How do subsidies affect oil drilling in the United States?

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U.S. government has reported over a dozen subsidies to producers

We quantify affect of largest subsidies on all new oil fields in the U.S.

But question remains: what effect?

• Prior findings differ
  – Researchers: Most subsidies (nearly all) to profit
  – Industry: No subsidies or, subsidies drive investment

• Here, for first time:
  – Field by field analysis (800+ fields)
  – Investor perspective (detailed cash flow analysis)
  – Broader list of subsidies – major federal subsidies plus state subsidies in two regions (North Dakota, Texas)
Cash flow perspective...(example)

Method

- All (800+) discovered, not-yet-developed oil fields in U.S. (using data from Rystad Energy)
- Modify cash flow streams for each field based on eligibility (e.g., independent producers), use 10% hurdle rate (with sensitivity cases)
- A dozen subsidies (both federal and state)
- Deeper focus on three basins: North Dakota Williston, Texas Permian, U.S. (federal) offshore
Results, $50/bbl: Permian, Williston

**a) Permian Basin, Texas**
- Base case (no subsidies)
- With subsidies
- With subsidies and pushed over hurdle rate

**b) Williston basin, ND**
- Base case (no subsidies)
- With subsidies
- With subsidies and pushed over hurdle rate

**Subsidy-dependent oil resources**
### Table 4: Impact of subsidies on undeveloped oil resources and GHG emissions (at $50/bbl)

<table>
<thead>
<tr>
<th>Area</th>
<th>Economic oil resources, discovered but not yet producing (billion barrels)</th>
<th>Percent subsidy-dependent</th>
<th>Increase in economic oil resources due to subsidies</th>
<th>Increase in net GHG emissions (Gt CO₂)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(billion barrels)</td>
<td>(Gt CO₂)</td>
</tr>
<tr>
<td>Williston basin</td>
<td>4.1</td>
<td>59%</td>
<td>2.4</td>
<td>1.0</td>
</tr>
<tr>
<td>Permian basin</td>
<td>20.3</td>
<td>40%</td>
<td>8.0</td>
<td>3.3</td>
</tr>
<tr>
<td>Gulf of Mexico</td>
<td>2.1</td>
<td>73%</td>
<td>1.5</td>
<td>0.6</td>
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<td>Rest of U.S.</td>
<td>16.7</td>
<td>46%</td>
<td>7.6</td>
<td>3.1</td>
</tr>
<tr>
<td><strong>Total U.S.</strong></td>
<td><strong>43.3</strong></td>
<td><strong>45%</strong></td>
<td><strong>19.6</strong></td>
<td><strong>8.1</strong></td>
</tr>
</tbody>
</table>

Source: SEI analysis based in part on data from Rystad Energy.
Effect diminishes at higher prices

Figure 2: Share of U.S. oil resources that are subsidy-dependent as a function of oil prices

- Economic oil resource (billion barrels)
- Numerical results at $50/barrel
- Subsidy-dependent
- Discovered, economic without subsidies
- Not yet discovered
- Already producing

Note: The chart assumes a 10% hurdle rate.
Federal tax subsidies largest, and...
Key points

• Considerable tax expenditures and other subsidies go to projects that would have happened anyway (half)
• At current prices, subsidies set to unlock about 8 Gt CO$_2$ worth of oil that wouldn’t be developed otherwise (up to a quarter of a U.S. carbon budget for oil)
• Inefficient spending, expansion of carbon-intensive fuel: strengthen case for subsidy reform?
Thank you

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- Paper reference: