Risky Bet: National Oil Companies in the Energy Transition
National oil companies are important

1. Half the world’s oil and gas
2. 280 million people in poverty
3. Financial entanglement
This time is crucial

Rising oil price

Spending carbon budget & Advancing energy transition
Climate Managed

- 2 degree warming
- Low oil & gas prices (c.$40)
- $400bn (out of $1.9trn) fails to break even
- Less funds to diversify & adapt

Climate Breakdown

- Over 2 degree warming
- High oil & gas prices (c.$60 - 70)
- $1.9trn breaks even
- But still need funds to diversify & adapt
1. Take all investments shown in Rystad Energy UCube expected from 2021 to 2030.

2. NOCs’ share of capital expenditure to develop each project (real, 2021 prices).

3. Aggregate NOC capex by each project’s post-tax break-even price per barrel of oil equivalent. Break-even price as of 2021, not FID, using 10% discount rate.

4. Apply price scenarios ($55, $60, $70). For each scenario, we assume NOCs invest assuming this long-term price. But actual long-term price is $40.

5. Calculate capex on projects for each NOC that fail to break-even in each scenario.
Oil price assumptions (real, 2020 prices)

**Long-term assumptions**
- $72 — IEA Stated Policies for 2.7°C (Carbon Tracker, 15% discount rate)
- $62 — IOC average (Westwood Energy, June 2020)
- $60 — Rystad base case as of 2020
- $55 — BP (company states is broadly consistent with Paris Agreement), and Rystad base case as of 2021

**Long-term oil price estimated to be consistent with meeting or being close to meeting the Paris Agreement**
- $50 — Van Meurs Energy
- $48 — IEA ‘Sustainable Development’ resulting in a 1.8°C temperature rise (Carbon Tracker, using 15% discount rate)
- $40 — Wood Mackenzie (Oil Search)
- $38 — IEA ‘Beyond 2 Degrees’ resulting in a 1.6°C temperature rise (Carbon Tracker, using 15% discount rate)
Method - Results - Policy
Range of post-tax break-even prices of the next generation of NOC investment
Following their current course NOCs could gamble $1.9trn, of which $400bn on projects won’t break even if we meet Paris target.

Value of NOC capital expenditure disaggregated by break-even price range:

- $414 billion of capex requires long-term price above $40 to break even.
- $943 billion of capex requires long-term price above $30 to break even.
NOCs are not equal: Saudi Aramco looks quite “safe”
To maintain production, Nigeria’s NNPC needs to invest up to $14 bn in high cost projects.
# NOCs place bets, countries face consequences

<table>
<thead>
<tr>
<th>Country</th>
<th>High risk capex as % of government expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mozambique (ENH)</td>
<td>179%</td>
</tr>
<tr>
<td>Azerbaijan (SOCAR)</td>
<td>157%</td>
</tr>
<tr>
<td>Oman (OOC)</td>
<td>61%</td>
</tr>
<tr>
<td>Nigeria (NNPC)</td>
<td>53%</td>
</tr>
<tr>
<td>Congo (Rep.) (SNPC)</td>
<td>42%</td>
</tr>
<tr>
<td>Turkmenistan (Turkmengaz)</td>
<td>41%</td>
</tr>
<tr>
<td>Algeria (Sonatrach)</td>
<td>36%</td>
</tr>
<tr>
<td>Qatar (Qatar Petroleum)</td>
<td>31%</td>
</tr>
<tr>
<td>UAE (ADNOC, ENOC)</td>
<td>30%</td>
</tr>
<tr>
<td>Malaysia (Petronas)</td>
<td>29%</td>
</tr>
<tr>
<td>Russia (Gazprom, Rosneft)</td>
<td>27%</td>
</tr>
<tr>
<td>Colombia (Ecopetrol)</td>
<td>21%</td>
</tr>
<tr>
<td>Ghana (GNPC)</td>
<td>18%</td>
</tr>
<tr>
<td>India (ONGC)</td>
<td>16%</td>
</tr>
<tr>
<td>Brunei (PetroleumBrunei)</td>
<td>14%</td>
</tr>
<tr>
<td>Norway (Equinor)</td>
<td>12%</td>
</tr>
<tr>
<td>Vietnam (PetroVietnam)</td>
<td>10%</td>
</tr>
<tr>
<td>Kazakhstan (KazMunayGas)</td>
<td>10%</td>
</tr>
</tbody>
</table>
High debts put NOCs on the back foot.

Comparison of estimated break-even prices of NOCs’ current global portfolio, and NOCs’ long-term debt as a proportion of general government revenue.
Obstacles

Many, conflicting responsibilities

Outsize control of public revenue

Expansionist

Weak accountability
Governments need to:

<table>
<thead>
<tr>
<th>ASSESS RISK EXPOSURE &amp; TOLERANCE</th>
<th>SET GOAL</th>
<th>IF CASHING OUT...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOC EXPOSURE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COUNTRY TOLERANCE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### IF CASHING OUT...

- **Control cash flows:**
  - Maintain high taxes on NOC
  - Set NOC borrowing limits (inc. domestic borrowing)
  - Consider divestment, listing shares

- **Place explicit limits on NOC exploration & development spending**

- **Improve reporting and corporate governance. Disclose:**
  - The assessment report
  - Project costs, NOC capital invested
  - Long-term price assumption
  - Reserves under lower prices
  - Borrowing – inc. from domestic lenders