The Permian: Value Drivers and Further Growth

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June 22, 2016
Value Drivers for Permian Performance
What drives good results and generates good economics?

There are a number of factors that result in a positive value for a drilling campaign, however the ultimate result can be judged on these basic factors:

1. Upstream Market Outlook
   - Where will prices be?

2. Geographic Location of Basin
   - Why is it valuable?

3. Completion Design
   - How are wells being drilled and at what cost?

4. EUR (Estimated Ultimate Recovery)
   - How much does the well produce?

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## Upstream Market Outlook

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How will prices affect overall production?

- Shale resiliency to the depressed markets was tough at first; however, production has clearly been in decline more recently.
- Shale is expected to continue its struggle over the next couple years. Pent-up supply in Iran & Iraq, combined with challenged financial restructurings present notable hurdles to growing market share for US onshore.
- We estimate prices will begin to recover in 2017 and increase to over $50/Bbl at WTI.
- Across the US, multiple plays have declined or shown a materially reduced rate of increase:
  - Eagle Ford (decline)
  - Bakken (decline)
  - Rockies region (decline)
  - Gassy-Regions (slowing)
Highlighting the Permian
An Oasis in a Tough Environment

The Permian continues to increase despite the current market environment.

Multiple basins continue to attract investment:

› Several stacked pay zones allow for multiple hydrocarbon targets,

› With BE's in the low $30/bbl range for the top 25% of wells, the Permian reflects some of the lowest BE prices in US shale (high IP/EUR combined with easier access to transportation infrastructure)

› Large inventory of previously drilled VT and HZ wells
What basin is best?

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Permian Economics

Where, within the core, are the best economics? (Assuming $6.0mm per well D&C)

- Currently, unconventional drilling accounts for 65% of total completions in the Permian.
  - Prior to 2014, the Midland basin accounted for ~50% of completions and the Central Basin Platform (CBP) accounted for ~24%.
    (Focused within SW Midland basin counties and southern CBP counties)

- Median 30-Yr EUR’s increase to the west of the Permian basin.
  - Total Permian basin average EUR = 340 Mboe

- Median breakeven values range from low $40/bbl to above $70/bbl on a county-wide basis.
  - When highlighting the top 25% of wells drilled within each county, the median BE lowers to a range between $20-35/bbl.
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Where is Activity Focusing?

- In 2012, almost 9,000 wells were completed within the overall Permian basin (TX + NM)
  - 62% stemmed from the Midland basin, and
  - 22% came from the Delaware.
- In 2014, well completions decreased by 10% over 2012 levels, and in 2015 completions dropped 47% over the same period.
- In 2015, completion trends in the Midland basin have held steady while completions in the Delaware have increased by ~22%.
- Despite drops in completions, production continues to rise due to efficiency gains, expanding target formations, and aligning proppant type to completion designs.
- New drill locations have begun to hone in on core counties within the Midland and Delaware basins:
  - Delaware: Reeves and Loving
  - Midland: Reagan and Midland
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How are wells being completed?

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? Capex | ? Mboe/Well |
Permian Basin
What is happening with lateral lengths and cycle times?

- Average lateral lengths in the basin are currently 4,875 ft, up over 80% from early 2012 levels, which averaged only 2,687 Ft.
- Current proppant per lateral foot (1,153 lbs/ft) has more than doubled since early 2012 (572 lbs/ft).

![Avg Days to Drill vs. Lateral Length: Q1 ‘14-Q1 ‘16](image)

![Avg Proppant per Lateral Foot vs. Lateral Length: Q1 ‘14-Q1 ‘16](image)
Permian Basin
How are wells being completed?

Frac Type Market Share: Q1 ‘14-Q1 ‘16

- The Permian has shifted to using slickwater fracs. Data since Jan. 2016 indicates this method in over 50% of completions, basin-wide.
- Sand has typically been widely used as the preferred proppant type; however, starting in 2015, it became the dominate proppant type, reflected in almost 65% of all completions.
Permian Basin
Breakeven versus EUR profile

Median BE by SubBasin ($/bbl at WTI)

- Central Basin Platform
- Delaware
- Midland
- Northwest Shelf

2013 2014 2015

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Permian Basin
Breakeven versus EUR profile

Top 25% of Wells Drilled: 2012-2015

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<th>SubBasin</th>
<th>Median EUR (Mboe)</th>
<th>Median BE ($/bbl at WTI)</th>
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<tr>
<td>Northwest Shelf</td>
<td>258</td>
<td>$ 31.80</td>
</tr>
<tr>
<td>Delaware</td>
<td>269</td>
<td>$ 33.00</td>
</tr>
<tr>
<td>Midland</td>
<td>264</td>
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<tr>
<td>Central Basin Platform</td>
<td>275</td>
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Median Breakeven of Top 25% of Wells Drilled ($/bbl at WTI)
Core County Case Studies
Loving County
Median EUR of 507 Mboe and Median BE of $28/bbl for Top 25% of Wells

Avg Days to Drill vs. Lateral Length: Q1 ‘14-Q1 ‘16

Avg Proppant per Lateral Foot vs. Lateral Length: Q1 ‘14-Q1 ‘16
Loving County

How are wells being completed?

**Frac Type Market Share: Q1 ‘14-Q1 ‘16**

**Proppant Type Market Share: Q1 ‘14-Q1 ‘16**
Reeves County
Median EUR of 447 Mboe and Median BE of $26/bbl for Top 25% of Wells

**Avg Days to Drill vs. Lateral Length: Q1 ‘14-Q1 ‘16**

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Reeves County
How are wells being completed?

Frac Type Market Share: Q1 '14-Q1 '16

Proppant Type Market Share: Q1 '14-Q1 '16

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Midland County
Median EUR of 313 Mboe and Median BE of $26/bbl for Top 25% of Wells

**Avg Days to Drill vs. Lateral Length: Q1 ’14-Q1 ’16**

**Avg Proppant per Lateral Foot vs. Lateral Length: Q1 ’14-Q1 ’16**
How are wells being completed?

Frac Type Market Share: Q1 ‘14-Q1 ‘16

Proppant Type Market Share: Q1 ‘14-Q1 ‘16
In Conclusion
Do the economics in the Permian work within today's market?

- The core of the Permian resides heavily within approximately 4 counties in terms of EUR and BE’s below $50-60/bbl. These counties demonstrate median EUR’s >250 Mboe, with the largest EUR of 507 Mboe in Loving County.
  - The “core of the core” lives within Loving, Reeves, and Midland counties.
  - With a median BE below $30/bbl and EUR between 300-500 Mboe within the top 25% of wells drilled, within these top 3 counties, the core of the play can continue unharmed in the current market.

- Completions trends have shifted to using more raw sands as the main proppant source. Operators are also increasing the use of slickwater fracking as a cheaper yet effective method for enhancing ultimate recovery rates.

- Under an assumed market price of approximately $44/Bbl, the Permian will likely continue its forward momentum and remain the top producer in terms of activity and cost in NA. We will likely see more A&D and activity shifts into the basin where operators can maximize recovery potential under minimal capital investment.

- Stratas Advisors expects that the upstream market will continue to show signs of improvement through 2017, with average WTI prices hovering around or above $50/bbl, which we believe will allow other areas to rebuild and ultimately grow market share.
We can help you develop a deeper understanding of the developments that are shaping the future of oil & gas. Our support includes customized consulting that is focused on a client’s specific strategic objectives, competitive challenges & asset base. Additionally, we offer support through subscription services & comprehensive market studies.

UPSTREAM | MIDSTREAM | DOWNSTREAM | FUEL & TRANSPORT

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