CME Group and the Benefits of the Tighter WTI Specifications

Daniel Brusstar

Denver, May 23, 2018

COQA – CCQTA Joint Meeting
Agenda

• Update on the Phase-in of the additional WTI tests

• The benefits of adopting the COQA WTI specs
  • Mid-continent Refiners benefit from stable and certain quality
  • Stable WTI Quality will *transform* the global market
  • A “New Era” will dawn for global refiners
    • Uniform and stable WTI quality will drive efficiency in the global market
    • New supply sources will increase competition globally
    • A massive fungible pool of stable WTI will energize the global marketplace
Brief History of the WTI Spec Change

2010
• Initial concerns emerge about the impact of Canadian imports on US crude oil quality
• The U.S. Crude Oil Quality Association (COQA) makes recommendations related to WTI quality specs for discussion and adoption by the refiners and pipeline operators

2016
• As concerns increase about WTI quality, COQA creates a Domestic Sweet Monitoring Program Subcommittee to analyze and publish data on the current quality of WTI
• CME Group becomes a funding member of the Domestic Sweet Monitoring Program, and actively supports testing efforts in collaboration with its oil industry customers

2017
• Over 100 random samples of Domestic Sweet were analyzed and reviewed
• Terminal operators Enterprise and Enbridge approve the new tests
• **On Monday 11 December, CME Group announced the revision of the WTI rulebook to adopt the new tests effective from January 2019 (12 months notice)**

2019
• **The revised WTI rulebook will come into effect for the January 2019 contract month**
Update on the Phase-in of WTI tests

- On-track for Jan 2019 start for the additional WTI tests
- Cushing Terminals doing additional testing to prepare
  - Enterprise has stepped up quality assurance program
  - Enbridge and Plains continue their enhanced testing
- Enforcement will be handled by the Cushing terminals
  - CME will defer to the expertise of the terminal operators
- Cushing Terminals will be fully-prepared in Jan 2019
Benefits of adopting the additional WTI tests

- Mid-continent Refiners benefit from stable quality and certainty
- Stable WTI quality will **transform** the global marketplace
  - Uniform WTI quality will drive the Export market
    - Why? Global refiners will benefit just like Mid-con refiners
    - Uniform and Fungible WTI pool will promote efficiency and transparency in the market like never before
    - Better Transparency with crudemonitor.us
Stable WTI quality will **transform** the global market

- A fungible pool of stable WTI will energize the Asian and European refiners who are thirsty for new supply sources.

- Over 4 million barrels per day of WTI-type crude oil is produced in Permian, Eagle Ford, Bakken, DJ Niobrara, and Oklahoma.

- Stable and certain WTI quality will create a powerhouse in the global marketplace with a **massive** fungible pool of crude oil.

- Uniformity in WTI quality will drive efficiency in the Export market with more competition and transparency like never before.

- A “New Era” will dawn for global refiners.
It is Happening Already: U.S. crude oil exports surge

U.S. Crude Oil Exports (EIA Data)
(Monthly Averages in Millions of Barrels per day)

Source: EIA
Infrastructure is expanding to meet the export surge

HOUSTON In-Bound Pipeline Capacity: 3.3 Million Barrels/Day

<table>
<thead>
<tr>
<th>Incoming Pipelines</th>
<th>Capacity</th>
<th>Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seaway Pipeline (from Cushing)</td>
<td>850,000</td>
<td>Enterprise/Enbridge</td>
</tr>
<tr>
<td>MarketLink Pipeline (from Cushing)</td>
<td>700,000</td>
<td>TransCanada</td>
</tr>
<tr>
<td>Dakota Access Pipeline (DAPL)</td>
<td>520,000</td>
<td>Energy Transfer Partners</td>
</tr>
<tr>
<td>BridgeTex Pipeline (from Midland, TX)</td>
<td>350,000</td>
<td>Magellan</td>
</tr>
<tr>
<td>Longhorn Pipeline (from Midland, TX)</td>
<td>250,000</td>
<td>Magellan</td>
</tr>
<tr>
<td>Enterprise Eagle Ford Pipeline</td>
<td>350,000</td>
<td>Enterprise</td>
</tr>
<tr>
<td>Kinder Morgan Pipeline (from Eagle Ford)</td>
<td>250,000</td>
<td>Kinder Morgan</td>
</tr>
</tbody>
</table>

Source: EIA
WTI Futures: Global Crude Oil Benchmark

- WTI Crude Oil Futures (CL) broke the single-day open interest record this month with 2,706,686 lots outstanding on May 11, 2018.

- Average open interest this month, May 2018, is currently at 2.68MM lots MTD, a new record.

- Volume remains strong with 1.33MM WTI Futures contracts traded per day in 2018 YTD.

Plug for crudemonitor.us: \textbf{TRANSPARENCY}

\textbf{What is Domestic Sweet Blend crude?}

Domestic Sweet Crude Oil is the CME (NYMEX) benchmark conventionally produced light sweet crude offered for contract sale at Cushing, OK.

Domestic Sweet is a fully blended aggregate of many feeder streams and only begins its existence in blend tanks in Cushing, OK. It is often confusingly referenced on crude price reports as West Texas Intermediate (WTI), which in fact is one of the feeder streams to Domestic Sweet Crude Oil.

Existing contract quality requirements are listed in the \textit{NYMEX Rulebook Section 200}. The COQA has proposed the addition of the \textit{attached specifications} to CME Section 200.

\textbf{COQA Recommended Analysis}

<table>
<thead>
<tr>
<th>Property</th>
<th>Most Recent Sample</th>
<th>6 Month Average</th>
<th>1 Year Average</th>
<th>5 Year Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity (°API)</td>
<td>41.70</td>
<td>41.34</td>
<td>41.40</td>
<td>41.32</td>
</tr>
<tr>
<td>Density (kg/m³)</td>
<td>816.3</td>
<td>817.8</td>
<td>817.3</td>
<td>818.0</td>
</tr>
<tr>
<td>Sulfur (wt%)</td>
<td>0.400</td>
<td>0.394</td>
<td>0.403</td>
<td>0.396</td>
</tr>
<tr>
<td>MCR (wt%)</td>
<td>1.71</td>
<td>1.79</td>
<td>1.88</td>
<td>1.79</td>
</tr>
<tr>
<td>TAN (mgKOH/g)</td>
<td>0.10</td>
<td>ND</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>Nickel (mg/kg)</td>
<td>4.47</td>
<td>4.68</td>
<td>4.93</td>
<td>4.83</td>
</tr>
<tr>
<td>Vanadium (mg/kg)</td>
<td>12.20</td>
<td>14.22</td>
<td>14.44</td>
<td>13.57</td>
</tr>
<tr>
<td>220°F minus (HTSD mass%)</td>
<td>17.4</td>
<td>16.3</td>
<td>17.2</td>
<td>17.0</td>
</tr>
<tr>
<td>Temp at 50 mass% (°F)</td>
<td>553.5</td>
<td>542.9</td>
<td>519.4</td>
<td>519.2</td>
</tr>
<tr>
<td>1020°F resid (HTSD mass%)</td>
<td>16.8</td>
<td>15.6</td>
<td>13.3</td>
<td>13.1</td>
</tr>
</tbody>
</table>

*ND indicates a tested value below the instrument threshold.

\textbf{Most Recent Sample Comments: DSW-140, Dec 21, 2017}

The December 21st sample of Domestic Sweet Blend saw increased butanes. Merged simulated distillation results showed a larger residue and smaller distillate compared to normal.

\textbf{Distillation}

- HTSD

\textbf{Light Ends Summary}

<table>
<thead>
<tr>
<th>Property (vol%)</th>
<th>Most Recent Sample</th>
<th>6 Month Average</th>
<th>1 Year Average</th>
<th>5 Year Average</th>
</tr>
</thead>
</table>

\textit{Last Samples}

\textit{Monthly Reports}
Disclaimer

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.

Any research views expressed are those of the individual author and do not necessarily represent the views of the CME Group or its affiliates.

CME Group is a trademark of CME Group Inc. The Globe Logo, CME, Globex and Chicago Mercantile Exchange are trademarks of Chicago Mercantile Exchange Inc. CBOT and the Chicago Board of Trade are trademarks of the Board of Trade of the City of Chicago, Inc. NYMEX, New York Mercantile Exchange and ClearPort are registered trademarks of New York Mercantile Exchange, Inc. COMEX is a trademark of Commodity Exchange, Inc. KCBOT, KCBT and Kansas City Board of Trade are trademarks of The Board of Trade of Kansas City, Missouri, Inc. All other trademarks are the property of their respective owners.

The information within this presentation has been compiled by CME Group for general purposes only. CME Group assumes no responsibility for any errors or omissions. Additionally, all examples in this presentation are hypothetical situations, used for explanation purposes only, and should not be considered investment advice or the results of actual market experience.

All matters pertaining to rules and specifications herein are made subject to and are superseded by official Exchange rules. Current rules should be consulted in all cases concerning contract specifications.