The Global Crude Oil Market:  
What is “Permania” and Why Does It Matter?  

Argus Methanol Forum  
Houston, Texas  
September 12, 2018
Baker & O’Brien, Inc. (Baker & O’Brien) prepared this report for the 2018 Argus Methanol Forum. The opinions and findings in this report are based upon Baker & O’Brien’s experience, expertise, skill, research, analysis, and related work to date. This report relies upon public and proprietary data available to Baker & O’Brien at the time this report was prepared.

All forecasts and projections contained in this presentation represent Baker & O’Brien’s best judgment, utilizing its skill, and expertise. However, such forecasts and projections are inherently uncertain due to the potential impact of factors or future events that are unforeseeable at this time or beyond Baker & O’Brien’s control.

Any reproduction, distribution, or disclosure of this information is strictly prohibited without Baker & O’Brien’s prior written authorization. Baker & O’Brien expressly disclaims all liability for the use, disclosure, reproduction, or distribution of this information by or to any third party.
• Supply and Demand Trends

• Impacts on Natural Gas and Methanol

• Conclusions
Global Liquid Fuels Production and Consumption Balance

Top 3 = 38 MBD
- United States = 14.5 MBD
- Saudi Arabia = 12.1 MBD
- Russia = 11.2 MBD

Source: Short-Term Energy Outlook. Includes crude oil, natural gas liquids (NGLs), all other petroleum liquids, and biofuels. 2018 Crude only: Rus. 10.6, US 10.4, Saudi 10.1
U.S. Crude Supply Trends and Outlook

U.S. Crude Oil Production by Basin

<table>
<thead>
<tr>
<th>Basin</th>
<th>Million Barrels per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permian</td>
<td>11</td>
</tr>
<tr>
<td>Gulf of Mexico</td>
<td>9</td>
</tr>
<tr>
<td>Bakken</td>
<td>7</td>
</tr>
<tr>
<td>Eagle Ford</td>
<td>5</td>
</tr>
<tr>
<td>Anadarko</td>
<td>3</td>
</tr>
<tr>
<td>Niobrara</td>
<td>2</td>
</tr>
</tbody>
</table>

U.S. Basin Projected Change ‘19 vs. ‘18

<table>
<thead>
<tr>
<th>Basin</th>
<th>Thousand Barrels per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permian</td>
<td>+514</td>
</tr>
<tr>
<td>Gulf of Mexico</td>
<td>+154</td>
</tr>
<tr>
<td>Bakken</td>
<td>+137</td>
</tr>
<tr>
<td>Eagle Ford</td>
<td>+97</td>
</tr>
<tr>
<td>Anadarko</td>
<td>+84</td>
</tr>
<tr>
<td>Niobrara</td>
<td>+71</td>
</tr>
<tr>
<td>Alaska</td>
<td>+4</td>
</tr>
<tr>
<td>Rest of U.S.</td>
<td>-58</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration, Short-Term Energy Outlook, July 2018
Source: U.S. EIA, April 2018
U.S. Crude Production Drives Associated Gas Supply

U.S. Gas Production and Change Since 2016 by Basin

Only the Appalachian and Haynesville Shales Produce Gas On Purpose

The Other Shales Produce Associated Gas
Permania
Impacts on Natural Gas and Methanol

$100,000 per year
$1,000,000 per day
U.S. EIA July 2018 Drilling Productivity Report for Permian Basin

Source: U.S. Energy Information Administration Drilling Productivity Report
Month average natural gas prices at the Waha and Henry Hubs (Jan 2015-Jun 2018)
Some planned natural gas pipelines out of the Permian Basin (July 2018)
Conclusions

- Global Liquids, Including Crude Oil, Market is 100 Million Barrels per Day

- Permian Basin is Fastest Growing Oil Supply Source

- Higher Global Oil Prices Now Seem to Lead to Lower Global Gas Prices
  - Permania
Baker & O’Brien – Independent Energy Consultants

Dallas
12001 N. Central Expressway
Suite 1200
Dallas, TX 75243
Phone: 1-214-368-7626
Fax: 1-214-368-0190

Houston
1333 West Loop South
Suite 1350
Houston, TX 77027
Phone: 1-832-358-1453
Fax: 1-832-358-1498

London
146 Fleet Street
Suite 2
London EC4A 2BU
Phone: 44-20-7373-0925

www.bakerobrien.com