CAN US SHALE SURVIVE?

CHALLENGES AND OPPORTUNITIES AHEAD

ARTEM ABRAMOV

APRIL 2, 2020
US light tight oil production doubled between 2016 and late-2019

US light tight oil production from horizontal wells by vintage*
Thousand barrels per day

*Vintage is defined as the year of first oil production
Source: Rystad Energy ShaleWellCube
Focus on free cash flow generation has become the standard business model for public E&Ps

Quarterly CFO* vs capex for public US shale oil producers
Billion USD

*CFO (LHS) vs Capex (LHS) vs % of companies with positive CFO-Capex (RHS)

*The peer group of 39 dedicated US shale oil companies adjusted for CRZO, JAG, SRC, EPEG
Source: Company reporting, Rystad Energy research and analysis, February 2020
Persistent pressure to reduce leverage ratios – E&Ps have to stay committed to FCF targets

Debt and interest by maturity
Billion USD

$133 billion of shale debt and interested to be paid in 2020–2026

Peer group of 29 operators: APA, CPE, CHK, XEC, CXL, COP, CLR, DVN, FANG, ESTE, EOG, HES, HPR, LPI, MRO, MTD, MUR, NBL, OAS, OVV, OXY, PE, PDCE, PXD, QEP, ROSE, SM, WLL, WPX

Source: Company reporting, Rystad Energy research and analysis

*Peer group of 29 operators: APA, CPE, CHK, XEC, CXL, COP, CLR, DVN, FANG, ESTE, EOG, HES, HPR, LPI, MRO, MTD, MUR, NBL, OAS, OVV, OXY, PE, PDCE, PXD, QEP, ROSE, SM, WLL, WPX

Source: Company reporting, Rystad Energy research and analysis
New target spend is 33% below the original guidance, still with $30 WTI in mind

Updated 2020 capital guidance vs original 2020 budget by company
Billion USD

<table>
<thead>
<tr>
<th></th>
<th>Updated 2020 vs original 2020 budget</th>
<th>Updated 2020 vs 2019 actual spend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision March 16, 2020</td>
<td>-23%</td>
<td>-30%</td>
</tr>
<tr>
<td>Revision March 19, 2020</td>
<td>-32.2%</td>
<td>-39.9%</td>
</tr>
<tr>
<td>Chevron</td>
<td>-50%</td>
<td>-44%</td>
</tr>
<tr>
<td>Continental Resources</td>
<td>-55%</td>
<td>-55%</td>
</tr>
<tr>
<td>ConocoPhillips</td>
<td>-19%</td>
<td>-23%</td>
</tr>
<tr>
<td>WPX Energy</td>
<td>-24%</td>
<td>-28%</td>
</tr>
<tr>
<td>Laredo Petroleum</td>
<td>-36%</td>
<td>-32%</td>
</tr>
<tr>
<td>Centennial Resource</td>
<td>-50%</td>
<td>-62%</td>
</tr>
<tr>
<td>HightPoint Resources</td>
<td>-74%</td>
<td>-83%</td>
</tr>
<tr>
<td>Antero Resources</td>
<td>-13%</td>
<td>-21%</td>
</tr>
<tr>
<td>Bonanza Creek Energy</td>
<td>-60%</td>
<td>-59%</td>
</tr>
<tr>
<td>Rosehill Resources</td>
<td>-70%</td>
<td>-79%</td>
</tr>
<tr>
<td>All updated companies</td>
<td>-33.7%</td>
<td>-39.7%</td>
</tr>
<tr>
<td>Total US shale</td>
<td>-25.7%</td>
<td>-33.0%</td>
</tr>
</tbody>
</table>

2020 original capital  Update March 16, 2020  Update March 19, 2020  CVX  CLR  Permian  COP  Niobrara  AR  2020 revised capital

CVX reflects Permian properties only
Source: Company reporting, Rystad Energy research and analysis
Horizontal oil rig count gains from January-February 2020 have already evaporated. Gas rig activity remains in decline, which started in June 2019.

Horizontal rig count by main hydrocarbon type*

*Oil – Permian, Bakken, Eagle Ford, DJ Basin, SCOOP & STACK, other horizontal drilling targeting oil
Gas – Appalachia, Haynesville, other horizontal drilling targeting gas
Source: Baker Hughes, Rystad Energy research and analysis, March 2020
Even with WTI of $30, new well count should return to the level of 2016 already in 2020

US Land horizontal wells fracked & frac stages ($30/bbl WTI)
Thousands

Source: Rystad Energy research and analysis, Rystad Energy ShaleWellCube
More than 1 million bpd of the US oil production will be lost already by 4Q20

US L48 ex.GoM oil production outlook
Thousand barrels per day

*All scenarios assume Henry Hub Gas and Mont Belvieu weighted average NGL prices of 1/20 and 0.35 of WTI oil price
Source: Rystad Energy research and analysis, Rystad Energy ShaleWellCube
Global liquids demand in 2020 to contract by 5.7% from 2019, 20% in Mar-May 2020

Global oil demand impact analysis Covid-19 – Effective Prevention Scenario (April 1, 2020)
Million barrels per day

Source: Rystad Energy research and analysis
Global stock build in 2Q cannot be absorbed by remaining storage capacity

Global liquids supply and demand balances, quarterly
Million barrels per day

<table>
<thead>
<tr>
<th></th>
<th>Not possible in practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implied stock change</td>
<td>Liquids Supply (rhs)</td>
</tr>
<tr>
<td>Products Demand (rhs)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Rystad Energy research and analysis, OilMarketCube
US L48 ex.GoM, stripper* well cash cost curve for 2020

Source: Rystad Energy

*Stripper well is a well producing less than 10 barrels of oil per day, defined dynamically each month

Source: Rystad Energy ShaleWellCube, Rystad Energy research and analysis
Average half-cycle WTI PV0 breakeven by activity type and County
Dollars per barrel of economic oil equivalent*

*Assumes gas and NGL prices – 0.3 and 0.35 of oil price on energy equivalent boe basis

**Well performance and costs are normalized to 10,000’ well design

Source: Rystad Energy ShaleWellCube, Rystad Energy UCube, Rystad Energy research and analysis
Total US E&P Chapter 11 scenarios by year and WTI oil price

Number of cases

Source: Haynes and Boone Oil Patch Bankruptcy Monitor, Rystad Energy research and analysis
Permian, wellhead flaring (LHS) and flaring-driven CO2 emissions (RHS)

Million cubic feet per day

KG CO2 per barrel of oil produced

*CO2 emissions include only emissions related to wellhead gas flaring in the Permian

Source: Rystad Energy research and analysis, Rystad Energy ShaleWellCube March 2020
Thank you for your attention

**Rystad Energy**: Independent energy consulting and business intelligence data firm established in 2004, headquartered in Oslo with offices across the globe.

**Databases**: Covering energy fundamentals, upstream, oilfield services and renewable energy industries.

**Analytics**: Extensive library of market reports, commentaries and fact sheets.

**Consulting**: Leading advisor on strategy, markets and business development within the energy space globally.

**Contact**: Artem Abramov  
Head of Shale Research  
artem.abramov@rystadenergy.com