Permian Basin 2018: Plateau or Powerhouse?

San Antonio, Texas

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Agenda

- About Argus
- Why the Permian?
- Output projections, major players
- Midstream frenzy to the Gulf coast
- Exports, how WTI is moving around the globe
- WTI Houston Argus pricing
- Looking forward, possible headwinds
- Questions
The Argus view

• One of the world’s leading PRAs, Argus is a team of more than 800 staff members in 20 global offices

• Publishing more than 11,000 daily spot and forward price assessments, plus market intelligence for world commodities markets

• Coverage includes:
  ◦ Energy
  ◦ Fertilizers
  ◦ Petrochemicals
  ◦ Metals

• Services
  ◦ Price reporting and indexation
  ◦ Consulting
  ◦ Conferences

• Indexation examples
  ◦ US crude oil
  ◦ US and European refined products
  ◦ US and European natural gas
  ◦ NGLs
  ◦ US and European environmental markets
Why the Permian?

Rising rig counts, DUC wells
Permian is the growth engine of US shale sector
US shale basin rig count

Rig count in EIA’s Drilling Productivity Report regions

number of active drilling rigs

- Permian
- Anadarko (new)
- Eagle Ford
- Appalachia (formerly Marcellus and Utica)
- Bakken
- Haynesville
- Niobrara

Jan-14 Jul-14 Jan-15 Jul-15 Jan-16 Jul-16 Jan-17 Jul-17
US onshore Drilled but Uncompleted (DUC) wells
Major players

Mergers & acquisitions, growth stories
## Biggest Permian drillers

<table>
<thead>
<tr>
<th>Company</th>
<th>Rig Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pioneer Natural Resources</td>
<td>20 rigs</td>
</tr>
<tr>
<td>ExxonMobil</td>
<td>20+10 rigs in 2018</td>
</tr>
<tr>
<td>Apache</td>
<td>16 rigs</td>
</tr>
<tr>
<td>Parsley Energy</td>
<td>16 rigs</td>
</tr>
<tr>
<td>Chevron</td>
<td>16+4 rigs in 2018</td>
</tr>
<tr>
<td>Concho</td>
<td>15 rigs</td>
</tr>
<tr>
<td>Occidental</td>
<td>15 rigs</td>
</tr>
<tr>
<td>EOG</td>
<td>14 rigs</td>
</tr>
</tbody>
</table>
ExxonMobil’s Permian story

• Expects Permian output to triple by 2025 to 600,000 b/d of oil equivalent (boe/d)
• Will spend $2bn to build transportation infrastructure to support operations
• Recent acquisitions of contiguous acreage allows longer lateral wells
• Building 3-mile long lateral well in the Permian and Bakken
• Lateral length average 10,000 ft in Midland
Pioneer Natural Resources

- Largest Midland basin acreage position holder
- Targeting to grow production to more than 1mn boe/d in 2026
- Translates to 15pc annual production growth, of which oil to rise by 18pc/year to 700,000 b/d in 2026
- Increase driven by Spraberry/Wolfcamp asset
- Plans to shed other Texas assets to focus on the Permian
- Exported about 90,000 b/d of Permian oil in 4Q to customers in Asia and Europe
North America M&A story

- Deals worth over $1bn dominated in 3Q, 4Q 2016 and 1H 2017
- Deals were driven by efforts to consolidate, shed non-core business
- ConocoPhillips sale of Canadian oil sands assets for $13.3bn, many others followed
- ExxonMobil’s $6.6bn purchase of Permian assets
US onshore M&A

- US oil & gas industry M&A in 3Q fell by 58pc from a year ago to $23.6bn
- But number of deals increased to 53, from 47 because of smaller, bolt-on acquisitions
- Megadeals in 4Q lower than in 3Q as year ended “with a whimper”
The Midstream Frenzy

Midstream companies race to add Permian takeaway capacity
Permian-to-Houston pipeline projects/expansions

- Enterprise: Midland-to-Sealy 450,000 b/d pipeline. Volumes averaged 333,000 b/d in the fourth quarter since it began limited service in November. Full service with batching in 2Q 2018. Could be expanded by 100,000 b/d

- Plains and Magellan BridgeTex pipeline expanded by 100,000 b/d to 400,000 b/d last year. Will expand to 440,000 b/d by early 2019

- Energy Transfer Partners expanded Permian Express by 100,000 b/d. Considering further increases

- Several companies buying and expanding Permian gathering systems including American Midstream Partners, Plains, NuStar
And then, there is Corpus.....

- Very Large Crude Carrier (VLCC) Euronav Anne arrives at the Port of Corpus Christi in May 2017 for testing
- Docks at Oxy 300,000 b/d Ingleside terminal
- First VLCC to dock at US Lower 48 export terminal
- Ingleside positioned to be major export hub
The Corpus Christi midstream race

• Plains All American Pipeline will build Cactus 2 pipeline, up to 585,000 b/d. Seeking producer partner. Trafigura signs long-term deal for 300,000 b/d

• Buckeye Partners proposing a 600,000 b/d Permian-to-Corpus Christi line

• Epic building a 590,000 b/d line. Negotiating deal with Noble to dedicate acreage and possibly buy into the project

• Magellan weighing project to move Permian and Eagleford crude to Corpus Christi and Houston
Texas export hubs: Cushing / Midland connections
Louisiana Offshore Oil Port (LOOP)

• LOOP has started testing its ability to load a VLCC at its US Gulf of Mexico facility after making "minor modifications" to handle bidirectional flows

• LOOP is owned by Shell and refiners Valero and Marathon Petroleum

• LOOP is the only port in the US Gulf capable of offloading deep draft tankers such as VLCCs and Ultra Large Crude Carriers (ULCC)
US crude exports

WTI moves around the globe as exports reach record highs
US crude exports up sharply in 2017

US crude exports
(source: US Census Bureau)

- Canada
- Asia-Pacific
- Europe
- Latin America
- Africa

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Asia-Pacific becomes key importer of US crude

US crude exports to Asia-Pacific (source: US Census Bureau)

- <25° API
- ≥25° API
- Condensate

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Brent-WTI spread

Monthly Brent-West Texas Intermediate crude oil spot price spread (Jan 2010 - Sep 2017)
dollars per barrel

- Brent crude oil price minus West Texas Intermediate crude oil price
- Brent price greater than WTI
- Brent price less than WTI

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Argus WTI-Houston

Two-step pricing mechanism
The liquidity and precision of the two-step hedge

Nymex WTI (Cushing) [$52.64]
Most liquid paper crude contract in the world (BASIS)

Argus WTI Houston (MEH) diff [+ $4.59]
Refine hedge with perfect match to coastal lt crude

$57.23
Houston is the key light crude price point on the coast
Possible headwinds to the Permian boom

Sustaining oil output volumes, overheated market, labor shortage
What could stop the Permian rise?

- Will wide Brent/WTI spread persist?
- Opec and non-Opec crude production deal will eventually expire
- Deal recently expanded through 2018; possible review in June
- Concern over well quality, natural gas-to-oil ratios
- Permian getting more expensive for investors
- Availability of manpower and equipment, hydraulic fracturing crews