The Effects of Domestic Supply and Demand on Exports

May 30, 2019

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Crude Oil Production from Major Tight Oil Basins

- Bakken
- Permian
- Niobrara & Anadarko
- Eagle Ford

Source: EIA DPR
Crude Oil Production from Major Tight Oil Basins

Permian

Other Basins

- Niobrara
- Anadarko
- Bakken
- Eagle Ford

Source: EIA DPR
Oil Production Growth by Basin (2009-2019YTD)

- Eagle Ford +1,375 Mb/d
- Permian +3,200 Mb/d
- Bakken +1,200 Mb/d
- Niobrara +600 Mb/d
- Anadarko (STACK/SCOOP) +440 Mb/d
- Appalachia +110 Mb/d
- Niobrara +600 Mb/d
- Appalachian +110 Mb/d
YTD Lower-48 Production Growth: Light Crude & Condensate

Source: EIA/RBN

- Condensate >55.0
- Superlight 50.1-55.0
- Light 40.1-50.0
- Medium 30.1-40.0
- Heavy <=30.0
Increases In Condensate and Light Crude Production

Source: EIA
U.S. Setting Records for Refinery Runs

Source: EIA
U.S. Refinery Utilization Higher Than Other Regions of the World

Global Refinery Utilization

- World
- Europe
- Asia
- US

U.S. Refinery Utilization by PADD

- PADD 1
- PADD 2
- PADD 3
- PADD 4
- PADD 5

Within U.S., PADDs 2, 3, and 4 have outperformed PADDs 1 and 5 on a utilization basis

Source: EIA; BP
U.S. Crude Oil Exports and Imports

Exports
- Canada
- Non-Canada
- Annual Avg.

Imports
- Canada
- OPEC
- Other

Crude export ban lifted

Source: EIA/RBN
U.S. Crude Oil Supply / Demand Equation

\[\text{Production + Imports } = \text{Refinery Runs + Exports}\]

*Every barrel that is exported requires that a replacement barrel be imported*

* +/- Inventory Adjustments*
MEH (Houston) minus Brent

\begin{center}
\begin{tikzpicture}
\begin{axis}[
    ybar,bar width=0.7cm,
    y axis line style={draw=none},
    axis y line*=left,
    axis x line*=bottom,
    xtick=data,
    xticklabels={2010-11, 2012-14, 2015-17, 2018-19},
    x tick label style={align=center,anchor=west},
    y tick label style={/pgf/number format/1000 sep=,anchor=west,rotate=90},
    ymin=-2.2,ymax=2.2,
    enlarge x limits=0.05,
]
\addplot+[ybar,draw=black,fill=green!60!black] coordinates {
(2010-11, 2.00)
(2012-14, 1.00)
(2015-17, 0.00)
(2018-19, 1.50)
};
\end{axis}
\end{tikzpicture}
\end{center}
U.S. Crude Oil Production Forecast Scenarios

Source: RBN Forecast - Unconstrained

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Oil Production Growth by Basin (2019-2024)

- Permian: +2,700 Mb/d
- Eagle Ford: +730 Mb/d
- Bakken: +380 Mb/d
- Niobrara: +230 Mb/d
- Anadarko (STACK/SCOOP): +130 Mb/d

Total U.S.: +4.2 MMB/d

Source: RBN Forecast – Base Scenario Unconstrained
Growth In Crude Oil Capacity To The Gulf

5 Projects
+ 2.2 MMb/d (2019-2021)

6 Projects
+ 4.3 MMb/d (2019-2021)

Source: RBN
New Pipelines Likely Shift Flows

Source: RBN; Bloomberg; Texas RRC
U.S. Crude Oil Supply/Demand/Export Balance

- **Heavy Imports < 35 API**
- **Light Imports > 35 API**
- **Heavy Production > 35 API**
- **Light Production > 35 API**
- **Refinery Runs**

Source: EIA, RBN
Crude Oil Exports By Facility

YTD 2019 2.4 MMb/d

Source: RBN

- Beaumont: 684 Mb/d
- Port Fourchon: 164 Mb/d
- Freeport: 493 Mb/d
- Houston: 1,055 Mb/d
- Seabrook: 164 Mb/d
- Texas City: YTD 2019 2.4 MMb/d

Texas
- Energy Transfer
- Enterprise
- Phillips 66
- HFOTCO
- Magellan
- Seaway
- Moda Ingleside
- Flint Hills Ingleside
- NuStar
- Buckeye
- Valero West

Louisiana
- Plains St. James
- NuStar St. James
- IMTT St. Rose
- MPLX Mount Airy
- LOOP
Crude Oil – Estimated Export Capacity

Total Gulf Coast 5.1 MMb/d

- Corpus Christi: 1,090 Mb/d
- Texas City: 1,300 Mb/d
- Freeport: 2,000 Mb/d
- Houston: 675 Mb/d
- Beaumont: Available Capacity
- St. James: Available Capacity
- Port Fourchon: Available Capacity

Available Capacity

Texas:
- Energy Transfer
- Enterprise
- Phillips 66
- HFOTCO
- Magellan
- Seaway
- Moda Ingleside
- Flint Hills Ingleside
- NuStar
- Buckeye
- Valero West

Louisiana:
- Plains St. James
- NuStar St. James
- IMTT St. Rose
- MPLX Mount Airy
- LOOP
Gulf Coast Crude Terminals – Greenfield & Expansions

Over 12 MMb/d of Additional Crude Export Capacity Planned

Source: RBN
Crude Export Outlook

» U.S. crude oil production will continue growing, up about 6 MMb/d over last year by 2024
» Most of this incremental production is destined for Gulf Coast export markets; Enough pipelines will be built to make that happen
» Enough dock capacity will be available to export all of the barrels that the global market can absorb
» U.S. crude oil production is expected to increase 3-5.5 MMB/d by 2024; All Growth from Light sweet crudes

» Light crude refining capacity is already at or near full utilization

» Over the next five years, U.S. refinery capacity increases will be minimal

» Consequently, most incremental light/sweet crude production will be economically incentivized to move offshore

» Global demand for these crudes will increase as IMO 2020 regulations force simple refineries around the world to shift away from higher sulfur crudes, toward low sulfur grades such as U.S. shale crudes
Upcoming IMO 2020 implementation should have increased value of light sweet crudes relative to heavy and medium-sour barrels.

Due to OPEC+ production cuts, international sanctions, and geopolitical events, availability of heavy and medium-sour barrels from countries like Canada, Saudi Arabia, Iran, and Venezuela has decreased.

Light/heavy spreads were expected to widen, but began narrowing significantly in 2018 and continued that trend in 2019.
U.S. Crude Oil Exports By Destination

- **Canadian Waterborne**
- **Europe**
- **APAC**
- **Latin America**
- **Africa**

Each section contains a bar chart showing export volumes in Mb/d for the years 2016 to 2019.
U.S. Crude Oil Exports to Asia

- China
- Korea
- India
- Tiawan
- Japan
- Thailand

2017-July 2018

Aug 2018-Present

 Mb/d

0 200 400 600 800 1,000

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