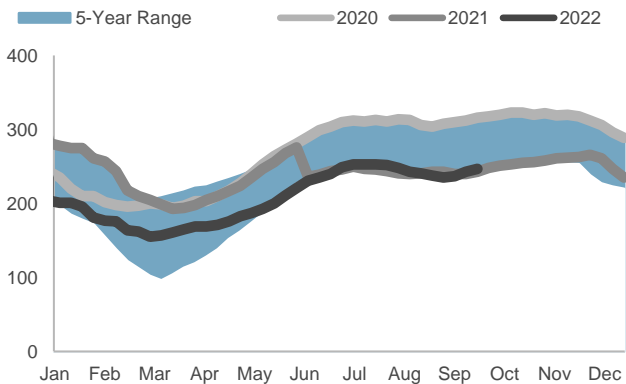
Midwest



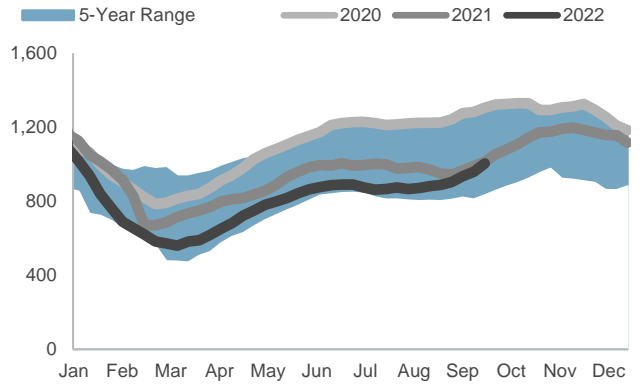
Mountain



Pacific

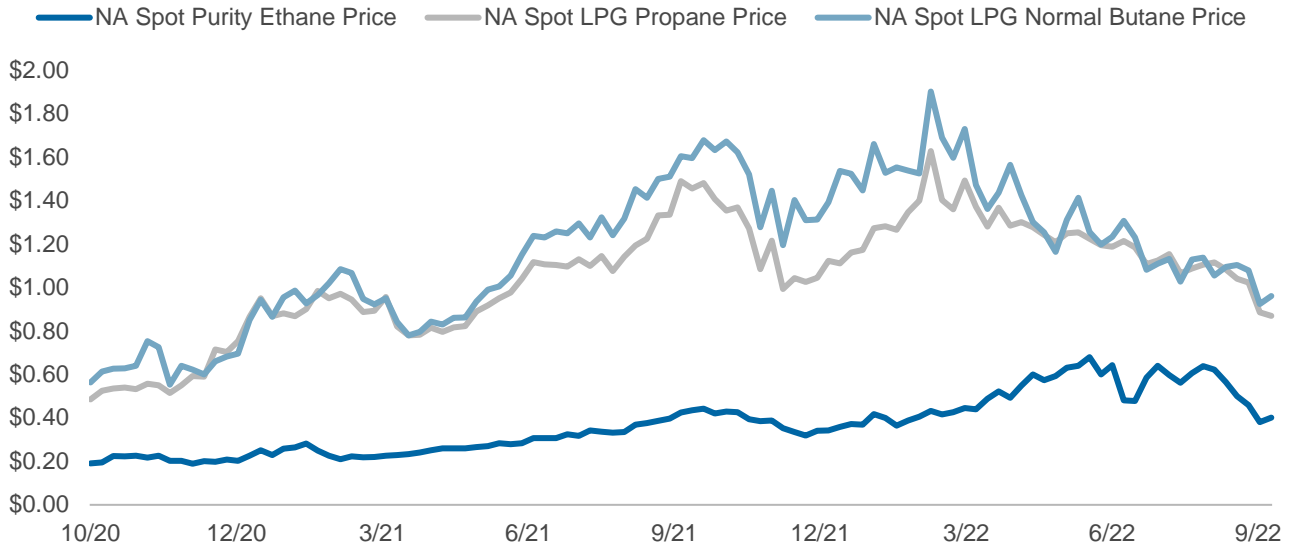


South Central



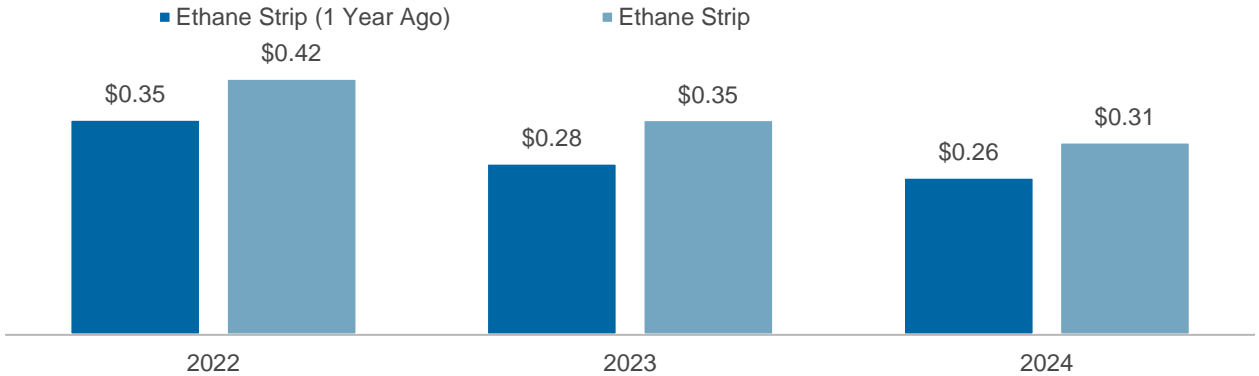
NGLs Spot Pricing

Pricing (\$/gal)

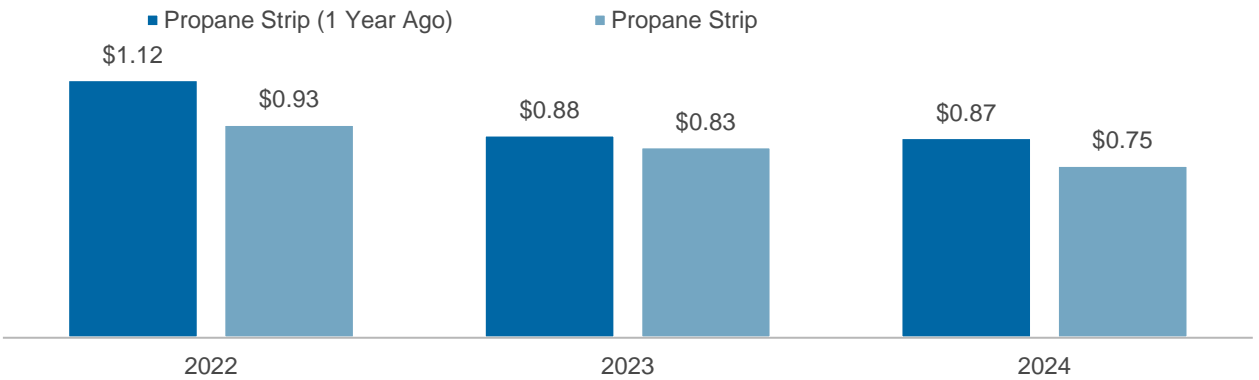


NGLs Strip Pricing

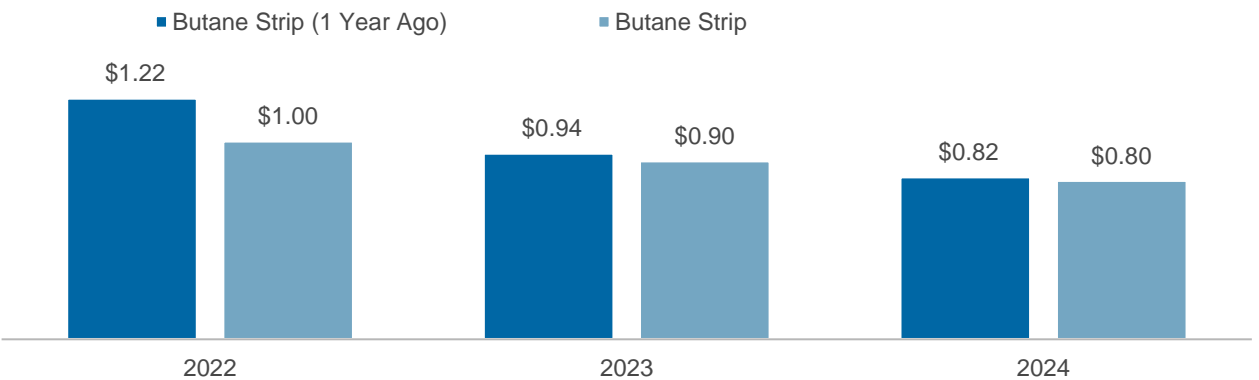
Ethane Strip Pricing Comparison (\$/gal)



Propane Strip Pricing Comparison (\$/gal)

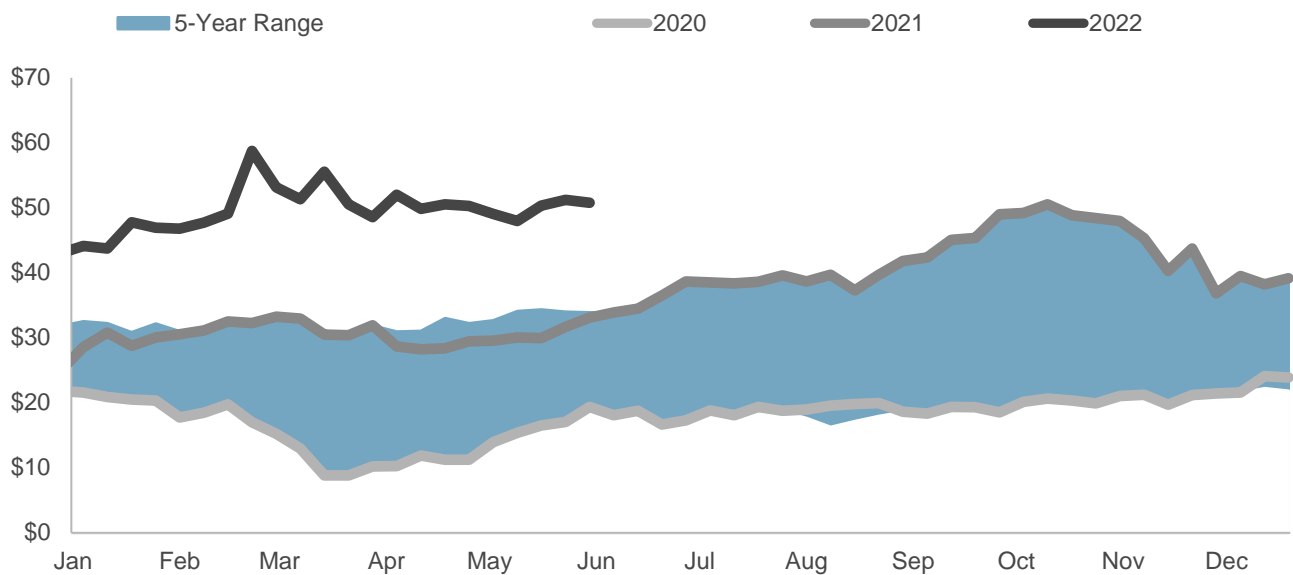


Butane Strip Pricing Comparison (\$/gal)



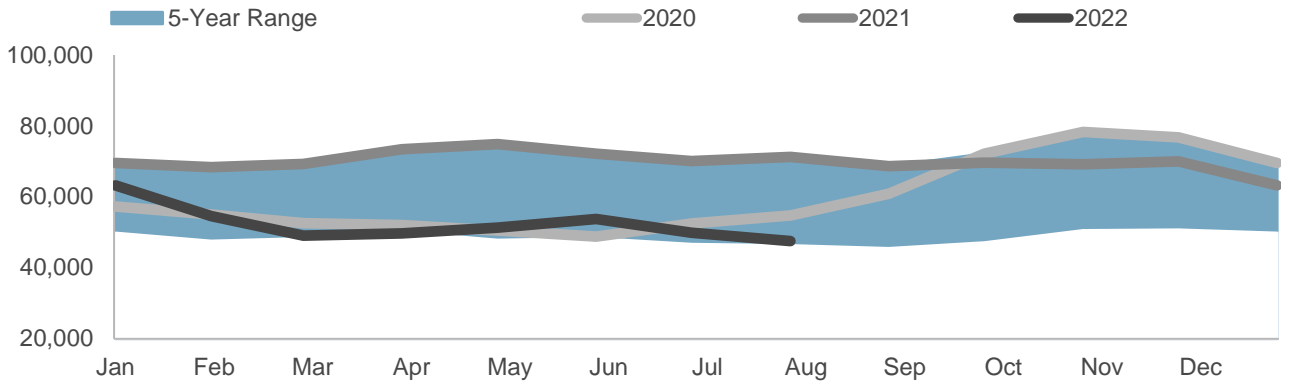
NGLs Frac Spreads

Mont Belvieu Frac Spread (\$/bbl)

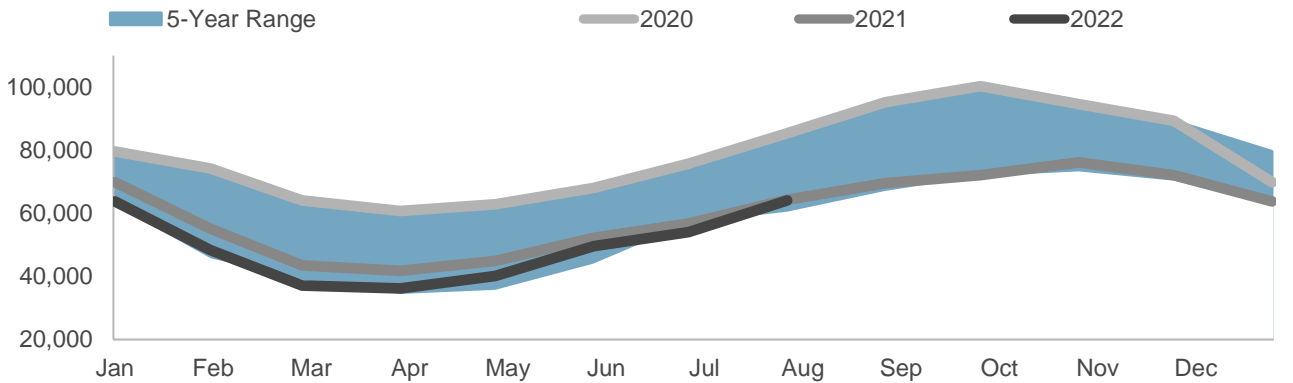


NGLs Inventory

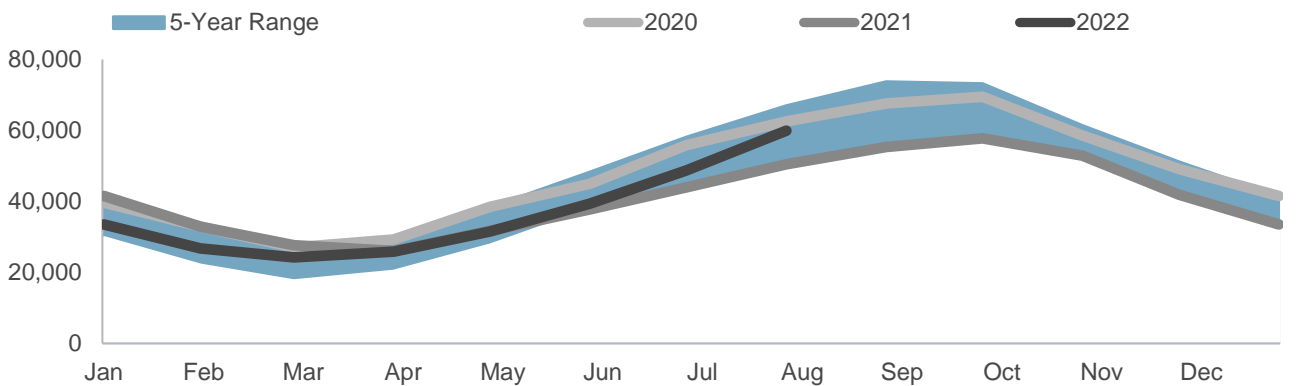
U.S. Ending Stocks Ethane (Mbbbls)



U.S. Ending Stocks Propane (Mbbbls)

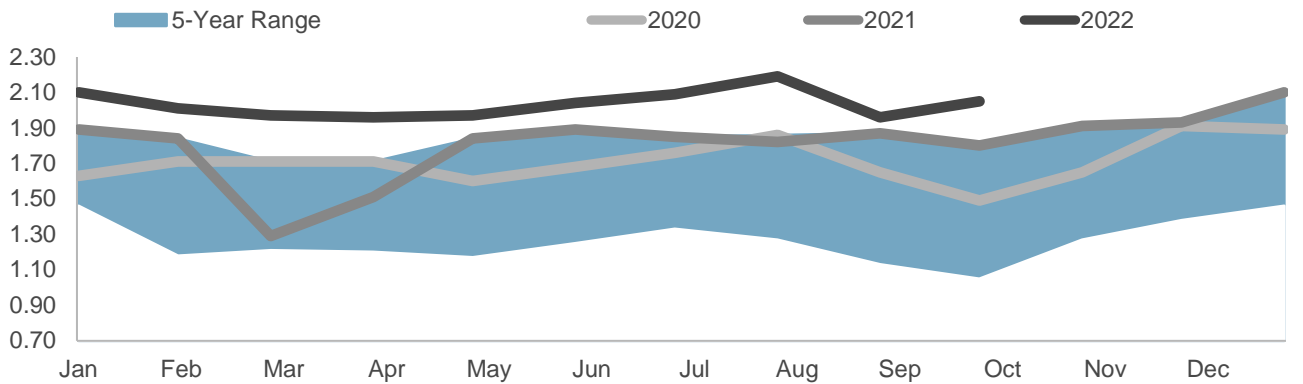


Normal Butane/Butylene (Mbbbls)

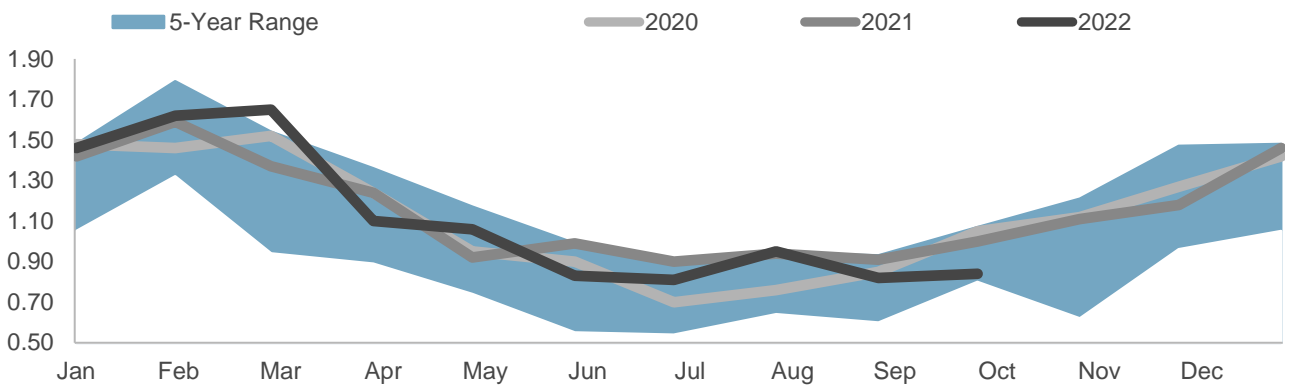


NGLs Consumption

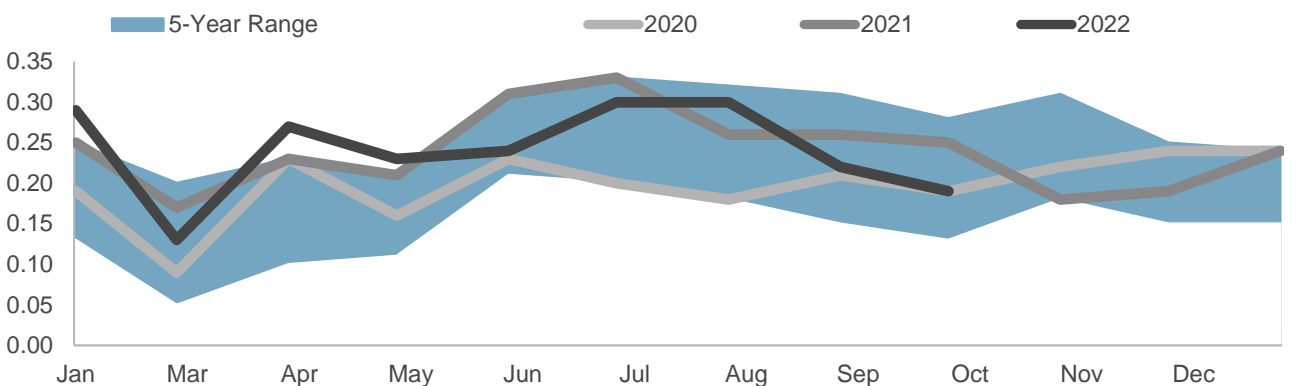
U.S. Ethane/Ethylene Consumption (MMboe/d)



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



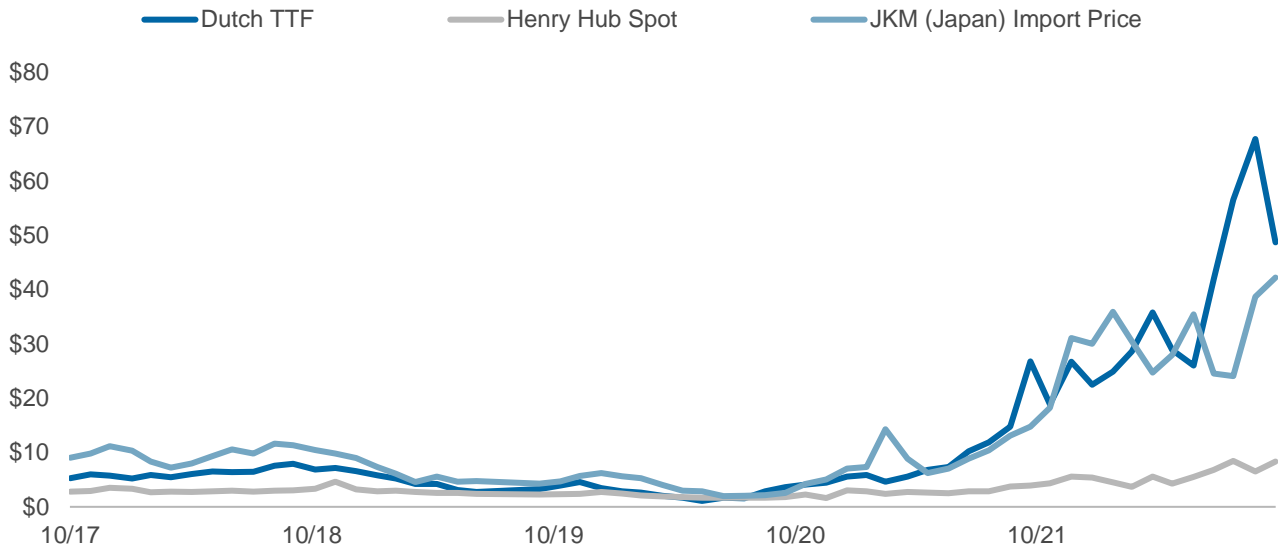
U.S. Butane/Butylene Consumption (MMboe/d)



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Spot Pricing

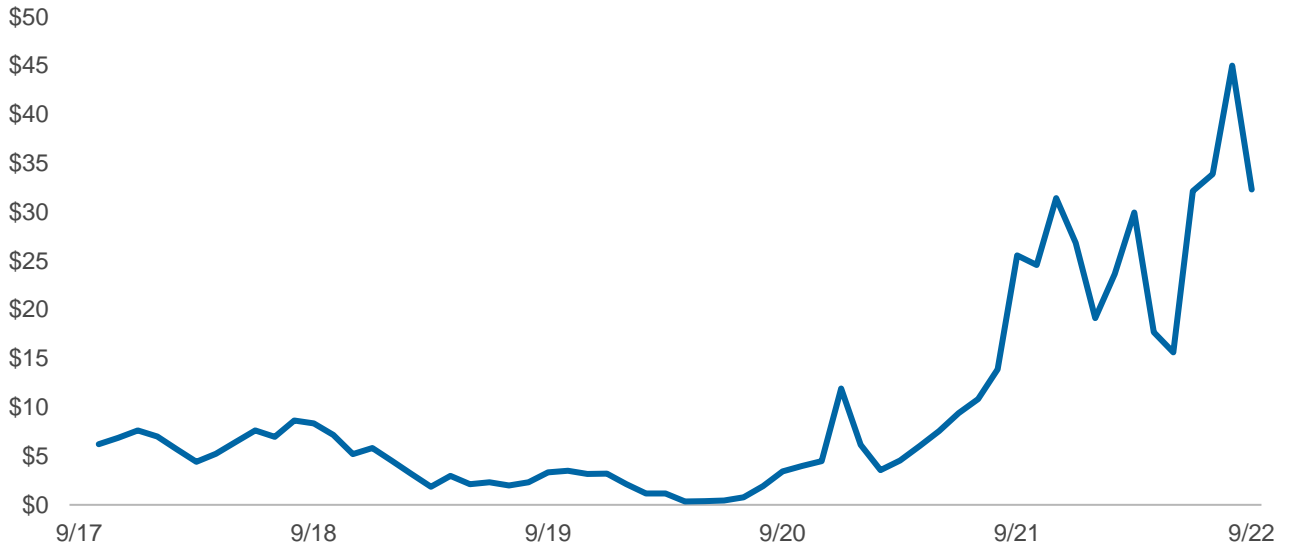
Spot Pricing (\$/MMbtu)



Notes: All data as of September 30, 2022. Data collected on a monthly basis.
JKM refers to Japan Korea Marker.
Dutch TTF refers to Dutch Title Transfer Facility.
Source: Bloomberg.

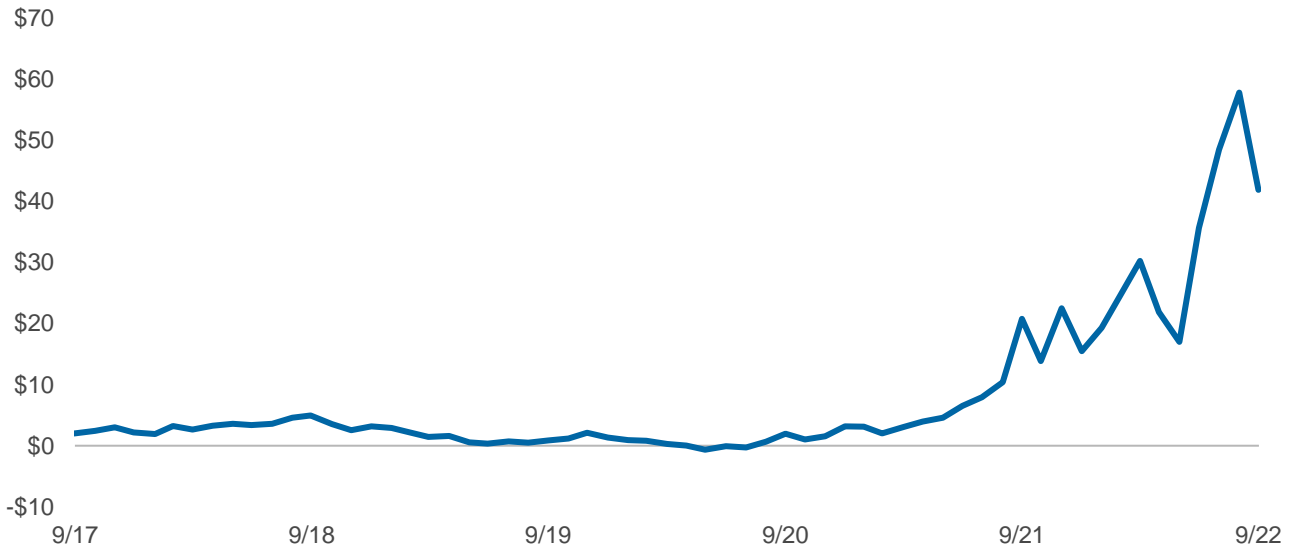
Differentials

JKM—Henry Hub (\$/MMbtu)



Note: Data collected on a monthly basis.

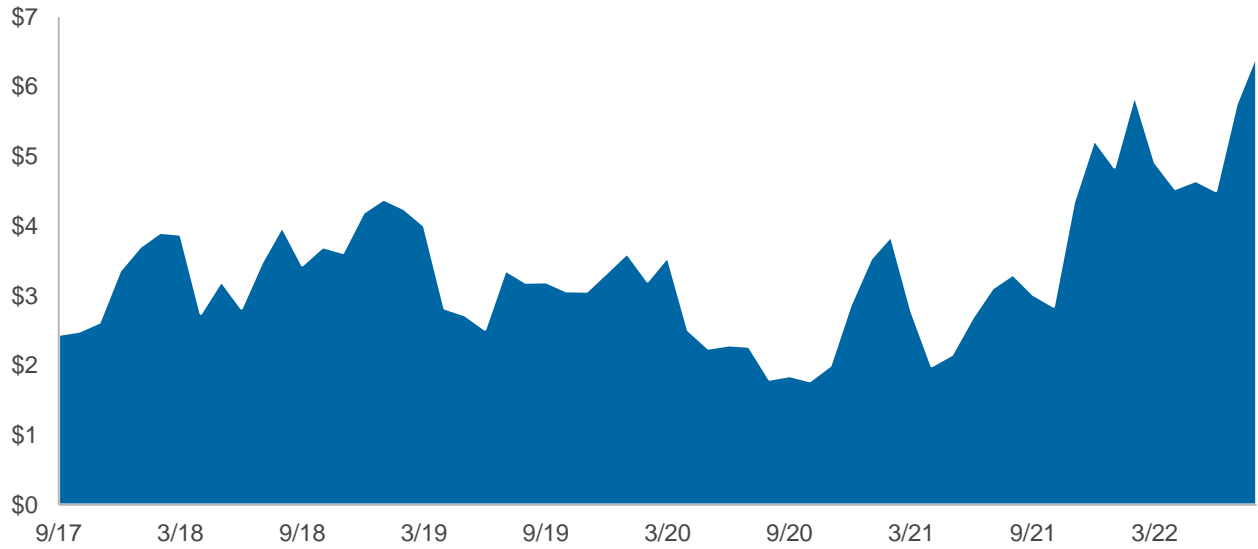
Dutch TTF—Henry Hub (\$/MMbtu)



Note: Data collected on a weekly basis.

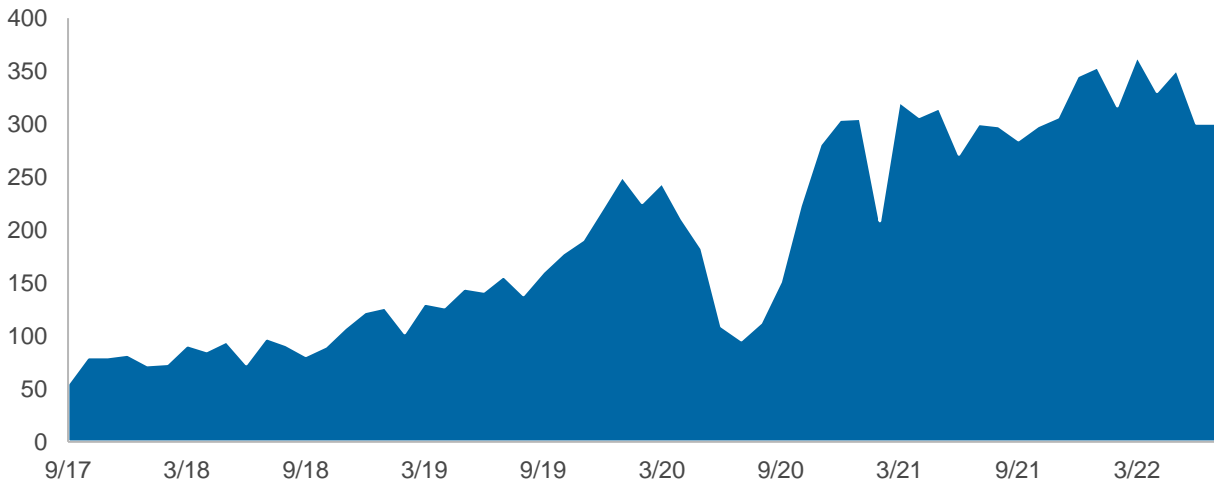
Exports

LNG Japan Import Value (US\$ in billions)



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

U.S. LNG Exports (Bcf/month)

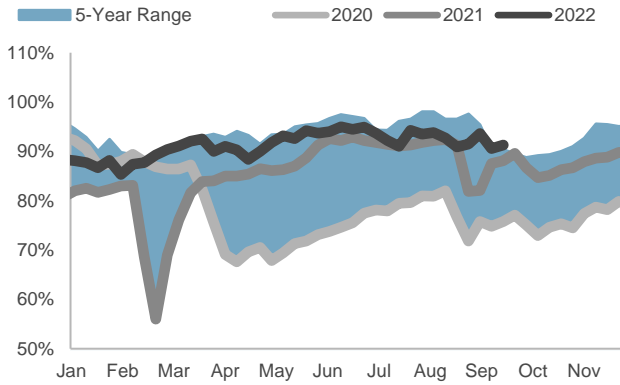


Note: Data collected on a monthly basis and subject to a two-month lag.

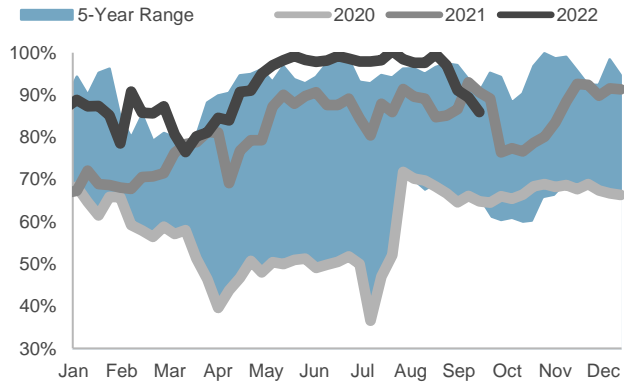
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Refining—Utilization (%)

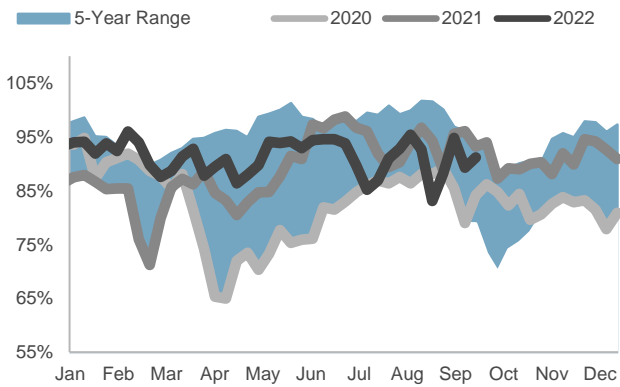
Total U.S.



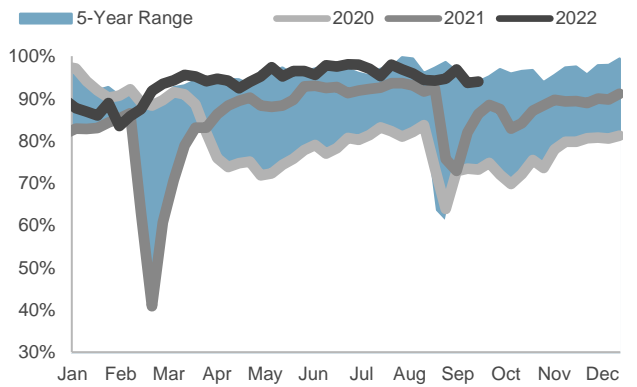
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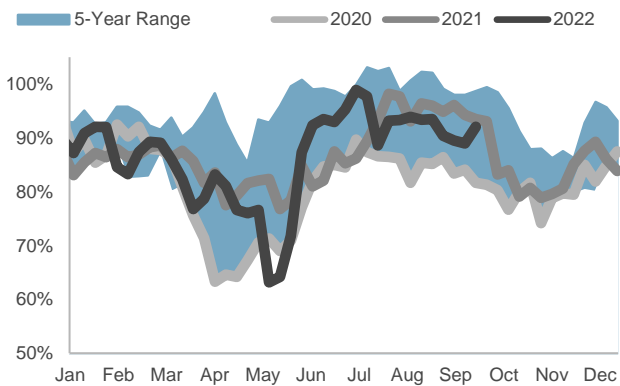
PADD II



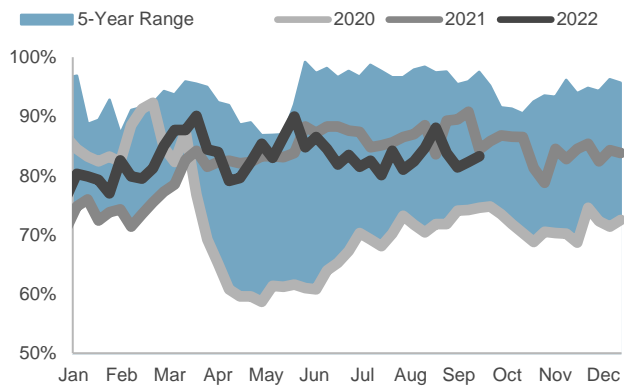
PADD III



PADD IV

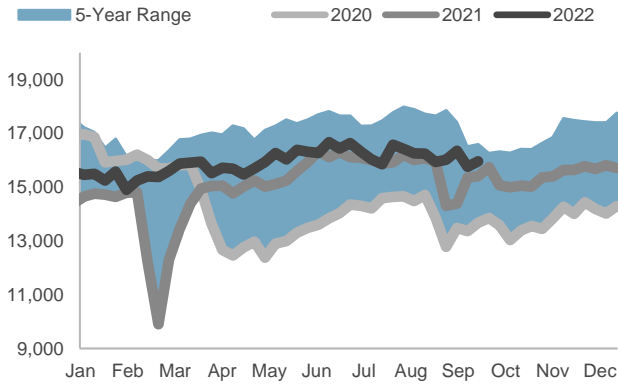


PADD V

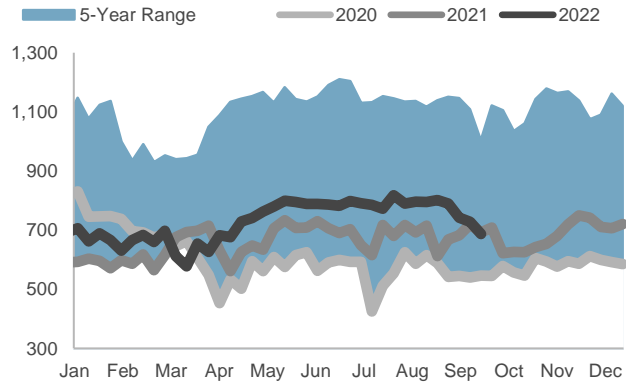


Refining—U.S. Crude Runs (Mbb/d)

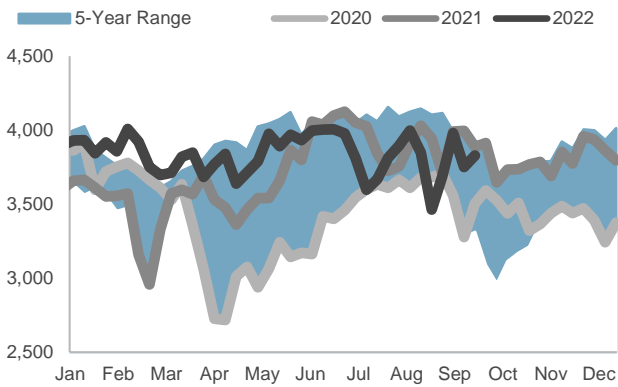
Total U.S.



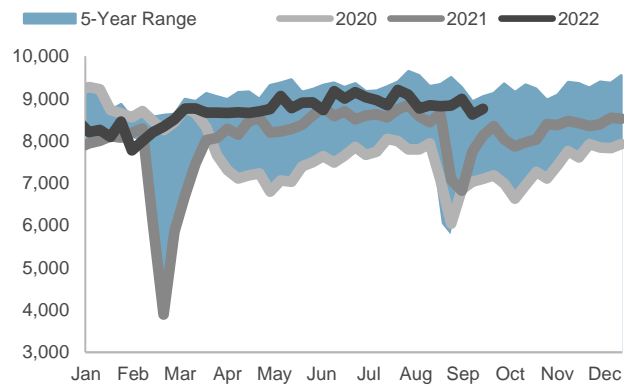
PADD I



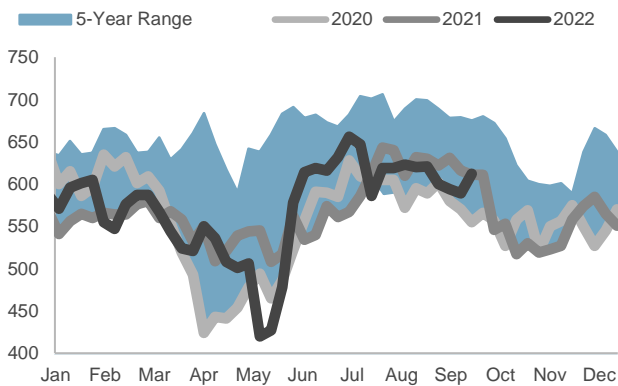
PADD II



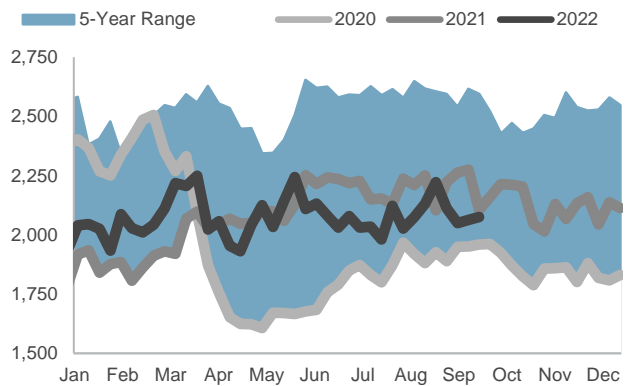
PADD III



PADD IV

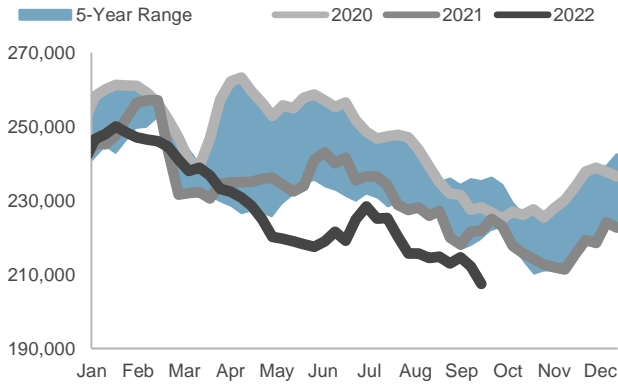


PADD V

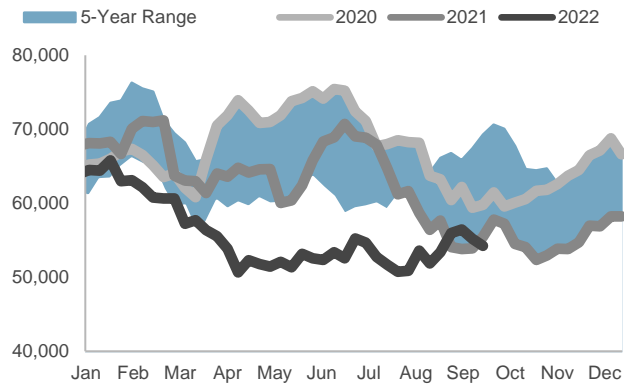


Refining—Motor Gasoline Inventory (Mbbl)

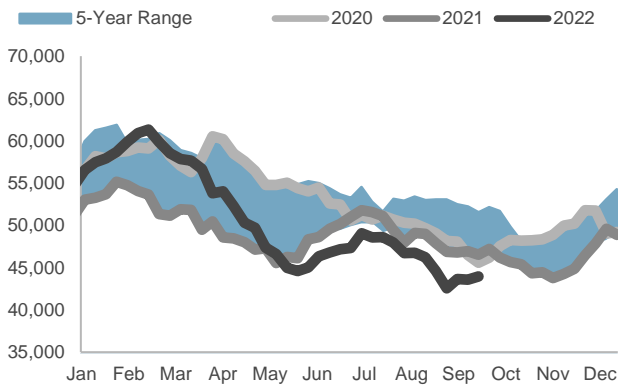
Total U.S.



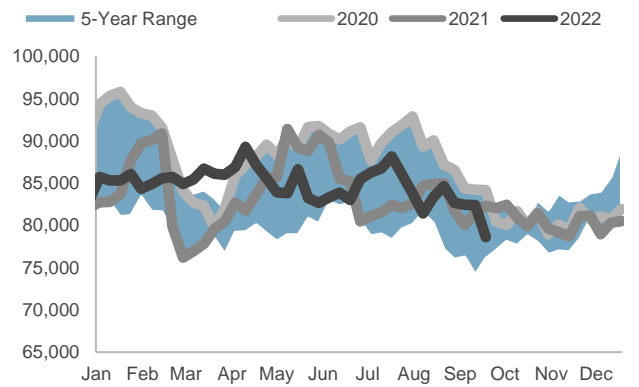
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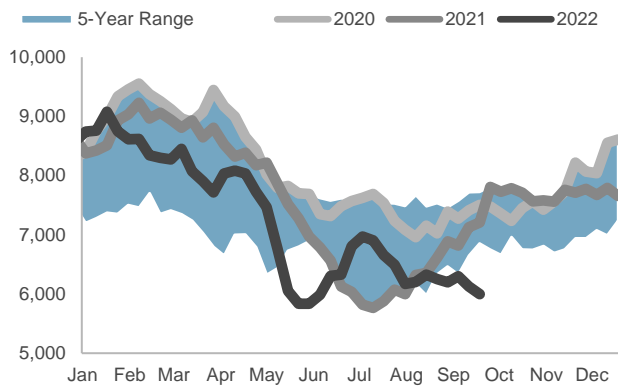
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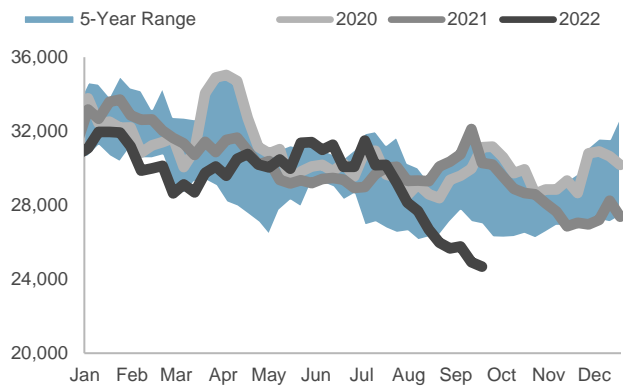
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PADD IV

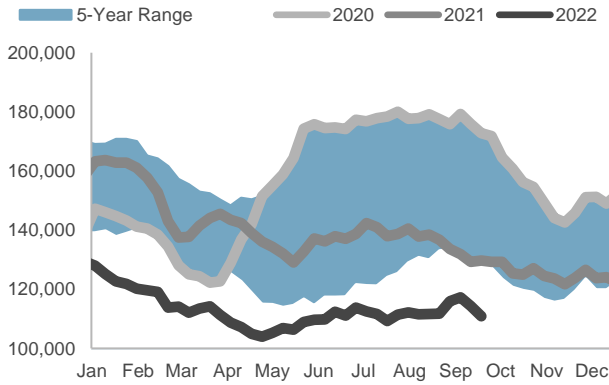


PADD V

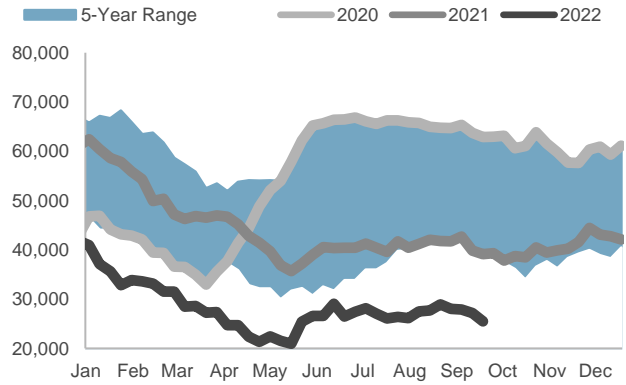


Refining—Distillate Fuel Oil Inventory (Mbbl)

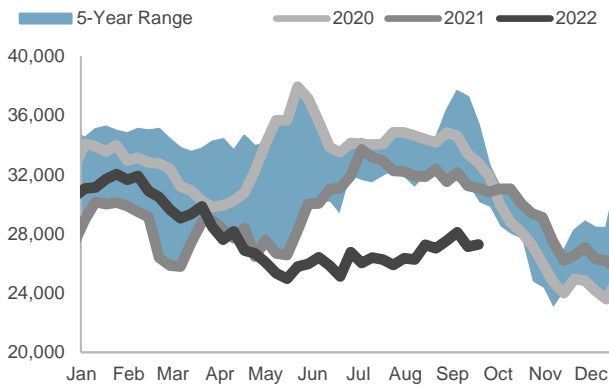
Total U.S.



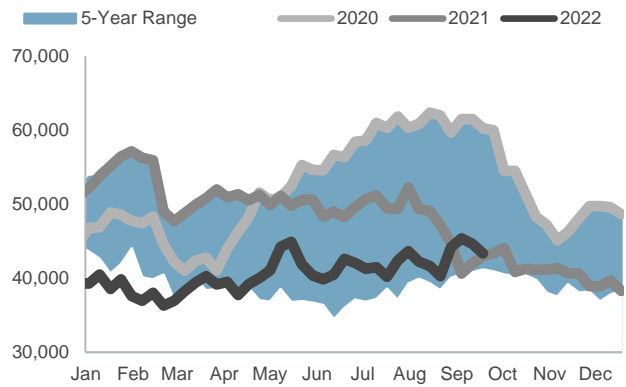
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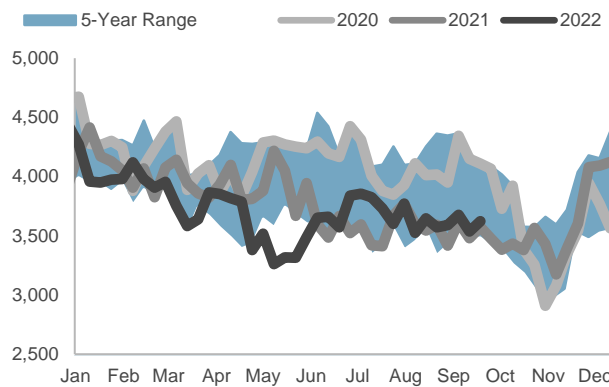
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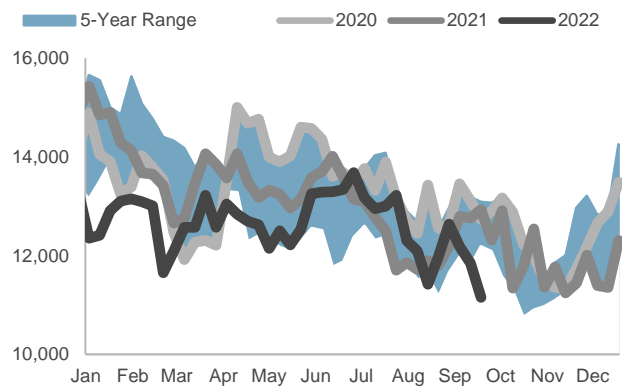
PADD III



PADD IV

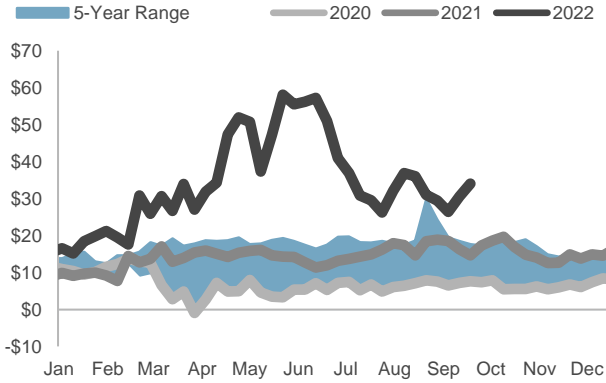


PADD V

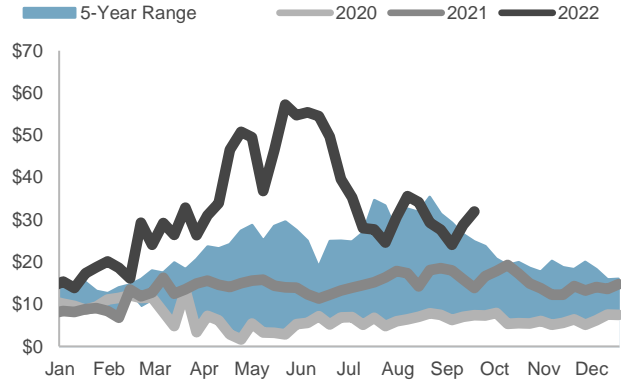


Refining—3:2:1 Crack Spreads (\$/bbl)

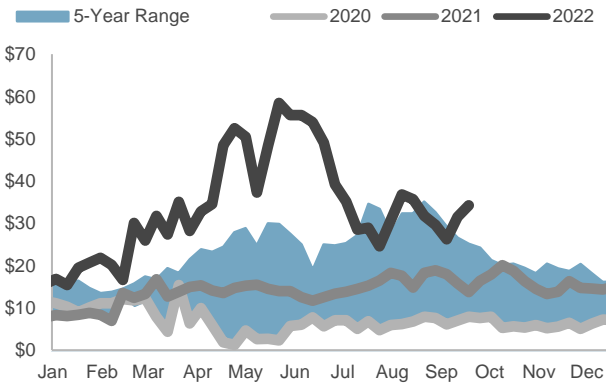
WTI Cushing (U.S. Gulf Coast)



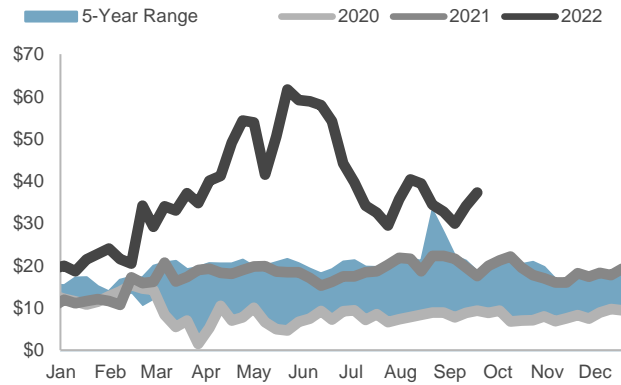
WTI Midland (U.S. Gulf Coast)



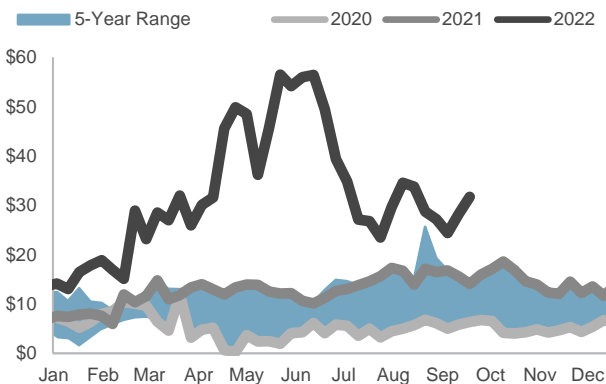
WTS Midland (U.S. Gulf Coast)



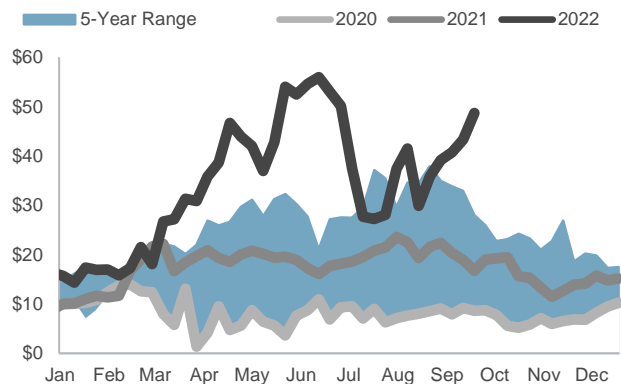
WTI Cushing ULSD (U.S. Gulf Coast)



LLS (U.S. Gulf Coast)

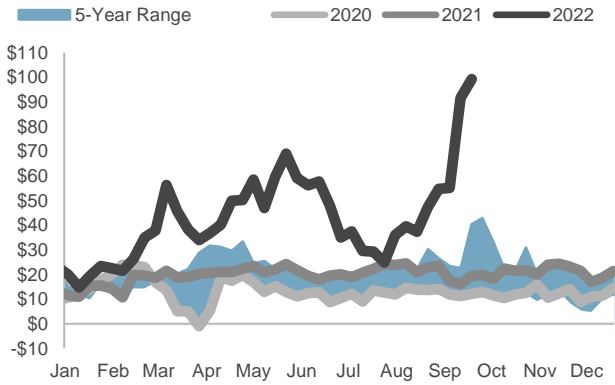


WTI Midland ULSD (U.S. Mid-Continent)

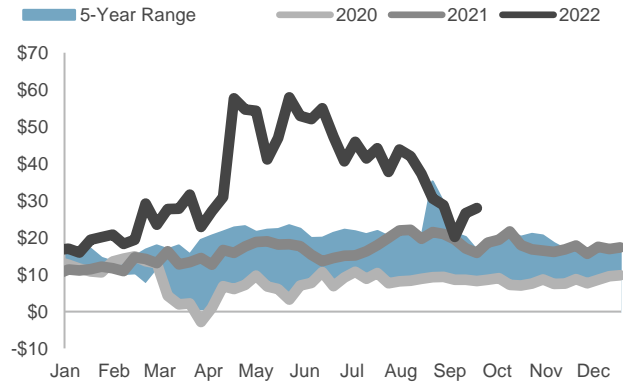


Refining—3:2:1 Crack Spreads (\$/bbl) (cont.)

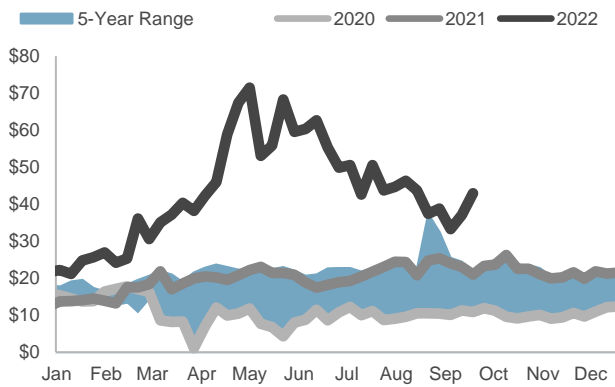
ANS (U.S. West Coast)



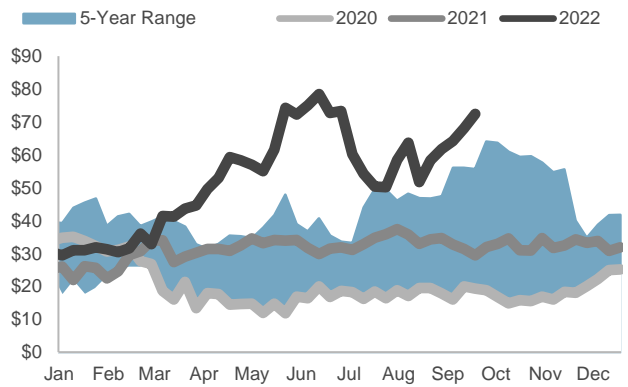
WTI Cushing (NYH RBOB Gasoline)



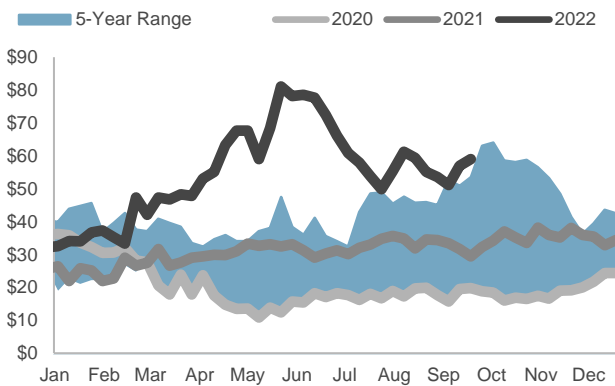
WTI Cushing ULSD (NY Harbor)



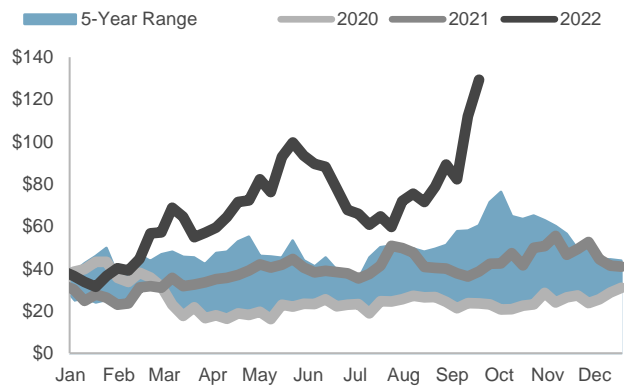
WCS (U.S. Mid-Continent)



WCS (U.S. Gulf Coast)

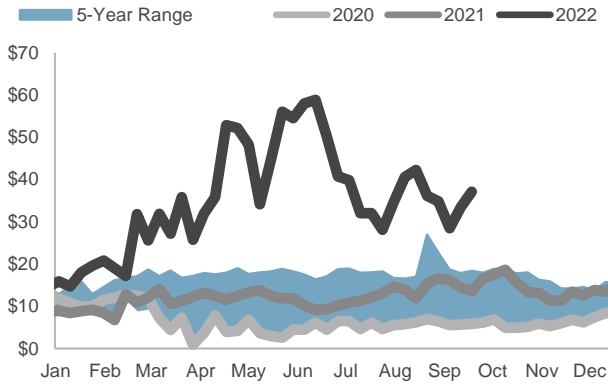


WCS (San Francisco)

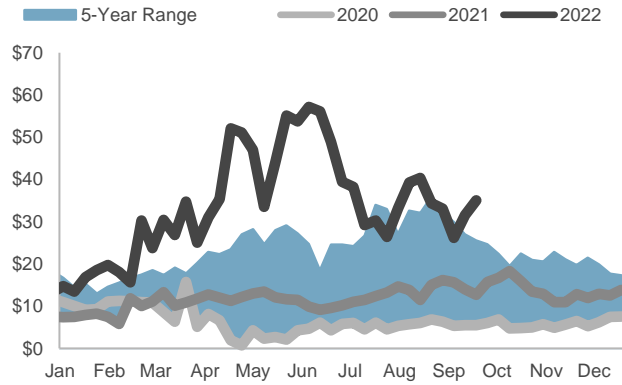


Refining—2:1:1 Crack Spreads (\$/bbl)

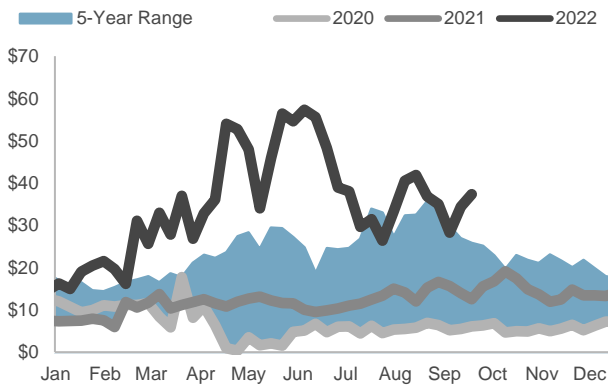
WTI Cushing (U.S. Gulf Coast)



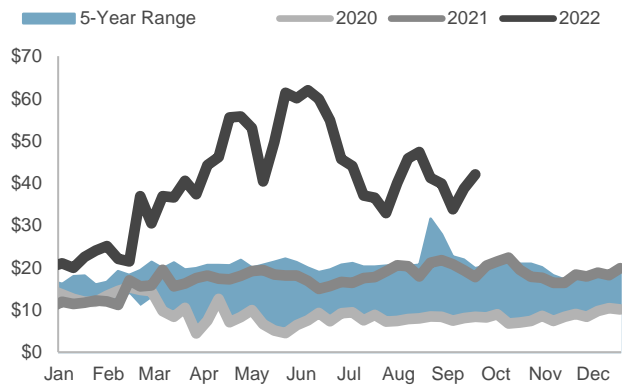
WTI Midland (U.S. Mid-Continent)



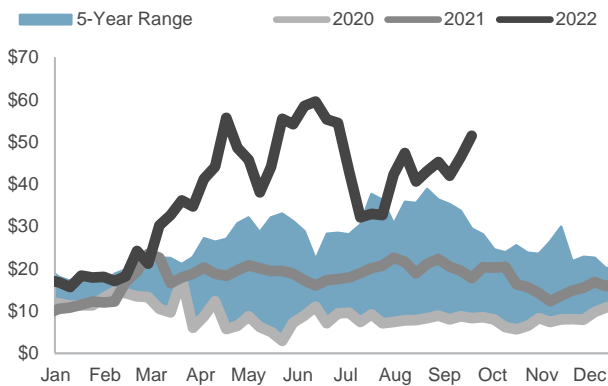
WTS Midland Crude (U.S. Gulf Coast)



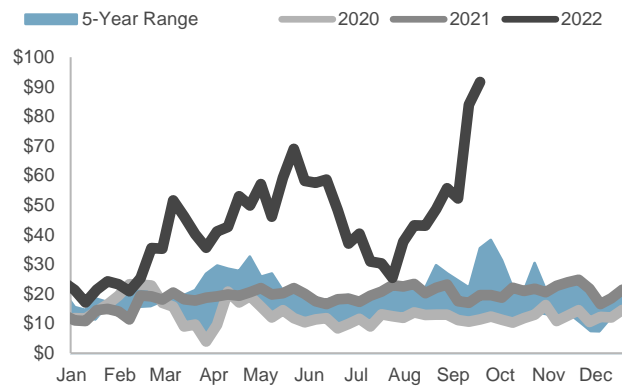
WTI Cushing ULSD (U.S. Gulf Coast)



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



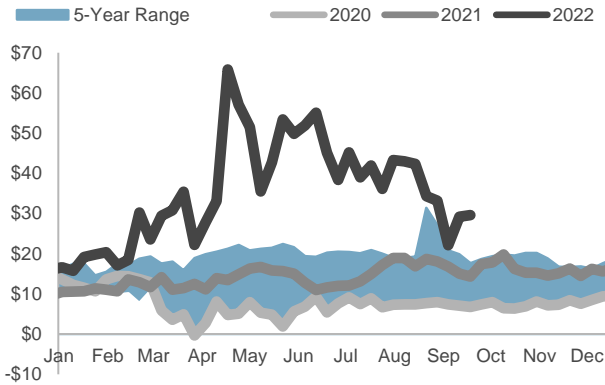
ANS (U.S. West Coast)



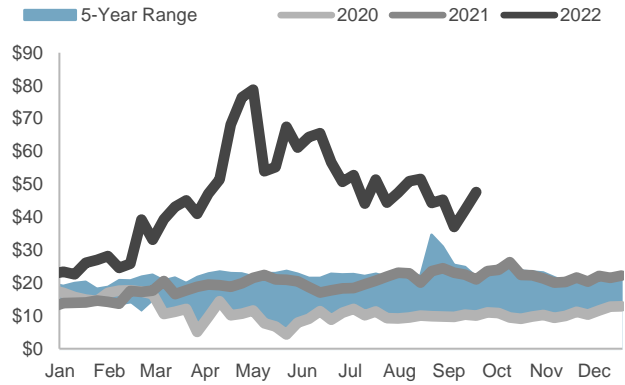
Notes: All data as of September 30, 2022. Data collected on a weekly basis. Source: Bloomberg.

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

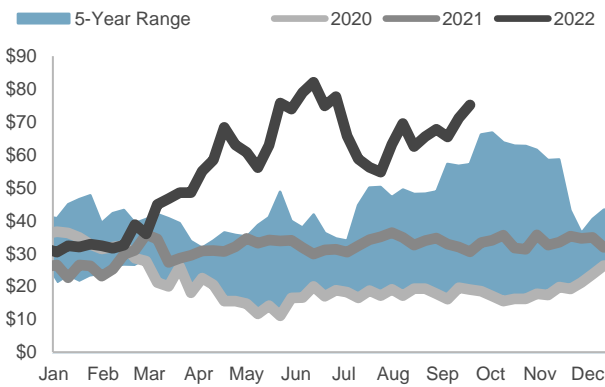
WTI Cushing (NYH RBOB Gasoline)



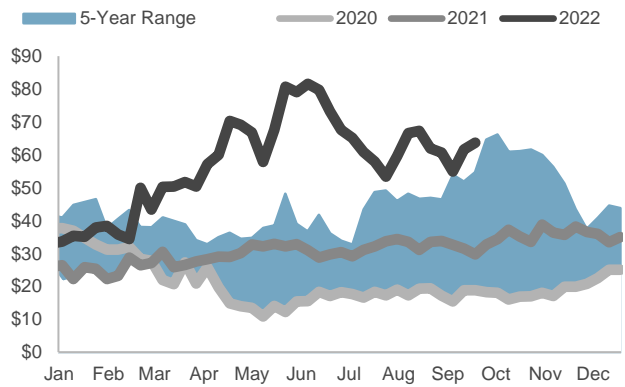
WTI Cushing ULSD (NY Harbor)



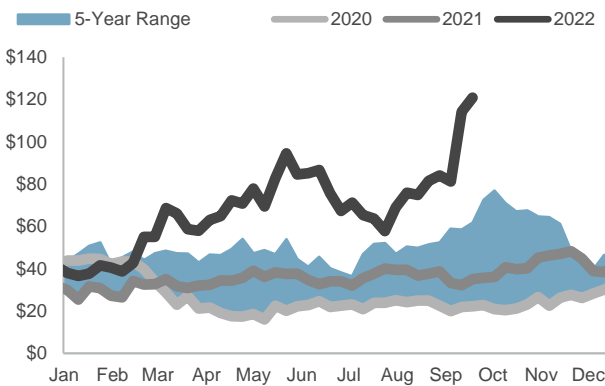
WCS (U.S. Mid-Continent)



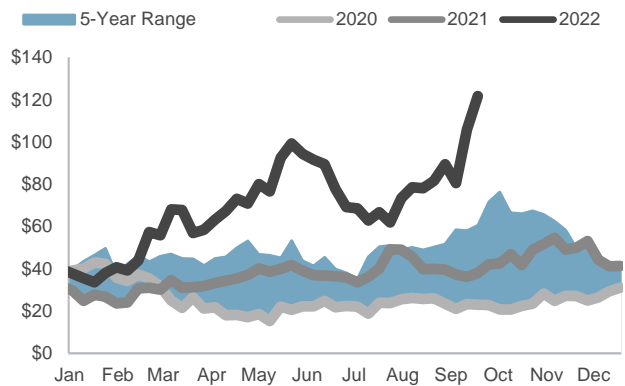
WCS (U.S. Gulf Coast)



WCS (U.S. West Coast)



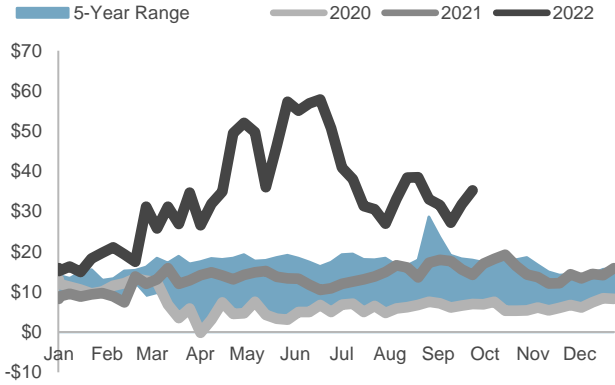
WCS (San Francisco)



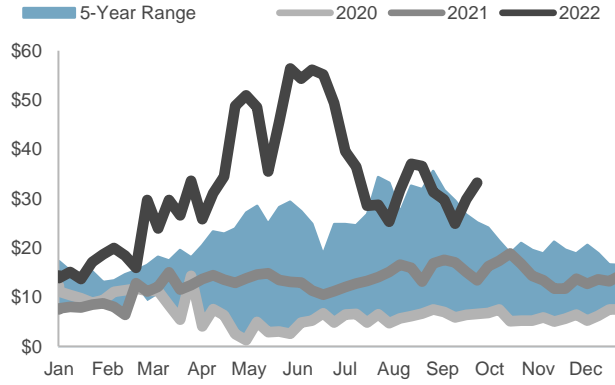
Notes: All data as of September 30, 2022. Data collected on a weekly basis. Source: Bloomberg.

Refining—5:3:2 Crack Spreads (\$/bbl)

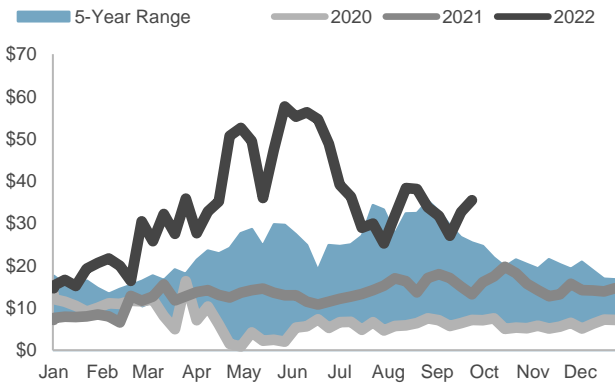
WTI Cushing (U.S. Gulf Coast)



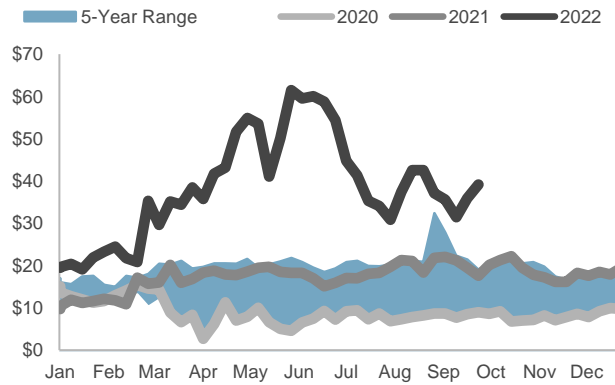
WTI Midland (U.S. Gulf Coast)



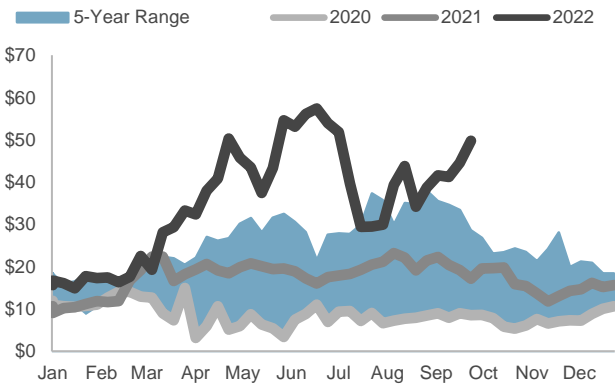
WTS (U.S. Gulf Coast)



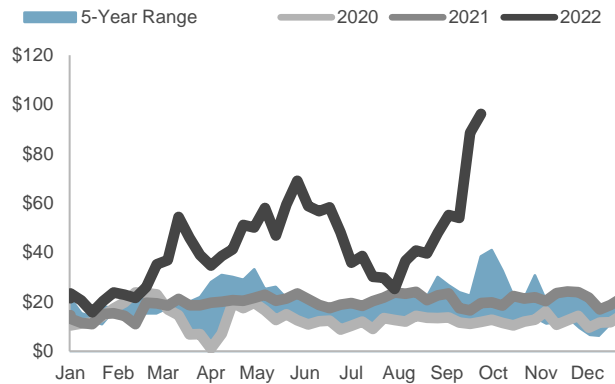
WTI Cushing ULSD (U.S. Gulf Coast)



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

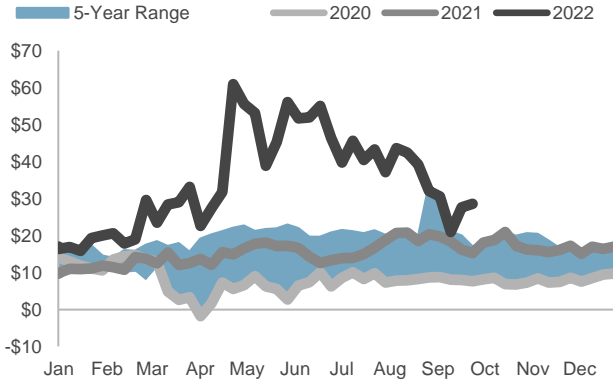


ANS (U.S. West Coast)

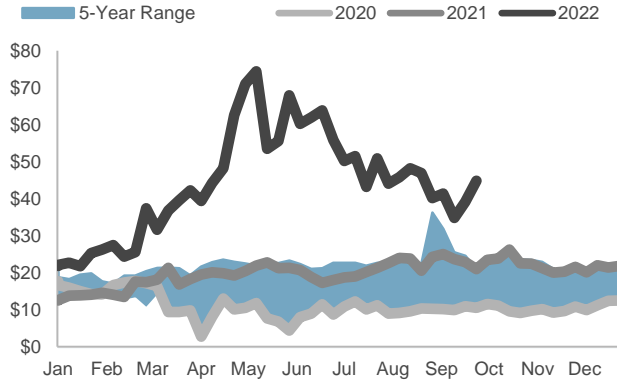


Refining—5:3:2 Crack Spreads (\$/bbl) (cont.)

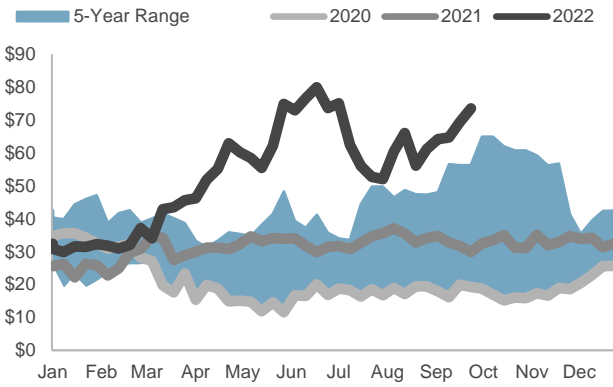
WTI Cushing (NYH RBOB Gasoline)



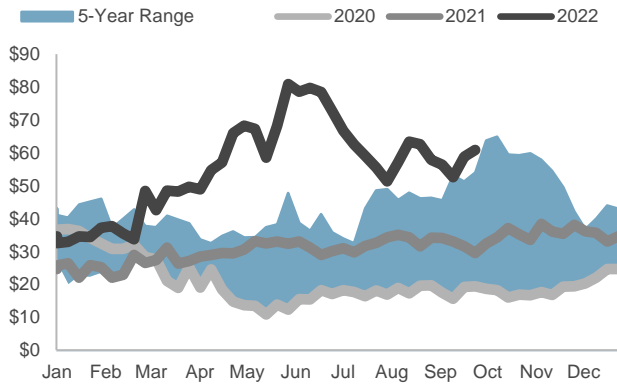
WTI Cushing ULSD (NY Harbor)



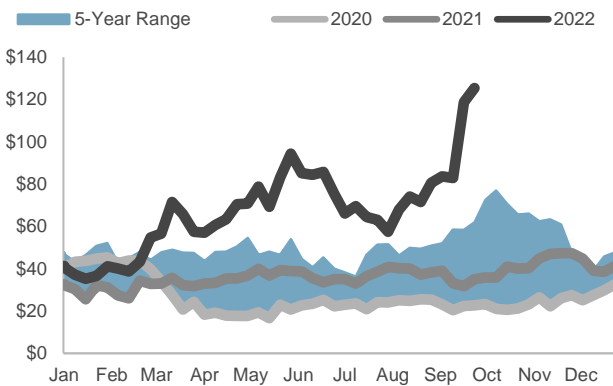
WCS (U.S. Mid-Continent)



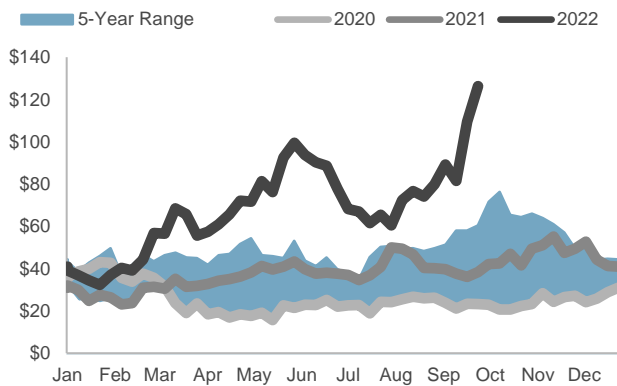
WCS (U.S. Gulf Coast)



WCS (U.S. West Coast)



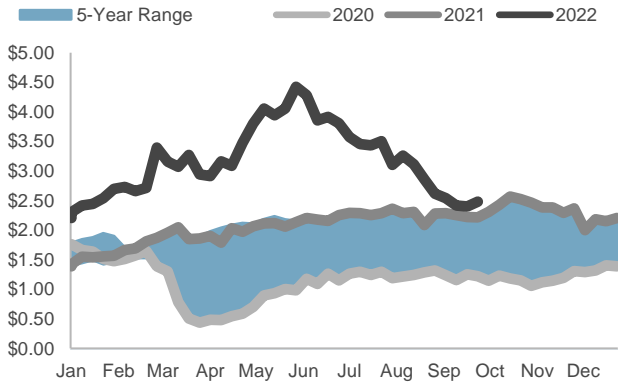
WCS (San Francisco)



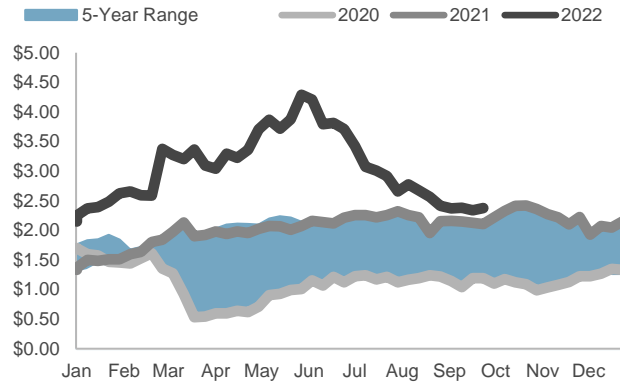
Notes: All data as of September 30, 2022. Data collected on a weekly basis. Source: Bloomberg.

Refining—Product Prices (\$/gal)

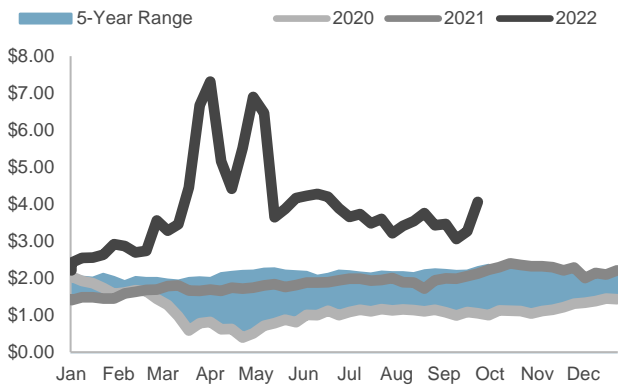
84 RBOB Gasoline (NY Harbor)



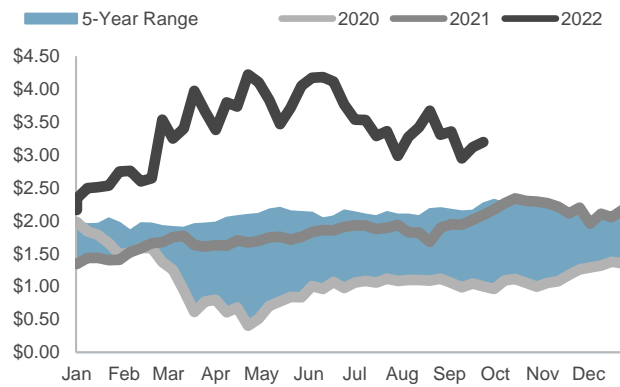
84 RBOB Gasoline (U.S. Gulf Coast)



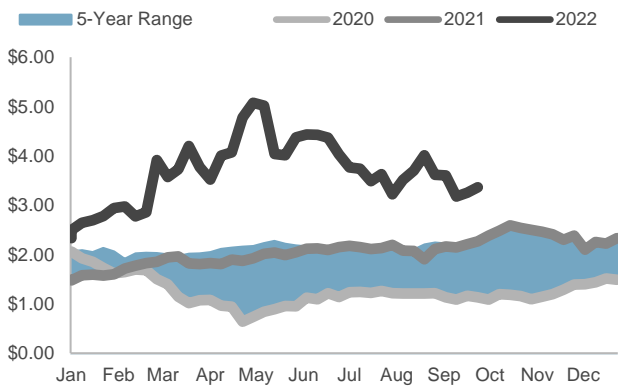
54-Grade Jet Fuel (NY Harbor)



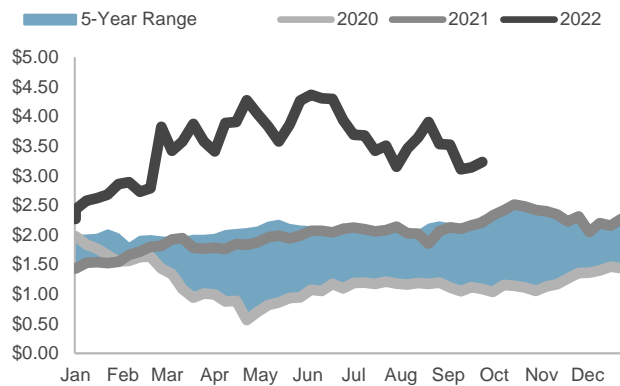
54-Grade Jet Fuel (U.S. Gulf Coast)



ULSD (NY Harbor)



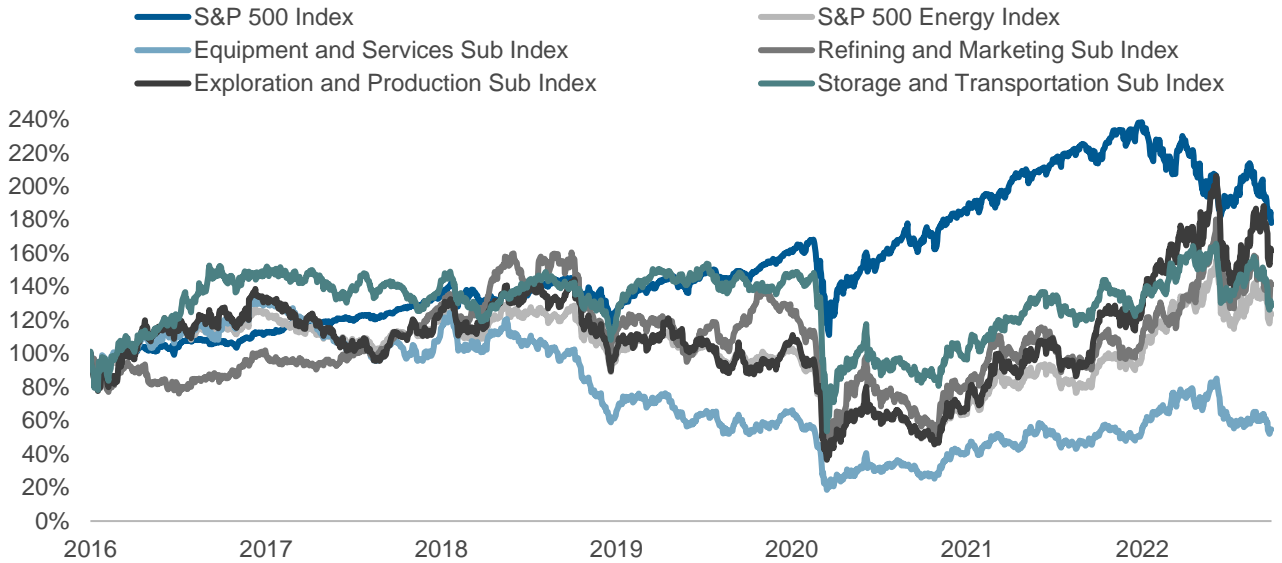
ULSD (U.S. Gulf Coast)



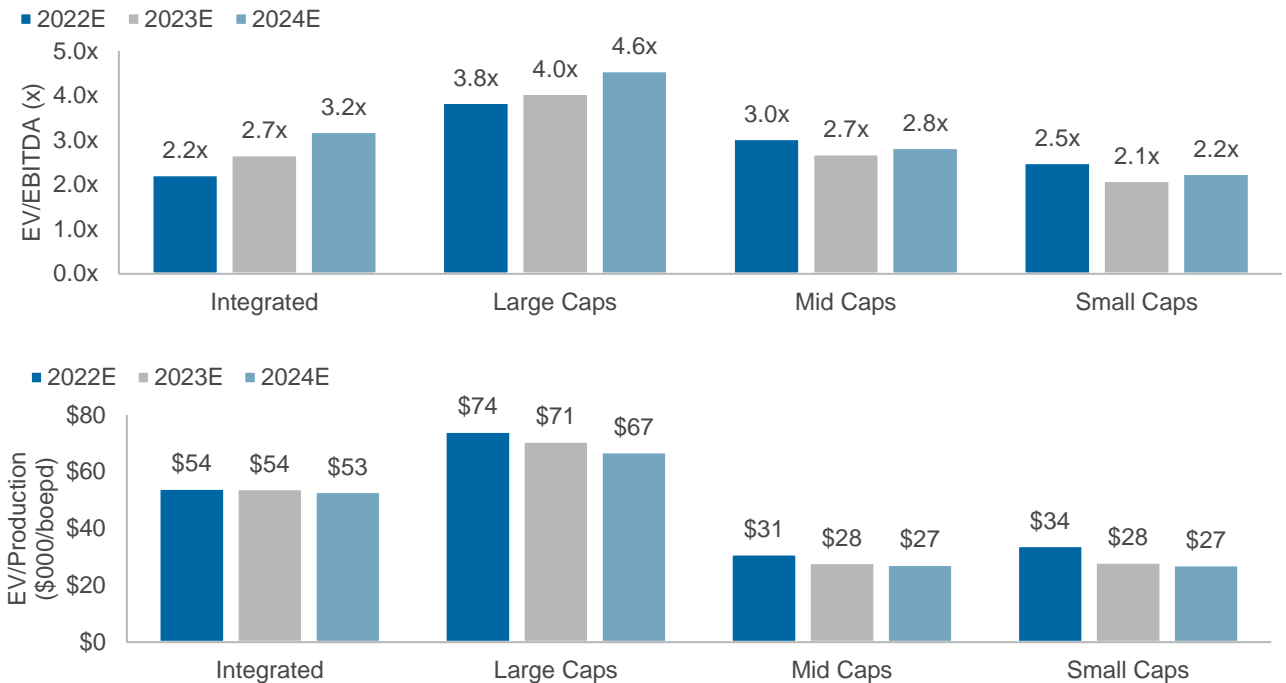
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8. Rigs	66

Public Markets Overview

Indexed Stock Price Performance (January 1, 2016 = 100%)



Public E&P Company Trading Metrics



Note: Trading multiples are based on share price and market data listed as of September 30, 2022, and broker consensus future earnings estimates from S&P Capital IQ as of September 30, 2022.
Source: S&P Capital IQ.

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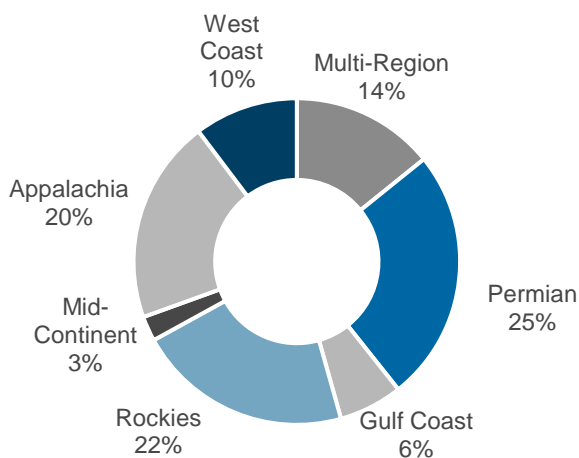
M&A (\$ in billions)

U.S. Region	2020	2021	YTD September		%Δ
			2021	2022	
Multi-Region	\$21.5	\$15.8	\$15.5	\$5.8	-63%
Permian	24.2	26.5	21.5	10.2	-52%
Gulf Coast	0.4	2.4	2.2	2.6	17%
Rockies	0.8	7.7	6.8	8.7	28%
Mid-Continent	0.6	1.1	0.4	1.0	171%
Appalachia	3.3	4.0	3.7	8.3	126%
Ark-La-Tex	0.4	8.1	5.7	0.3	-96%
Gulf of Mexico	1.0	1.2	1.2	1.3	5%
West Coast	0.0	0.2	0.2	4.2	NMF
Alaska	0.0	0.0	0.0	0.0	NMF
Total	\$52.4	\$66.9	\$57.1	\$42.3	-26%

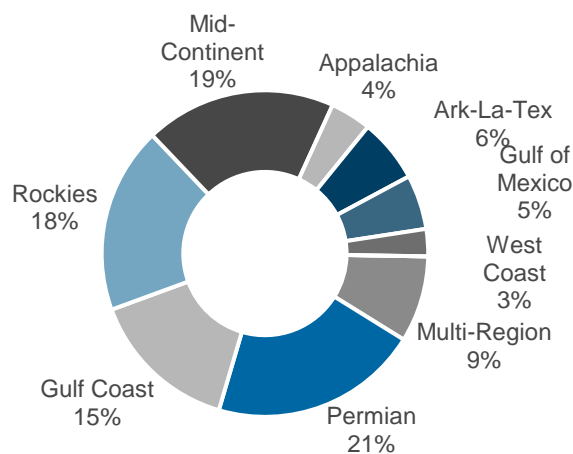
M&A (Deal Count)

U.S. Region	2020	2021	YTD September		%Δ
			2021	2022	
Multi-Region	45	43	34	19	-44%
Permian	120	141	113	46	-59%
Gulf Coast	53	52	40	33	-18%
Rockies	46	67	56	41	-27%
Mid-Continent	67	102	74	42	-43%
Appalachia	39	28	22	9	-59%
Ark-La-Tex	20	32	25	14	-44%
Gulf of Mexico	8	10	10	12	20%
West Coast	9	6	5	6	20%
Alaska	6	5	4	0	-100%
Total	413	486	383	222	-42%

M&A—2022 (\$ in billions)



M&A—2022 (Deal Count)

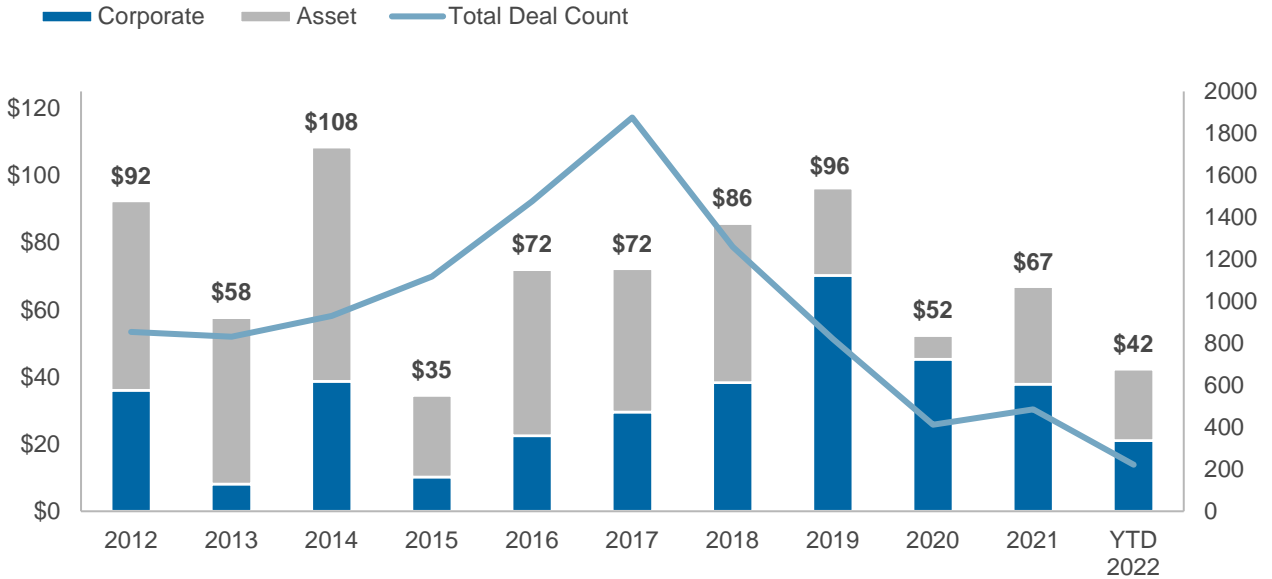


Note: All data as of September 30, 2022.

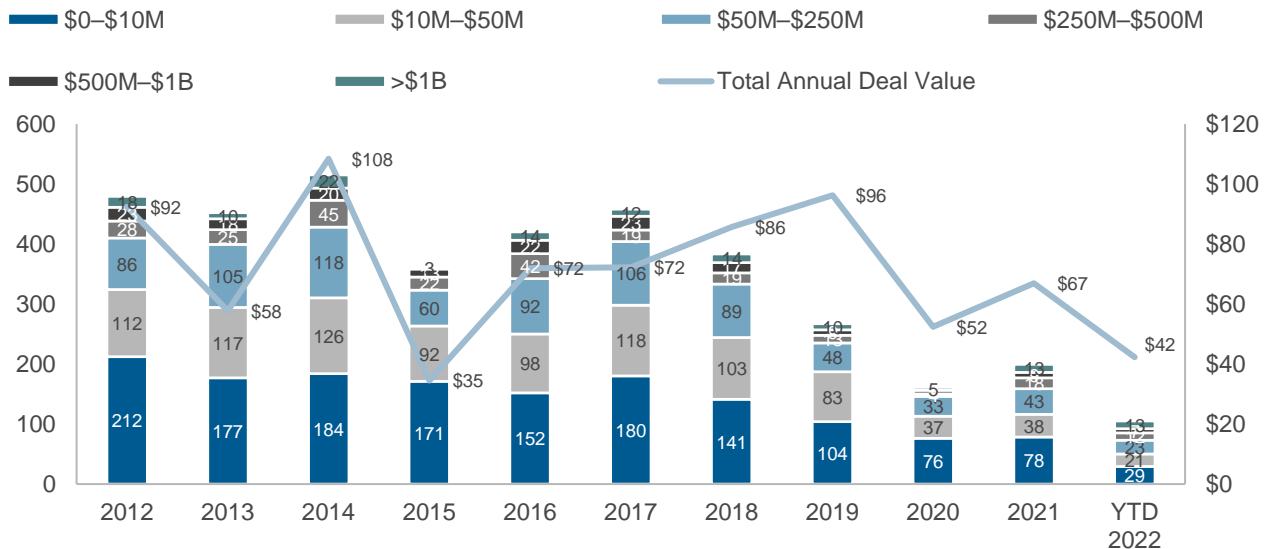
Source: Enverus based on selection criteria of seller assets being located in the U.S. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available.

Historical E&P Transaction Activity

U.S. Transactions Since 2012 (\$ in billions)



U.S. Transactions by Deal Size Since 2012⁽¹⁾ (\$ in billions)



Note: All data as of September 30, 2022.

(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.

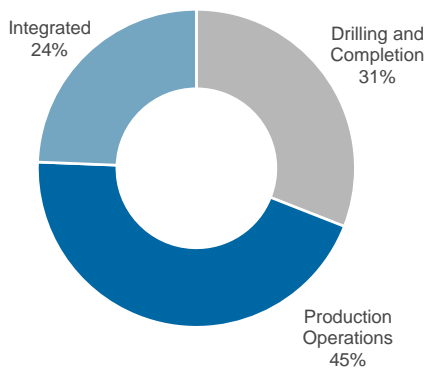
M&A (\$ in billions)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Drilling and Completion	\$0.2	\$0.8	\$0.2	\$0.2	31%
Production Operations	0.7	0.7	0.5	0.3	-35%
Information Services	0.0	0.0	0.0	0.0	NMF
Integrated	0.0	0.8	0.7	0.2	-75%
Other	0.0	0.0	0.0	0.0	NMF
Total	\$0.8	\$2.3	\$1.3	0.7	-48%

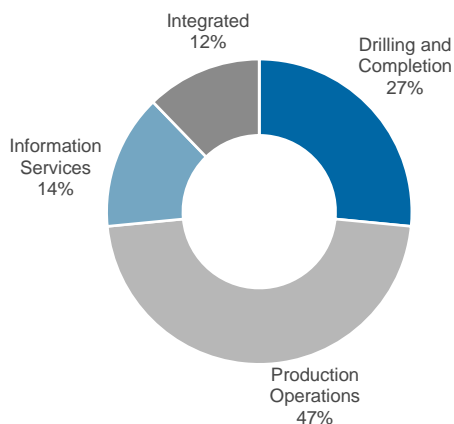
M&A (Deal Count)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Drilling and Completion	\$0.2	\$0.8	\$0.2	\$0.2	31%
Production Operations	0.7	0.7	0.5	0.3	-35%
Information Services	0.0	0.0	0.0	0.0	NMF
Integrated	0.0	0.8	0.7	0.2	-75%
Other	0.0	0.0	0.0	0.0	NMF
Total	\$0.8	\$2.3	\$1.3	0.7	-48%

M&A—2022 (\$ in billions)



M&A—2022 (Deal Count)



Downstream

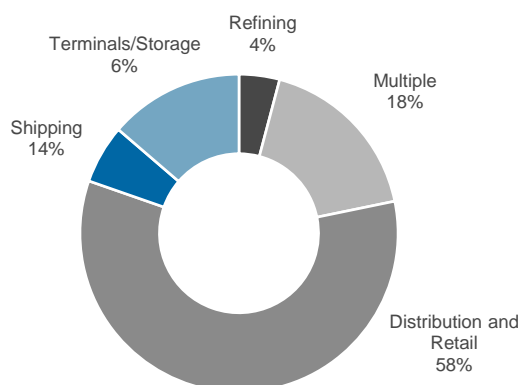
M&A (\$ in billions)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Refining	\$0.3	\$0.1	\$0.0	\$0.2	NMF
Multiple	0.7	4.4	4.4	1.1	-76%
Distribution and Retail	22.9	6.2	5.4	3.5	-35%
Terminals/Storage	4.2	1.5	1.4	0.4	-74%
Shipping	0.5	0.1	0.1	0.8	NMF
Total	\$28.7	\$12.2	\$11.3	\$6.0	-47%

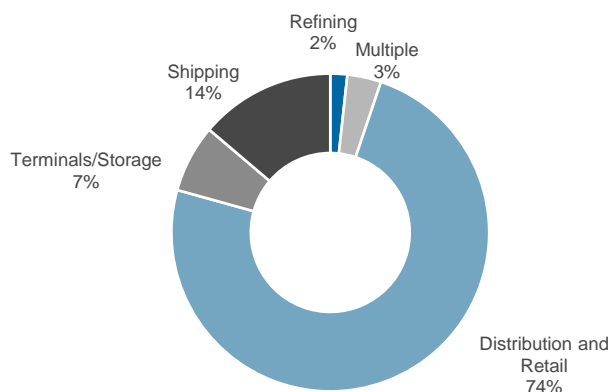
M&A (Deal Count)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Refining	2	1	0	1	NMF
Multiple	4	8	5	2	-60%
Distribution and Retail	49	75	45	43	-4%
Terminals/Storage	12	12	10	4	-60%
Shipping	4	4	4	8	100%
Total	71	100	64	58	-9%

M&A—2022 (\$ in billions)



M&A—2022 (Deal Count)



Note: All data as of September 30, 2022.

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

Midstream

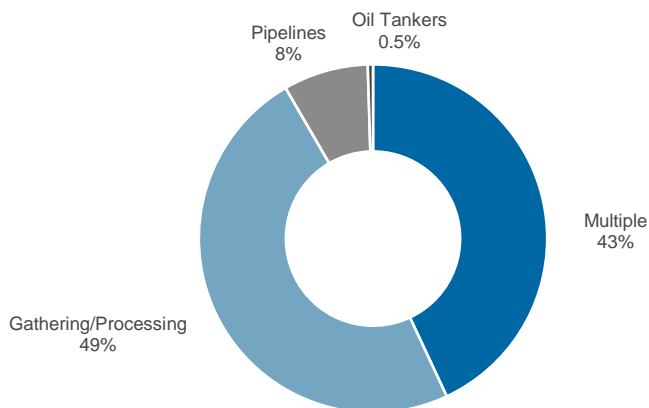
M&A (\$ in billions)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Multiple	15.2	30.8	22.5	10.0	-56%
Gathering/Processing	1.6	2.9	0.8	11.2	NMF
Gas Processing	0.0	0.0	0.0	0.0	NMF
Pipelines	3.5	1.6	1.2	1.8	49%
Oil Tankers	0.1	1.0	1.0	0.1	-89%
Storage	0.4	0.9	0.9	0.0	-100%
Total	\$20.8	\$37.2	\$26.4	\$23.1	-12%

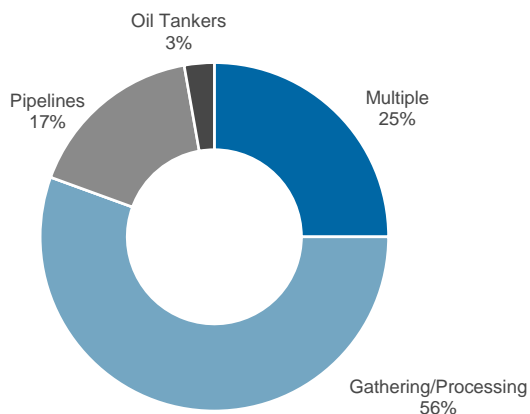
M&A (Deal Count)

Segment	2020	2021	YTD September		%Δ
			2021	2022	
Multiple	9	16	12	9	-25%
Gathering/Processing	16	17	10	20	100%
Gas Processing	0	0	0	0	NMF
Pipelines	11	11	7	6	-14%
Oil Tankers	3	2	2	1	-50%
Storage	4	2	2	0	-100%
Total	43	48	33	36	9%

M&A—2022 (\$ in billions)



M&A—2022 (Deal Count)



Note: All data as of September 30, 2022.

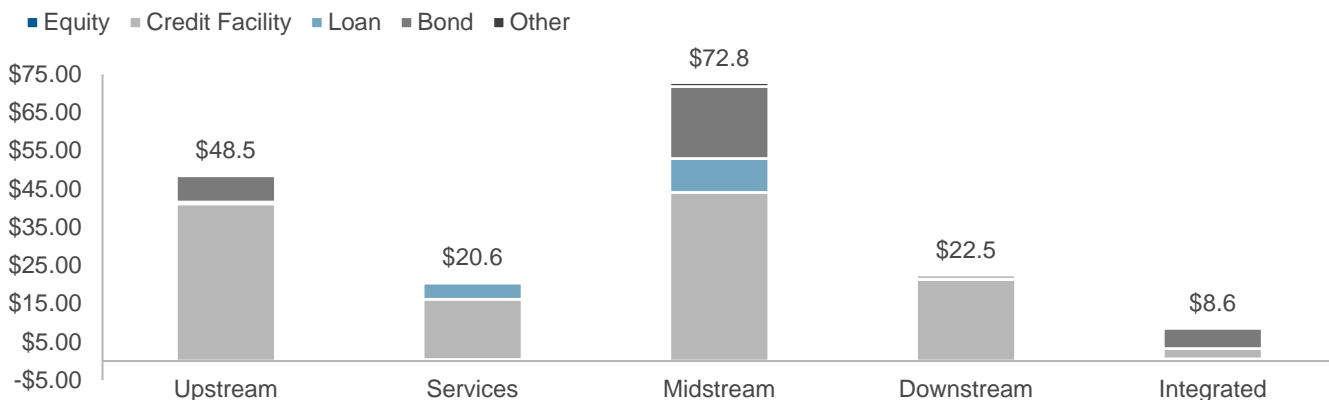
Source: Enverus based on selection criteria of seller headquarters being located in the U.S.

Financing by Instrument

Financing by Instrument (\$ in billions)

Capital	2020	2021	YTD September		%Δ
			2021	2022	
Upstream					
Equity	\$1.1	\$1.4	\$0.8	\$0.0	NMF
Credit Facility	46.1	45.0	21.7	41.1	90%
Loan	12.7	2.5	0.7	0.5	NMF
Bond	32.9	30.3	23.9	6.8	-72%
Other	0.1	0.5	0.5	0.1	NMF
Total	\$92.9	\$79.6	\$47.6	\$48.5	2%
Services					
Equity	\$0.0	\$0.5	\$0.2	\$0.4	NMF
Credit Facility	18.6	7.5	4.6	15.7	242%
Loan	5.8	6.4	3.7	4.2	14%
Bond	6.6	7.3	3.5	0.2	-93%
Other	0.2	0.6	0.6	0.0	NMF
Total	\$31.1	\$22.3	\$12.6	\$20.6	64%
Midstream					
Equity	\$2.9	\$1.2	\$1.2	\$0.0	-100%
Credit Facility	28.4	41.0	29.0	44.1	52%
Loan	6.1	2.4	1.4	8.8	552%
Bond	43.9	29.4	23.3	18.8	-19%
Other	2.6	1.7	1.5	1.0	-33%
Total	\$84.0	\$75.7	\$56.4	\$72.8	29%
Downstream					
Equity	\$0.0	\$0.1	\$0.1	\$0.0	NMF
Credit Facility	8.7	4.7	4.1	21.3	418%
Loan	1.3	0.9	0.6	0.2	NMF
Bond	15.6	6.4	3.2	1.0	-69%
Other	0.0	0.0	0.0	0.0	NMF
Total	\$25.6	\$12.1	\$8.0	\$22.5	182%
Integrated					
Equity	\$1.1	\$0.8	\$0.0	\$0.6	NMF
Credit Facility	0.9	1.9	1.9	2.8	45%
Loan	0.7	1.4	1.4	0.0	-100%
Bond	73.1	13.7	11.2	5.3	-53%
Other	1.5	0.2	0.2	0.0	NMF
Total	\$77.3	\$18.0	\$14.8	\$8.6	-42%
Grand Total	\$310.9	\$207.9	\$139.3	\$173.0	24%

Financing by Instrument—YTD 2022 (\$ in billions)



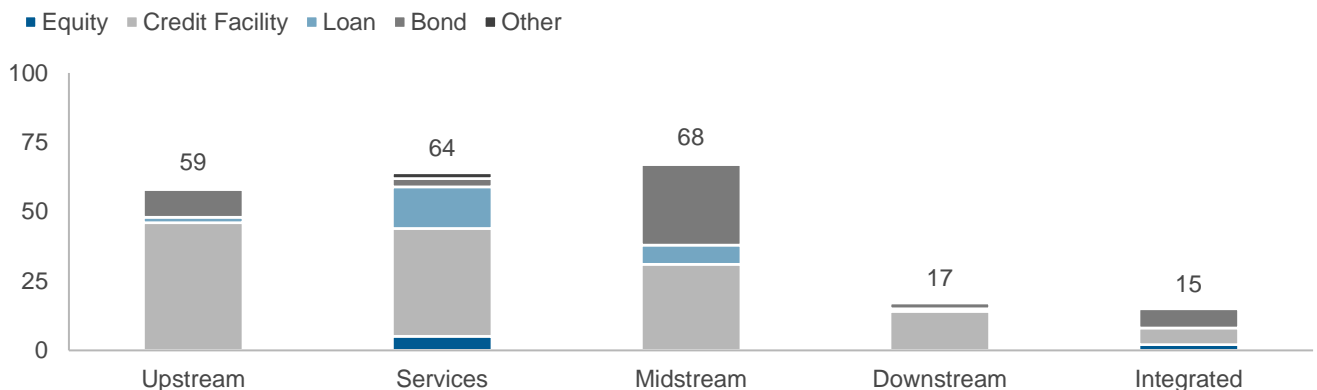
Notes: All data as of September 30, 2022. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available. Source: Enverus.

Financing by Instrument (cont.)

Financing by Instrument (Count)

Capital	2020	2021	YTD September		%Δ
			2021	2022	
Upstream					
Equity	12	14	9	0	-100%
Credit Facility	69	48	22	46	109%
Loan	28	9	5	2	-60%
Bond	47	49	39	10	-74%
Other	2	7	6	1	-83%
Total	158	127	81	59	-27%
Services					
Equity	2	9	6	5	-17%
Credit Facility	62	40	28	39	39%
Loan	33	23	15	15	0%
Bond	16	16	10	3	-70%
Other	6	10	8	2	-75%
Total	119	98	67	64	-4%
Midstream					
Equity	6	5	4	0	NMF
Credit Facility	25	38	23	31	35%
Loan	12	6	5	7	40%
Bond	59	41	29	29	0%
Other	6	10	9	1	-89%
Total	108	100	70	68	-3%
Downstream					
Equity	0	1	1	0	NMF
Credit Facility	9	9	8	14	75%
Loan	4	6	4	1	NMF
Bond	25	9	5	2	-60%
Other	1	0	0	0	NMF
Total	39	25	18	17	-6%
Integrated					
Equity	2	1	0	2	NMF
Credit Facility	2	3	3	6	NMF
Loan	2	3	3	0	NMF
Bond	65	18	15	7	-53%
Other	2	1	1	0	NMF
Total	73	26	22	15	-32%
Grand Total	497	376	258	223	-14%

Financing by Instrument—YTD 2022 (Deal Count)

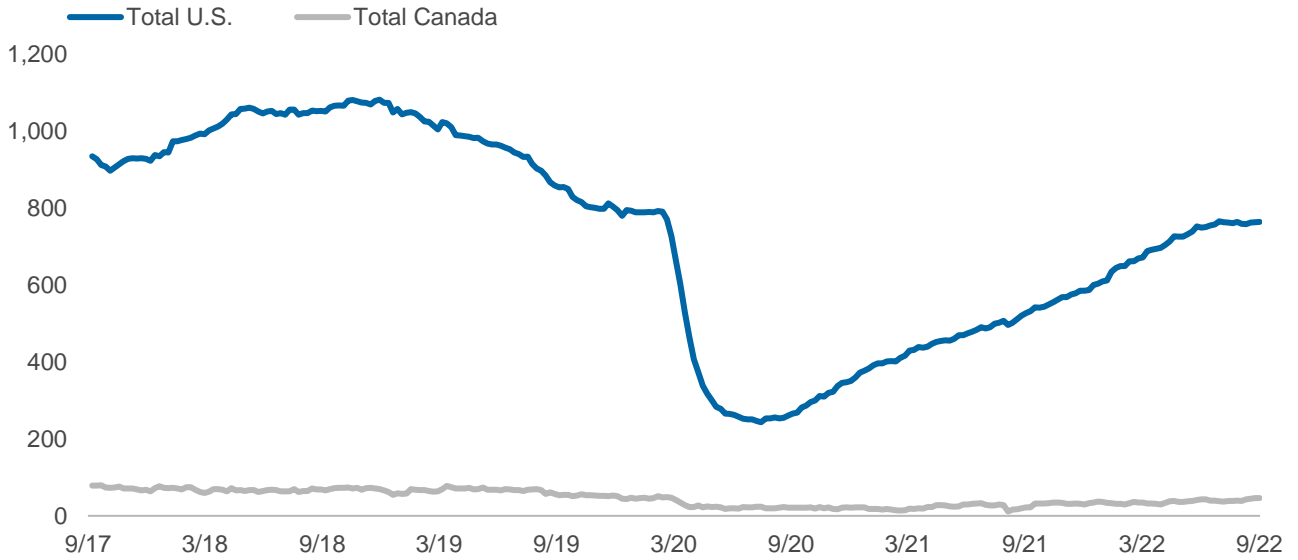


Notes: All data as of September 30, 2022. Current year may not include values for all announced transactions or findings. Historical amounts may be adjusted as additional information is available. Source: Enverus.

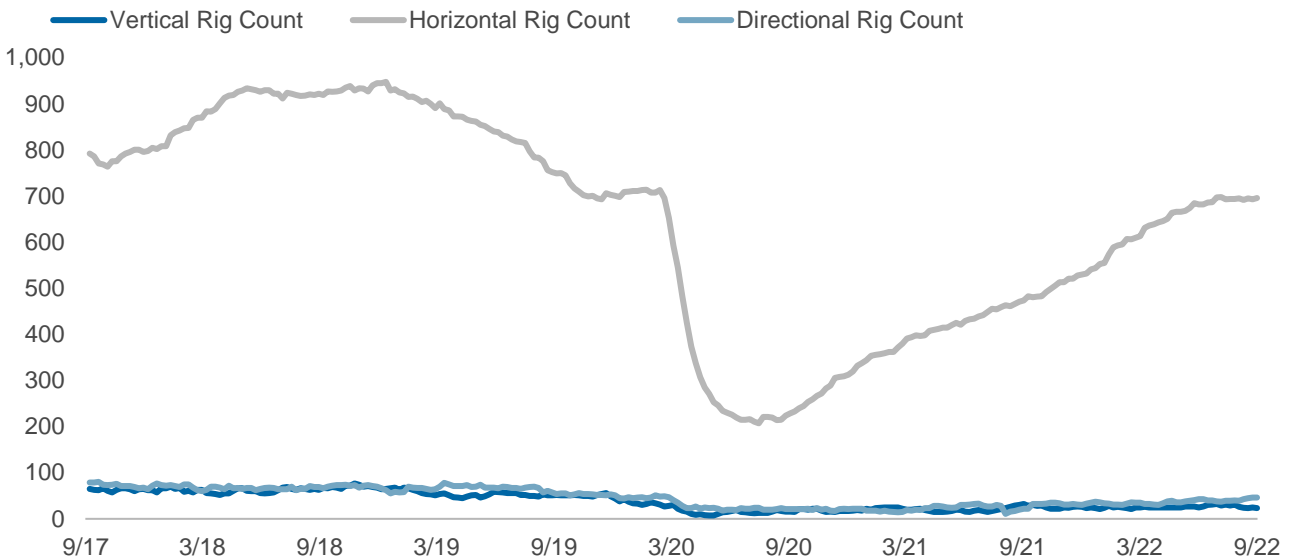
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Rigs

Total U.S. vs. Canada Rigs

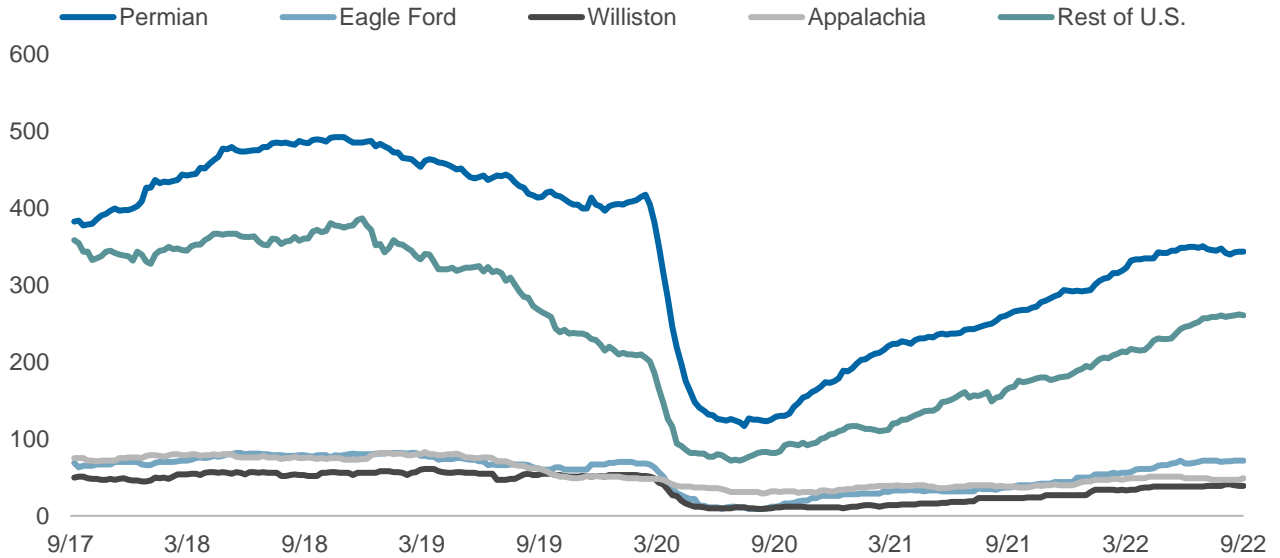


U.S. Rig Counts by Vertical, Horizontal, and Directional



Rigs (cont.)

U.S. Rigs by Regions

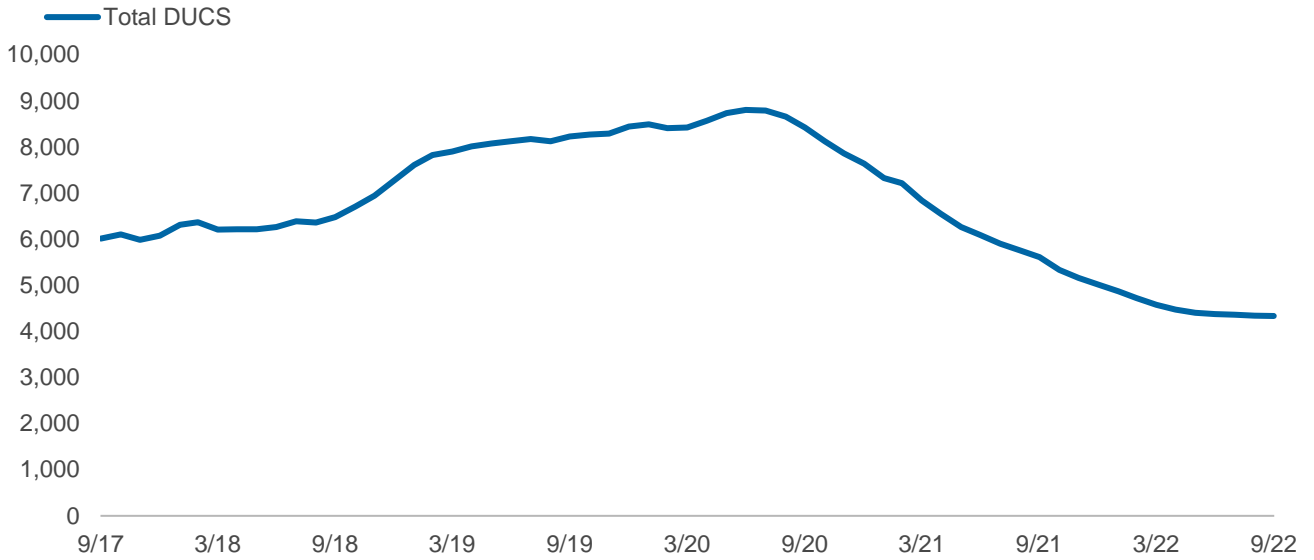


Change in Rig Counts

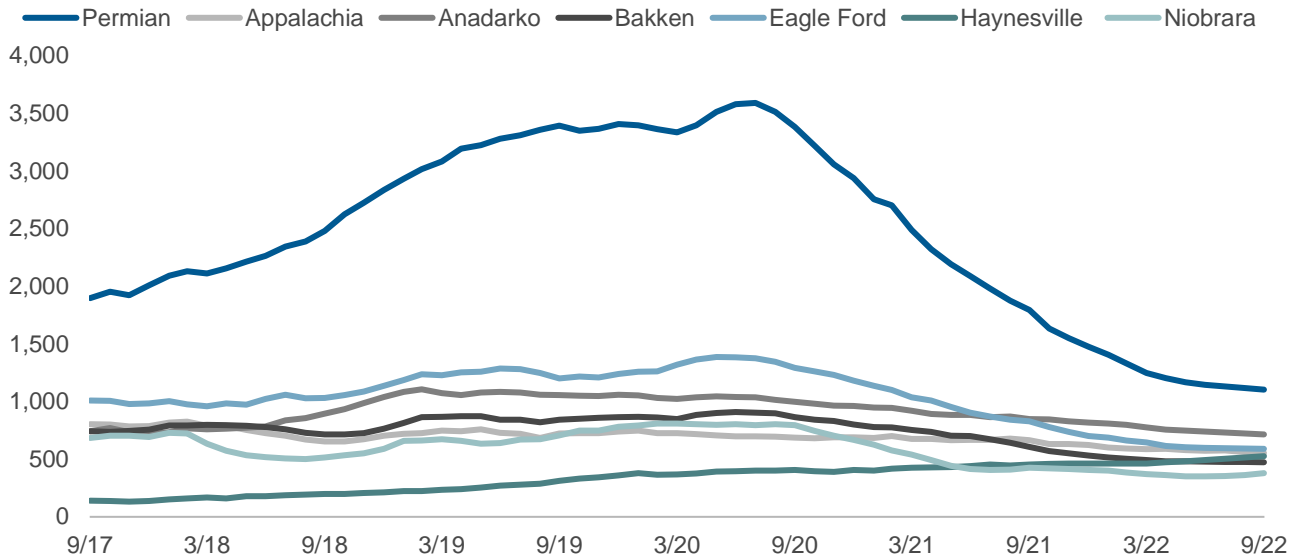
Region	9/30/2022	9/30/2021	6/30/2022	YoY % Change	QoQ % Change
Permian	344	260	349	32.3%	-1.4%
Eagle Ford	72	37	72	94.6%	0.0%
Williston	39	23	38	69.6%	2.6%
Marcellus	39	26	39	50.0%	0.0%
Cana Woodford	26	20	32	30.0%	-18.8%
DJ Niobrara	17	12	16	41.7%	6.3%
Granite Walsh	6	3	2	100.0%	NMF
Haynesville	71	47	69	51.1%	2.9%
Utica	10	12	12	-16.7%	-16.7%
Rest of U.S.	141	81	124	74.1%	13.7%
Total	765	521	753	46.8%	1.6%

Rigs (cont.)

Total U.S. DUCs



Total DUCs by Basin



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