

# CME Energy Markets

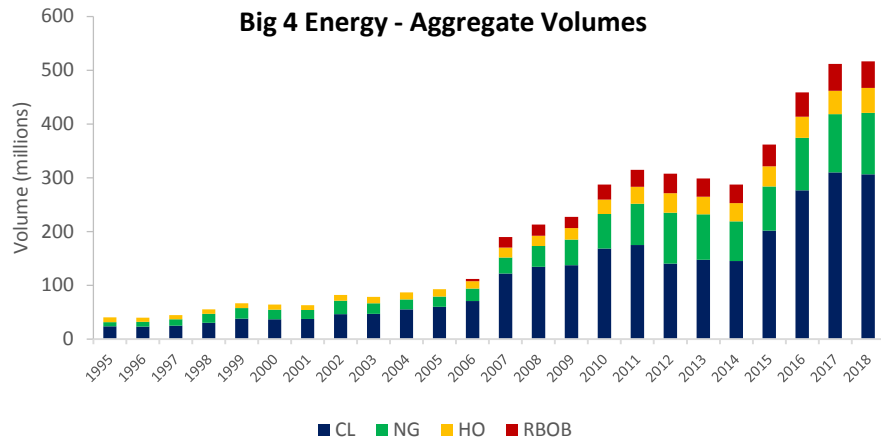
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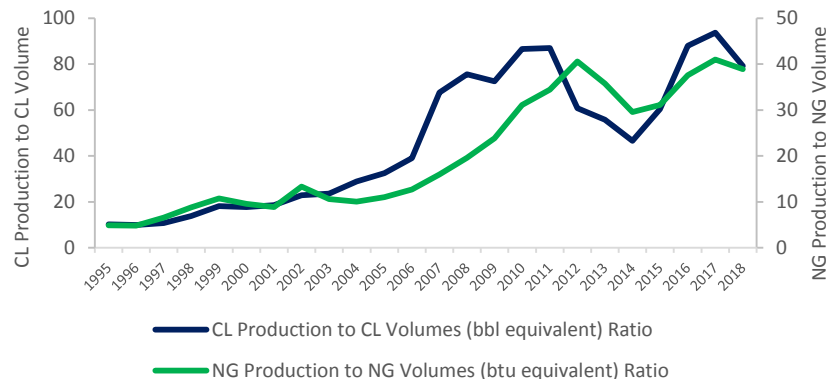
April 17, 2019

# NYMEX Energy Futures



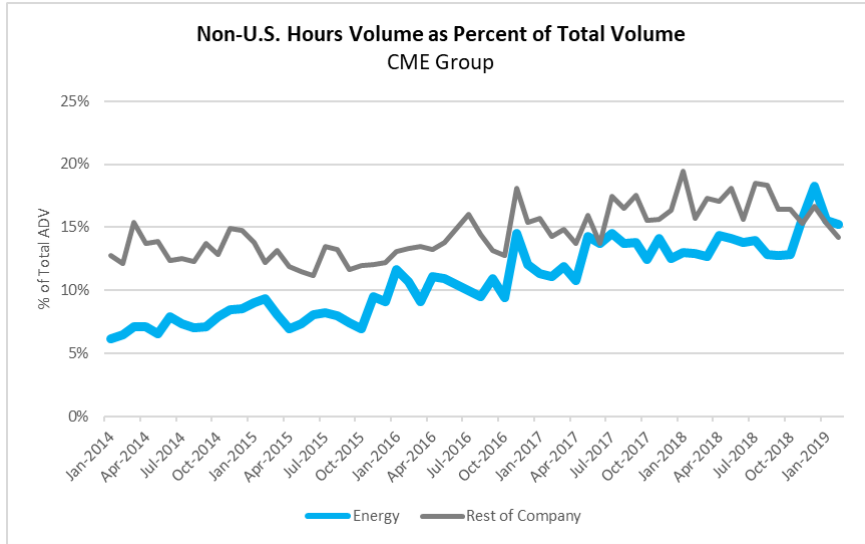
- Tremendous uptake of energy futures in recent years exemplifies an increased appetite for risk management in the energy sector
- Since 2008:
  - CL **+128%**
  - NG **+197%**
  - HO **+137%**
  - RB **+143%**

## CL and NG futures volumes outpace rising U.S. crude oil and natural gas production



- CL and NG volumes illustrate extensive growth in derivatives trading relative to the growth of the physical market
- WTI Futures: 306.613 billion barrels in volume traded in 2018
- Henry Hub Futures: 1.143 trillion mmBtu in volume traded in 2018

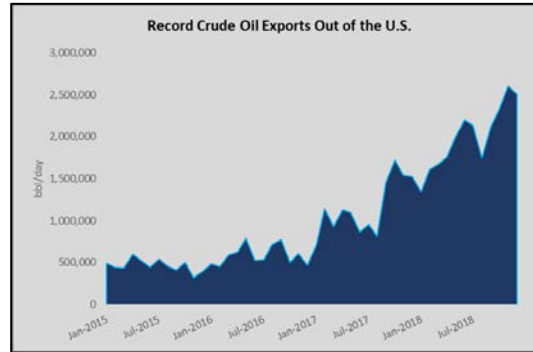
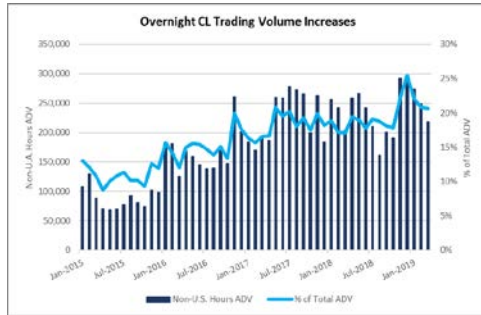
# International Traders Looking to NYMEX



- **15%** of total Energy volume in Feb 2019 was executed during non-U.S. hours, compared to just 6% five years ago
- Overseas traders have increasing exposure to CME's benchmark energy products as U.S. crude oil and LNG production and exports increase

CME Energy Products Non-U.S. Hours Trading	
Year	% of Total Volume
Feb-14	6%
Feb-15	9%
Feb-16	11%
Feb-17	11%
Feb-18	13%
Feb-19	15%

# CME Group Benchmarks Head Overseas



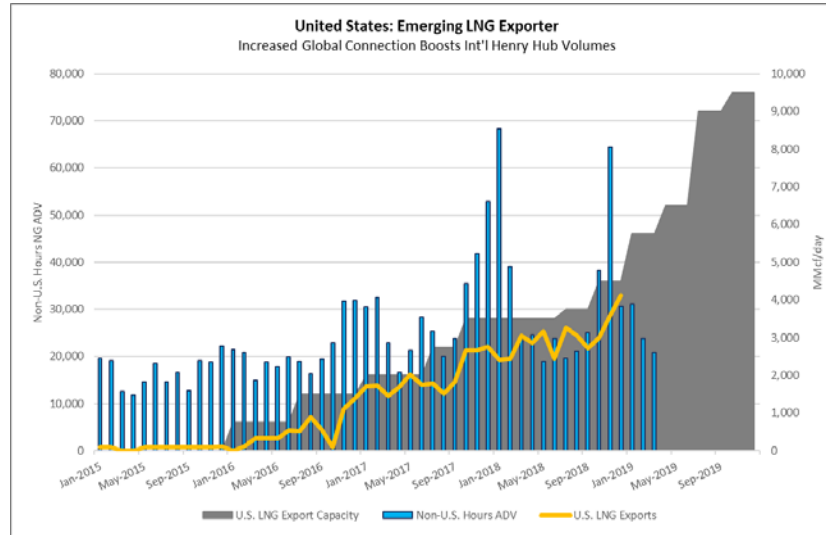
- **21%** of WTI Crude Oil Futures (CL) volume was executed during non-U.S. hours in Feb 2019 (vs. 17% in Feb 2018)
- Overnight hours CL volume is **+5% YoY**

- The United States is exporting record amounts of light, sweet crude oil; **2.5mmbbl/day** in December 2018\*
- EIA predicts the U.S. will become a net exporter of energy in Q3 2020
- International traders have increasing exposure to price of NYMEX CL

- WTI Crude Oil Options (LO) non-U.S. hours volume comprised **15%** of total volume in Feb 2019 (vs. 10% in Feb 2018, and 8% in Feb 2017)
- Overnight trading in LO ADV is averaging **113k YTD**

Source: EIA  
\*most recent data published

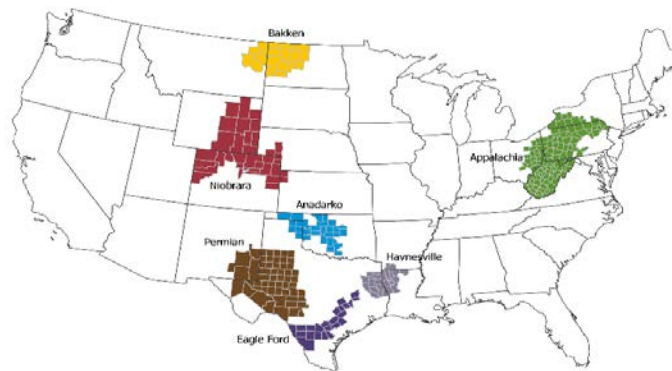
# Henry Hub as a Global Benchmark



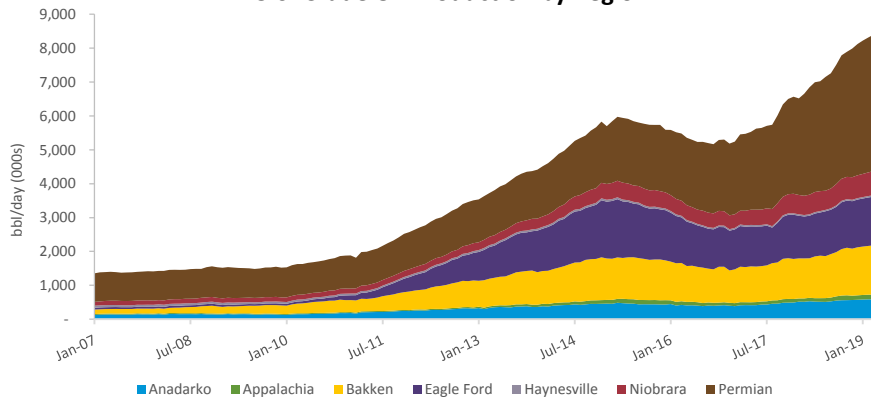
- U.S. Gulf Coast LNG continues to reach more destinations in Europe and Asia solidifying NYMEX's Henry Hub Futures (NG) contract as an international benchmark
- Volume during Asian and European trading hours has increased as overseas participants look to hedge exposure to increasing flows of U.S. LNG

# The Shale Revolution

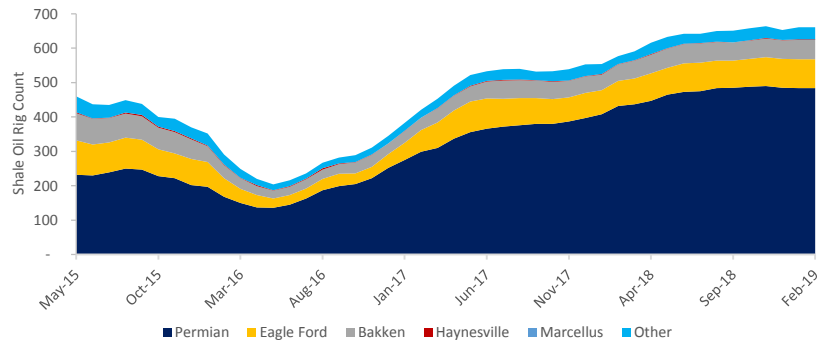
- Current shale oil production in the Permian Basin is over **4 Mb/d** while pipeline capacity used to transport crude from the region is approximately **3.4 Mb/d**
- Permian operators are unable to move excess supply to the Gulf Coast (USGC) for export
- Producers in the region are forced to utilize alternative routes to meet surging export demand in the USGC
- Wood Mackenzie estimates that supply growth in the Basin will increase by **2.4 Mb/d by 2023**



U.S. Crude Oil Production by Region

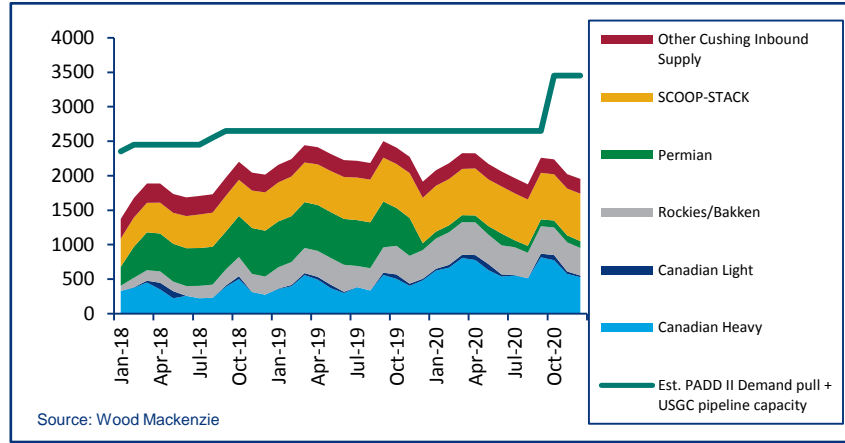


Operating oil rig count in the Permian Basin has grown substantially since 2015

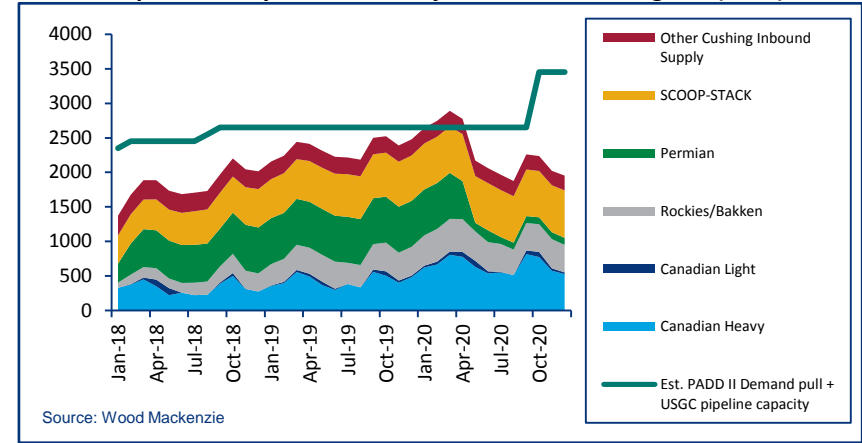


# Permian Pipeline Bottleneck

Base Case Oil Flow Projections into Cushing, OK (kb/d)



Permian Pipeline Delay Case Flow Projections into Cushing, OK (kb/d)

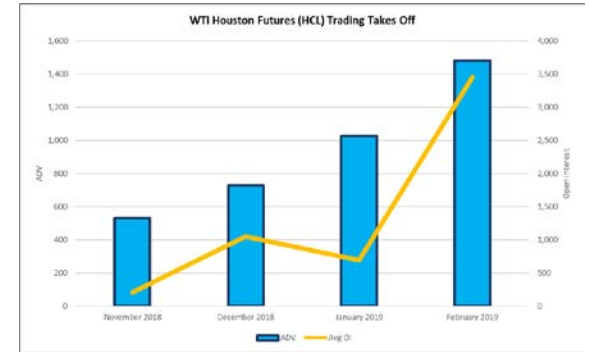


- Approximately **2.1 Mb/d** of pipeline capacity between the Permian Basin and USGC is set to be available via Cactus II, EPIC, and Grey Oak by **January 2020**
- In June of 2018, market participants began to express concerns regarding target completion dates for the three pipelines
- Wood Mackenzie projections show that delays in pipeline completion dates have the potential to add **565 kb/d** to the original **Permian-to-Cushing** flow estimates

# CME Group Offers New Hedging Tools

## WTI Houston Futures (HCL)

- Traders gain access to the most robust crude infrastructure in Houston, with connections to major refiners, robust storage capacity, and export terminals
- Specifications are reflective of Midland crude, and provide a consistent, quality barrel of crude oil (40-44 API, .275 sulfur, 4ppm Nickel, 4ppm Vanadium)
- **Market Participants can now effectively hedge a crude oil barrel in the U.S. Gulf Coast (contract launched November 5, 2019)**



## CME Crude Oil Auctions

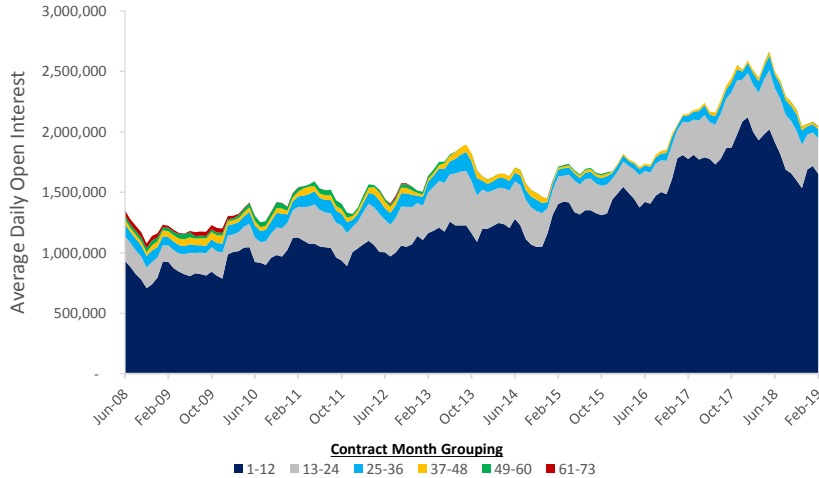
- A transparent, competitive, anonymous electronic auction for firms across the world to hedge U.S. crude oil
- Auction price is benchmarked against WTI Houston (HCL) futures
- Winner works directly with seller on physical delivery and is subject to the seller's GT&Cs
- **Firms bid to have their ship loaded with Midland crude in the Gulf Coast**





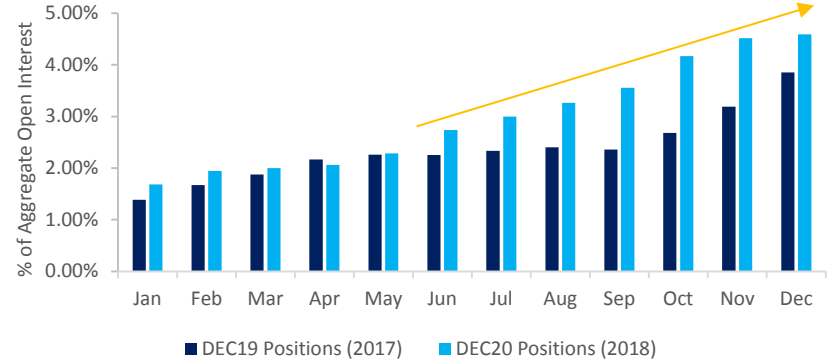
# Hedging Developments

**Prompt hedging responsible for majority of open interest growth since 2008**



- Hedging patterns shift from protecting long term investment projects to preserving cash flow at the shorter end of the curve

**Producers see increased price exposure in 2020 as two-year hedging positions rise Y-o-Y**



- Potential setbacks in greenfield pipeline projects could continue to push crude volumes north to Cushing throughout Q1 2020
- Participants began increasing their DEC20 WTI hedging positions in June 2018 in anticipation of increased WTI Cushing price exposure

# Key Takeaways

- U.S. shale revolution has led to record levels of U.S. crude oil production and exports, increasing the importance of US crude in international markets
- These trends are reflected in the derivatives markets through increased activity in NYMEX Energy futures contracts
- The evolving U.S. crude oil environment has generated a global appetite for new risk management instruments and exchanges are adapting accordingly
- CME will continue to focus on rolling out new risk management tools and building liquidity in existing products to serve a radically changing market
- NYMEX WTI Houston Crude Oil Futures (HCL) and Options (HCO) launched on November 5, allowing participants access to the most robust crude infrastructure system in Houston as exports out of the region rapidly increase

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