U.S. public oil and natural gas (O&G) extraction companies continue to focus on spending less, through a combination of realizing efficiencies and growing more slowly. Consistent with this, more O&G companies are making specific commitments to use their profits to pay dividends to shareholders (and to lowering carbon emissions) in an effort to “win back” investors. As a result and as was highlighted in the last quarterly, the private operators have increased activity more aggressively in response to the recent recovery in commodity prices.

In the near term, at least some of the public extraction companies are likely going to get more active as the industry gains confidence that higher oil prices can be sustained, suggesting activity will rise further. More generally, the future for the U.S O&G industry appears likely to include higher productivity, propelling further recovery in produced volumes but using fewer workers and concentrating in the most prolific basins. Please see pages 3-4 for an activity update and then pages 5-8 for discussion of these themes.
## Reference Data Table

<table>
<thead>
<tr>
<th></th>
<th>2Q19</th>
<th>3Q19</th>
<th>4Q19</th>
<th>1Q20</th>
<th>2Q20</th>
<th>3Q20</th>
<th>4Q20</th>
<th>1Q21</th>
<th>4/30/21</th>
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<tbody>
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<td><strong>Oil Price</strong></td>
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<tr>
<td>(West Texas Intermediate, $/bbl)</td>
<td>$59.93</td>
<td>$56.43</td>
<td>$56.87</td>
<td>$45.80</td>
<td>$29.14</td>
<td>$40.94</td>
<td>$42.72</td>
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<td><strong>Nat Gas Price</strong></td>
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<tr>
<td>(Henry Hub, $/Mcf)</td>
<td>$2.57</td>
<td>$2.38</td>
<td>$2.40</td>
<td>$1.90</td>
<td>$1.70</td>
<td>$2.00</td>
<td>$2.53</td>
<td>$2.77</td>
<td>$2.52</td>
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<td><strong>Oil Production</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Millions of Barrels per day)</td>
<td>12.1</td>
<td>12.2</td>
<td>12.8</td>
<td>12.7</td>
<td>10.8</td>
<td>10.8</td>
<td>10.9</td>
<td>10.5</td>
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<tr>
<td><strong>Drilled but Uncompleted Wells (DUCs)</strong></td>
<td>8,047</td>
<td>8,192</td>
<td>8,374</td>
<td>8,423</td>
<td>8,518</td>
<td>8,355</td>
<td>7,611</td>
<td>7,061</td>
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<tr>
<td><strong>Rig Count</strong></td>
<td>963</td>
<td>895</td>
<td>797</td>
<td>763</td>
<td>378</td>
<td>240</td>
<td>293</td>
<td>374</td>
<td>426</td>
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<tr>
<td><strong>Frac Spread Count</strong></td>
<td>405</td>
<td>377</td>
<td>363</td>
<td>318</td>
<td>89</td>
<td>79</td>
<td>132</td>
<td>156</td>
<td>212</td>
</tr>
<tr>
<td><strong>Oil &amp; Gas Co. Bankruptcies</strong></td>
<td>13</td>
<td>15</td>
<td>9</td>
<td>5</td>
<td>18</td>
<td>17</td>
<td>6</td>
<td>8</td>
<td>NA</td>
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<tr>
<td><strong>Oilfield Services Bankruptcies</strong></td>
<td>1</td>
<td>11</td>
<td>6</td>
<td>7</td>
<td>11</td>
<td>27</td>
<td>17</td>
<td>5</td>
<td>NA</td>
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<tr>
<td><strong>Direct Employment In O&amp;G Extraction (Thousands)</strong></td>
<td>490.5</td>
<td>480.6</td>
<td>458.7</td>
<td>442.0</td>
<td>376.9</td>
<td>369.5</td>
<td>371.9</td>
<td>388.1</td>
<td>NA</td>
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</tbody>
</table>

**Sources:**
- Commodity Prices: Macrotrends.net
- DUCs: Energy Information Administration
- Rig Count: Baker Hughes
- Frac Crew Count: Primary Vision
- Bankruptcies: Haynes and Boone LLP

**Notes:**
- All reflect averages for the period except 1) employment, which is end of the period and 2) DUCx, which are total per period
- Direct Employment is BLS CES NAICS code 211 (Oil & Gas) and 213 (Support for Mining) segments.
- NAICS code 213 includes ~5,000-10,000 employees in the coal and non-energy sectors. Reflects end of period.
- Winter storm Uri weighed on 1Q21 averages. Oil production, for example, was 11.1 million b/d in January and 9.9 million b/d in February
- NA = Not Available
1Q 2021 Activity Overview

The U.S. oil industry’s activity recovery continued in 1Q21, including bringing more oil and natural gas production back on-line (except as impacted by winter storm Uri). The U.S. onshore drilling rig count averaged 374 in 1Q21, vs. 293 in 4Q20 and its low of 230 set in mid-August 2020. The rig count has since risen to ~440 by the end of April 2021. The U.S. onshore frac crew count averaged 156 in 1Q21, coming off of a trough set in mid-May of 45. The frac crew count has since risen to ~215 by late April 2021 (see Reference Table and Exhibit 1). Both the rig and the hydraulic fracturing (frac) crew count averages in 1Q21 were approximately 55% below their pre-pandemic levels.

Per the Bureau of Labor Statistics, the industry had added back 18,600 direct jobs by the end of 1Q21 from its trough in 3Q20. Direct employment remained over 20% below the recent peak set in 1Q19 and 40% below levels experienced in 2014. See Reference Table.

The U.S. oil industry’s activity recovery continued in 1Q21, including bringing more oil and natural gas production back on-line. 

Exhibit 1:
Rig and Frac Crew Counts, September 2019 - April 2021
Privates Remain More Responsive to Higher Oil Prices

Private extraction companies added the majority of incremental working rigs in 1Q21 and raised their total proportion of rigs to 55% by the end of the quarter up from roughly ½ in 4Q20. Private companies are responding to:

1. higher oil prices — they do not have shareholder pressure to be more disciplined in their spending — and
2. to a lesser degree, their Private Equity backers, who are promoting growth in the hopes that the current commodity price strength might finally let them exit the business (by selling the companies to larger O&G firms). This appears to be the case for the largest acquisition in the space over the last three months, Pioneer Natural Resources’ purchase of private equity-backed DoublePoint Energy for $6.4 Billion. Pioneer has indicated it will slow DoublePoint’s rate of spending as it assumes control.

With respect to the next few months, the public oilfield service companies indicated that they expected some additional demand from the public O&G companies, which suggests drilling and completion activity should climb further. With that said, some of the largest O&G companies, including ExxonMobil and Chevron have suggested their U.S. activity growth, which is heavily weighted to the Permian, would more likely wait until 2022 and beyond.

Over the medium term, U.S. rig/activity addition appears in part dependent on what happens with these private equity-backed private companies. As discussed in the previous quarterly, public companies acquiring these private ones can give these public companies more acreage and scale (a source of efficiencies). (An example of this is the other notable recent acquisition, that of Sabalo Energy by Laredo Petroleum.) However, the general bias in the industry appears to be that there are only a small number of private companies that are attractive to buy and a dwindling amount of investor capital that would support acquisitions; this line of thinking suggests that the vast majority of private companies remain private and thus that their “inflated” spending level declines over time. Private companies may consolidate among themselves but generally would be expected to spend less/shrink over time barring sustained higher oil prices.

Broad-Based Efficiency Gains

O&G companies continue to become more cost efficient with their development of their (shale oil) assets. They are exploiting ever-greater understanding of the reservoir and employing techniques...
such as drilling even longer lateral sections (i.e. more regularly drilling wells that include horizontal sections as long as 3 miles), drilling more quickly, “co-developing” different depths of hydrocarbon-bearing rock and hydraulically fracturing two wells at the same time (vs. one at a time historically). As discussed in previous quarterlies, the underlying efficiency trend, which includes the ability to use fewer oilfield workers throughout the drilling and completion processes, appears set to continue. As such, it appears unlikely that the industry recovers its direct employment to levels seen as recently as 2019, even with strong oil prices.

In part, the efficiency emphasis has included being more targeted in where these companies are active (and thus more targeted in where workers are being rehired). This has led to a wide disparity in which regions have experience recovery from the pandemic-driven hemorrhaging. For example, the rig count in Texas, driven by its vast Permian basin, has doubled to 211 since the trough set in August 2020 (which is still down 45% from levels in early 2020) while the rig count in North Dakota has added only six rigs from its trough and is still 70% below early 2020 activity (see Exhibit 2).

As expected, the federal government’s pause on permitting on public lands and ongoing evaluation of its leasing practices has not yielded a discernable activity impact. To wit, New Mexico’s active rig count, which is driven by its Permian basin acreage and which held up better than other states through the pandemic-driven downturn, has continued to recover. With that said, it is plausible some concerns about the incoming administration precipitated some “bobble” in the New Mexico rig count in late January-February 2021 (there is federal land in both the Permian and San Juan basins) before it resumed that recovery (see Exhibit 2). For reference, the rig count in New Mexico is 40% below is early 2020 level.
This targeting of more prolific basins is expected to persist, pointing to relatively smaller oilfield businesses in plays such as the Bakken in North Dakota and the STACK/SCOOP in Oklahoma. (Please see a map of the major U.S. unconventional basins in Appendix 1 on page 8.)

**Differing Approaches to Lowering Carbon Footprint**

With investors increasingly clamoring for the O&G industry to take action to address climate change concerns, the public O&G companies are responding in various ways. The area that is seeing the most consistency across companies is lowering their carbon footprint (generally Scope 1 and 2 CO$_2$ and methane emissions). To provide just a few examples from the many companies that have provided some form of update and/or targets:

- **Marathon Oil** lowered its greenhouse gas (GHG) emissions by 25% in 2020 vs 2019 and introduced a 50% reduction target (2025 vs. 2019) along with identifying $100 Million of projects associated with meeting those targets; executive compensation structure was also altered to align with financial and ESG targets.
- **Occidental Petroleum** made new commitments to cut CO$_2$ and methane emissions intensity by nearly half by 2025 vs. 2017 levels.
- **ExxonMobil** intends to reduce Scope 1 and 2 GHG emissions from its upstream operations by 30% by 2025 vs. 2016 and absolute flaring and methane emissions by 40-50%.
- **Chevron** has cut its methane emissions in the U.S. by 85% since 2013 and intends to meet the World Bank Initiative of no routine flaring (of CO$_2$) by 2030.

When it comes to more “fundamental” change, i.e. in what businesses these companies are going to engage in over the long-term, there starts to be more divergence, particularly among the largest companies (the supermajors). The U.S.-based supermajors, like their smaller, E&P counterparts, have thus far continued to seek to grow their fossil fuel production (and as noted the Permian is a key target for both ExxonMobil and Chevron). They are supplementing that ongoing “base” business with investment in carbon capture technologies (often referred to as CCS or CCUS) that can take CO$_2$ that is released during industrial processes, including their own refineries, and store it underground. A large-scale illustration of this from ExxonMobil is its proposed 100 Million CO$_2$ tons per year Houston CCS Innovation Zone project.
These “fossil fuel” supermajors are also investing in renewable technologies that are more akin to what they produce commercially today, including Hydrogen and renewable natural gas/liquids. Yet all told, ExxonMobil and Chevron have committed to invest only <5% of their planned capital expenditures over the next several years on CCUS, H₂ and renewables.

In contrast, the European supermajors, including BP and Shell, are allocating 1/3+ of their longer term capital investment programs to renewables. BP also expects to gradually shrink and concentrate its oil & gas production, largely through divestitures. Thus, over time, these European companies will become much more diversified energy businesses.

Given recent events, however, specifically the shareholder activism that is putting two new directors on ExxonMobil’s Board and the Dutch court that ruled that Shell must further deepen its carbon emissions cuts, it seems likely that both the U.S. and European Supermajors are likely to go further to deemphasize hydrocarbons in their portfolios and to expand their commitments to address (Scope 3) CO₂ emissions.

Appendix 1: Map of U.S. Unconventional Hydrocarbon Plays

Source: U.S. Energy Information Administration
ABOUT THE AUTHOR

Brad Handler is a Non-resident Fellow at the Payne Institute. He is currently researching the Oil & Gas industry’s role and vulnerability in the global transition to lower-carbon energy, as well as the intersection between finance and energy, and has recently had articles published in the Petroleum Economist, WorldOil, The Hill and The Conversation. He is a former Wall Street Equity Research Analyst with 20 years’ experience covering the Oilfield Services & Drilling (OFS) sector and was most recently a Managing Director, Equity Research at Jefferies LLC, following several years at Credit Suisse. Brad has an M.B.A from the Kellogg School of Management at Northwestern University and a B.A. in Economics from Johns Hopkins University.
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