



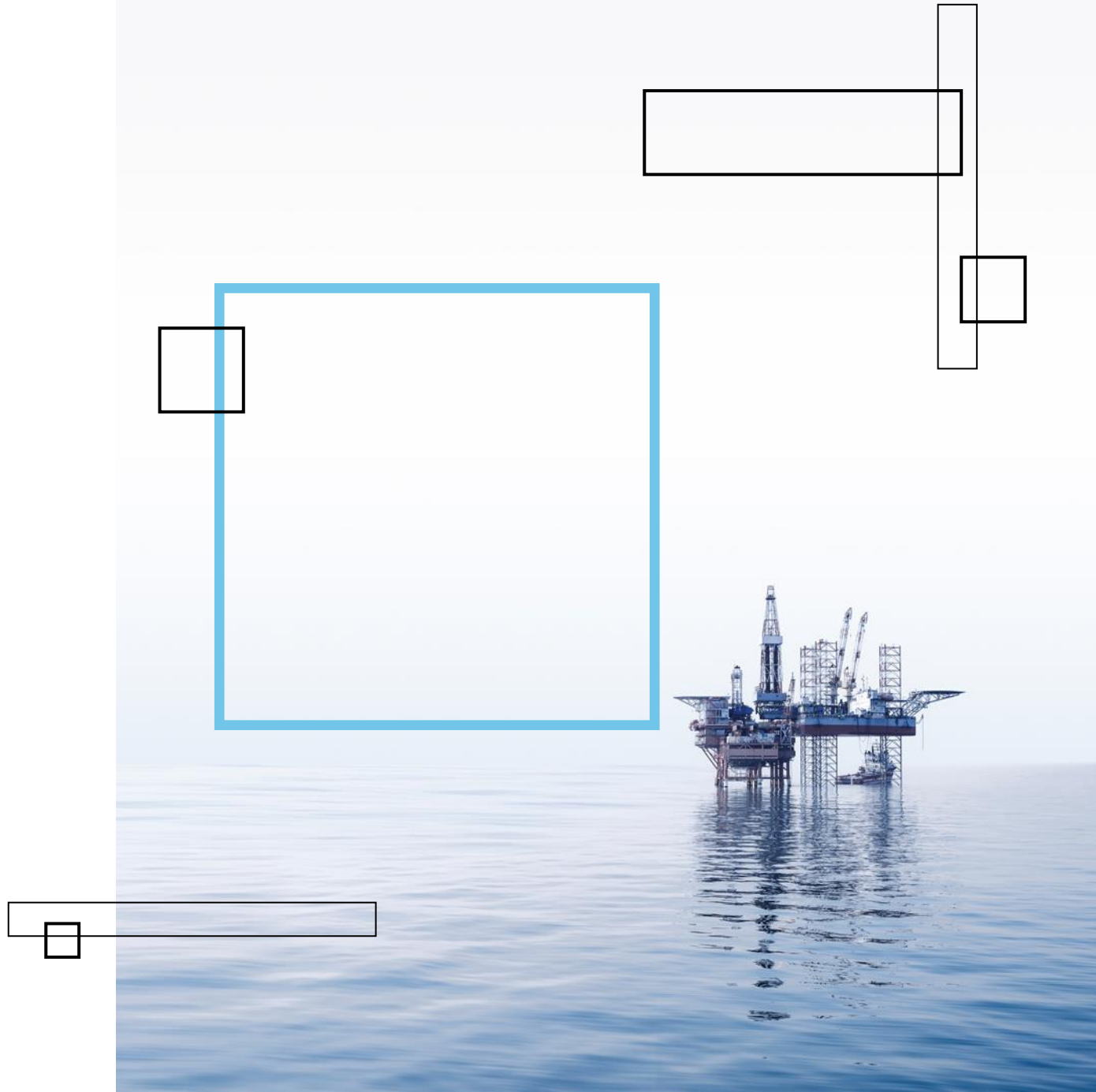
ICE Midland WTI American Gulf Coast (HOU) Futures

Mike Wittner

Global Head of Oil Market Research, ICE

COQA – New Orleans

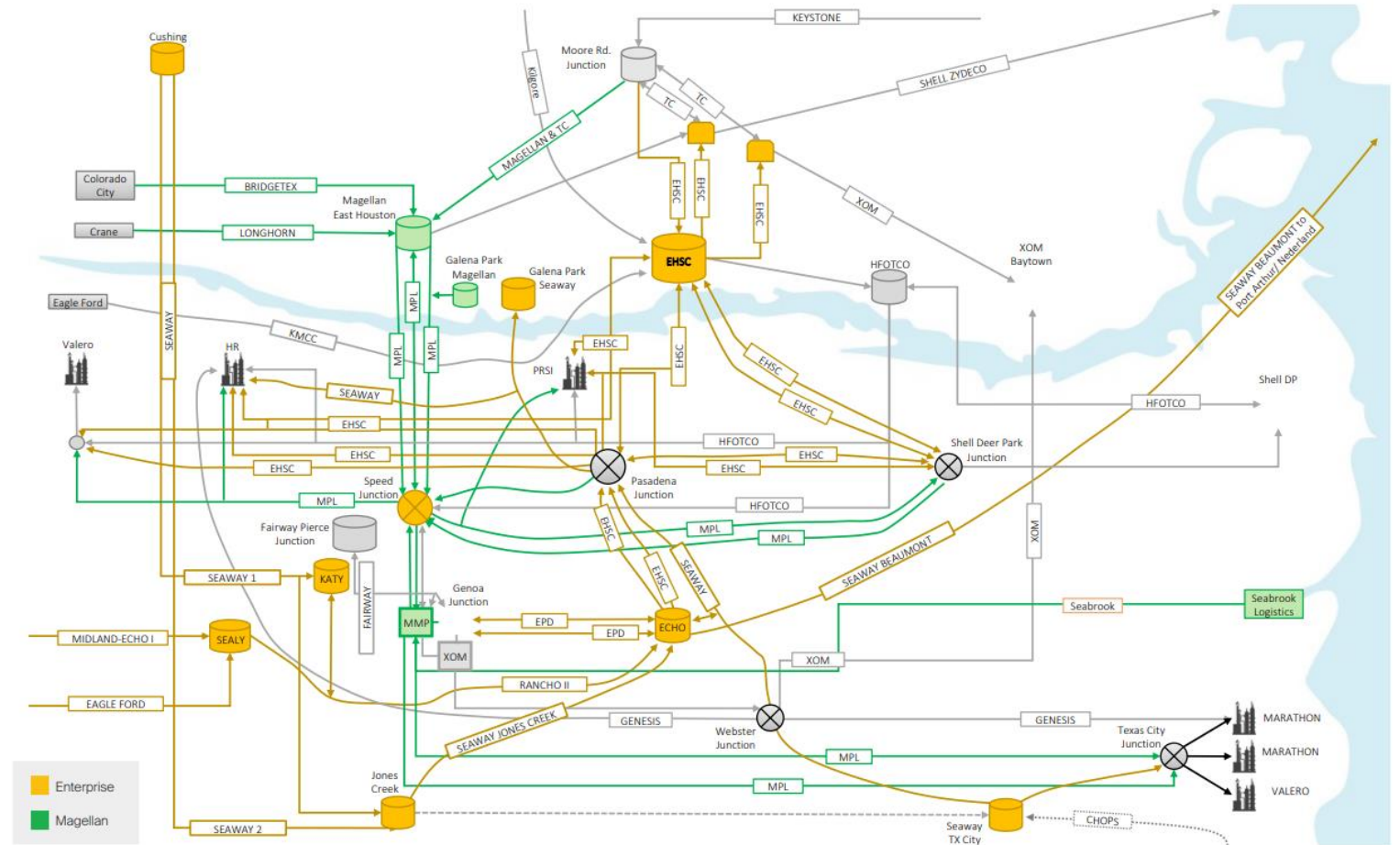
March 2, 2023



Today's Topics

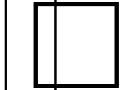
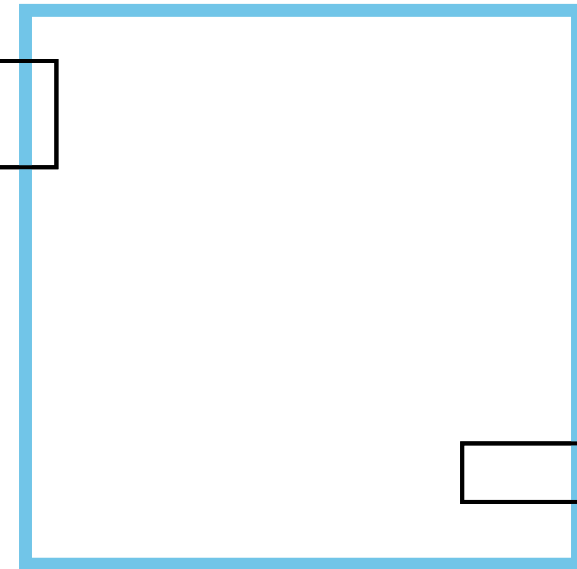
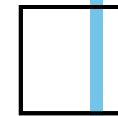
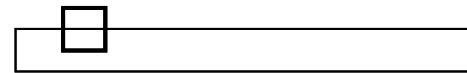
- Introduction to ICE Midland WTI American Gulf Coast (HOU) futures
- USGC crude fundamentals
- Features of the contract
- USGC pricing and risk management

Magellan and Enterprise: Critical mass of infrastructure



Source: Magellan, Enterprise, and ICE

ICE Midland WTI American Gulf Coast (HOU) Futures: Why?



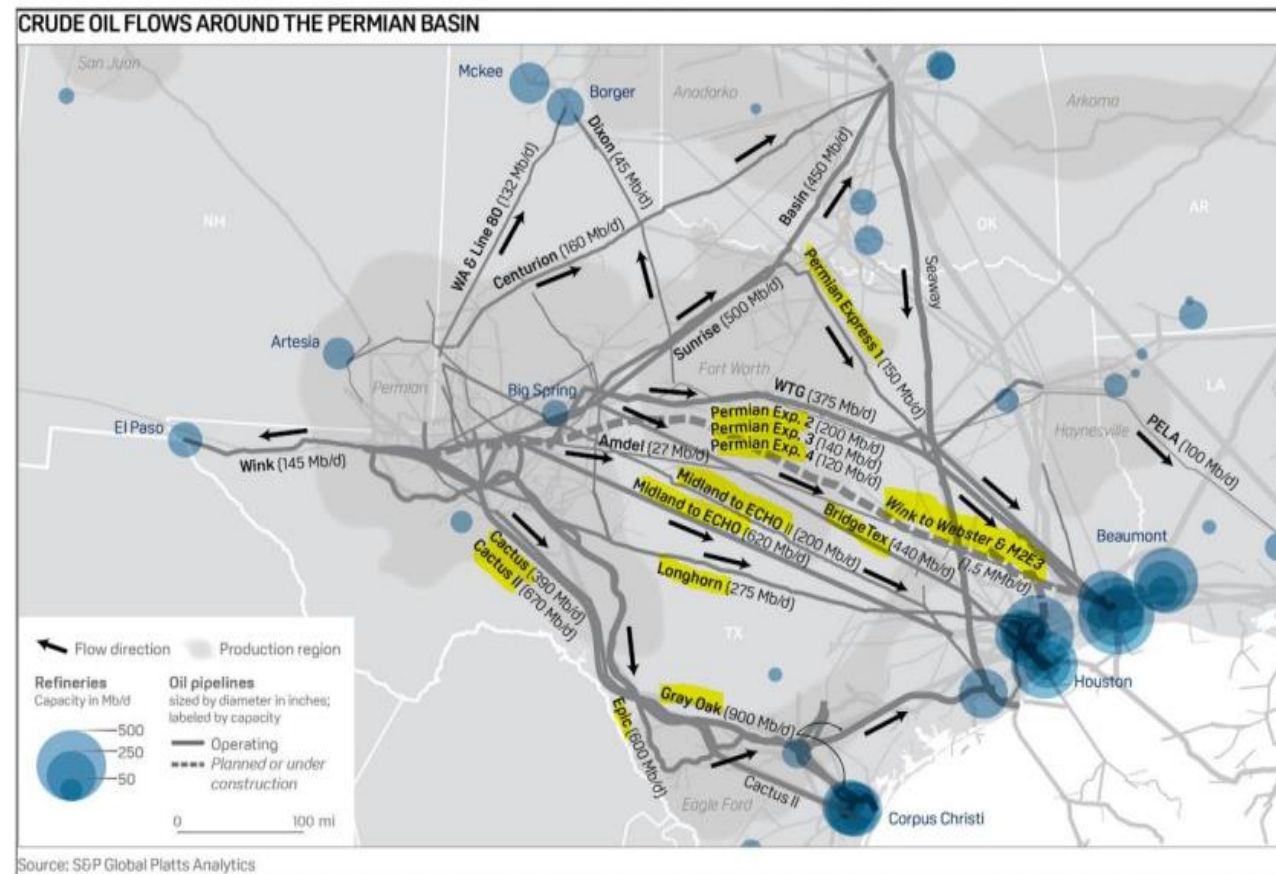
ICE Midland WTI American Gulf Coast (HOU) Futures: Why?

- The market wants and needs a physically deliverable futures contract that is transparent, liquid and truly representative of today's domestic crude market fundamentals
- With the dramatic shift in U.S .crude fundamentals over the last 12 years, the marginal barrel that sets the domestic price has transitioned to WTI on the U.S. Gulf Coast
- Houston's direct connectivity to more than half of U.S. refining capacity, substantial waterborne exports and domestic outbound pipeline capacity, along with access to approximately 150 million barrels of crude storage capacity, solidify the price of WTI in Houston as the most representative price for U.S. crude oil
- A truly representative domestic price can now be achieved

The marginal barrel that sets domestic prices has transitioned to the US Gulf Coast

In the current shale era, the price for domestic oil is set on the U.S. Gulf Coast, where the fundamentals include both domestic and international demand for U.S. light sweet crude.

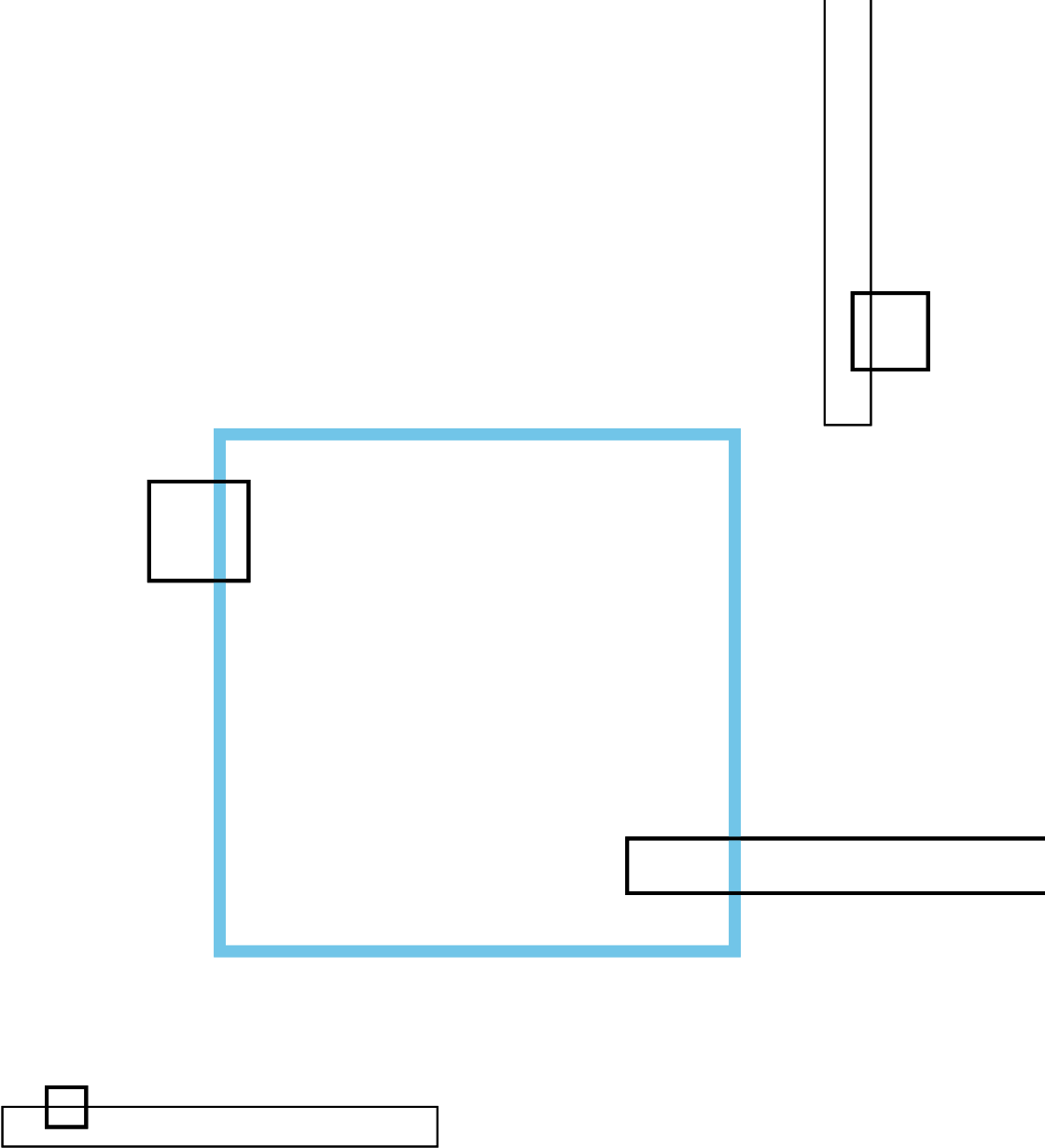
The map shows 2 key points: Most crude flows from the Permian to the USGC. Most USGC refining capacity is around Houston.



Houston has evolved beyond MEH

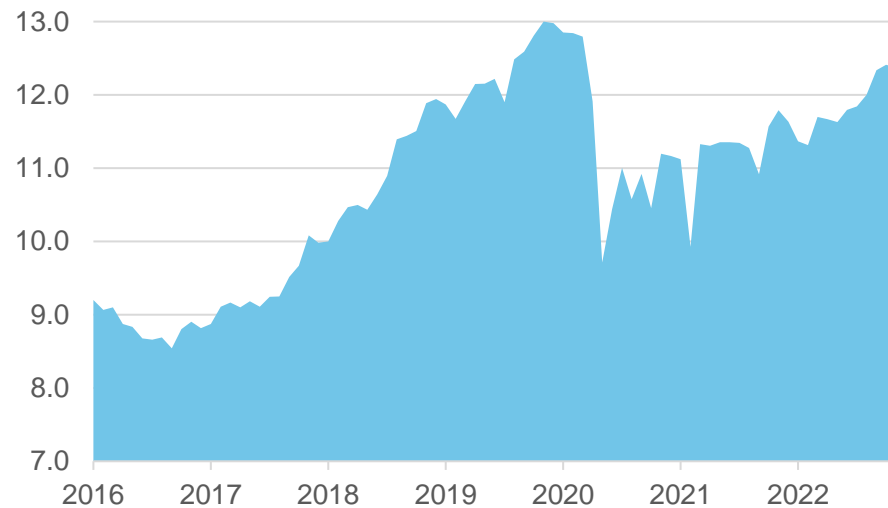
- **MEH (Magellan):**
 - 715 kb/d capacity of direct inbound Midland quality connectivity (Bridgetex 440 kb/d and Longhorn 275 kb/d)
 - 9 Mb of crude storage capacity
- **MEH plus ECHO (Magellan plus Enterprise):**
 - 4+ Mb/d of direct inbound Midland quality WTI connectivity between MEH and ECHO
 - 60+ Mb of Magellan/Enterprise crude storage capacity in Houston, out of a total 150 Mb
- **The HOU contract:**
 - To meet the market's need for scale and redundancy, Magellan, Enterprise, and ICE teamed up to align their vast supply capacity, storage capacity, system connectivity, and export access. Physical delivery at MEH and ECHO. One common Midland-quality / Midland-origin spec
 - One large liquidity pool underpins the HOU contract. No friction between the MEH and ECHO physical delivery locations

USGC Crude Fundamentals



U.S. crude output & exports increasing since 2011 / 2016

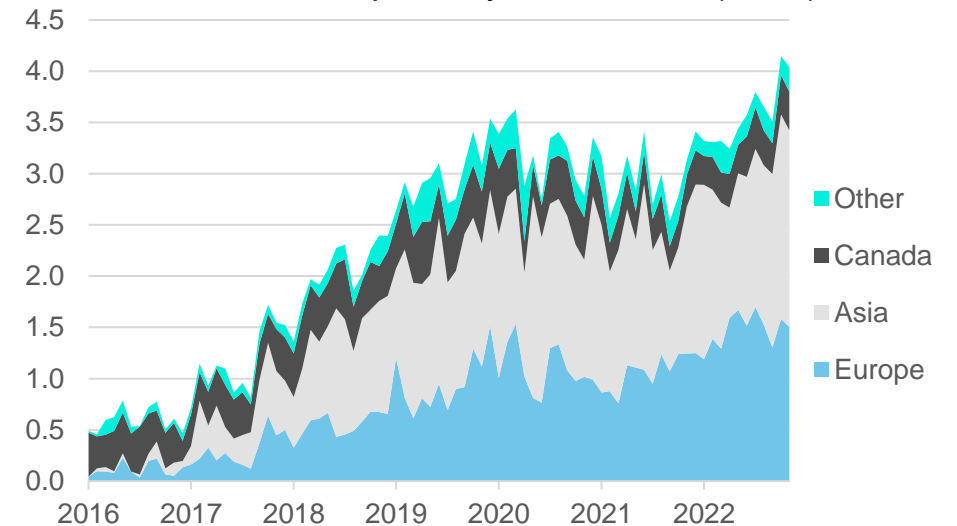
U.S. Crude Production (Mb/d)



U.S. crude production

- Recently around 12.3-12.4 Mb/d (prelim)
- U.S. EIA growth forecast: 0.6 Mb/d in 2023, 0.2 Mb/d in 2024*
- Growth should be driven by Permian (currently 5.7 Mb/d)*
- Factors: spending; inflation; supply chain; maturing resources

U.S. Crude Exports by Destination (Mb/d)



U.S. crude exports

- 2021: 3.0 Mb/d (Europe: 1.1 Mb/d. Asia: 1.4 Mb/d.)
- 2022: 3.6 Mb/d (Europe: 1.5 Mb/d. Asia: 1.6 Mb/d.)
- In 2023: exports should increase broadly in line with output. Under normal circumstances, U.S. refiners are maxed out in processing domestic light sweet grades

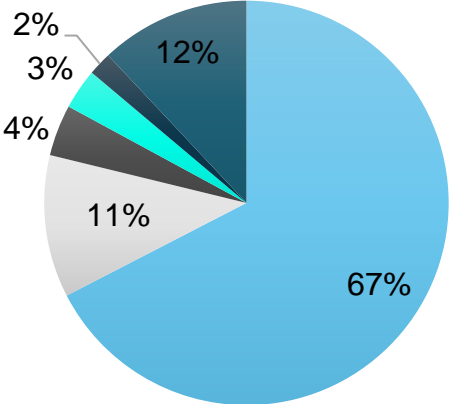
U.S. crude exports by grade: Midland WTI leads the way. HOU is key for U.S. and global pricing.

Midland leads crude exports with over 2.2 Mb/d in 2022, out of a total of 3.6 Mb/d

The importance of U.S. exports to Europe and Asia ties USGC price risk to Brent and Dubai much more than to Cushing

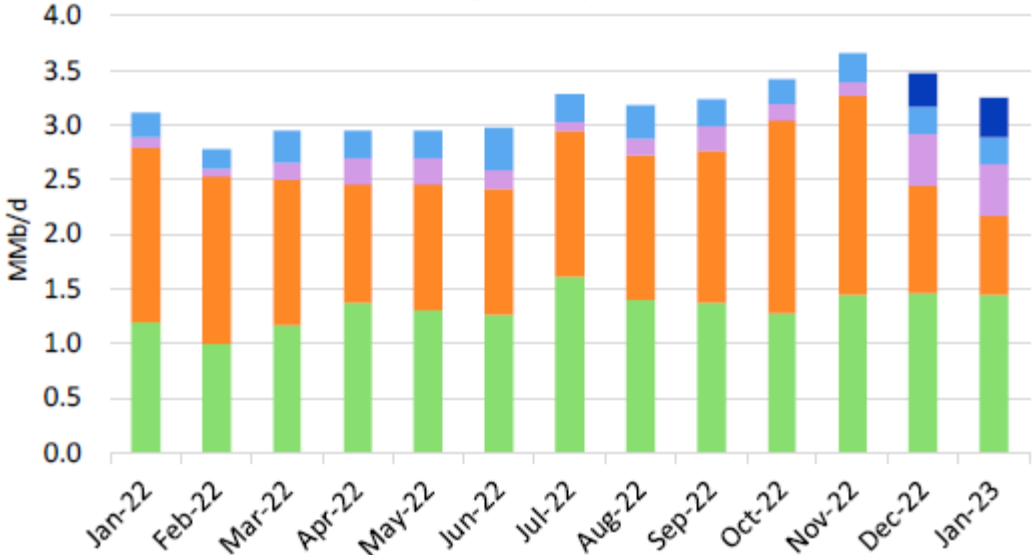
The HOU futures contract: a USGC benchmark that enables participants to directly price and hedge the marginal domestic barrel in the most efficient and cost-effective manner. Producers can hedge production, refiners and exporters can hedge supply and traders can effectively manage positions

U.S. Exports by Grade - 2022



Midland WTL Mars Cold Lake Eagle Ford Other

Crude Oil Exports by Destinations



Europe APAC Latin America Canada NA Africa

9 Source: Platts/Kpler (left-hand chart) and RBN (right-hand chart)



Permian crude flows to the USGC far exceed Cushing

Permian crude flows to Cushing have been declining quickly, down from 1 Mb/d in 2019 to 0.4 Mb/d in 2022. Forecast of 0.4 Mb/d in 2023, utilising only 33% of pipeline capacity

In contrast, Permian crude flows to the USGC have grown to 4-5 Mb/d. Forecast of 5 Mb/d in 2023, leaving spare pipeline capacity of 1.5 Mb/d

Additional production is likely to be exported as U.S. refiners are maxed out on light sweet crude processing

Fig. 5 Permian Outflows To Wichita Falls/Cushing, MMb/d

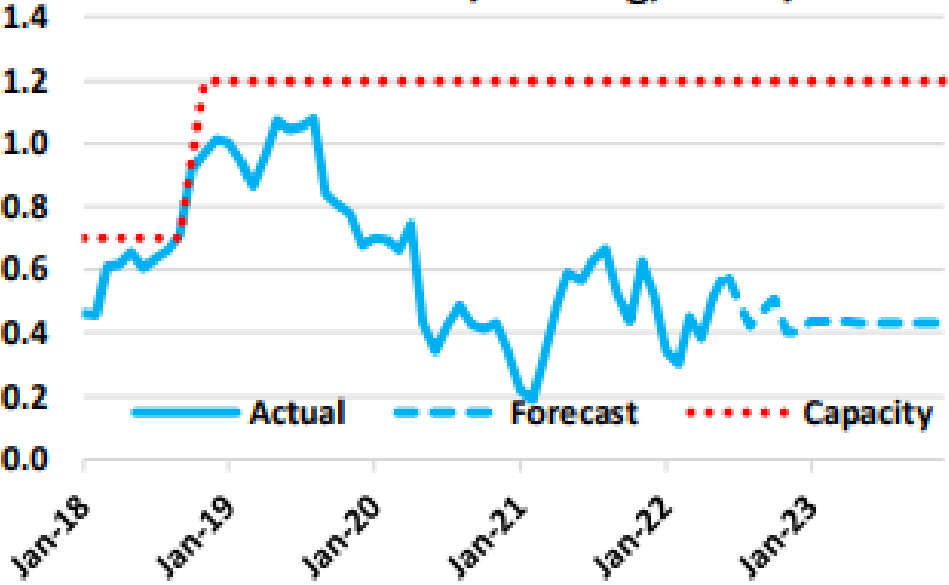
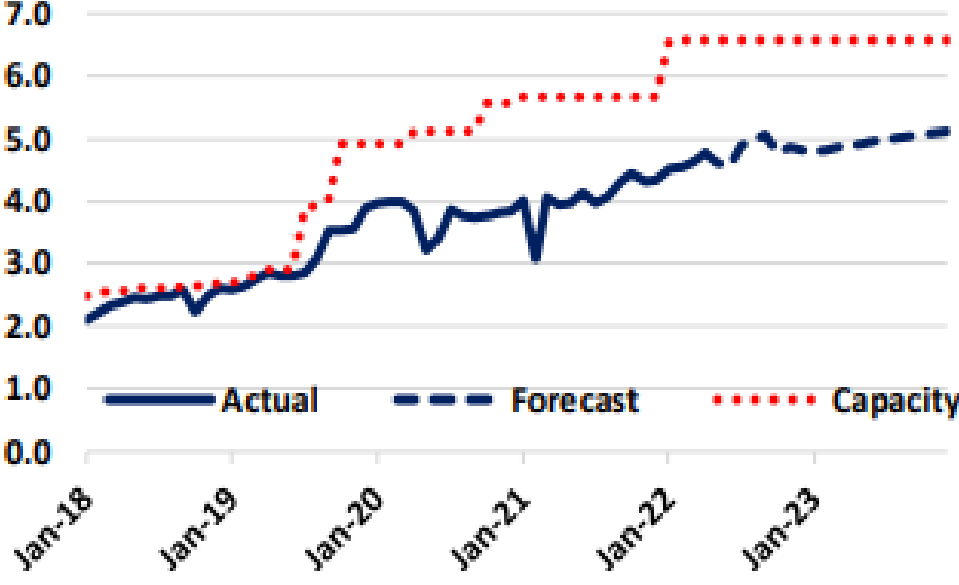
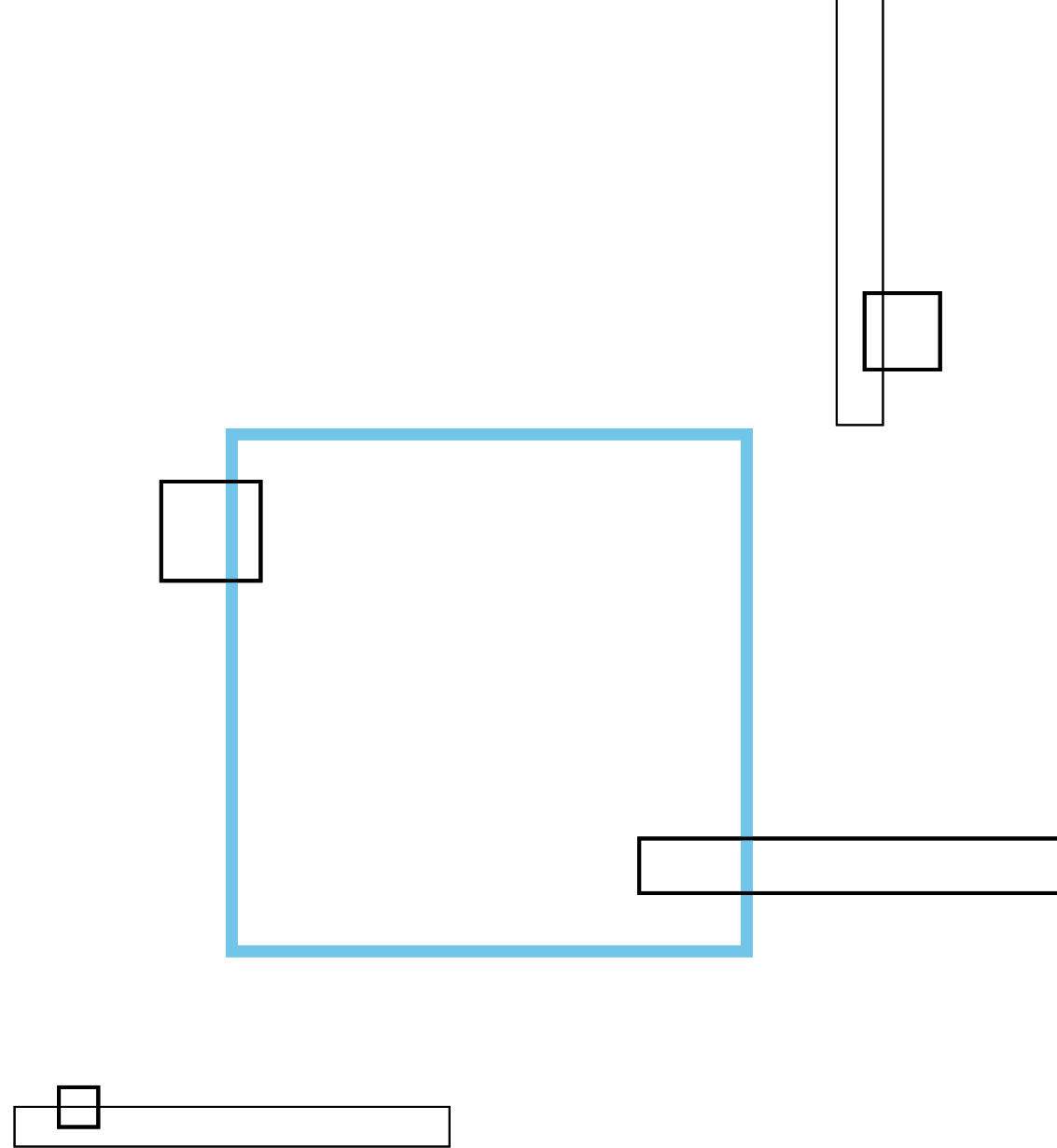


Fig. 6 Permian Outflows To Texas Coast, MMb/d



ICE Midland WTI American Gulf Coast Futures (HOU):

Features of the Contract



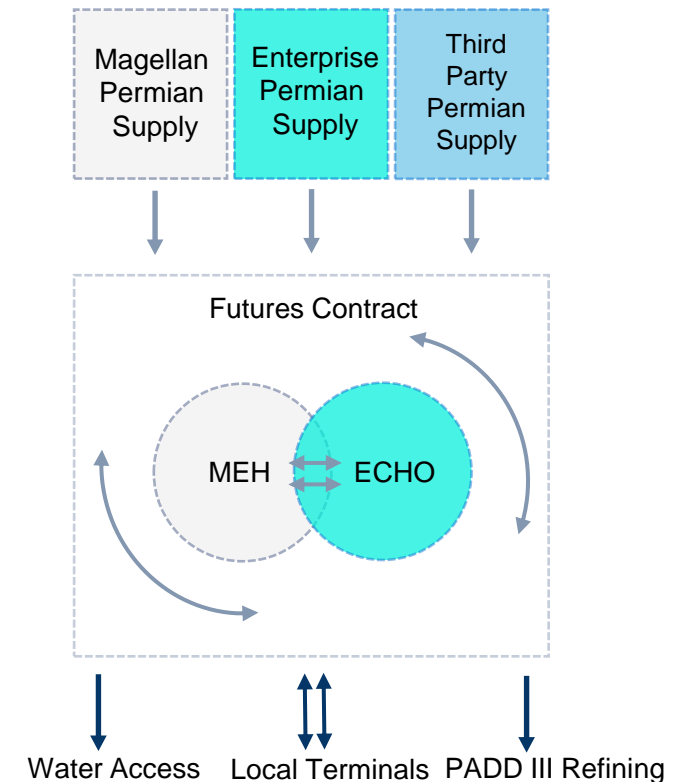
Integrated ICE Midland WTI AGC Futures Contract (HOU)

FUTURES CONTRACT OVERVIEW

- Futures contract for physical delivery at MEH and ECHO, establishing consistent quality and price transparency in the Houston market
- Sellers have the option to deliver to either the MEH or ECHO terminal
- Buyers have the ability to indicate their terminal of preference in which to take delivery
 - In order to further facilitate trading between the terminals and to create one large liquidity pool, Magellan and Enterprise have agreed to transfer Midland WTI barrels between MEH and ECHO for no charge, if the barrels are not delivered to the buyer's preferred terminal.
 - A fee of 10 cents/bbl will be charged for Midland WTI transfers made outside of the contract.
- Quality specifications are the best representation of Midland-quality WTI to date, developed through consultation with Permian producers, Gulf Coast refiners, and the international market

WHY HOUSTON?

- Backed by the most extensive crude oil infrastructure in the country, the Houston market provides optionality and redundancy of supply, storage, and take-away capacity, driving confidence for buyers and sellers
 - 4+ Mb/d of direct inbound Midland quality WTI connectivity between MEH and ECHO with access to all inbound Permian to Houston supply.
 - 6+ Mb/d of direct outbound connectivity to demand centers between MEH and ECHO facilities
 - 9+ Mb/d of outbound capacity
 - 5+ Mb/d of Texas Gulf Coast refining capacity
 - 60+ Mb of Magellan/Enterprise crude storage capacity in Houston, out of a total 150 Mb
 - 490+ Mb of USGC (PADD 3) crude storage capacity (refineries, tank farms, terminals)



Source: ICE

ICE Midland WTI AGC (HOU) crude quality specs

- HOU is a globally applicable spec
- A tight and robust spec, ICE contract rules and oversight, and Magellan and Enterprise’s strict/proven quality programs aim to protect and give confidence to buyers and sellers regarding Midland-origin
- It is difficult to blend and not exceed one of the specs. Tight specs address the “dumbbell crude” issue.
- Quality data published by Magellan and Enterprise

ICE Midland WTI AGC (HOU)

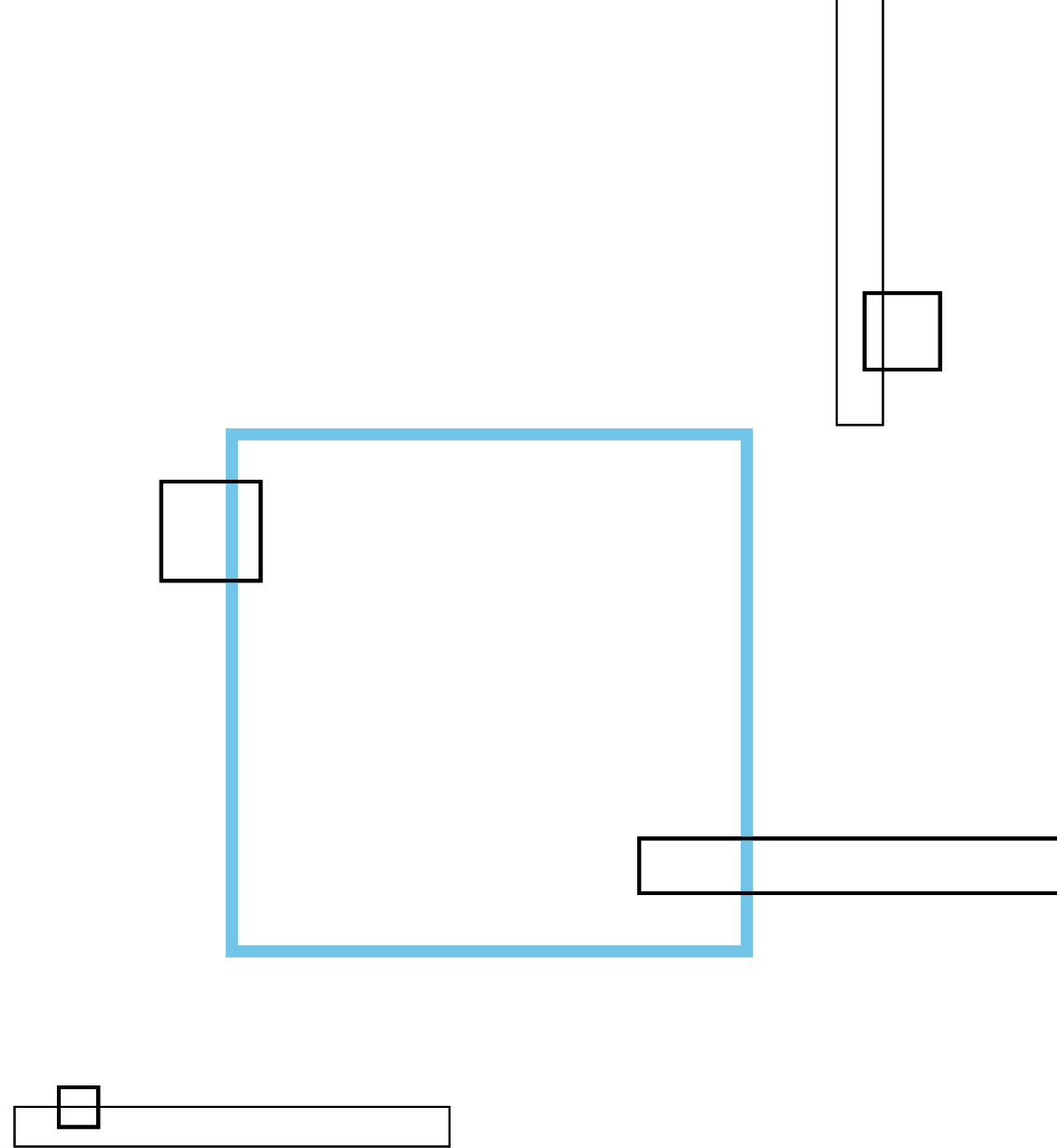
PARAMETER	UNITS	MIN	MAX	REQUIRED TEST METHOD
API Gravity	°API, 60°F	40.0	44.0	ASTM D1298 or D5002
Sulfur Content	% (m/m)		0.20	ASTM D4294
Mercaptan Sulfur	ppm Wt		75	UOP 163
RVP	PSI		9.0	ASTM D6377
BS&W	% (v/v)		1.0	ASTM D4007 per API MPMS 10.4
Nickel & Vanadium (Combined)	mg/kg		3.0	ASTM D8252 or D5708, Procedure B

NYMEX WTI Specifications

PARAMETER	UNITS	MIN	MAX	REQUIRED TEST METHOD
API Gravity	*API, 60F	37.0	42.0	ASTM D-287
Sulfur Content	% (m/m)		0.42	ASTM D4249
Mercaptan Sulfur	ppm Wt		N/A	
RVP	PSI		9.5	ASTM D5191
BS&W	% (v/v)		1	ASTM D9688
Nickel	mg/kg		8	ASTM D5708
Vanadium	mg/kg		15	ASTM D5708

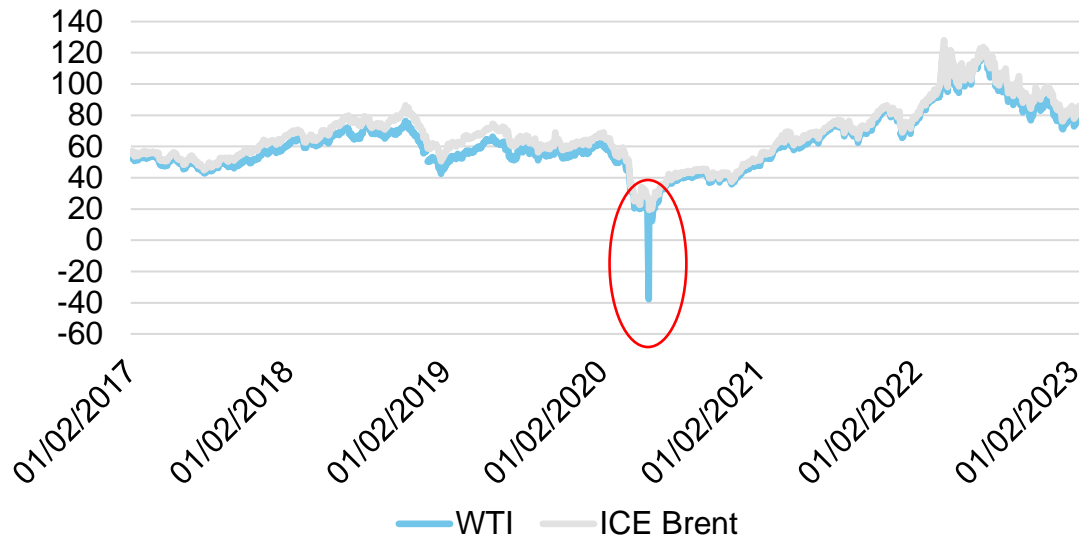
Source: ICE and CME

USGC Crude Pricing and Risk Management



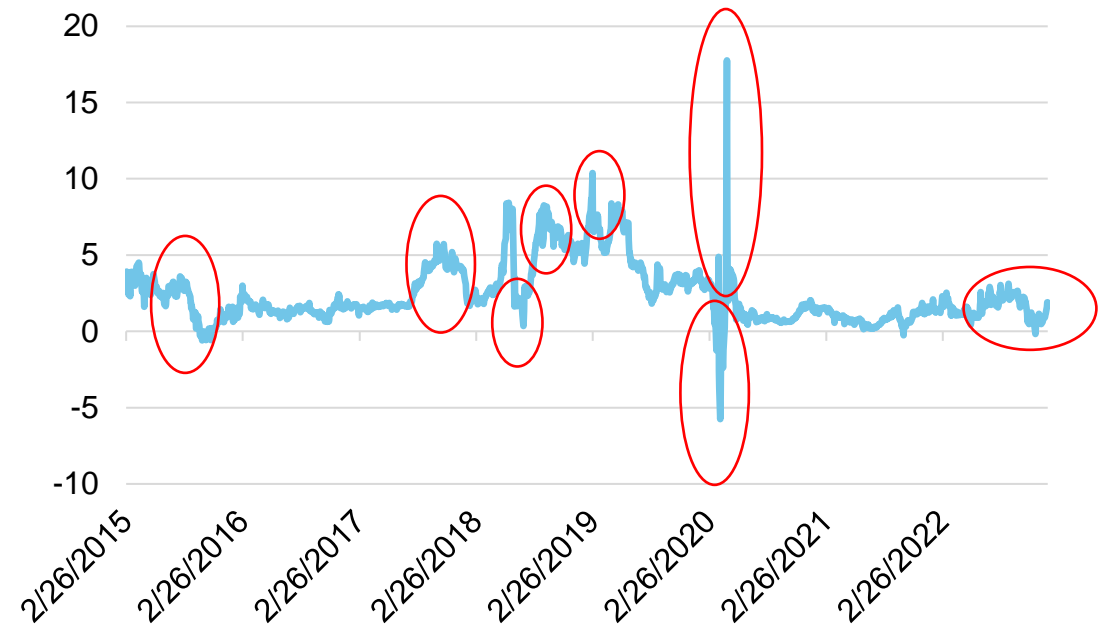
WTI negative pricing in April 2020: A catalyst for change

ICE Brent & NYMEX WTI Front Month Prices



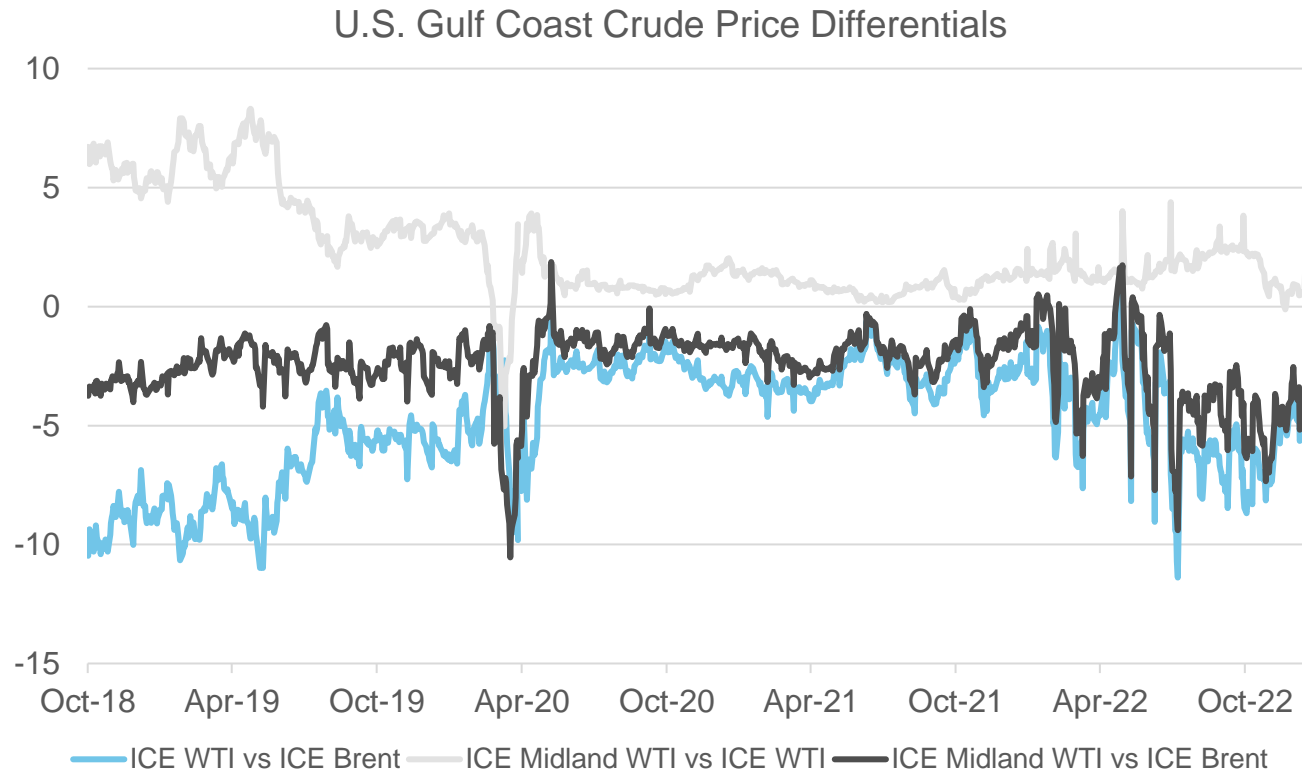
Source: ICE, CME, & Argus

Argus MEH vs. NYMEX WTI



- April 20, 2020 closing prices: May NYMEX WTI -\$37.63, June ICE Brent \$25.57
- Futures prices have a very real impact on physical crude prices, which are quoted as a differential to NYMEX WTI Cushing
- Fundamental exposure from Cushing: logistical constraints (storage capacity), inventory swings (low/high), Canadian pipeline leaks, refinery outages, off-spec crude
- Non-fundamental exposure from Cushing: managed money or non-commercial activity (hedge funds, asset managers), ETF oil fund “roll periods”

Key USGC crude price differentials drive exports & hedging



Traders exposed to WTI where it meets the global waterborne market on the USGC. Once WTI hits the water, it prices off Brent or Dubai.

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

For US crude exports to Asia, the key is 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 AGC (HOU) vs. WTI Cushing
- B) WTI Cushing vs. Brent
- C) ICE Midland WTI AGC (HOU) vs. Brent

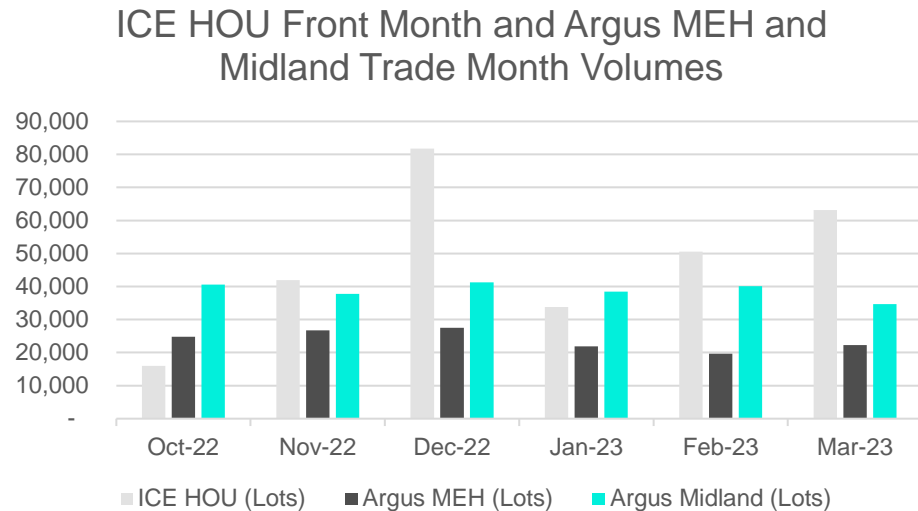
Trader does A and B. The WTI Cushing legs cancel, and trader is left with C.

A better way:

Trader simply does C.

HOU is a better and more efficient way to hedge

HOU offers a better hedge, because it is more direct, more liquid, more visible, and better value



On average, front month ICE HOU has more daily volume than trade month Argus MEH or Midland

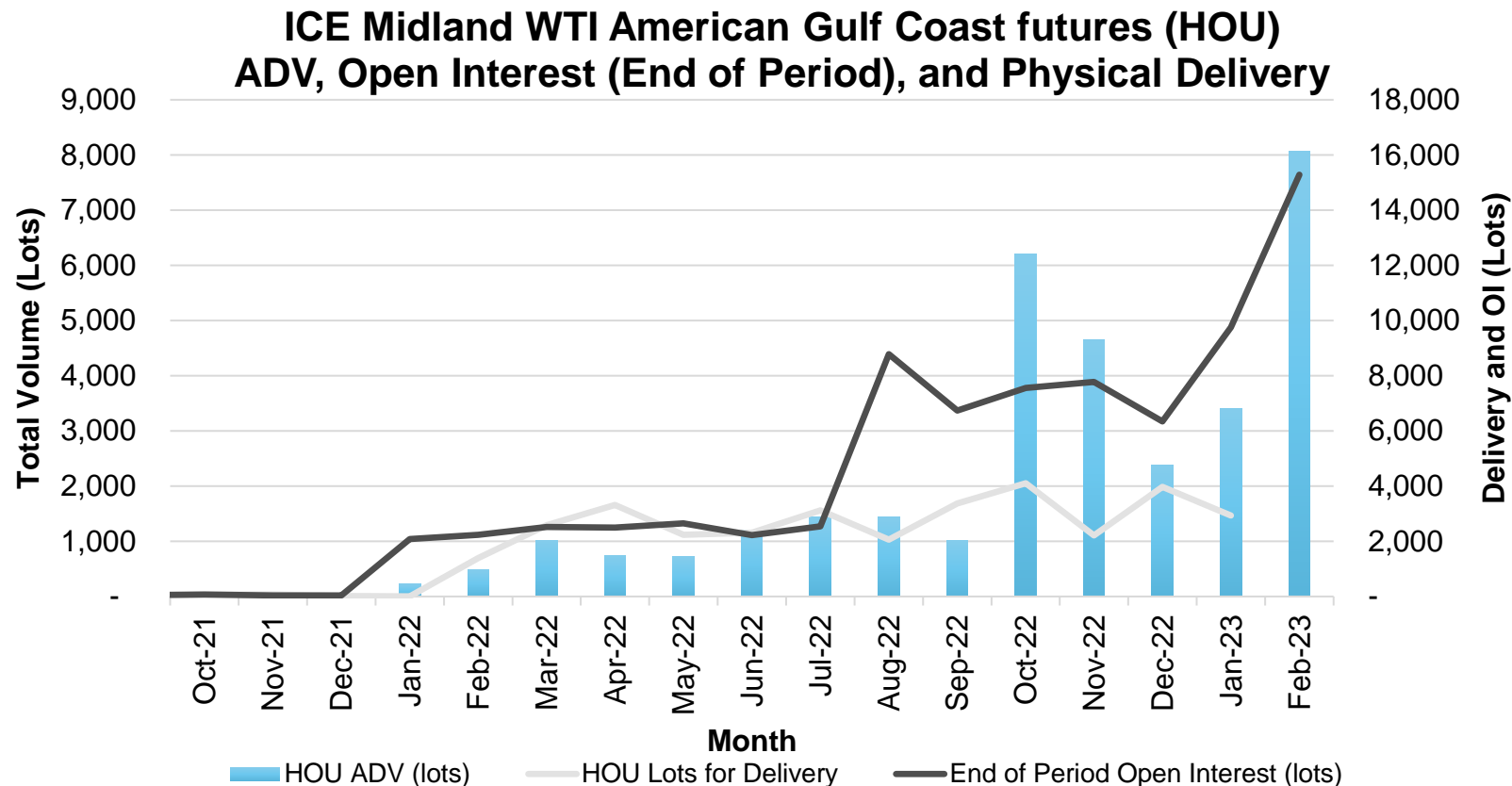
Midland WTI prices on the U.S. Gulf Coast are more transparent. Trading is executable electronically without counterparty risk

Cost savings include:

- Eliminating multiple trades
- Lower transaction costs (margin offsets)
- Data and price subscriptions
- Broker commissions
- Wider markets allow more precise pricing:
 - \$0.05 per tick for voice broker/physical
 - \$0.01 per tick for ICE HOU futures on the screen

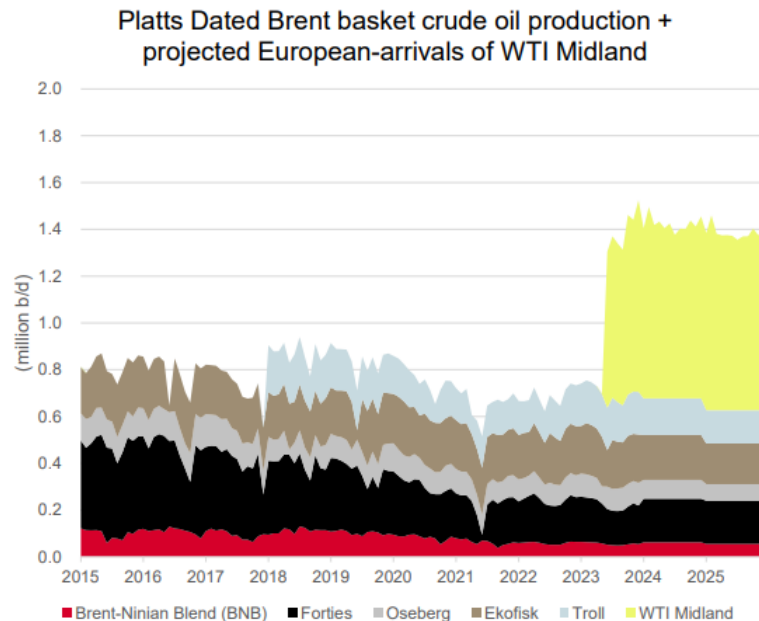
A successful restructuring for ICE Midland WTI AGC (HOU)

- Since January 2022 contract restructuring, solid growth in trading activity
- After Platts June 2022 decision that WTI Midland would be included in Brent, there was an immediate increase in HOU trading volumes and open interest
- Open interest extends out to December 2023
- Contracts going to physical delivery on expiry around 3,000 lots (3 Mb) each month
- 60 market participants



Physical Midland WTI will have a key role in Brent pricing. ICE Midland WTI AGC (HOU) will work well with the Brent complex

- WTI Midland crude will be added to the current Brent “basket” of BFOET and will be reflected in the Dated Brent and Cash BFOE price assessments, starting with June 2023 cargo deliveries. Brent assessments will continue on an FOB basis
- ICE Midland WTI AGC (HOU) will work well with the revised Brent complex. Why?
 - Based on the spec for ICE Midland WTI AGC (HOU), the same physical Midland WTI crude deliverable against HOU will be deliverable into both the Dated Brent and Cash BFOE markets
 - ICE Midland WTI AGC (HOU) vs. Brent will be the best way to hedge the trans-Atlantic arbitrage - both location and quality



Source: Platts

Grade	API Gravity (degrees)	Sulfur
Brent Blend	37.5	0.40%
Forties	38.7	0.64%
Oseberg	37.8	0.25%
Ekofisk	38.5	0.19%
Troll	35.9	0.14%
WTI Midland	40-44	≤0.20%



Summary & conclusions

Summary and conclusions

- The marginal barrel that sets the U.S. domestic price has transitioned to Midland WTI on the U.S. Gulf Coast
- The pairing of the Magellan and Enterprise systems provides critical mass in terms of: supply of Midland-origin / Midland-quality WTI crude, crude storage capacity, and connectivity / access to domestic and export refining demand
- Today, oil producers, refiners, exporters and traders use a combination of two or three regional differential trades to hedge their U.S. Gulf Coast exposure, which introduces unnecessary risk to crude prices from Cushing. Both fundamental and non-fundamental risk exposure from Cushing
- The ICE Midland WTI AGC (HOU) futures contract enables participants to directly price and hedge the marginal domestic barrel (Midland WTI quality crude) in the most efficient and cost-effective manner. Producers can hedge output, refiners and exporters can hedge supply and traders can effectively manage positions
- Margin efficiencies are more important than ever. By hedging and trading both Midland WTI and Brent on ICE, margins can be reduced by more than 80%
- A range of other cost savings
- ICE Midland WTI AGC (HOU) will work well as part of the revised Brent complex, due to quality and deliverability

Contacts and resources

For more information on ICE Midland WTI American Gulf Coast Futures (HOU)

Mike Wittner

**Global Head of Oil
Market Research**

+1 646 733 5007

mike.wittner@ice.com

Scott Mullervy

**Director, US Crude &
Options Market
Development**

+1 713 210 4305

scott.mullervy@ice.com

Kevin Kelly

**Market Manager, US
Crude & Options**

+1 646 733 5003

kevin.kelly@ice.com

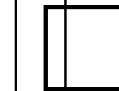
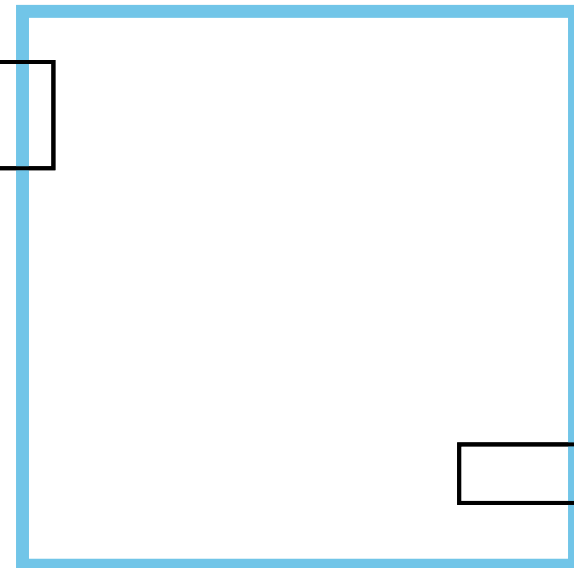
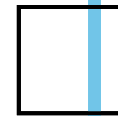
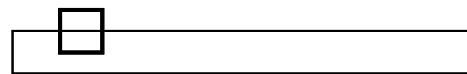
Jeff Barbuto

Global Head of Oil

+1 646 733 5014

jeff.barbuto@ice.com

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