ICE Midland WTI (HOU) Futures

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ICE Midland WTI (HOU) Futures: physically deliverable crude futures for the USGC

ICE Midland WTI (HOU) Futures: Introduction

- HOU is a physically deliverable futures contract for Midland-origin / Midland-quality crude priced in Houston, on the U.S. Gulf Coast.

- Over the last decade, as a pricing center, Houston has evolved from MEH (ONEOK/former Magellan) to both MEH and ECHO (Enterprise).

  - Then:
    - One terminal with 8 Mb of crude storage capacity
    - 440 kb/d of direct-from-Permian pipeline capacity
    - No export capacity (crude exports not allowed by the U.S. until 2016)

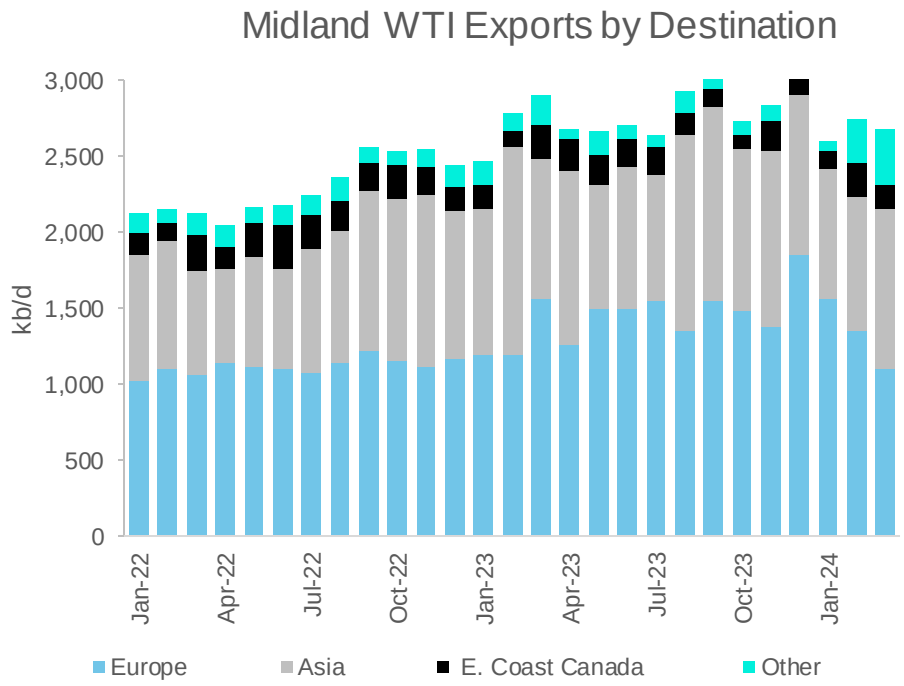
  - Now (since 2022):
    - Multiple terminals with 60+ Mb of crude storage capacity
      - The 60+ Mb is part of, and tied into, the overall 150 Mb of Houston crude storage capacity
    - 2.8 Mb/d of direct-from-Permian pipeline capacity
    - Export capacity via 17 ship docks

ICE Midland WTI (HOU) Futures: Today's Topics

- Today's topics:
  - USGC fundamentals
  - Price risk management
  - Supply risk management
  - HOU trading activity
  - Recent changes to the HOU crude quality specification
  - Addition of Midland to the Brent complex

Midland WTI: driving growth in U.S. crude production and exports

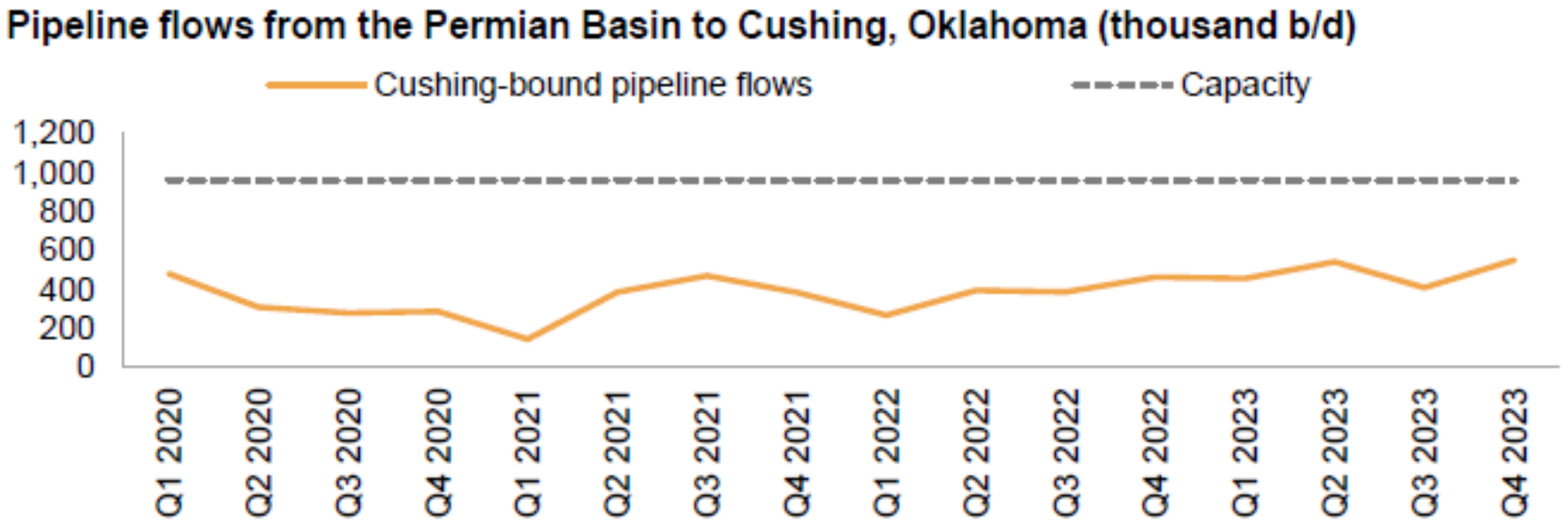
Flows of Midland to Europe have increased since the Russia-Ukraine war



Source: Kpler and ICE

- The Permian Basin/Midland dominates U.S. crude production and exports. Total U.S. output 13.1 Mb/d. Permian Basin output 6.2 Mb/d.
- Driven by the Permian Basin, U.S. EIA crude growth forecast: US +1.0 Mb/d in 2023, +0.3 Mb/d in 2024, +0.5 Mb/d in 2025
- U.S. crude exports should increase broadly in line with output, because U.S. refiners are usually maxed out in processing light sweet crude
- Out of a total 4.2 Mb/d of U.S. crude exports in 2023, Midland WTI accounted for around two-thirds
- U.S. exports of Midland to Europe increased after the Russia-Ukraine war began, as Europe replaced flows from Russia

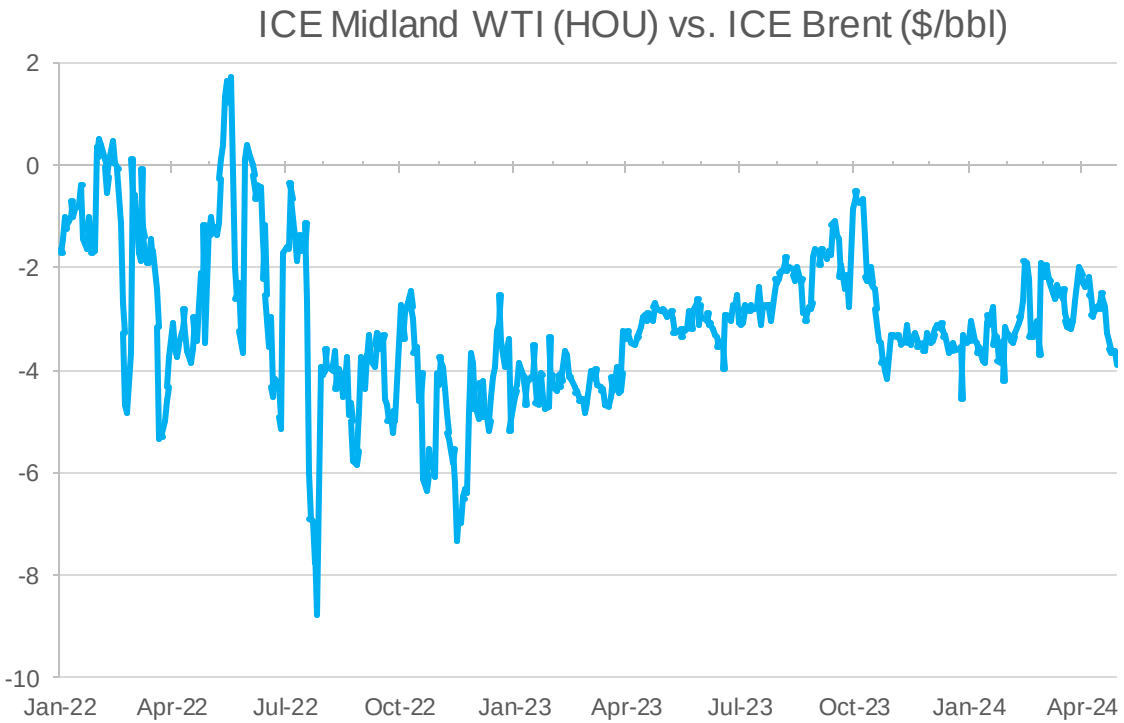
The U.S. market has evolved beyond Cushing. Most Permian Basin crude flows directly to the USGC.

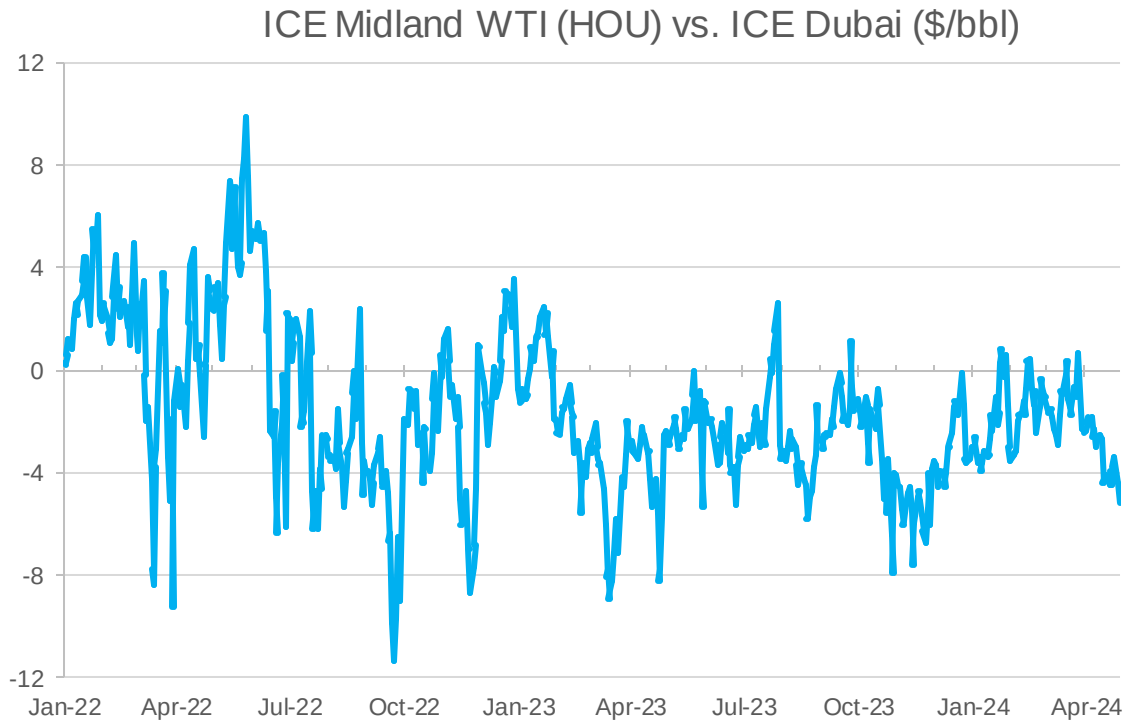


Source: S&P Global Commodity Insights – North American Crude Oil Markets Short-term Outlook, May 2024.

- The U.S. market has evolved beyond Cushing. Crude gets produced in the Permian and is transported directly to the USGC. Most of it bypasses Cushing entirely.
- Flows from the Permian Basin to Cushing are in the 400-500 kb/d range. As a destination, Cushing is mainly used for storage. Cushing is connected to a limited number of refineries that run light crude.
- Cushing has logistics/storage constraints. Only 78 Mb of working crude storage capacity.
- As the physical delivery point for NYMEX WTI Cushing, inventory increases and decreases can lead to price volatility for WTI Cushing. This adds unnecessary risks for both pricing and hedging.
- Midland WTI is not WTI Cushing. Midland is literally a different crude grade, with different quality, origin, and pricing location.

Price risk management: Midland WTI exports price off Brent or Dubai

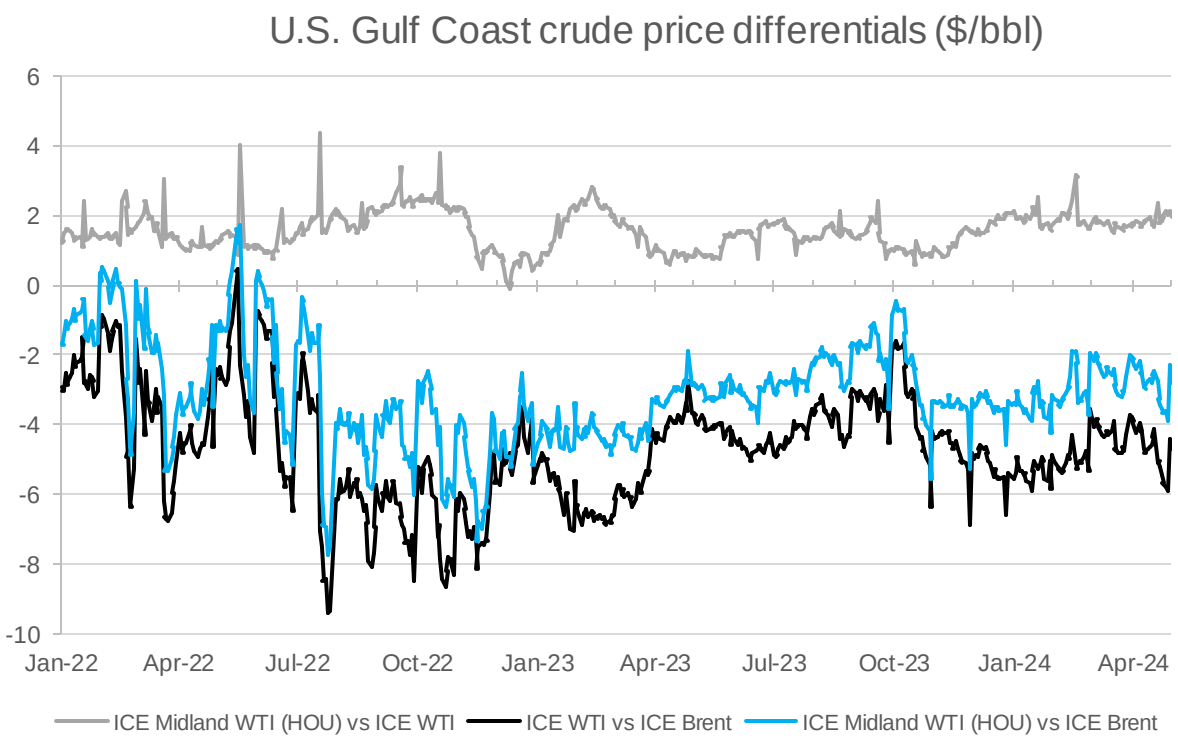




Source: ICE

- Once Midland WTI hits the water, it prices off Brent (to Europe) or Dubai (to Asia), also Midland WTI vs. Murban (to Asia)
- HOU offers a simpler, more efficient and more cost-effective way for producers, refiners and traders to hedge USGC exposure
- The same Midland WTI crude deliverable against HOU is deliverable into Brent complex. HOU tradeable vs. Dated Brent and ICE Brent

Key USGC crude price differentials drive exports & hedging



Source: ICE

Traders are exposed to Midland WTI where it meets the global waterborne market on the USGC.

For U.S. crude exports to Europe, the key is Midland WTI priced at Houston vs. Brent -- not WTI Cushing vs. Brent.

For U.S. crude exports to Asia, the key is Midland WTI priced at Houston vs. Dubai – not WTI Cushing vs. Dubai

How to hedge/manage this risk?

Currently (for exports to Europe):

- **A) ICE Midland WTI (HOU) vs. WTI Cushing**
- **B) WTI Cushing vs. Brent**
- **C) ICE Midland WTI (HOU) vs. Brent**

Trader does A and B. The WTI Cushing legs cancel, and trader is left with C.

A better way: **Trader simply does C.**

Minimize unnecessary exposure to Cushing storage constraints and WTI Cushing price volatility.

Margin offsets as high as 97% when clearing HOU alongside other positions on ICE Clear Europe (including ICE Brent, ICE Dubai (Platts), ICE Murban and ICE Gasoil).

Physical supply risks can be managed with guaranteed physical delivery of on-spec Midland WTI crude

- U.S. physical market participants experience occasional problems with Midland crude supply
  - Exporters can receive off spec Midland WTI at USGC terminals (as reported in the trade press)
  - Refiners can unexpectedly receive non-ratable volumes of Midland WTI from suppliers, i.e., supply cuts (according to market participants)

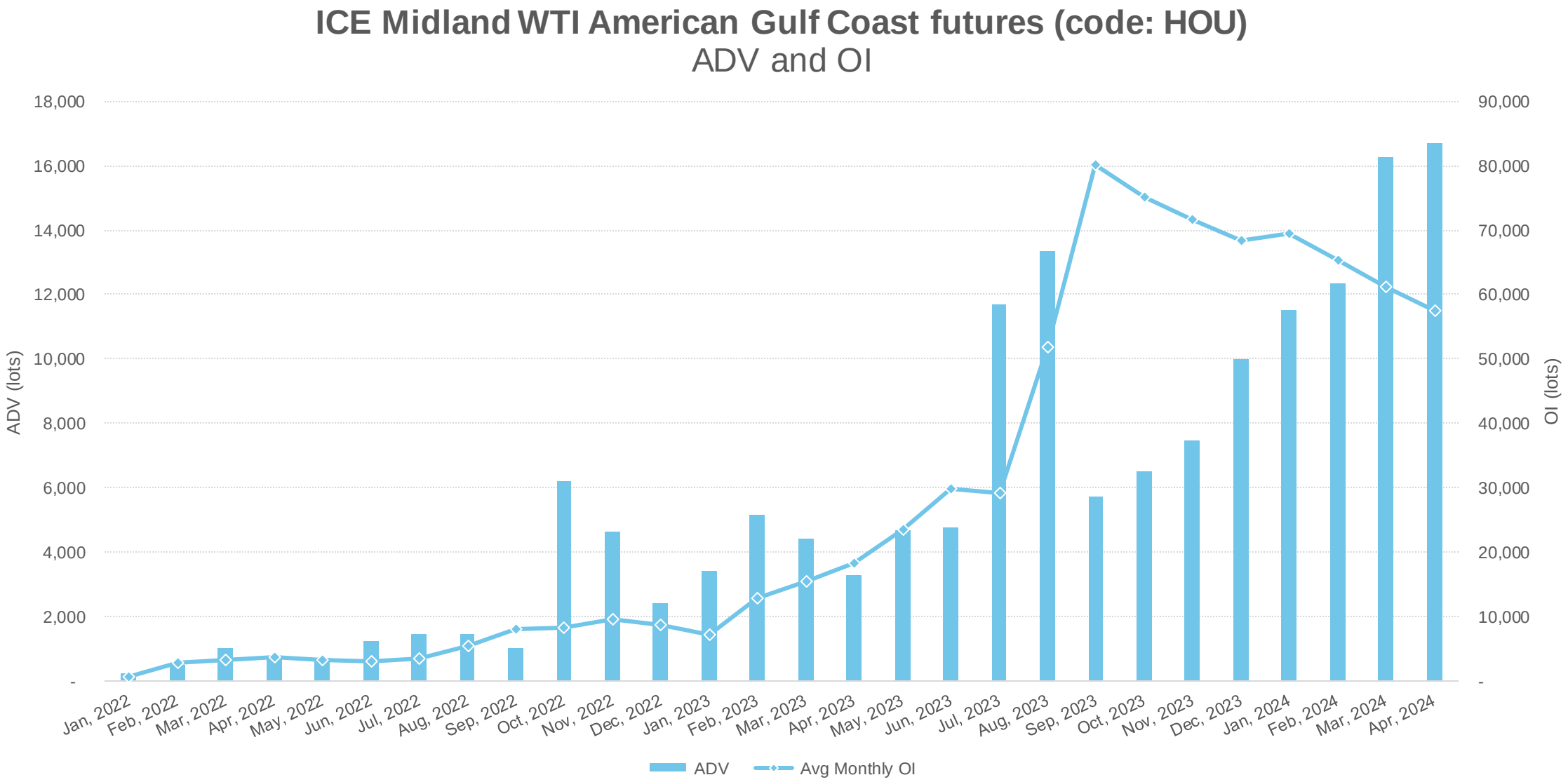
- Going to expiry in the HOU contract results in guaranteed physical delivery of on-spec and ratably delivered Midland WTI crude that can be run in U.S. domestic refineries or exported to European and Asian refiners.

- From July 2023 through April 2024: Deliveries of Midland WTI via the HOU contract averaged 4.3 Mb. Deliveries via EFPs (Exchange for Physicals) averaged 7.4 Mb. Total deliveries averaged 11.7 Mb.

- Because ICE is a regulated exchange and clearinghouse, HOU is traded and cleared with strict procedures in place to provide a robust, fair, and transparent marketplace. There are clear procedures and protocols for physical delivery.

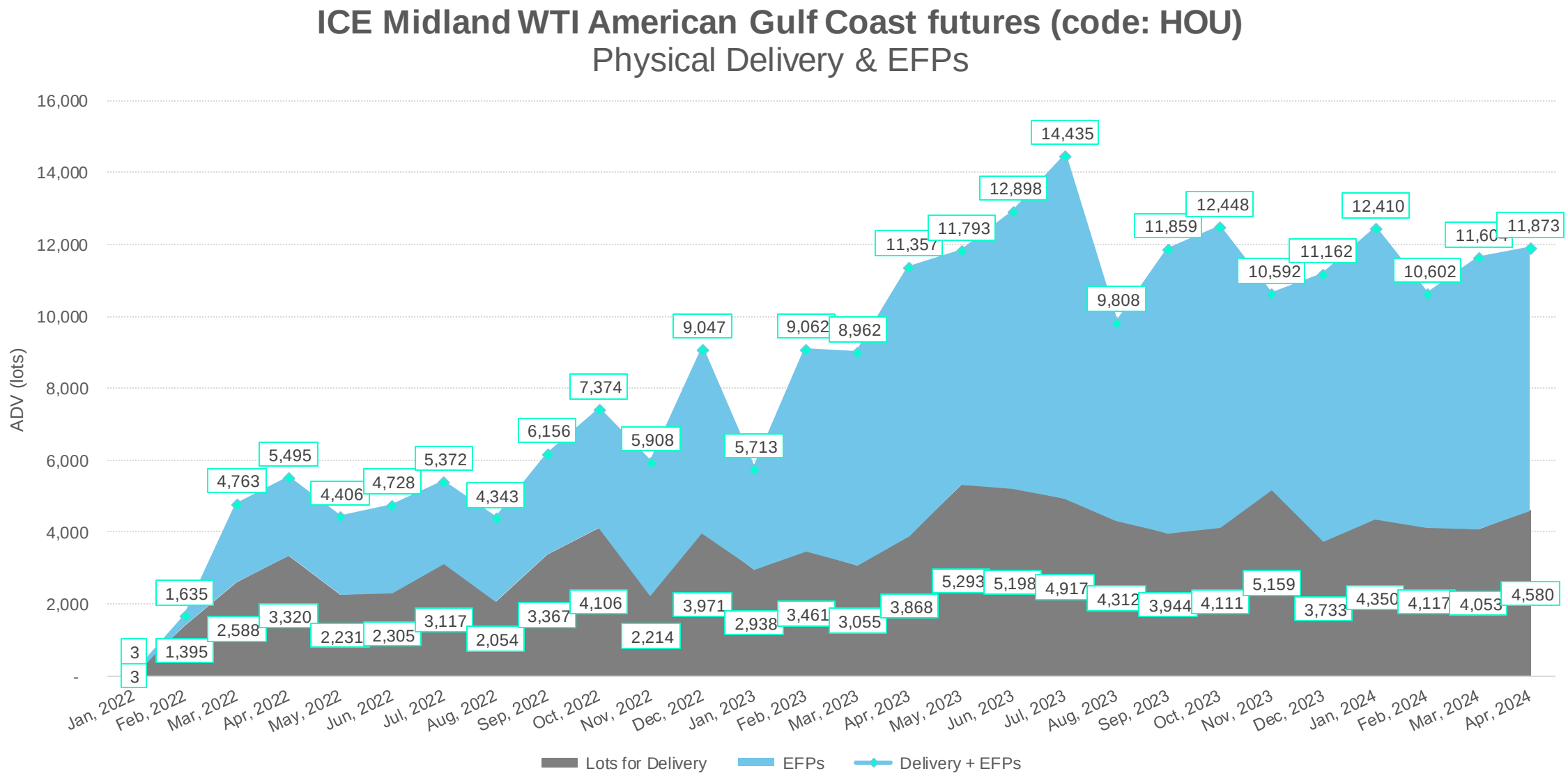
- Volumes are received as planned: on-spec and at the agreed volumes and delivery timeframe
  - Guaranteed deliveries can help ensure that export vessels load on time, avoiding demurrage fees
  - Refineries in the U.S., Europe, and Asia receive crude volumes as planned, allowing for smooth operations

ICE Midland WTI (HOU): trading activity (ADV/Open Interest) gaining momentum



Source: ICE

ICE Midland WTI (HOU): physical deliveries & EFPs also gaining momentum



Source: ICE

ICE Midland WTI (HOU) crude quality specs further aligned w Platts

- As announced on Feb. 28, 2024, HOU spec further aligned with Platts WTI Midland spec as included in Dated Brent
- Changes to HOU spec: addition of max Iron content; combined Nickel/Vanadium max content replaced by individual max content; RVP max increased from 9.0 to 9.5 PSI
- Changes effective from the June 2024 contract month, which expires on May 21, 2024
- A tight and robust spec, ICE contract rules and oversight, and ONEOK and Enterprise's strict/proven quality programs aim to protect and give confidence to buyers and sellers regarding quality. Quality data published by ONEOK and Enterprise

ICE Midland WTI (HOU) Specifications

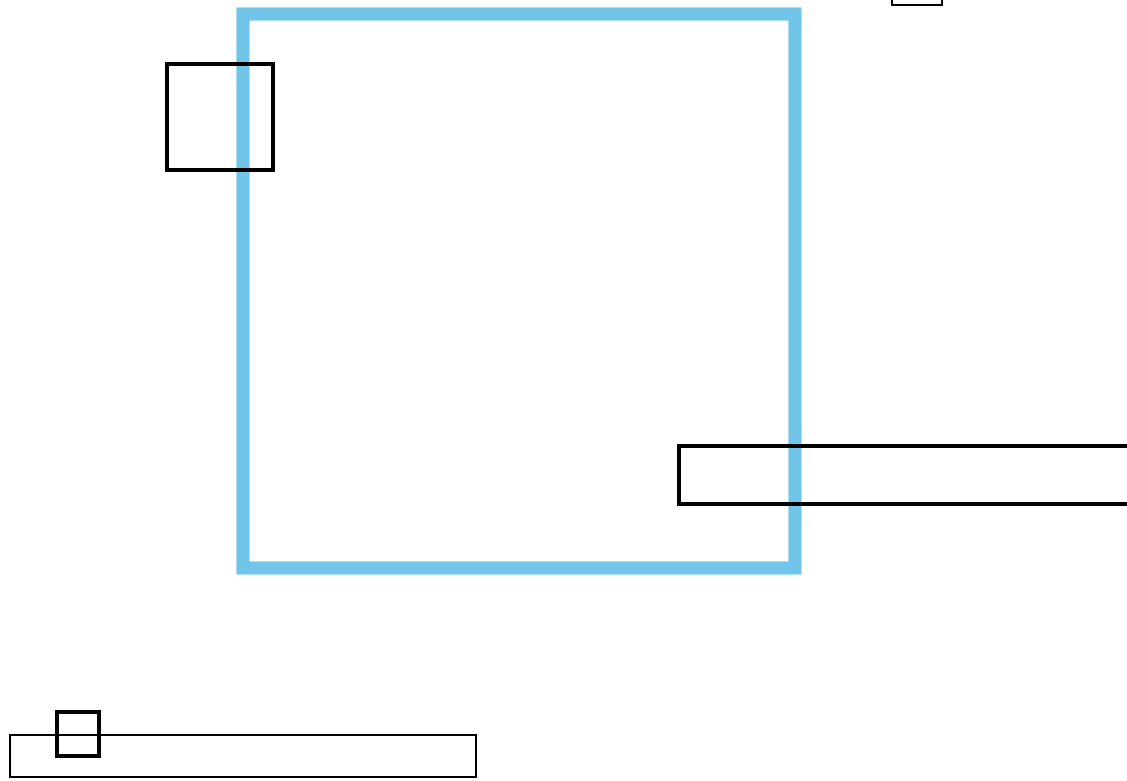
PARAMETER	UNITS	MIN	MAX
API Gravity	˚API, 60˚F	40.0	44.0
Sulfur Content	% (m/m)		0.20
Mercaptans	ppm Wt		75
RVP	PSI		9.5
BS&W	% (v/v)		1.0
Nickel	ppm Wt		2.0
Vanadium	ppm Wt		2.0
Iron	ppm Wt		10

Platts WTI Midland Specifications

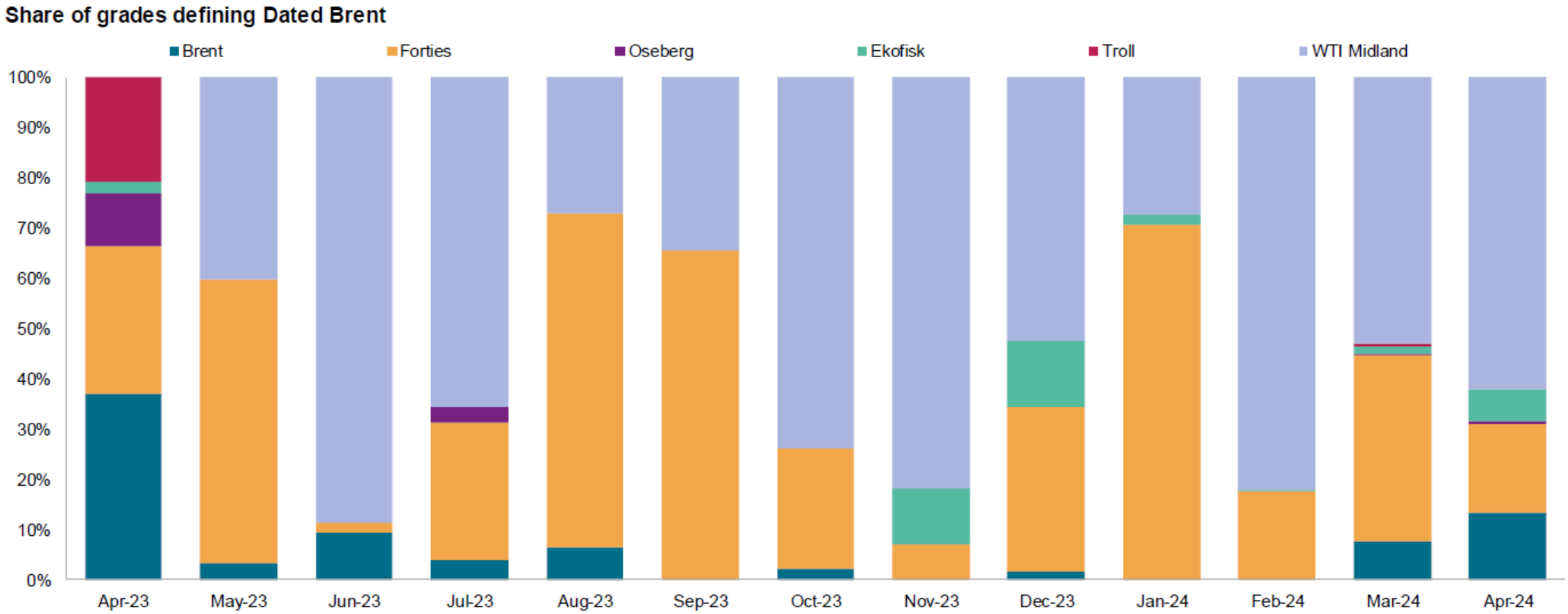
PARAMETER	UNITS	MIN	MAX
API Gravity	˚API, 60˚F	40.0	44.0
Sulfur Content	% (m/m)		0.20
Mercaptans	ppm Wt		75
RVP	PSI		9.5
BS&W	% (v/v)		1.0
Nickel	ppm Wt		2.0
Vanadium	ppm Wt		2.0
Iron	ppm Wt		10

Source: ICE and S&P Global Commodity Insights

The addition of Midland to the Brent complex: smooth and successful



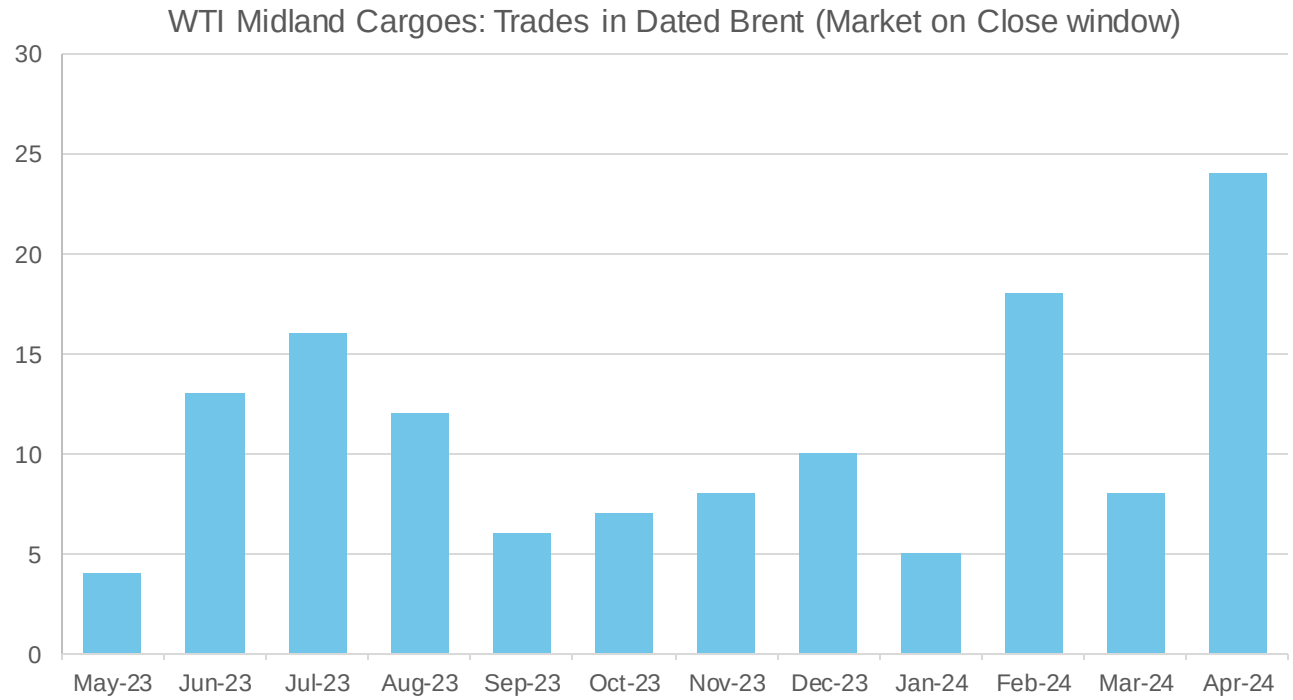
The addition of Midland WTI to the Brent Complex: smooth and successful Impact on pricing similar to expectations:



Source: S&P Global Commodity Insights - Europe, Eurasia and Africa Crude Oil Markets Short-term Outlook, May 2024. Data as of April 29, 2024.

- Pricing: from May 2023 through April 2024, Midland WTI was the most competitive grade that set the price of Dated Brent approximately 55-60% of the time. This has been broadly similar to expectations.

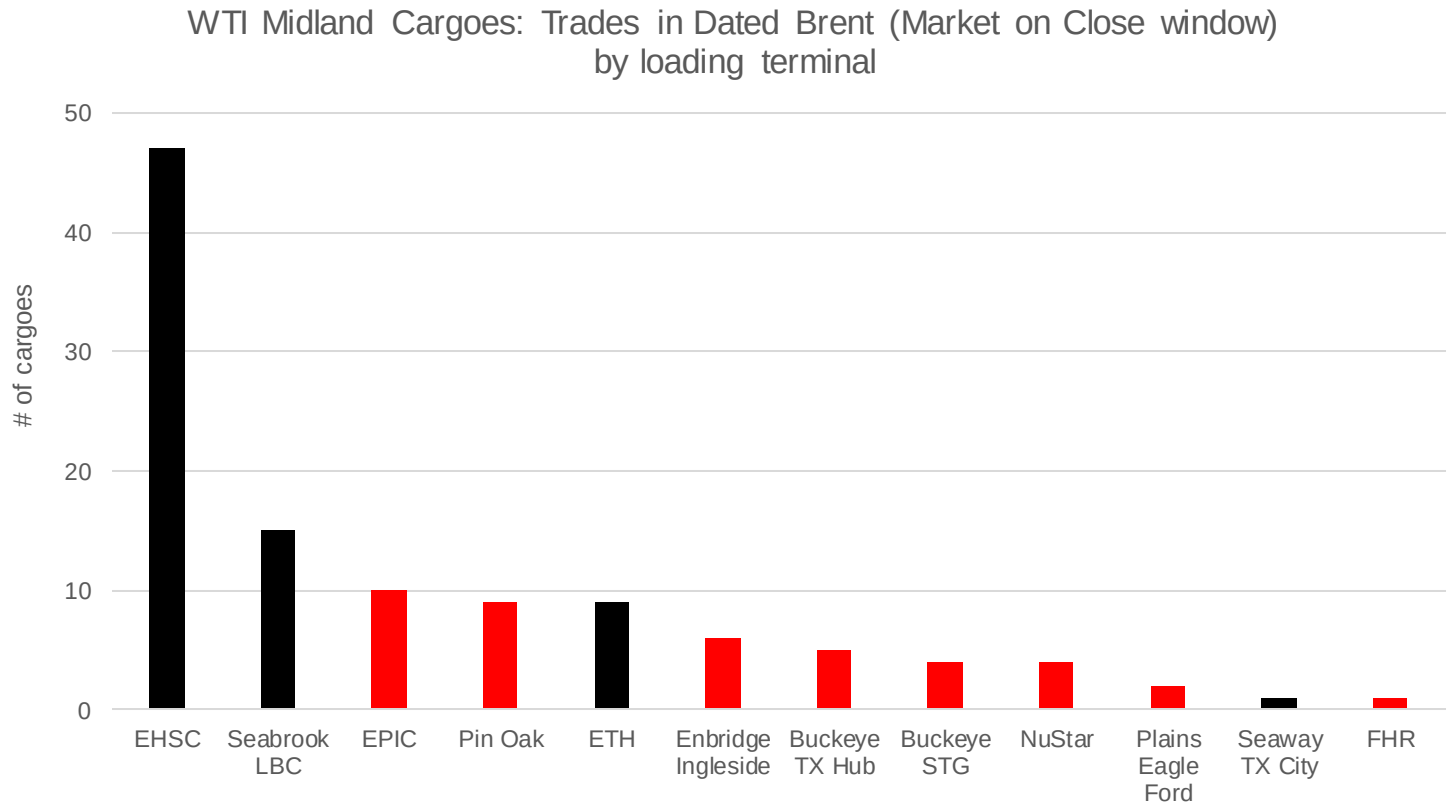
The addition of Midland WTI to the Brent Complex: smooth and successful Impact on physical volumes similar to expectations



Source: Platts Crude Oil Marketwire. Data assembled by ICE. Data through April.

- Volumes: from June 2023 through April 2024, an average of 11.5 cargoes of Midland per month traded in the Dated Brent MOC window
- Before Midland WTI was added, less than 10 cargoes of BFOET (the old basket) traded per month. With Midland, volumes have approximately doubled. Again, this has been broadly similar to expectations.
- Midland WTI is not WTI Cushing. Midland is literally a different crude grade, with different quality, origin and pricing location.
- The same Midland WTI crude deliverable against the ICE HOU contract is deliverable into the Brent complex

Most Midland cargoes delivered into the Dated Brent MOC window load at Houston terminals, mainly EHSC and Seabrook. These are the only two terminals that guarantee the quality of Midland crude.



Note: Houston terminals in black. Source: S&P Global Commodity Insights. Data through May 8, 2024.

- From Platts performance tracking. Physical performance is reviewed against published parameters
- All 12 Platts-approved terminals have delivered Midland into Dated Brent. Total of 113 Midland cargoes (as of May 8). Out of this total, 72 (or 64%) have loaded from Houston terminals
- Of Houston loadings, most (62 out of 72) have been from Enterprise EHSC and ONEOK Seabrook terminals. These are the only terminals that guarantee the quality of Midland crude.

ICE Midland WTI (HOU) key points / conclusion: effective management of price risk and physical supply risk

- **Price risk management:**
  - HOU offers a more direct, more efficient (simpler) and more cost-effective way for producers, refiners, and traders to hedge USGC exposure. Also a way to minimize unnecessary exposure to Cushing logistics/storage constraints.
  - Once Midland WTI hits the water, it prices off Brent (to Europe) or Dubai (to Asia). It can be used to hedge export flows to both regions.
- **Physical supply risk management:**
  - U.S. physical market participants experience occasional problems with Midland crude supply.
    - Exporters can receive off spec Midland WTI at USGC terminals.
    - Refiners can unexpectedly receive non-ratable volumes of Midland WTI from suppliers (i.e., supply cuts).
  - Going to expiry in the HOU contract results in guaranteed physical delivery of on-spec and ratably delivered Midland WTI crude that can be run in U.S. domestic refineries or exported to European and Asian refiners.
  - Volumes are received as planned: on-spec and at the agreed volumes and delivery timeframe

Contacts and resources

For more information on ICE Midland WTI Futures (HOU)

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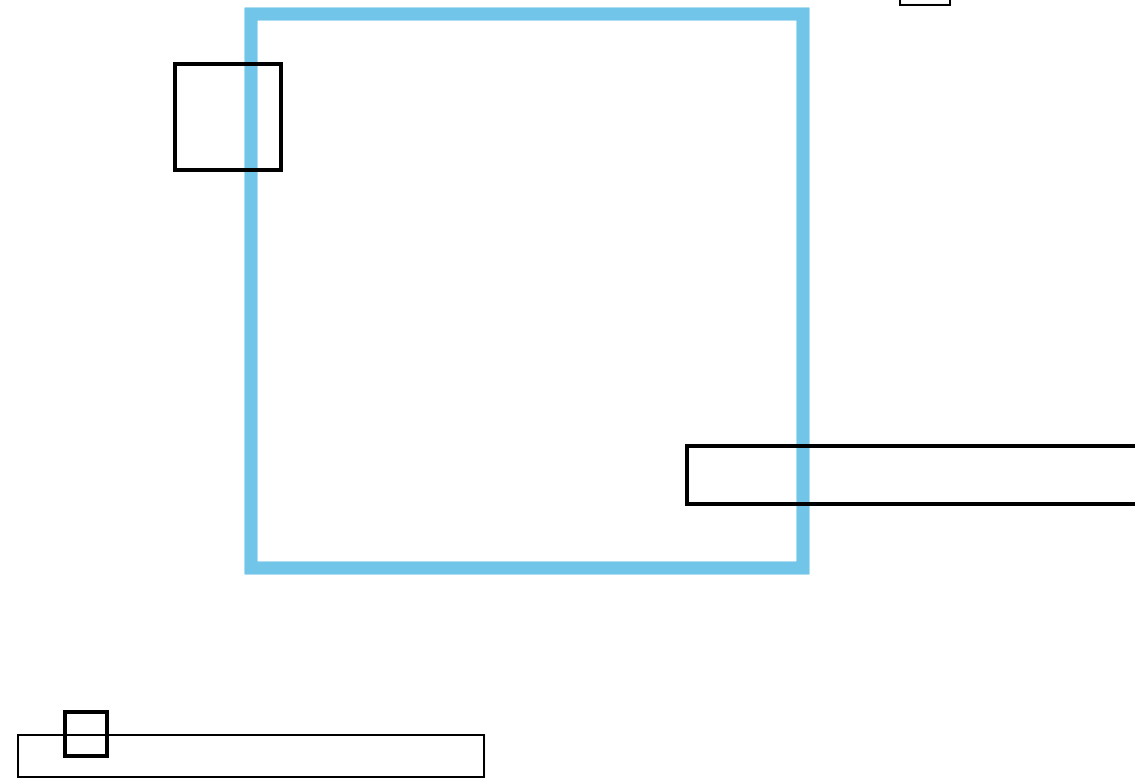
Thank You



Limitations

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