

Key Fundamental and Technical Drivers of the Crude Oil Market

Presented By Craig Bewick and Dan Gramza

About Craig Bewick

Craig Bewick has spent over 20 years working in Futures and Options markets. He began his career working at both the Chicago Board of Trade and Chicago Mercantile Exchange in roles ranging from Risk Management, Regulatory, Technology, Product Management and Client Development. He then spent 8.5 years as the General Manager of Chicago-based proprietary trading firm, WH Trading LLC, where he was responsible for managing day to day operations of the firm.

Craig currently serves as Director, Client Development and Sales at CME Group where he is responsible for working with both brokerage firms and individual traders to educate and promote futures and options on futures trading.

Craig writes commentary for the InFocus Options Corner, a daily op-ed focused on trade analysis and helping traders identify trading opportunities within CME Group futures markets.

About Dan Gramza

Over 25 years' experience trading futures, options on futures, stocks, stock options and cash markets around the world

Started on the exchange floors, trades upstairs

Experience with scalping, day trading, swing trading and position trading

Testified as an expert in U.S. federal court

Set up prop trading operations

Co-inventor of two issued security patents

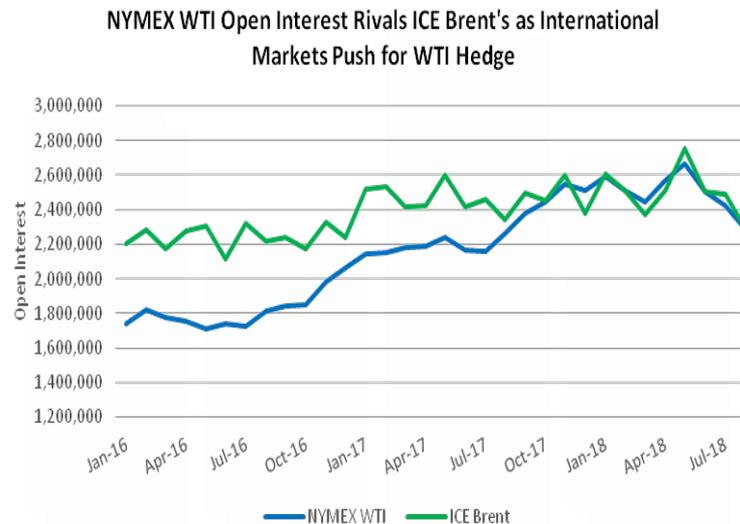
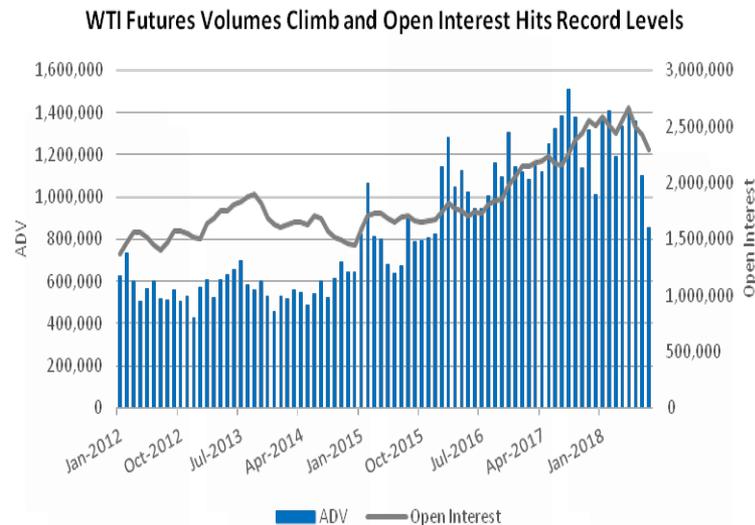
Co-inventor of 3rd pending security patent

Has worked with traders from over 36 exchanges, 450 institutions and 35 countries.

• WTI Futures: Global Crude Oil Benchmark

- WTI Crude Oil Futures (CL) broke the single-day open interest record on May 16, 2018 with **2,713,986** lots outstanding
- Volume remains strong with **1.25mm** WTI Futures contracts traded per day in 2018 YTD
- As crude oil exports soar and cargoes find homes across the world, international traders look to hedge using NYMEX WTI

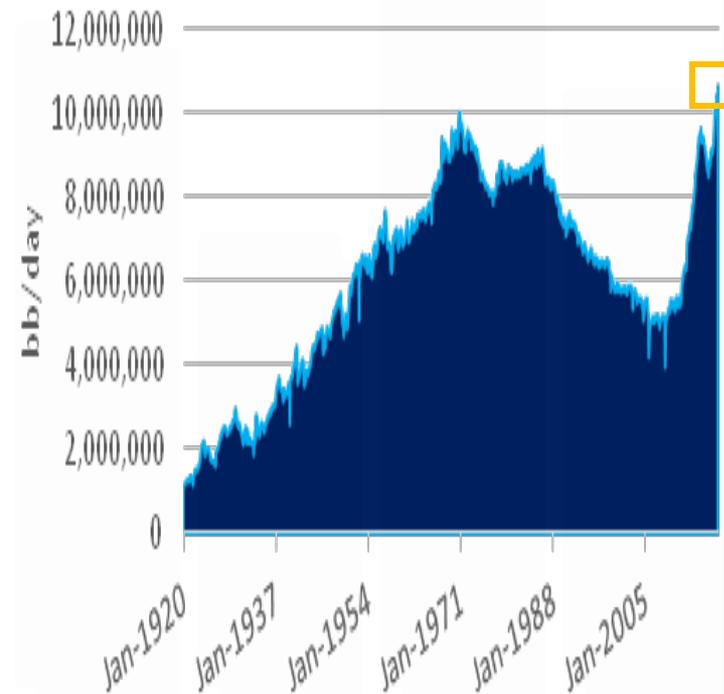
Source: EIA



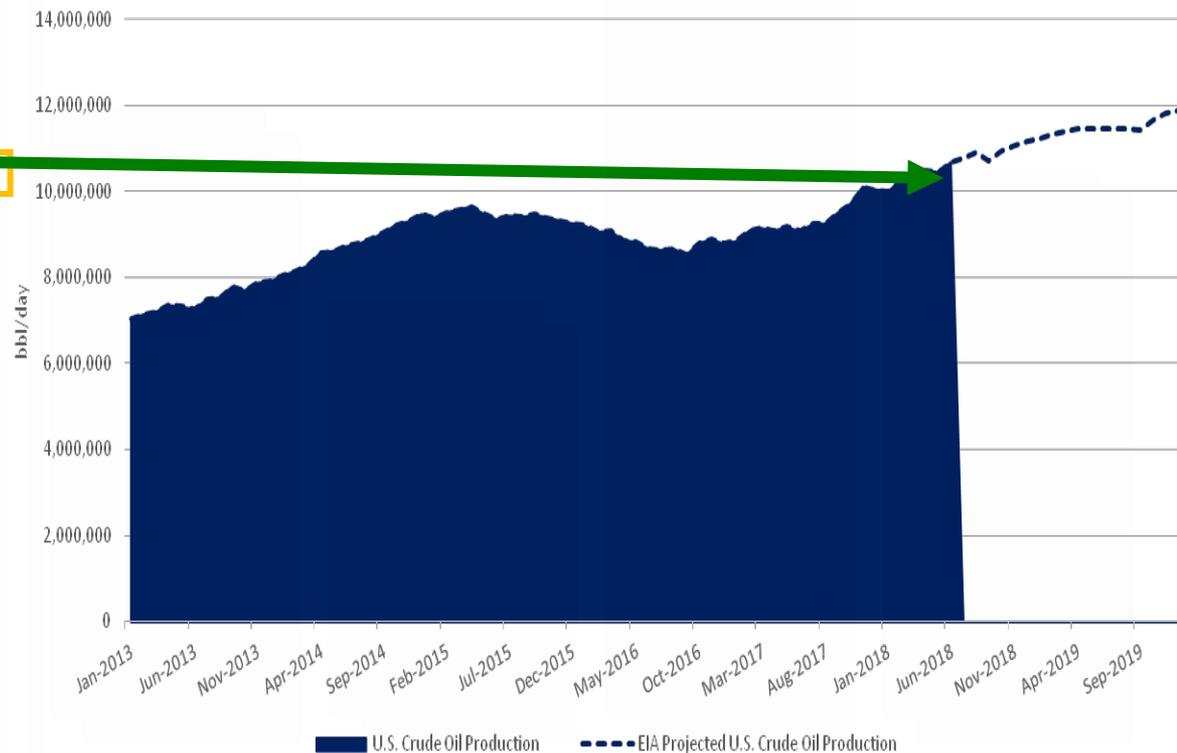
•U.S. Crude Oil Production Hits Record Highs

- History made in June 2018 – U.S. produces largest amount of crude oil ever at **10.7mm** bbl/day
- EIA projects production will average **10.7mm** bbl/day in 2018 and **11.5mm** bbl/day in 2019

U.S. Crude Oil Production Since 1920



U.S. Crude Oil Production Expected to Keep Climbing



Source: EIA

• Energy Production Facts

IEA US to claim worlds No 1 oil producer status in 2023

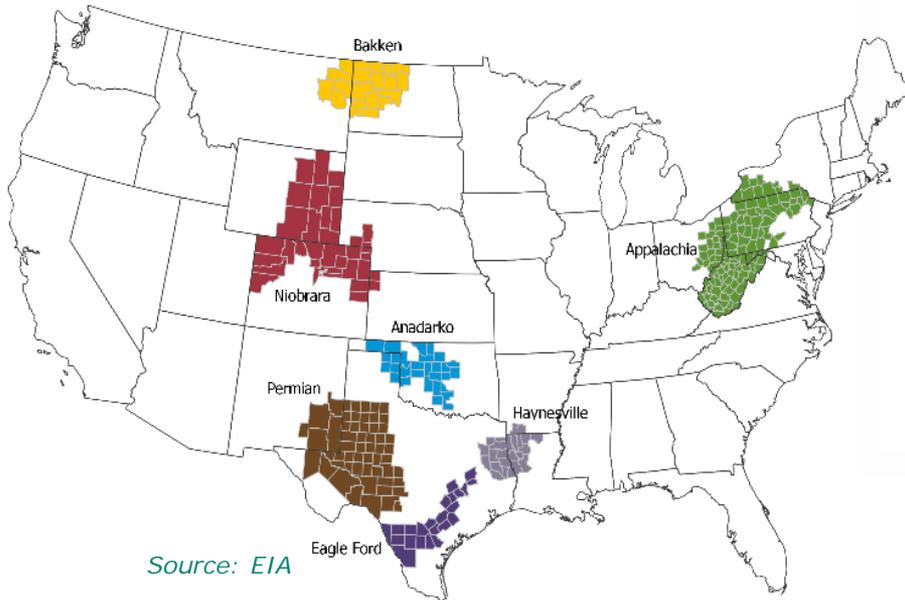
The International Energy Agency predicts that US oil production will hit a record of 12.1 million barrels per day in 2023, making the US overtake Russia as the world's biggest oil producer.

Global production is expected to increase by 6.4 million barrels per day by 2023, with the US accounting for nearly 60% of the new oil, while American oil exports are seen more than doubling to 4.9 million barrels per day

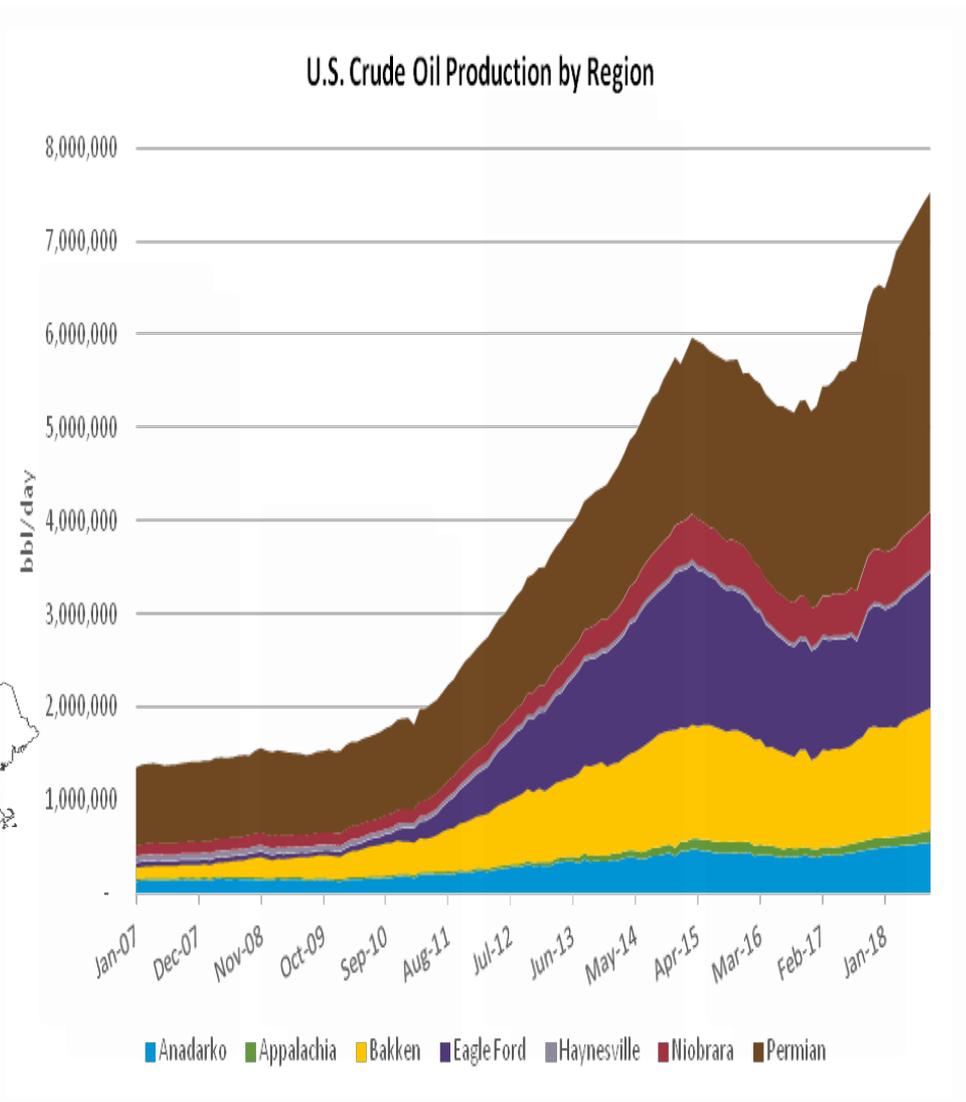
Source: [bloomberg](#)

Texas' Permian Basin Drives WTI Production

- Texas produces **40%** of total U.S. crude YTD in 2018 compared to **37%** in 2017, and **36%** in 2016
- YTD 2018 – With **50%** of all active U.S. oil rigs located in the Permian Basin, this region has been able to pump **45%** of all U.S. crude oil
- Skyrocketing production in Permian Basin + Transportation and infrastructure constraints are challenges for this region



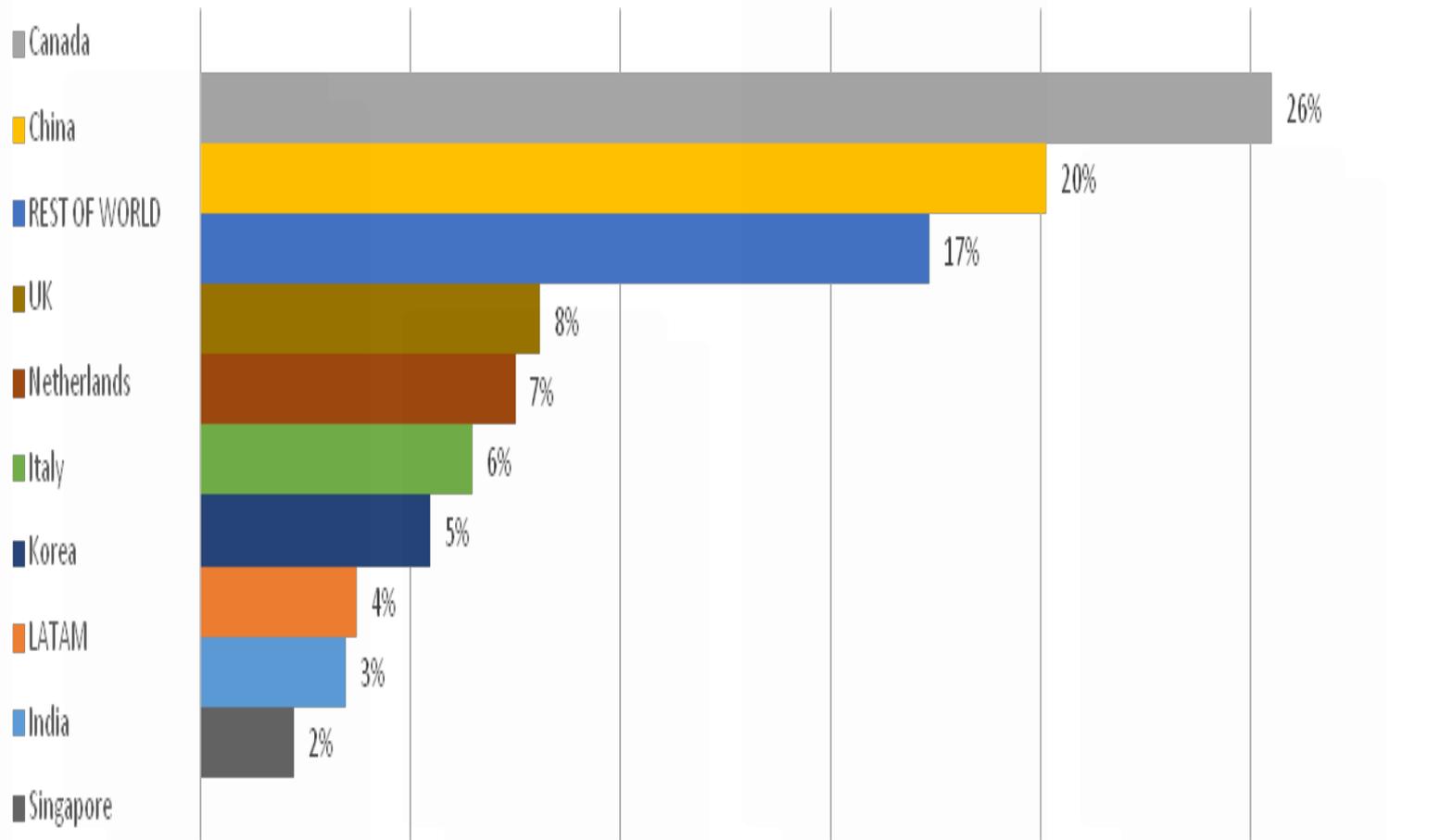
Source: EIA



Source: EIA

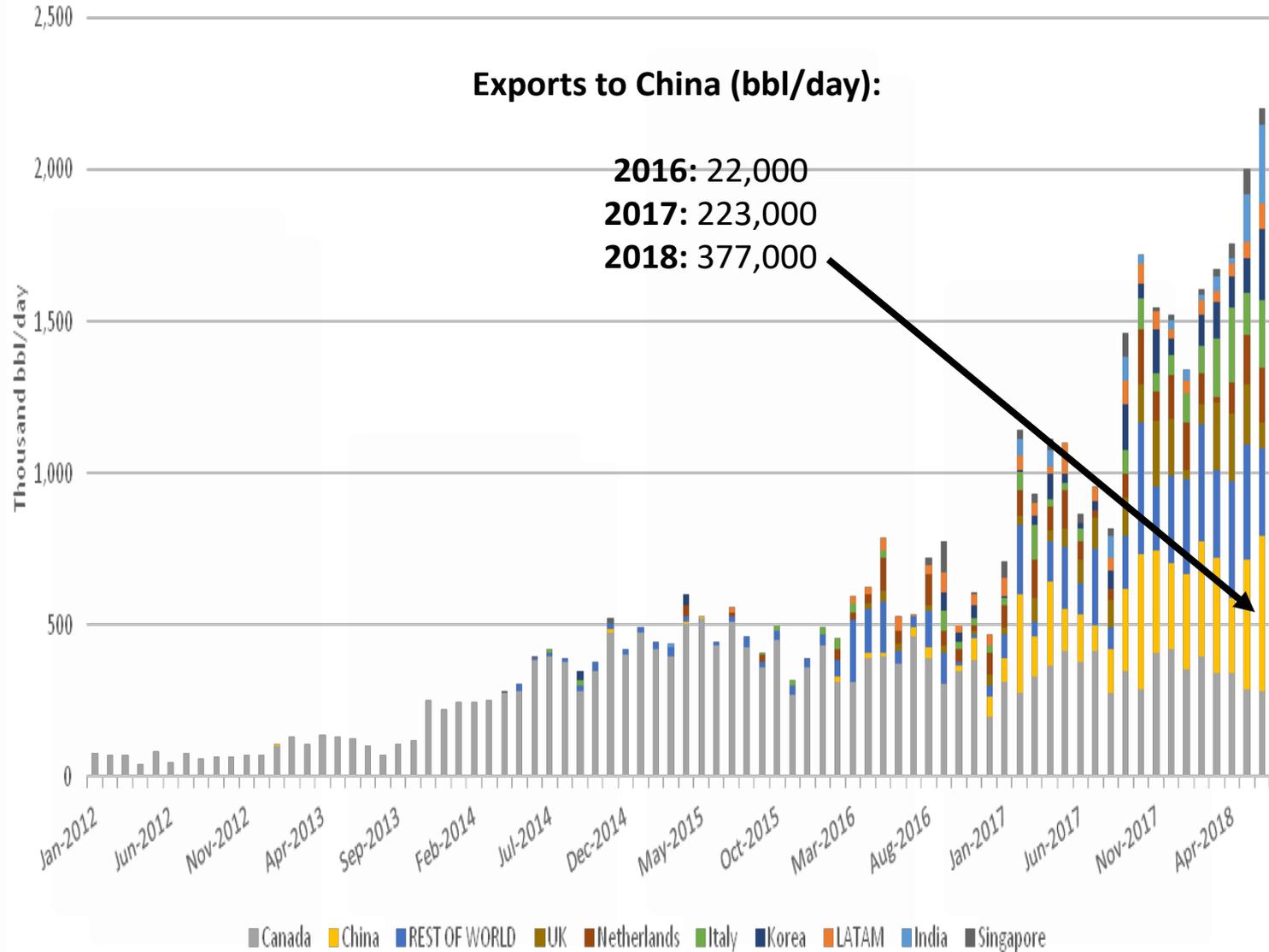
U.S. Crude Oil Exports Find New Destinations

U.S. Crude Oil Exports Since January 2017



Source: EIA

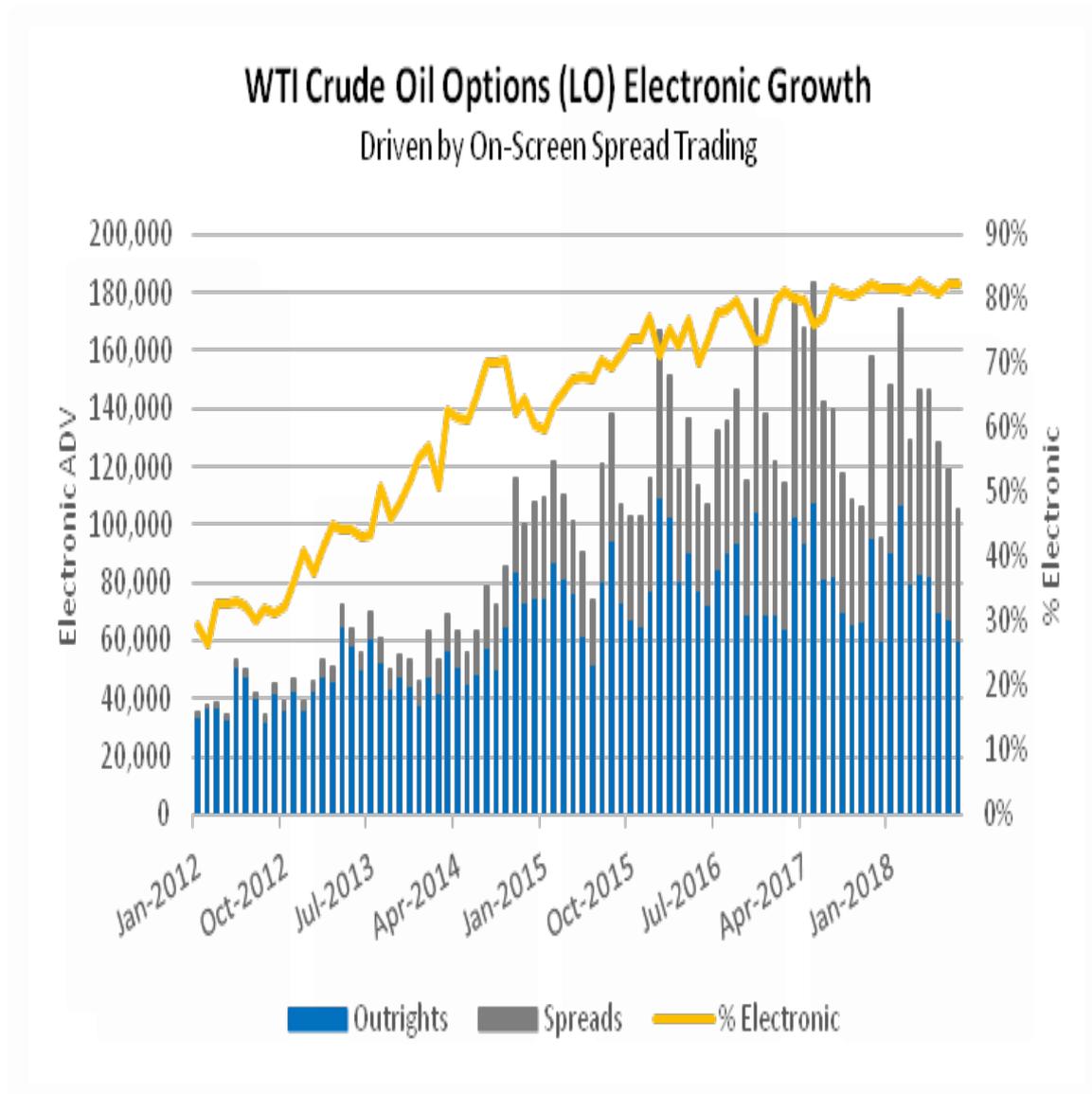
U.S. Crude Oil Exports Find New Destinations



• WTI Options: Electronic Growth

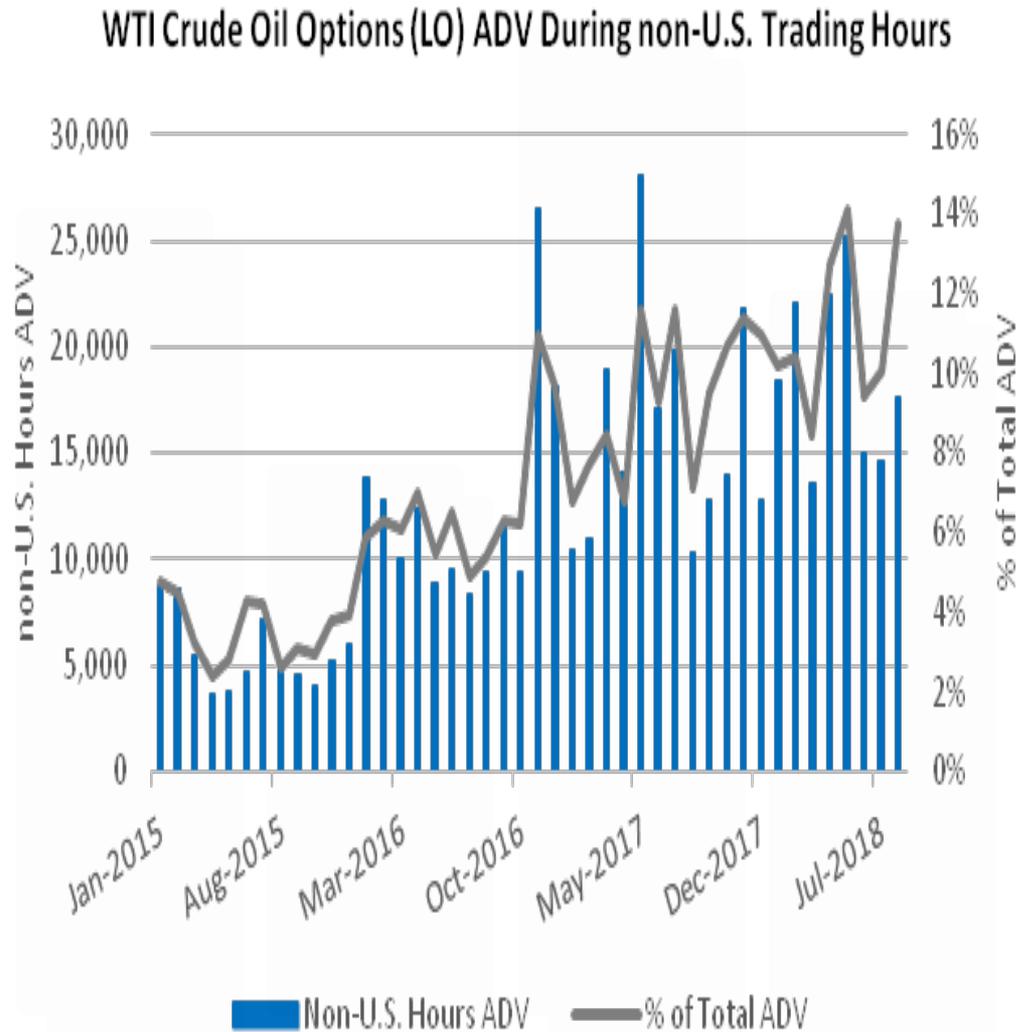
• **80%+** of total LO volume has traded on-screen for over a year straight

• **43%** of total electronic volume came from on-screen spread trading via CME's "Request for Quotes" (RFQ) functionality in August 2018



• WTI Options: International Growth

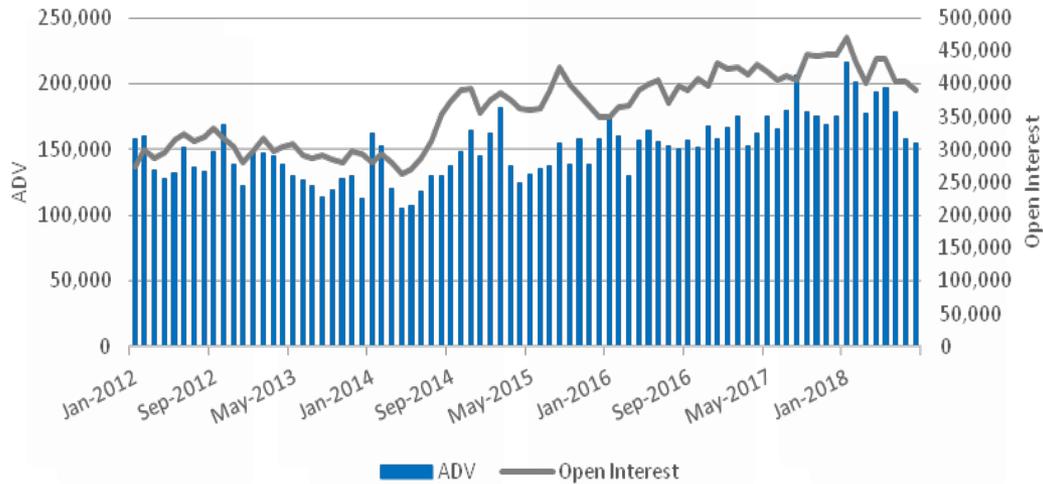
- Overnight volume of WTI Options (LO) in August 2018 YTD has increased **71%** vs. August 2017 as international traders take advantage of increased, around-the-clock liquidity
- LO volume during London Morning Hours **+69%** in August 2018 vs. August 2017
- Non-U.S. hours volume in WTI Options (LO) increased **78%** in September vs. one year ago
- Volume during London morning hours increased **69%**



Consistent Growth in NYMEX Refined Products

NY Harbor ULSD Futures (HO)

Average Daily Volume & Open Interest

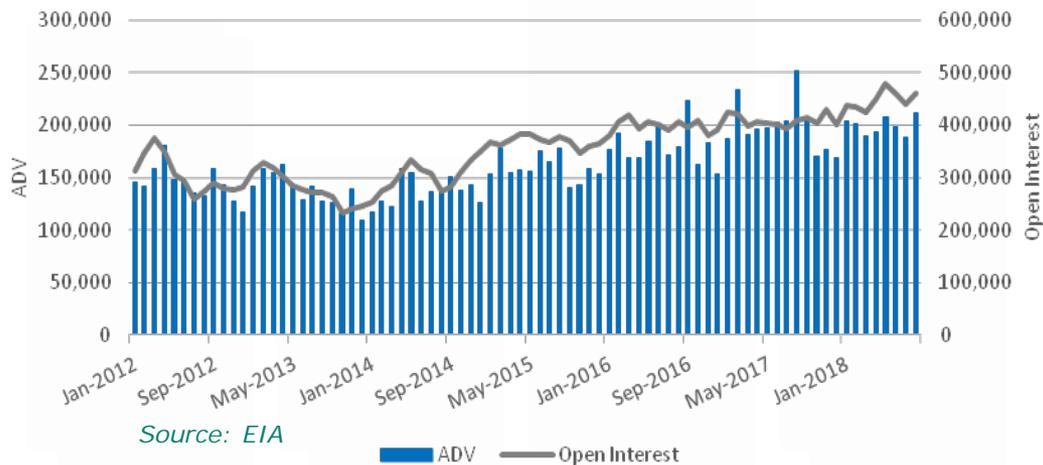


- RBOB Gasoline Futures (RB) hit a single-day open interest record of **501,000** on May 22, 2018

- In January 2018, NY Harbor ULSD Futures (HO) hit a single-day open interest record of **491,000**

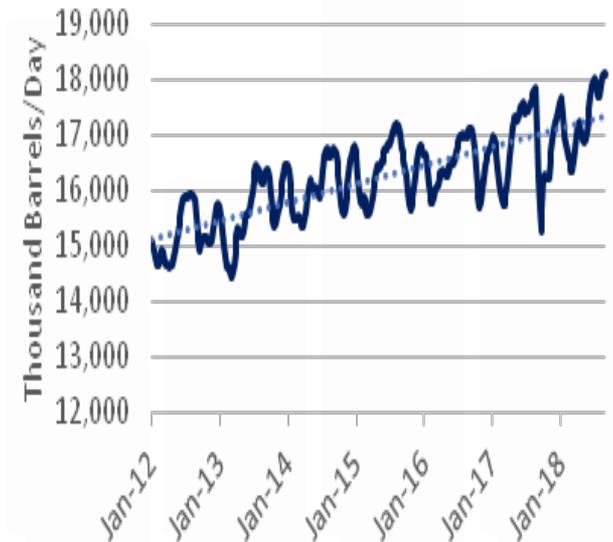
RBOB Gasoline Futures (RB)

Average Daily Volume & Open Interest



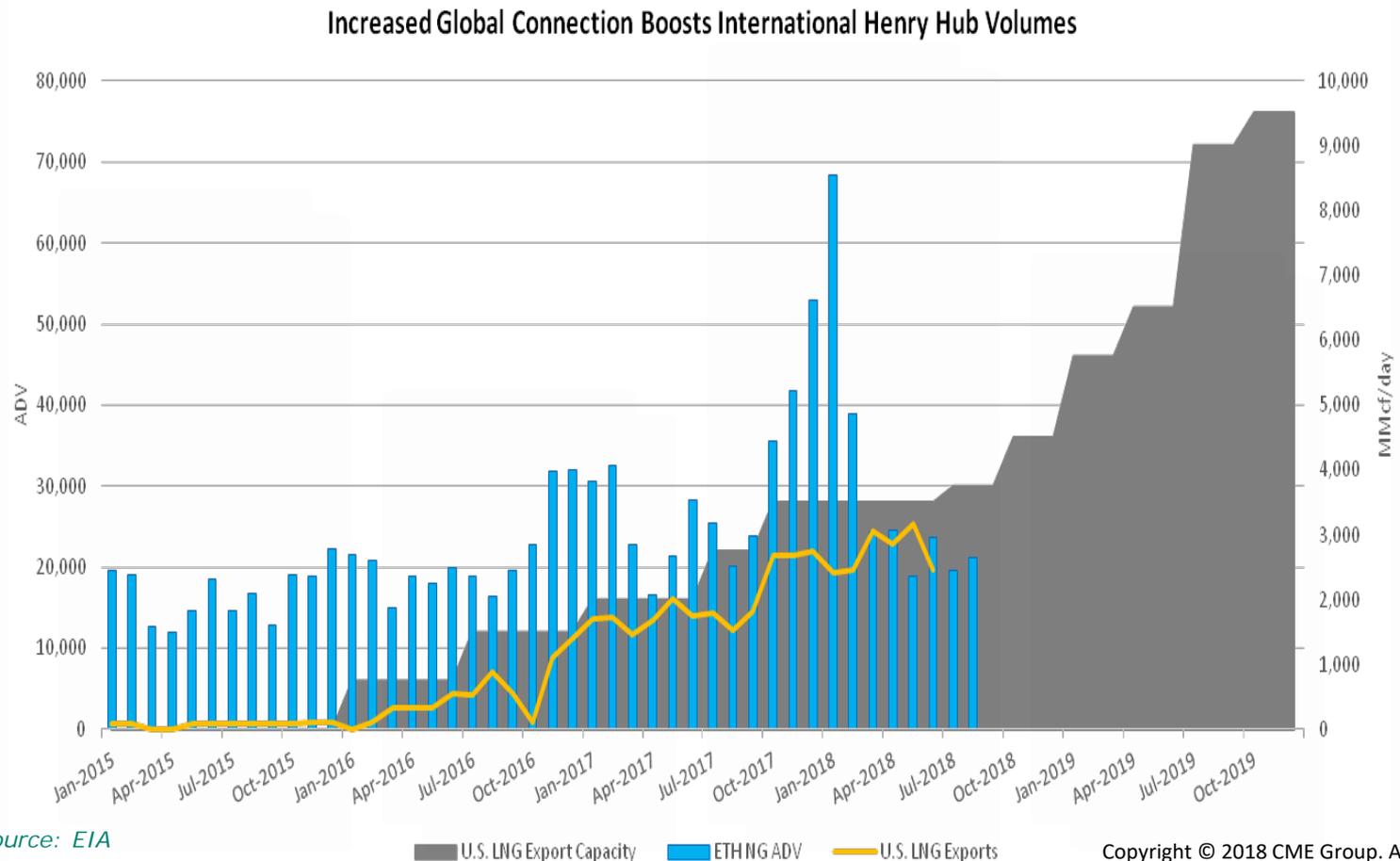
Source: EIA

Gross Inputs to U.S. Refineries



United States: Henry Hub Global Benchmark

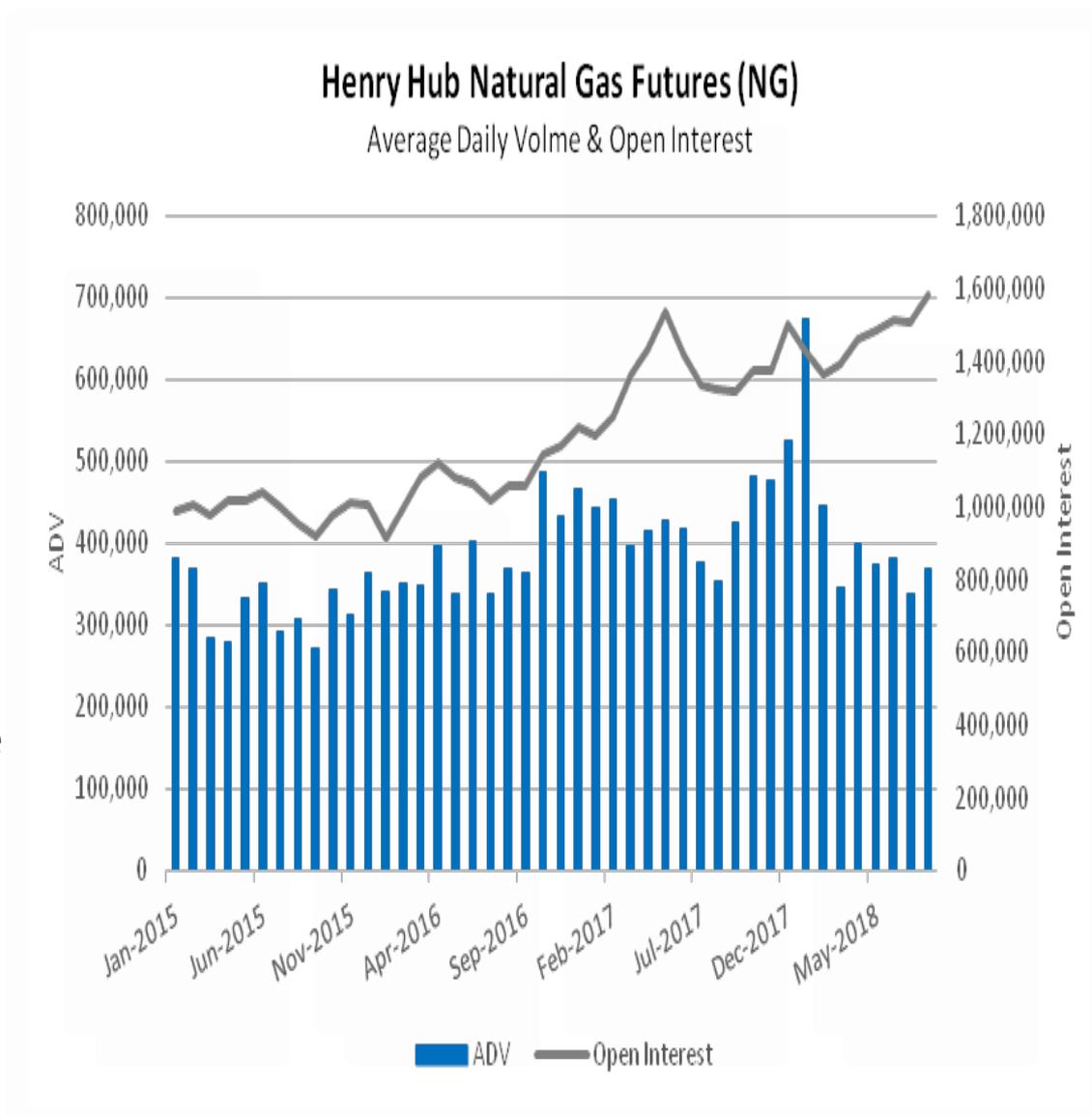
- NYMEX Henry Hub Natural Gas benchmark pricing now extends beyond interstate pipelines and domestic borders
- U.S. Gulf Coast LNG continues to reach more destinations in Europe and Asia solidifying NYMEX's Henry Hub Futures (NG) contract as an international benchmark
- Traded volume during Asian and European hours (overnight hours) has increased as overseas participants look to hedge exposure to US LNG



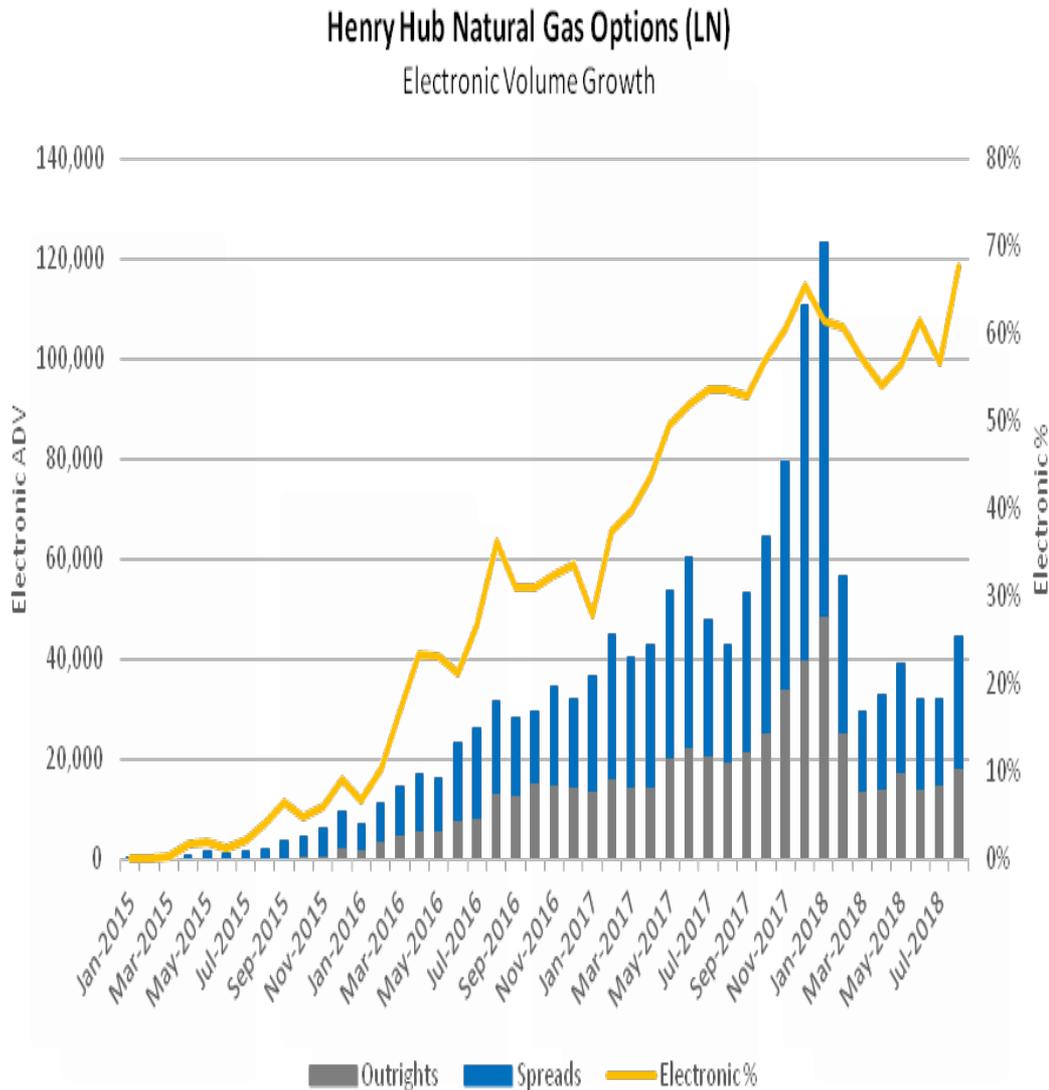
Source: EIA

Rising NYMEX Natural Gas Volumes

- Henry Hub Natural Gas Futures (NG) hit a daily open interest record of **1,656,829** on September 7, 2018
- NG Average Daily Volume (ADV) reached a record high **676,000** in January 2018
- January 12, 2018 – Henry Hub futures single day volume record of **1.02mm** contracts – first time 1mm+ contracts were traded in a single trading day



Natural Gas Options Volume Moves On-Screen



Source: EIA

- Henry Hub Options (LN) 2018 electronic volume **+5% YoY**
- Over **50%** of volume has traded on-screen for almost a year and a half
- Daily Natural Gas Options (KD) traded **60%** electronic in August 2018 vs. 39% electronic in August 2017

Natural Gas and Russia

Gazprom, Moscow-based natural gas giant plays a double role:

- state-controlled instrument of Kremlin foreign policy

- major source of tax revenue for Vladimir Putin's government.

Gazprom been accustomed to dictating terms because of its size.

In the European Union, it supplies about 30 percent of the gas.

But with a 70 percent drop in profits, it is fighting to protect its share of EU market

- which = third of its \$100 billion revenue

Gazprom is no longer a potent diplomatic tool at a time when customers have many more options.

Natural Gas and Russia

By 2025, says the International Energy Agency (IEA),

EU gas IMPORTS will account for 77 percent of its consumption, up from 63 percent now.

Gazprom will not necessarily be supplying Europe with those extra imports.

American companies will be providing liquefied shale gas to European power plants starting next year.

U.S. exports may make up half of flexible liquid natural gas volumes heading to Europe by 2020, says Philip Olivier, chief executive officer of Engie Global LNG, a shipper of flexible LNG.

“Flexible” means the gas can be shipped anywhere.

Natural Gas Futures

- 3rd largest traded physical contract
- Increased production with “fracking” techniques
- Changing dynamics in terms of demand

Product	Natural Gas
Trading Venue ¹	CME Globex
Ticker Symbol	NG
Underlying Instrument	10,000 mmBtu
Minimum Tick	\$0.001 mmBtu
Dollar Value of One Tick	\$10.00
Options	Yes

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

New horizontal drilling method opens new oil fields in US

- A new drilling technique opens out-of-reach oil in the western United States
- New oil deposits scattered across North Dakota, Montana, Colorado, Wyoming, Nebraska, Kansas, New Mexico, Texas and California
- This oil is cheaper to tap than the oil in the deep waters of the Gulf of Mexico or in Canada's oil sands.

Source Associated Press

Fracking drilling method

- IT'S NOT NEW.
- Since the late 1940s over 1 million wells have been hydraulically fracked in the U.S.
- Worldwide more than 2 million have been fracked.
- According to the National Petroleum Council, "95% of oil and gas wells drilled today are hydraulically fractured."
- IT IS HIGHLY REGULATED.
- FRACKING IS A COMPLETION METHOD that occurs after the well is constructed and the well integrity is confirmed. Not during drilling.

Fracking

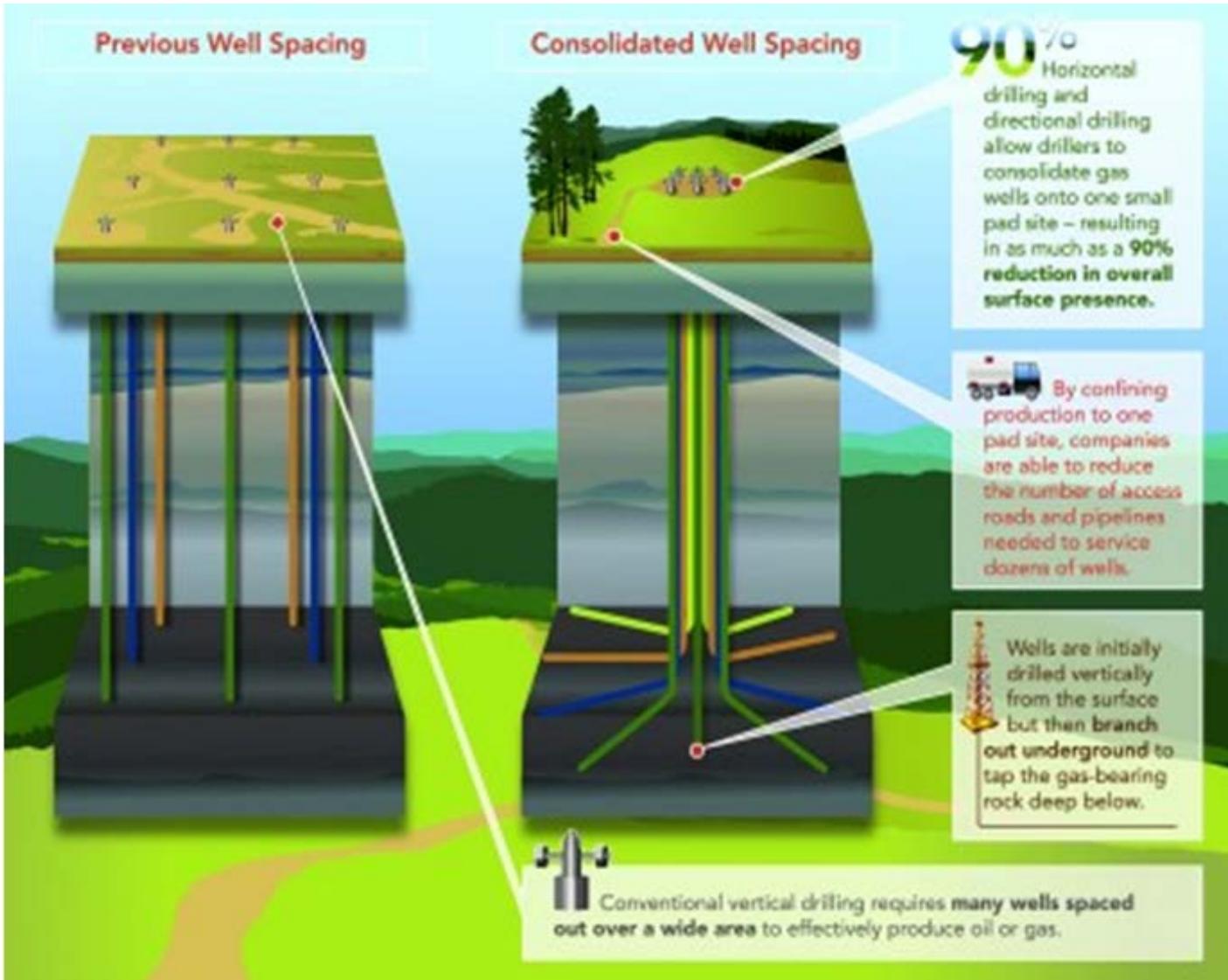


Water Table

Oil or Gas Shale

Source: Greenpeace

Fracking



Source: Energyfromshale.org

Crude Oil Cracking

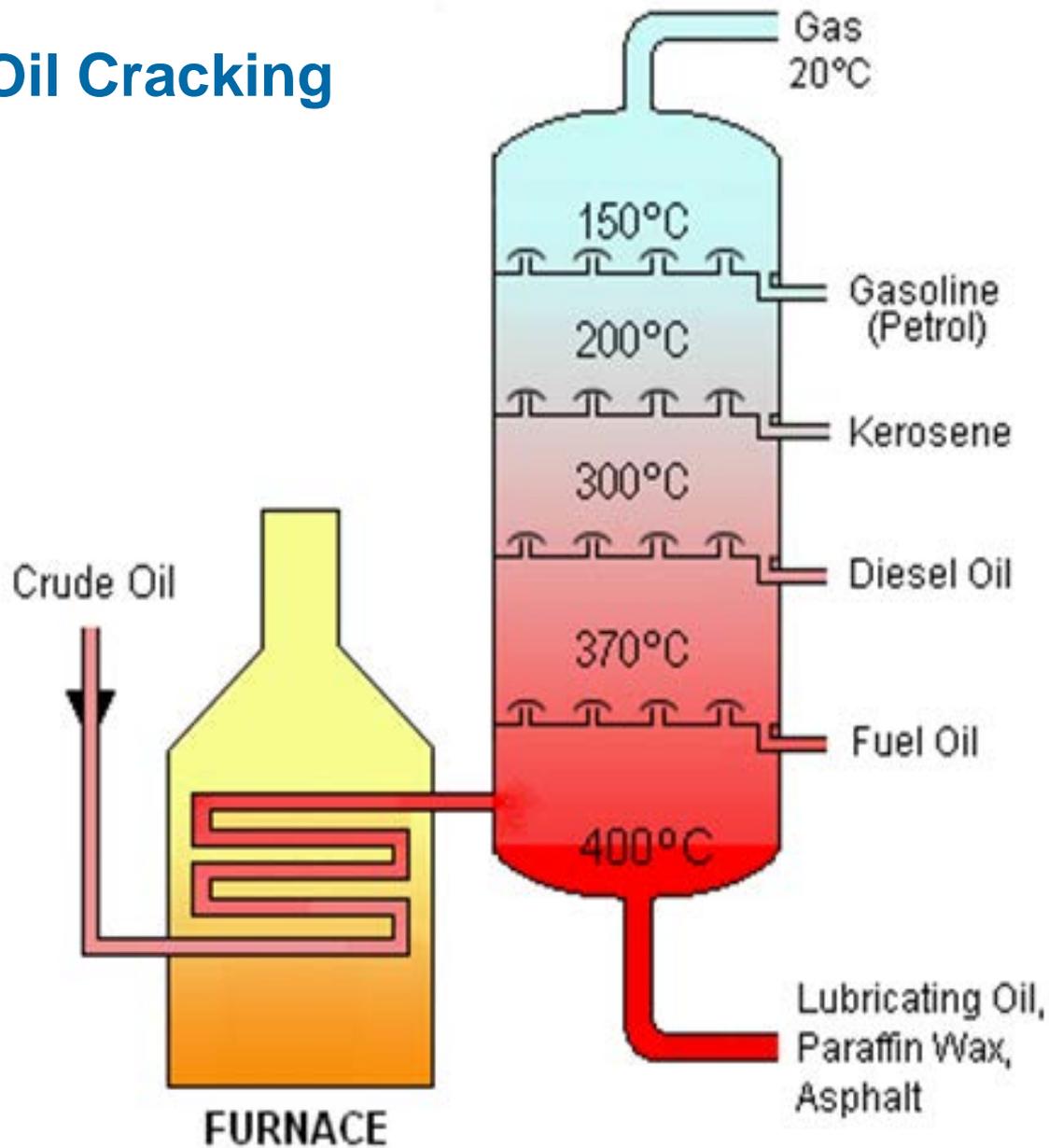
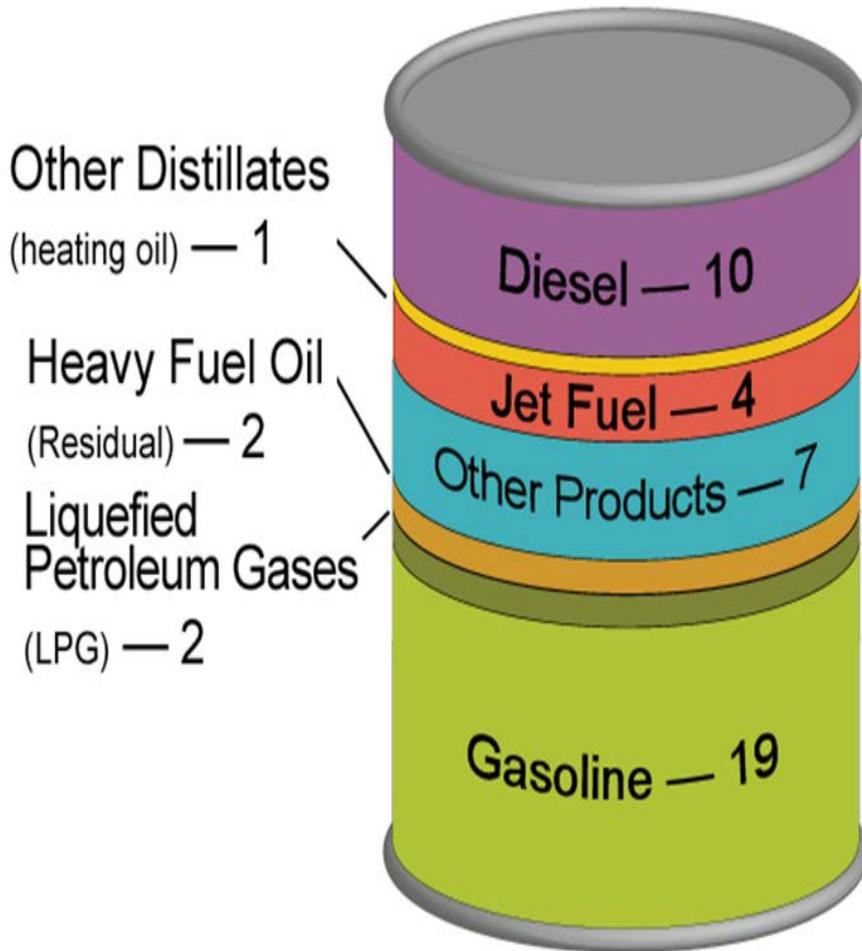


Diagram drawn by Theresa knott

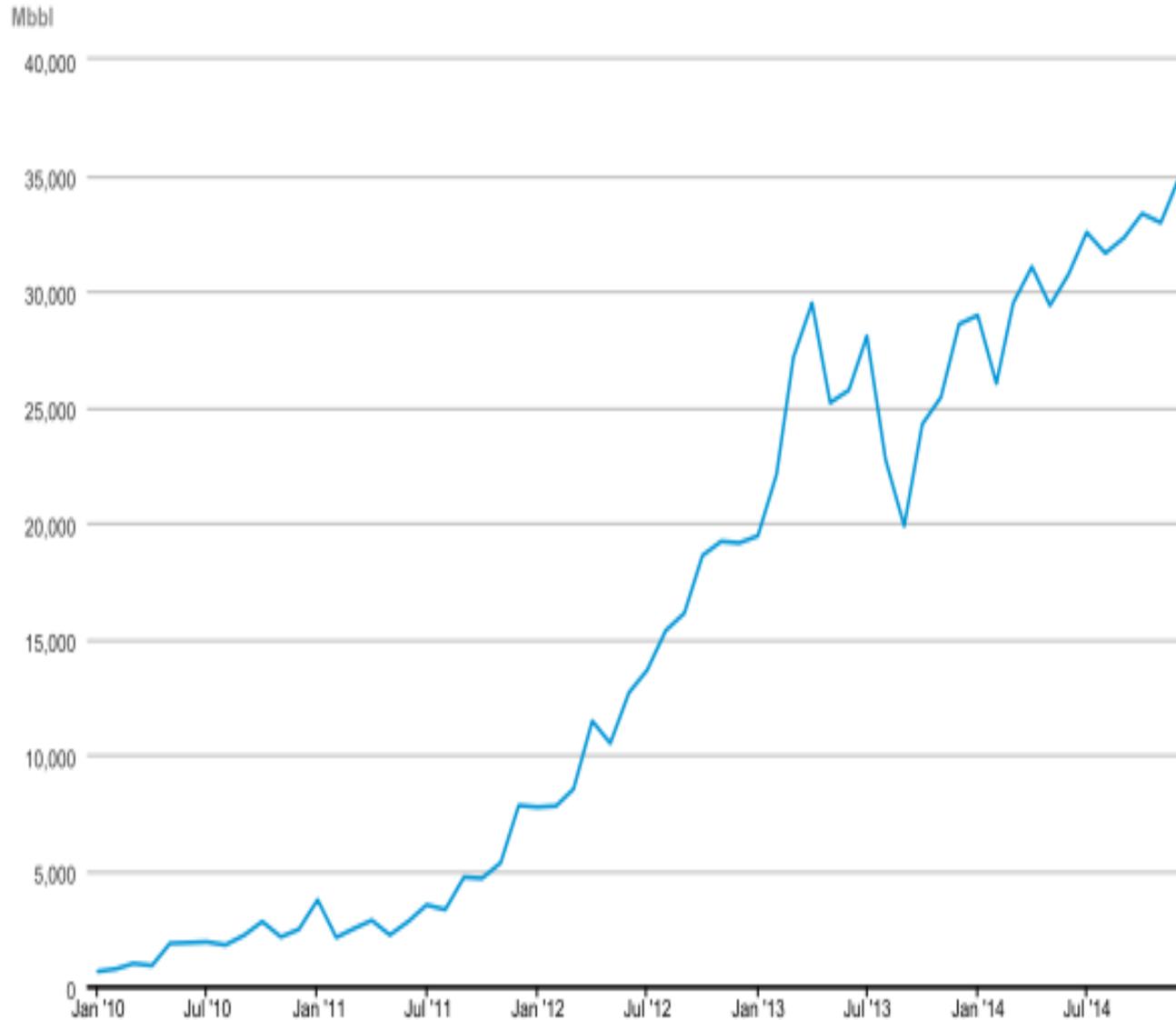
Products Made from a Barrel of Crude Oil (Gallons)



A 42-U.S. gallon barrel of crude oil provides about 45 gallons of petroleum products.

Source: EIA

The Rise of Crude on the Rails



Source: EIA

Energy Production Facts

Electric Buses Are Hurting the Oil Industry

China adds a London-sized electric bus fleet every five weeks

All this is starting to make an observable reduction in fuel demand.

And because they consume 30 times more fuel than average sized cars, their impact on energy use so far has become much greater than the passenger sedans

For every 1,000 battery-powered buses on the road, about 500 barrels a day of diesel fuel will be displaced from the market, according to BNEF calculations.

Energy Production Facts

Electric Buses Are Hurting the Oil Industry

2018 the volume of fuel not needed may rise 37 percent to 279,000 barrels a day because of electric transport

About as much oil as Greece consumes per day, according to BNEF.

Buses account for about 233,000 barrels of that total.

Paris, London, Mexico City and Los Angeles are among 13 authorities that have committed to only buying zero emissions transport by 2025.

Market-Influencing Factors

- OPEC output and supply
- Supply and demand
- Currency Impact on Oil
- Terrorism
- Weather/storms
- War
- Geopolitical factors
- Government regulations
- Perceptions of supply disruptions
- Global demand particularly from emerging nations
- Refinery fires or Shutdowns

- **NYMEX WTI Light Sweet Crude Oil**

Crude oil = world's most actively traded commodity

NYMEX Division light, sweet crude oil futures contract is the world's most liquid forum for crude oil trading

World's largest-volume futures contract trading on a physical commodity

Contract used as international pricing benchmark

Light, sweet crudes preferred by refiners because of low paraffin and sulfur content and relatively high yields of high-value products like:

Gasoline

Diesel fuel

Heating oil

Jet fuel

• WTI Crude Oil Futures

- Most liquid benchmark oil contract
- Deep pool of liquidity
- Flexible contract sizes to capitalize on supply and demand fluctuations

Product	Light Sweet Crude Oil Futures
Trading Venue ¹	CME Globex
Ticker Symbol	CL
Underlying Instrument	1,000 Barrels of Light Sweet Crude Oil
Minimum Tick	\$0.01 per barrel
Dollar Value of One Tick	\$10.00
Options	Yes

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

• E-mini Crude Oil Futures

- Smaller contract size allows traders the opportunity to participate with less market exposure
- Lower margin requirement

Product	E-mini Crude Oil Futures
Trading Venue ¹	CME Globex
Ticker Symbol	QM
Underlying Instrument	500 Barrels of Light Sweet Crude Oil
Minimum Tick	\$0.025 per barrel
Dollar Value of One Tick	\$12.50
Options	No

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

• Brent Crude Oil Futures

- Prices based on light sweet North Sea crude oil
- North Sea crude oil serves as an international benchmark grade
- Trading opportunities and margin efficiencies when used with WTI futures

Product	Brent Crude Oil Futures
Trading Venue ¹	CME Globex
Ticker Symbol	BZ
Underlying Instrument	1,000 Barrels of Light Sweet Crude Oil
Minimum Tick	\$0.01 per barrel
Dollar Value of One Tick	\$10.00
Options	Yes

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

- **RBOB Gasoline Futures**

Ability for traders to participate in the “crack” spread

Product	RBOB
Trading Venue ¹	CME Globex
Ticker Symbol	RB
Underlying Instrument	42,000 gallons
Minimum Tick	\$0.0001 per barrel
Dollar Value of One Tick	\$4.20
Options	Yes

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

ULSD Futures

Traders can gain exposure to:

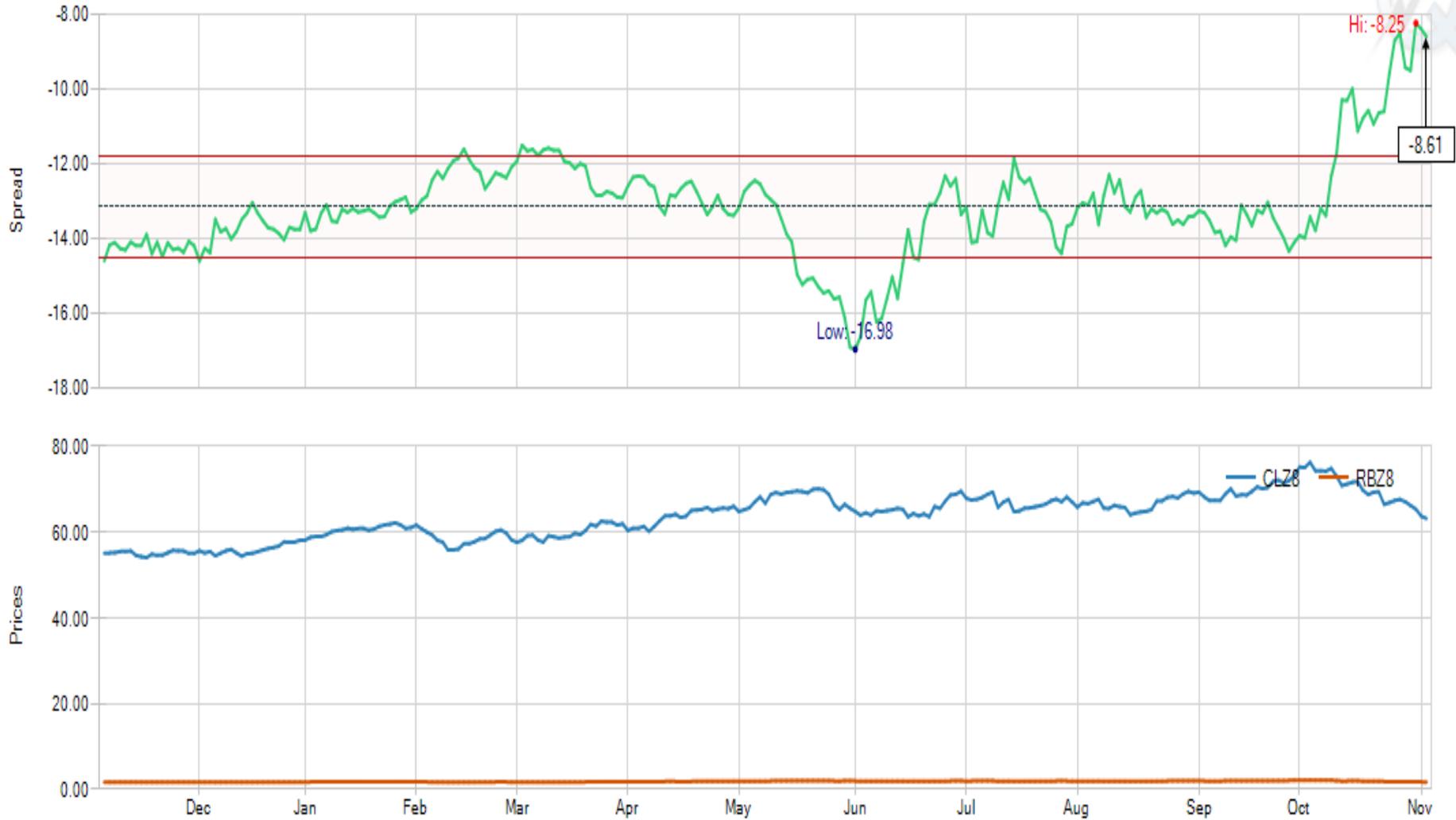
- Jet Fuel
- Heating Oil
- Road Diesel
- Coastal Marine Diesel

Product	ULSD
Trading Venue ¹	CME Globex
Ticker Symbol	HO
Underlying Instrument	42,000 gallons
Minimum Tick	\$0.0001 per barrel
Dollar Value of One Tick	\$4.20
Options	Yes

¹Also available for trading in Open Outcry and for submission to clearing via CME Clearport

WTI – RBOB “Crack Spread”

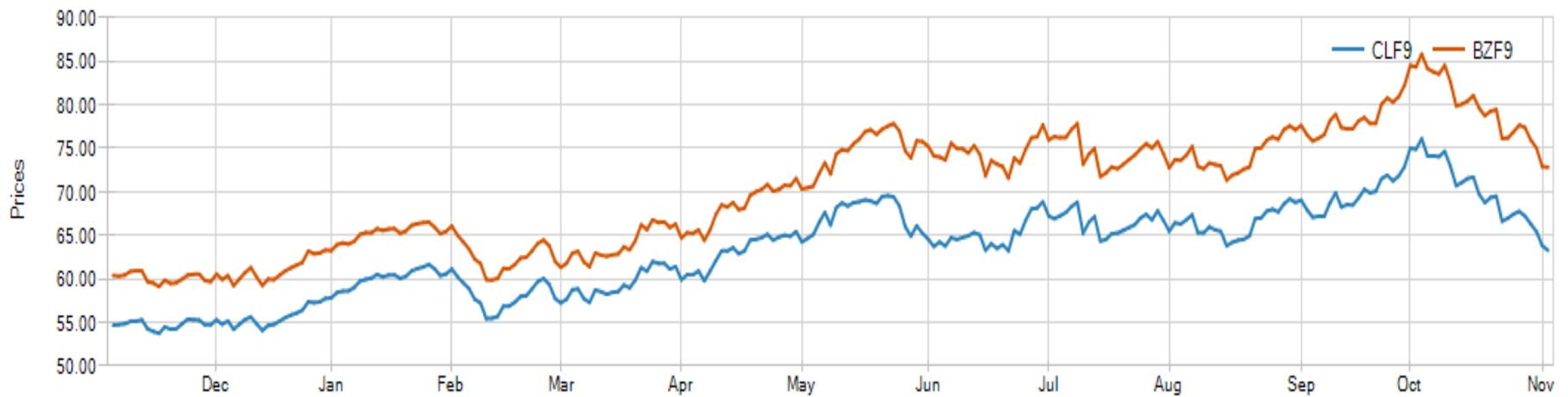
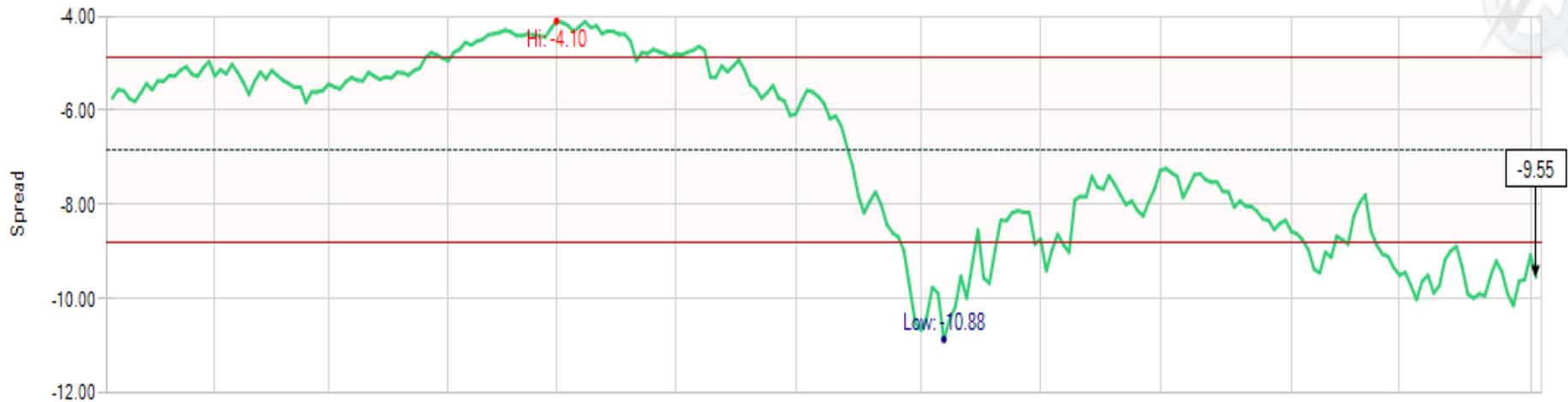
+CLZ8 - 42*RBZ8 (11/5/2017 - 11/5/2018)



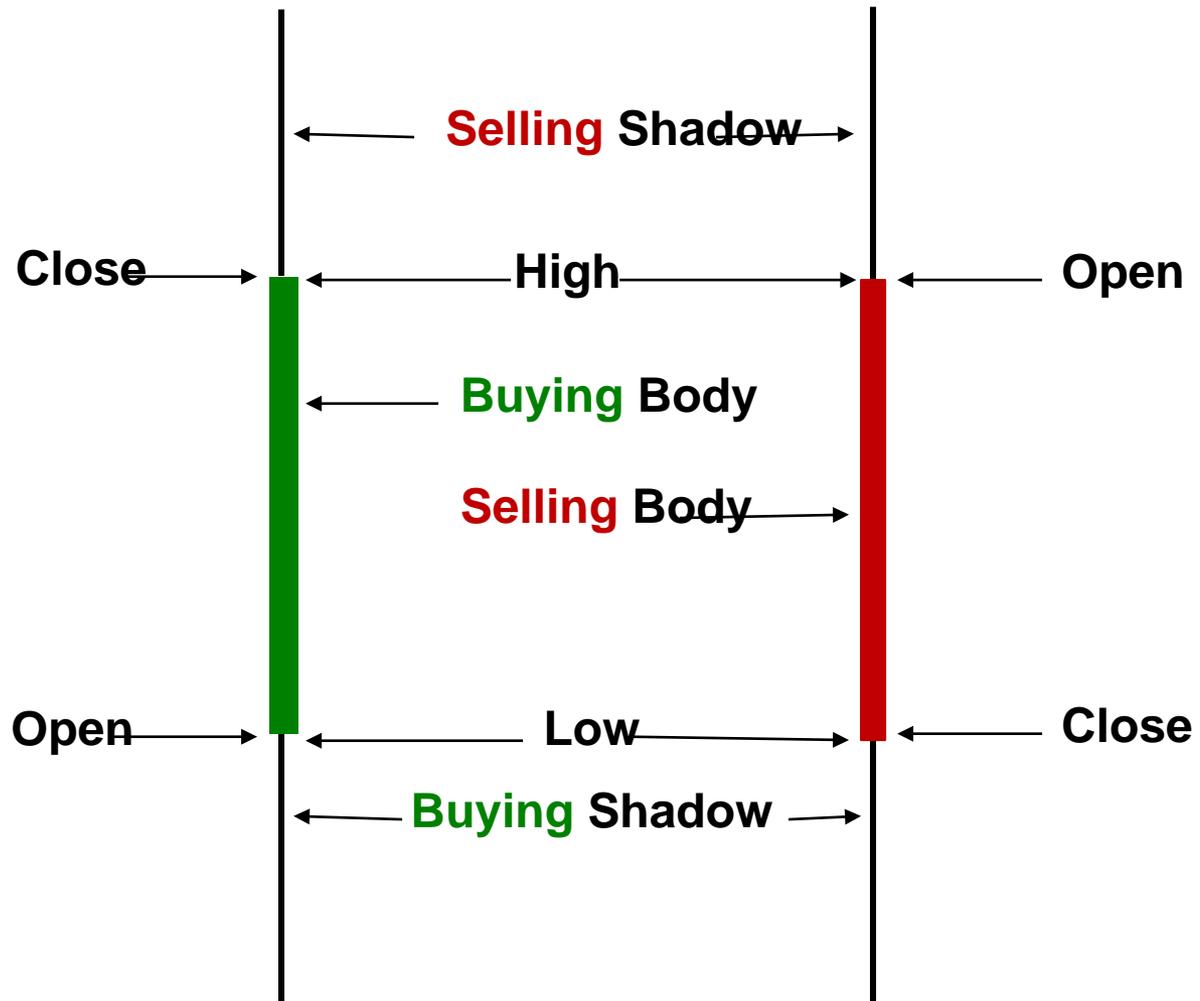
Source: COG

WTI – Brent Crude Spread

+CLF9 - BZF9 (11/5/2017 - 11/5/2018)



Behavioral Japanese Candle Construction



Question and Answer Session

Futures trading is not suitable for all investors, and involves the risk of loss. Futures are a leveraged investment, and because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for a futures position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles. And only a portion of those funds should be devoted to any one trade because they cannot expect to profit on every trade. All references to options refer to options on futures.

Swaps trading is not suitable for all investors, involves the risk of loss and should only be undertaken by investors who are ECPs within the meaning of section 1(a)12 of the Commodity Exchange Act. Swaps are a leveraged investment, and because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for a swaps position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles. And only a portion of those funds should be devoted to any one trade because they cannot expect to profit on every trade.

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