

National Oil Companies and Climate Change: Insights for Advocates

KEY MESSAGES

National oil companies are the “hidden half” of the global oil industry. Climate and development advocates who seek to reduce fossil fuel supply and promote sustainable economies must engage with these state-owned companies, many of which are based in countries with high levels of poverty. Here are five ideas for engagement:

1. National oil companies are *national*. Engaging with them means engaging with the ambitions of their countries' governments and citizens.

- National oil companies (NOCs) are central to their countries' economic systems, and national governments and other domestic actors exert the most influence on them.
- To encourage climate reform among NOCs, acknowledge NOCs' public roles and the challenges and opportunities facing their countries.

2. Interests cloud perception of risks. National oil companies and their governments don't fully appreciate the economic risks associated with their investments.

- The energy transition creates huge risks for many NOCs, but decision makers don't perceive them while their interests and incentives are tied to the status quo.
- Address these biases by helping leaders to see the positive potential in creating and thriving in a low-carbon future, and empowering NOC and government leaders to succeed in it.

3. Economic development matters. National oil companies won't change without public pressure and international support to diversify their countries' economies.

- Reducing NOC oil production without an alternative to fill the resulting economic void would harm vulnerable people in oil-producing countries. Despite many promises and plans, diversification efforts have made little progress, due to structural barriers at both domestic and international levels, and lack of serious political commitment.
- Build public pressure in producing countries to drive real action on diversification, and help create an enabling environment while sharing positive lessons across countries.

4. National oil companies differ. Climate and development advocates should tailor their strategies to distinct types of national oil companies, which present varying opportunities and challenges for reform.

- NOCs vary along five dimensions that impact their reform potential: scope of climate impacts, production cost, home economy dependence on oil, national income level and openness to external influence.
- Examine NOCs along these dimensions to design strategies that maximize impact on climate and development.

5. Renewable energy can be an opportunity or an obstacle. National oil company investment in renewables can boost the energy transition and give NOCs a stake in it, but can be counter-productive in some cases.

- Some NOCs are pursuing investments in renewable energy. Sometimes, these efforts can bolster clean energy and give an NOC a stake in the energy transition, making the company less likely to resist change.
- Think carefully, however, before pushing for a central role for an NOC in a country's renewables plans. Many NOCs lack the financial, institutional and technical capacities and incentives to drive renewable energy growth, and there is a danger of crowding out other public and private actors.

INTRODUCTION

Reducing greenhouse gas emissions requires engaging with the “hidden half” of the global oil industry: national oil companies (NOCs). These state-owned companies produce half the world’s oil and gas, and fund about 40 percent of the industry’s investment.¹

Reducing emissions enough to keep the rise in the global temperature to 1.5 °C or well below 2 °C, as agreed by almost all countries in Paris in 2015, requires a rapid decline in production and consumption of all fossil fuels. While climate policy has conventionally focused on fuel demand (since greenhouse gases are emitted when they are consumed), markets are shaped by both supply and demand, and a growing body of scholarship and policy recognizes that effective and holistic climate policy should tackle fossil fuel supply as well as demand.²

In 1.5-degree scenarios published by the Intergovernmental Panel on Climate Change, global oil production falls by an average of 4 percent per year and gas production by 3 percent, such that 2030 levels would be respectively 32 percent and 29 percent below 2020 levels.³ So far, neither international oil companies (IOCs) nor NOCs have taken meaningful steps toward reducing their production; but NOCs, on average, lag behind their private-sector peers in announcing plans for transition.⁴ NOCs that have begun to take steps on climate change have focused primarily on emissions from their own processes (“Scope 1” emissions), addressed for example by improving operational efficiencies, ending flaring, and plugging gas leaks. While such measures are necessary, this briefing focuses on the more difficult question of NOCs’ roles in a global production phase-out.

In addition to their impact on climate, NOC decisions affect the development prospects of producer countries themselves. The global transition from fossil fuel use to cleaner energy removes the prospect of significant oil income that producer countries came to expect in previous decades. The International Energy Agency recently found that in its scenario that limits warming to 1.5 °C, global demand would fall by 20 percent by 2030 and 55 percent by 2040, and oil prices would fall to \$35 by 2030.⁵ Yet NOCs, expecting higher prices for oil and gas, are projected to over the next decade invest \$400 billion in projects that would lose money even in a 2 °C scenario.⁶

1 Authors’ calculation from Rystad Energy UCube Database, 2021.

2 Fergus Green and Richard Denniss, “Cutting with both arms of the scissors: the economic and political case for restrictive supply-side climate policies” (*Climatic Change*, 2018), link.springer.com/article/10.1007/s10584-018-2162-x. Peter Erickson, Michael Lazarus and Georgia Piggot, “Limiting fossil fuel production as the next big step in climate policy” (*Nature Climate Change*, 2018), www.nature.com/articles/s41558-018-0337-0?WT.feed_name=subjects_environmental-social-sciences.

3 SEI, IISD, ODI, E3G and UNEP, *The Production Gap Report 2021* (2021), productiongap.org/wp-content/uploads/2021/10/PGR2021_web_rev.pdf.

4 See, e.g., World Benchmarking Alliance, *Oil and Gas Benchmark*, July 2021, www.worldbenchmarkingalliance.org/publication/oil-and-gas.

5 International Energy Agency, *Net Zero by 2050* (2021), www.iea.org/reports/net-zero-by-2050.

6 David Manley and Patrick R. P. Heller, *Risky Bet: National Oil Companies in the Energy Transition* (Natural Resource Governance Institute, 2021), resourcegovernance.org/analysis-tools/publications/risky-bet-national-oil-companies-energy-transition.



For the governments and citizens, many in poverty-stricken countries, that depend on NOC revenues, unchecked spending and a failure to transition threatens economic crisis. Bad investment decisions by NOC executives can put public funds at risk, divert spending that could otherwise bolster diversification and lock their countries into costly, carbon-heavy domestic energy systems. Engaging with NOCs is a way to reduce the risks these companies might undertake while helping them prepare for a low-carbon future.

In this briefing note we share some ideas from a series of 2021 discussions between experts from NOCs, producer governments, research institutions and advocacy organizations about the future of NOCs in relation to climate change.⁷ We aim to help climate and development advocates build strategies to influence these companies and their governments to accelerate transition and promote development for citizens. We use the term “advocate” to refer to a range of actors working to combat climate change and/or pursue poverty reduction in producer countries, including civil society activists, reformers within governments and NOCs and officials in international institutions.

⁷ Recordings of the series are available at Natural Resource Governance Institute, “National Oil Companies and Climate Change,” resourcegovernance.org/analysis-tools/collection/national-oil-companies-and-climate-change.

1. NOCs ARE NATIONAL. ENGAGING WITH THEM MEANS ENGAGING WITH THE AMBITIONS OF THEIR COUNTRIES' GOVERNMENTS AND CITIZENS.

Some commentators see NOCs as irredeemable bogeymen, impervious to climate concerns and lying in wait to snatch up projects that are too “dirty” for other companies. Rooted in a stereotype of NOCs as inefficient, corrupt and backward, this dismissal serves IOC efforts to portray themselves as preferable and modern vehicles for delivering energy. At the same time, defeatism within the climate community about NOC potential for reform risks giving an excuse to IOCs not to act on climate. A more nuanced understanding of NOCs and their contexts can illuminate pathways to change.

All NOCs play important political and economic roles in their home countries. Some, like Saudi Aramco and Malaysia’s Petronas, are linchpins of their economies, managing massive revenue streams that fund the public sector. Some (e.g., Petróleos de Venezuela S.A., Ukraine’s Naftogaz, Angola’s Sonangol) are public service providers that go well beyond oil production to provide fuel subsidies and public infrastructure. NOCs including Russia’s Gazprom, the China National Petroleum Corporation (CNPC) and Petróleos Mexicanos (Pemex) are centerpieces of their countries’ geopolitical and energy security strategies. In other settings, companies such as Staatsolie of Suriname and the Myanmar Oil and Gas Enterprise are quasi-regulators overseeing other companies. Many NOCs play several of these roles simultaneously.

Given the central role NOCs play in national development, their decisions are fundamentally intertwined with bigger-picture plans and political ambitions. Many NOCs in former European colonies were established soon after independence as oil-producing countries gained sovereignty over their resources, ending the era of control by private oil companies from the West.⁸ Some state companies have delivered major development dividends to citizens, managing the oil sector efficiently, generating fiscal windfalls and jobs. Other NOCs have failed to maximize their countries’ oil wealth, mismanaged finances or been corrupt. But virtually all NOCs—those that have succeeded and those that have failed—are perceived by citizens and politicians as powerful symbols of national identity.

NOCs’ missions are usually directed by governments. This helps explain why many NOCs’ approaches to climate focus on operational decisions that are within their mandate, such as reducing their own (Scope 1) emissions or investing in carbon capture and storage (CCS) or renewables. It raises a strategic question of whether such measures can precipitate deeper change or distract from it. For instance, such investments could be a first step along the road to decarbonization, cultivating internal climate champions in the NOC and beginning corporate learning that will eventually result in the full embrace of the energy transition. Alternatively, they could be an excuse that holds back engagement on more fundamental decisions about the sustainability of the company’s production and investment.

In any case, national influences—their owners, their mandates and (in most cases) the majority of their operations—affect NOCs much more than international ones. Those who seek meaningful climate reform among NOCs, either by pressuring them or by inviting them to the table, must acknowledge NOCs’ public roles and the concerns of their governments and citizens.

National oil companies' decisions are fundamentally intertwined with bigger-picture plans and political ambitions.

Those who seek meaningful climate reform among national oil companies must acknowledge the companies' public roles and the concerns of their governments and citizens.

8 Greg Muttitt, “What Role for OPEC in the Last Generation of Oil?”, (Oil Change International, 2020) priceofoil.org/2020/02/10/what-role-for-opec-in-the-last-generation-of-oil/; blog based on chapter of the same title in Dag Harald Claes and Giuliano Garavini, eds., *Handbook of OPEC and the Global Energy Order Past, Present and Future Challenges* (Routledge, 2020).

2. INTERESTS CLOUD PERCEPTION OF RISKS. NATIONAL OIL COMPANIES AND THEIR GOVERNMENTS DON'T FULLY APPRECIATE THE ECONOMIC RISKS ASSOCIATED WITH THEIR INVESTMENTS.

Moral arguments for climate mitigation are unlikely on their own to persuade NOC executives to reduce production, especially while major IOCs continue to expand. Climate and development advocates should therefore appeal to NOCs' (and their governments') interests and concerns, including the economic risk they face from the global energy transition.

NOCs and their governments will lose trillions of dollars in revenues, as well as jobs and exports, if global oil and gas markets permanently decline.⁹ NOCs exacerbate this risk if they continue spending public money on high-cost oil and gas projects. Yet to date, despite the risks, most NOCs have maintained their course. One important reason is doubt over whether the global energy transition will happen within the time horizons with which NOC executives are concerned. While doubt is rationally defensible based on present and historical climate politics, it is also shaped by confirmation bias: it suits the interests of NOC executives and government leaders to believe the transition is not happening. To paraphrase novelist Upton Sinclair, it is difficult to get someone to perceive something whose livelihood depends on not perceiving it.¹⁰

Continuing the dominant role of oil in the economy gives an NOC influence within its country and beyond, whereas a decline in oil profits and revenues—or in the economy's dependence on them—would reduce this influence. For governments too, the lure of oil is powerful. The extractive economy is conceptually simple, leading oil wealth to feel like “free money”: for relatively little bureaucratic effort or political cost, governments get a lot of revenue. Furthermore, oil money fuels patronage toward politically influential or threatening actors; it can fund public services or largesse toward citizens (who are often also voters); departing from these arrangements can create political dangers for the government. And in democracies, politicians may fear being blamed for choosing a path away from oil that fails, but expect to be forgiven for continuing on an unsustainable course; after all, changes in oil price can be seen as global factors beyond their control.

Like many IOCs,¹¹ NOCs often favor a hedging strategy, where they dip gently into non-oil businesses but resist substantial changes to their investment profile until all other companies have done so, when the direction of energy markets is absolutely clear. Executives sometimes justify this on grounds that a company can be the “last one standing” after all others have ceased or reduced extraction.¹² This notion plays into corporate mythologies that they can be the smartest or best-performing. In any case, the measures that will determine who remains standing—low production costs, strategic flexibility, effective project management—are valuable regardless of the transition. Some NOCs, especially low-cost producers in the Persian Gulf, are indeed well-placed to be among the last standing.

While doubt about the global energy transition is rationally defensible based on present and historical climate politics, it is also shaped by confirmation bias: it suits the interests of national oil company executives and government leaders to believe the transition is not happening.

9 Mike Coffin, Axel Dalman and Andrew Grant, *Beyond Petrostates* (Carbon Tracker Initiative, 2021), carbontracker.org/reports/petrostates-energy-transition-report

10 Upton Sinclair, *I, Candidate for Governor: And How I Got Licked* (1935 / repr. University of California Press, 1994), 109.

11 Jessica Green, Jennifer Hadden, Thomas Hale and Paasha Mahdavi, “Transition, hedge, or resist? Understanding political and economic behavior toward decarbonization in the oil and gas industry”

12 Ole Ketil Helgesen, “Norway aims to challenge Opec for oil market share in IEA's pathway to net zero”, *Upstream* 19 May 2021, www.upstreamonline.com/energy-transition/norway-aims-to-challenge-opec-for-oil-market-share-in-ieas-pathway-to-net-zero/2-1-1012612

But not all companies can be the last; few will be.¹³ The notion may serve rather as a convenient rationale to not act on climate. Given the complexity of the global energy economy, it is difficult to see clear signals in time to change course. By the time other companies have moved, it will be too late for most to adjust course to avoid economic risks: their asset values will be rock-bottom, and they will have already lost the time needed to plan a transition already lost.¹⁴ NOC decision makers must learn to interpret the earlier indicators, which while unclear are timely enough to permit action.

Given the complexity of the global energy economy, it is difficult to see clear signals in time to change course.

The challenge for climate and development advocates is to overcome such biases in decision making. However powerful the argument about economic risks of continued oil investment, an NOC manager, civil servant or politician may not engage with it unless they can see ongoing viable roles for themselves in the alternative future. Part of the answer then may be to change NOC leaders' perceptions and incentives, by increasing the attractiveness of success in new non-oil ventures in the NOC or wider economy, and empowering leaders to deliver them successfully.

3. ECONOMIC DEVELOPMENT MATTERS. NATIONAL OIL COMPANIES WON'T CHANGE WITHOUT PUBLIC PRESSURE AND INTERNATIONAL SUPPORT TO DIVERSIFY THEIR ECONOMIES.

The consequences of IOCs' investments are (at least nominally) borne by private investors. In contrast, the consequences of NOCs' choices are borne by citizens, including many living in poverty. A downscaling of an NOC—without plans for how to fill the void—could prove deeply inequitable. Most obviously, the transition away from oil production will affect NOC employees and suppliers—but also those who depend on public services or public sector salaries funded by oil revenue, and consumers who may experience increased energy prices if reduced domestic production is replaced by imports (rather than by domestic clean energy). A just transition is vital both to keep people out of poverty, and to build political support for a transition. This entails creating jobs in new sectors, transparent and participatory decision-making, retraining oil workers, and social protection for those affected during the transition.¹⁵

Officials in oil-producing countries and international development institutions have talked about diversifying economies for decades, but few countries have achieved meaningful diversification.¹⁶ Only when oil prices have fallen has there been any serious push; but as soon as prices rise, such goals are often forgotten. In places that have diversified more successfully, such as Indonesia and Dubai, diversification has more often been driven by long-term depletion of reserves—meaning governments had little choice. The dominant influence of oil interests on political decisions is a major obstacle to diversification in many countries. So too are economic distortions caused by the sector: for example, oil inflates currencies and input prices, making alternative industries less competitive internationally.

The dominant influence of oil interests on political decisions is a major obstacle to diversification. So too are economic distortions caused by the sector.

- 13 Ben Caldecott, Ingrid Holmes, Lucas Kruitwagen, Dileimy Orozco and Shane Tomlinson, *Crude Awakening: Making oil major business models climate-compatible* (E3G and University of Oxford Sustainable Finance Programme, 2018), www.e3g.org/publications/crude-awakening-making-oil-major-business-models-climate-compatible
- 14 Sam Butler-Sloss, Kingsmill Bond and Harry Benham, *Spiralling Disruption: The feedback loops of the energy transition* (Carbon Tracker, 2021), carbontracker.org/reports/spiralling-disruption; Kingsmill Bond, Ed Vaughan and Harry Benham, *Decline and Fall: The Size & Vulnerability of the Fossil Fuel System* (Carbon Tracker, 2020), carbontracker.org/reports/decline-and-fall.
- 15 Greg Muttitt and Sivan Kartha, "Equity, Climate Justice, and Fossil Fuel Extraction: Principles for a Managed Phase Out," *Climate Policy 2020*, accepted manuscript available at priceofoil.org/2020/06/01/equity-climate-justice-and-fossil-fuel-extraction-principles-for-a-managed-phase-out.
- 16 Michael Ross, "What Do We Know About Export Diversification in Oil-Producing Countries?" *The Extractive Industries and Society* 6(3) (August 2019); Nouf Alsharif, Sambit Bhattacharyya and Maurizio Intartaglio, *Economic Diversification in Resource Rich Countries: Uncovering the State of Knowledge*, Centre for the Study of African Economies, 2016, sro.sussex.ac.uk/id/eprint/64986/1/csae-wps-2016-28.pdf.

There are also international barriers to oil-exporting countries diversifying. For example, global tax rules have long been written by and for wealthy countries, while global trade and investment rules hinder poorer countries from protecting their own industries before they are ready to face international competition. International initiatives seemingly unrelated to the energy transition and climate crisis but that help or hinder countries' ability to fund development—those related to development aid, trade and international tax reform, international finance, and collaboration with other countries—will affect the capacity of NOCs and producer countries to change course. Regulators and international finance and governance institutions must improve international transparency standards around the viability, climate impacts and financial risk of oil and gas projects to promote data-driven and accountable investment decisions by NOCs and their governments. And Global North governments' continued failure to provide the \$100 billion per year of climate finance—which they promised in 2009 to deliver by 2020, and which may now be insufficient in any case—is a significant barrier to NOC reform in developing countries.¹⁷

The global energy transition creates new urgency for diversification: countries must not only improve their economies' performance over the long term, but also counter an existential threat. Furthermore, this “diversification 2.0” must be different from previous proposals in at least two respects. First, in light of climate change, it will no longer be sufficient to develop sectors additional to and alongside oil; the emphasis must move to developing sectors that can replace oil. Second, the common approach, seen in several Gulf states, of building new industries piggybacking off of oil, especially in energy-intensive sectors such as aluminum and petrochemical production, will prove more risky in a carbon-constrained world.

Over recent decades, a large literature and a technocratic consultancy industry have developed to advise countries on diversifying. But the drive for economic alternatives has not become a top-line political priority in most countries. With energy transition looming, civil society must create a bottom-up societal push to pressure governments to prioritize economic transition. Civil society can also help enable progress, including by convening public processes to develop a shared future vision, increasing transparency around the risks and opportunities associated with transition, and sharing experiences across countries.

4. NATIONAL OIL COMPANIES DIFFER. CLIMATE AND DEVELOPMENT ADVOCATES SHOULD TAILOR THEIR STRATEGIES TO DISTINCT TYPES OF NATIONAL OIL COMPANIES, WHICH PRESENT VARYING OPPORTUNITIES AND CHALLENGES FOR REFORM.

Saudi Aramco and the Ghana National Petroleum Corporation are more different than they are alike. The variety among the objectives, capabilities and governance models of NOCs precludes simplistic generalizations and one-size-fits-all strategies. Below are five characteristics that differentiate NOCs from one another and influence their incentives around energy transition.

Climate impact

A first dimension is how important changes by the NOC would be for the climate, including most importantly the size of the NOC's production and investments. Just seven NOCs produce 52 percent of the world's oil and gas.¹⁸ Reforms by these NOCs

The global energy transition creates a new urgency for diversification: countries must not only improve their economies' performance over the long term, but also counter an existential threat.

NOCs differ in the size of their production and investments, and hence in their importance to climate change.

17 David Eckstein, Bertha Argueta and David Ryfisch, “Post-2020 Climate Finance – a Much Needed Response to Multiple Crises,” Germanwatch, 21 April 2021, [germanwatch.org/en/20112](https://www.germanwatch.org/en/20112).

18 Authors' calculation from Rystad Energy UCube Database.

have greater impact than those undertaken by minor players. Project decisions to bring major new production online also have significant climate repercussions, regardless of the overall size of the company. Analyzing an NOC along this dimension can help focus scarce advocacy resources and avoid focusing disproportionate attention on companies whose decisions will have relatively little impact on climate goals.

Production cost

All NOCs face the prospect of dramatically lower profits as the energy transition lowers the long-term value of their products. But some NOCs face a particularly acute risk of projects across their portfolios failing to break even, with the cost of production as the driving factor. NOCs such as Saudi Aramco, Qatar Petroleum and the Kuwait Petroleum Corporation have low-cost reserves that they can develop profitably even at low prices. While they will still feel pressure to be more efficient amid the global energy transition, these NOCs are unlikely to feel an existential threat, and it will be difficult to convince them—or their governments—that major disinvestment is in their economic interest. By contrast, some NOCs with higher production costs, including India’s ONGC, Colombia’s Ecopetrol and Azerbaijan’s SOCAR, all face a daunting prospect: half or more of their upcoming capital expenditure will to break even if oil prices suffer a sustained decline.¹⁹ And if such an NOC ends up on the brink of financial collapse, its government may divert more public money to bail it out. These situations make for a strong economic and management case for more sustainable spending, to protect the long-term national interest.

Some national oil companies face a particularly acute risk of projects across their portfolios failing to break even, with the cost of production as the driving factor.

Economic dependence of home country

The more dependent an economy is on oil, the more significantly it will be affected as fossil fuels decline, and the larger may be the reverberations of failed bets by NOCs. Dependence exacerbates the development challenges associated with the decline in fossil fuels; reduced oil revenues mean reduced funds for public services, public sector salaries and investments.²⁰ Yet dependence makes change politically harder. For some big producers, such as China and Brazil, oil is not the only game in town, and the NOC could more readily take change course without sparking severe economic upheaval at a national level. In countries with less diversified economies, people struggle to see alternatives, so their loyalty to the oil industry is strong, and advocacy strategies must take a longer-term approach.

Income/development level of home country

A country’s level of wealth and development impacts its ability to develop economic alternatives that depend less on NOC oil and gas revenues. A transition away from a fossil-fuel-led economy is particularly difficult for low-income countries with limited human and financial capacity to chart a new course and undertake a just transition. Pushing hard for NOCs based in these countries to divest creates concerns about fairness, especially given that the climate crisis has been overwhelmingly caused by behavior in wealthy countries. In these countries, provision of climate finance is crucial to enable the transition, on grounds of both international equity and political viability. Advocates of NOC reform should also demand an increase in climate finance from Global North governments.

A transition away from a fossil-fuel-led economy is particularly difficult for low-income countries with limited capacity to chart a new course.

19 David Manley and Patrick R.P. Heller, *Risky Bet: National Oil Companies in the Energy Transition*, February 2021.

20 Greg Muttitt and Sivan Kartha, “Equity, Climate Justice, and Fossil Fuel Extraction: Principles for a managed phase out” (Climate Policy, 2020); accepted manuscript available at priceofoil.org/2020/06/01/equity-climate-justice-and-fossil-fuel-extraction-principles-for-a-managed-phase-out

Openness

Some NOCs are more susceptible to influence outside their leadership and government than others. NOCs in oil-rich autocracies with a steady flow of public revenues and management structures intertwined with national ruling elites are mostly insulated from external influence.

For NOCs that are not comfortably self-financed, one avenue for influence is international finance. The ten NOCs listed on international stock exchanges—including Ecopetrol, Norway-based Equinor, Gazprom, Brazil’s Petrobras and Petrochina—produce about 35 percent of global oil and gas production. Many more NOCs borrow from international lenders, and some NOCs, such as Petrobras and Petronas, also compete for oil and gas licenses abroad. With these NOCs, advocates may adapt strategies and tactics historically employed for IOC advocacy, including shareholder action, direct advocacy with institutional investors and litigation in the countries where the companies are listed.

Accountability to home-country citizens also matters. Companies with independent management, strong governance and a practice of responding to citizen concerns, such as Argentina’s YPF and the Ghana National Petroleum Corporation, will be more open to reform in the public interest. The strength of domestic civil society, democratic institutions and economic governance have a major impact on opportunities to promote reforms.

NOCs lie at various places along the spectrum on all five of these characteristics. Analyzing a particular NOC across these categories can enable advocates to prioritize and strategize. The table below provides examples that illustrate the implications of these factors for a sample of NOCs. The figure below and the annex provide snapshots of 37 NOCs, using simplified proxies to measure NOCs along these dimensions.

Some national oil companies are more susceptible to influence from outside their leadership and government than others.

Table. National oil company dimensions and their implications for advocacy (illustrative examples)^{21, 22}

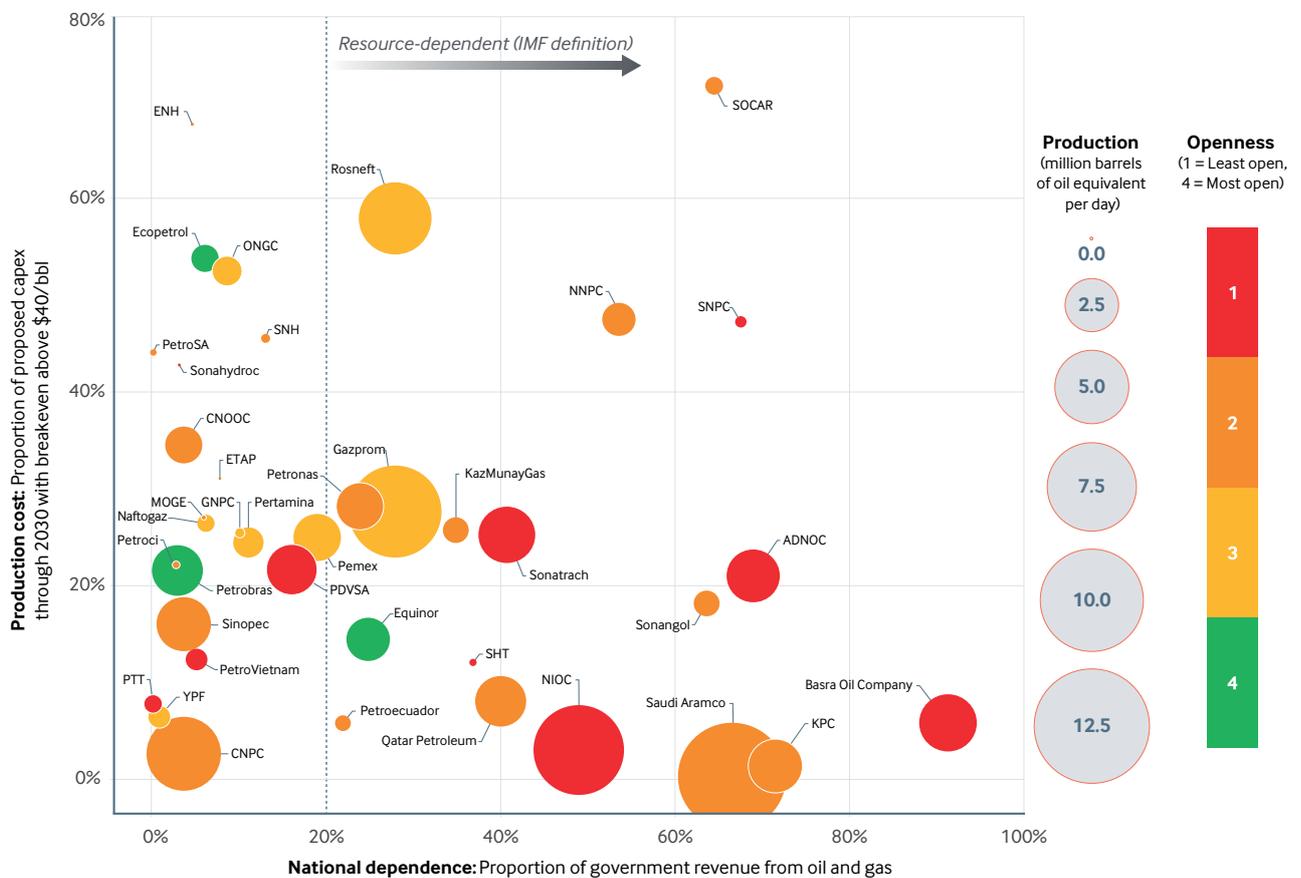
Company (home country)	 Climate impact	 Production cost	 National dependence	 National income level	 Openness	Implications for advocates
CNPC/ Petrochina (China) ²²	 >6 million barrels of oil equivalent (boe)/day	 Low average breakeven cost (3% of capex would not break even with oil prices at \$40 per barrel)	 Sector generates less than 5% of government revenue	 Upper-middle income	 Company openness: Petrochina is listed on NYSE, publishes audited financials Country openness: "Weak" score on Resource Governance Index (RGI); 6th percentile on Voice and Accountability (V/A) Indicator	International market presence and renewables ambitions create openings for engagement as a climate mover with major global influence. Advocates should focus on company's global responsibility, opportunity to evolve and exert leadership and economic opportunities associated with transition. Country's low dependence may facilitate reform arguments based on long-term strategy and climate goals.
Ecopetrol (Colombia)	 >800,000 boe/day	 Heavy share of high-cost projects (54% of capex would not break even at \$40)	 Sector generates 6% of government revenue (though oil is a heavy share of exports)	 Upper-middle income	 Company: Listed on NYSE, extensive public reporting Country: "Good" score on RGI; 55th percentile on V/A Indicator	Multiple openings for influence. High-cost investments carry high risks to the NOC, and a significant climate impact. Advocacy should focus both on climate and economic stability narratives, with specific and ambitious objectives.
GNPC (Ghana)	 Production small in global terms (<100,000 boe/day)	 High current and prospective spending on high-cost projects (25% of capex would not break even at \$40)	 Sector generates 10% of government revenue	 Lower-middle income	 Company: Not publicly listed, but extensive public reporting on company activities and finances Country: "Good" score on RGI; 66th percentile on V/A Indicator	Openings exist to support improvements in sustainable decisions. Advocacy efforts should focus on long-term national interest rather than climate impact, should include data-driven analysis of economic challenges and support development of economic alternatives.

21 See Annex for methodology used to determine the proxy score for each dimension.

22 For more detailed analysis of the climate pressures facing Chinese NOCs, see Erica Downs, *Green Giants? China's National Oil Companies Prepare for the Energy Transition* (Center for Global Energy Policy, 2021), energypolicy.columbia.edu/sites/default/files/file-uploads/ChinaNOCs_CGEP_Report_092221-2.pdf; Ben Cahill and Ryan McNamara, "Chinese National Oil Companies Face the Energy Transition" (Center for Strategic and International Studies, August 26, 2021), csis.org/analysis/chinese-national-oil-companies-face-energy-transition.

Company (home country)	Climate impact	Production cost	National dependence	National income level	Openness	Implications for advocates
NNPC (Nigeria)	<p>■■■■</p> <p>>1 million boe/day</p>	<p>■■■■■</p> <p>Heavy share of high-cost projects (47% of capex would not break even at \$40)</p>	<p>■■■■■</p> <p>Sector generates more than 50% of government revenue</p>	<p>■■</p> <p>Lower-middle income</p>	<p>■■</p> <p>Company: Not publicly listed, but has begun publishing financial statements</p> <p>Country: "Weak" score on RGI; 32nd percentile on V/A Indicator</p>	Combination of costly oil, high dependence and income status suggests need to support national dialogue to reduce risks and diversify to promote long-term sustainable development.
Saudi Aramco (Saudi Arabia)	<p>■■■■■</p> <p>>13 million boe/day</p>	<p>■</p> <p>Low-cost reserves that can be profitable even at low costs (<1% of capex would not break even at \$40)</p>	<p>■■■■■</p> <p>Sector generates more than 60% of government revenue</p>	<p>■■■■■</p> <p>High income</p>	<p>■■</p> <p>Company: Only listed domestically; publishes audited financials</p> <p>Country: "Poor" score on RGI; 6th percentile on V/A Indicator</p>	Few avenues of influence, and high dependence impedes change. Any company action would have large climate impact. Advocacy may sow seeds for change related to the need to reduce long-term national dependence on the sector or improve the reliability of clean energy for citizens.

Figure. National oil companies along four dimensions



5. RENEWABLE ENERGY CAN BE AN OPPORTUNITY OR AN OBSTACLE. NATIONAL OIL COMPANY INVESTMENT IN RENEWABLES CAN BOOST THE ENERGY TRANSITION AND GIVE NOCS A STAKE IN IT, BUT CAN BE COUNTER-PRODUCTIVE IN SOME CASES.

Like their IOC counterparts, some NOCs are investing in renewable energy. The investments have been small, but in some countries they could generate new profit for NOCs and clean energy for citizens. This model will not work in other contexts.

Investing in renewables can give an NOC a place in a country's prospective low-carbon future, which could reduce the NOC's incentives to stand in the way of change. Companies might invest in renewable energy to future-proof their businesses, transfer skills, or meet government climate and energy plans. The China National Offshore Oil Corporation (CNOOC) renewed its activities in offshore wind in 2019 in an effort to leverage skills from offshore oil and gas to wind, reducing the risk that the energy transition will destroy jobs.²³ In the case of Colombia's Ecopetrol, the need to replace dwindling oil reserves with another source of income and political pressure to raise rapid revenue during the coronavirus pandemic pushed the NOC to acquire a majority stake in a government-controlled electricity transmission company.²⁴ Denmark's Ørsted has divested from oil and gas altogether, transferring its focus to the offshore wind market, and to advance national climate goals by generating 90 percent of Denmark's electricity from renewables. Those NOCs without the pressure for every project to turn an immediate profit can invest in clean technologies to bring down costs and make them viable, such as Chinese NOC Sinopec's investment in green hydrogen.²⁵ Saudi Aramco has touted its investments in solar energy as key to a national push to decarbonize the country's energy consumption.

However, in and of itself, renewable energy does not reduce climate change: it does so only insofar as it substitutes for fossil fuels. While some NOCs explore renewables investments, they continue to spend most of their money on fossil exploration and development. Even as Ecopetrol acquires the majority of Colombia's electricity transmission company ISA, for example, and pledges to become "net zero," the company is simultaneously increasing investments in fracking projects.²⁶ The Chinese government has ordered NOCs CNPC, Sinopec and CNOOC to simultaneously expand renewables activities and increase oil and gas production.²⁷ Some renewables investments may even prolong extraction rather than support a shift to alternatives. Petroleum Development Oman, for example, invested in one of the world's largest solar thermal projects to create steam for enhanced oil recovery.

Furthermore, NOCs may not be the best-placed organizations to develop a country's renewable potential. The business models of the petroleum and renewables industries are different; oil generates massive rents while renewables depend on complex regulatory mechanisms spanning generation, transmission and distribution. Many skills are not easily transferable across the sectors. A company's interest in maintaining a market for its oil and gas may also conflict with a genuine push to transform the way citizens consume energy. Without strong coordination across public agencies, efforts by NOCs to move into the renewables space could serve to disrupt the efforts of other public or private entities that may be better placed to spur energy transition. And if an NOC is poorly governed, it could make it harder for the country to attract outside finance for renewable projects.

Investing in renewables can give an NOC a place in a country's prospective low-carbon future, which could reduce the NOC's incentives to stand in the way of change.

The business models of the petroleum and renewables industries are different; oil generates massive rents while renewables depend on complex regulatory mechanisms spanning generation, transmission and distribution.

23 IRENA, *International oil companies and the energy transition* (2021)

24 Mauricio Cardenas and Luisa Palacios, *National Oil Companies and the Energy Transition: Ecopetrol's Acquisition of an Electric Transmission Company* (Columbia SIPA: 2021)

25 Muyu Xu and Shivani Singh, "Sinopec to launch first green hydrogen project in 2022," Reuters, 25 May 2021

26 BnAmericas, "Ecopetrol details fracking pilot monitoring plans", 9 February, 2021

27 David Gates et al. *NOCs, climate initiatives, and the energy transition* (IHS Markit: 2020)

Whether an NOC will bolster renewables potential is highly context-specific. Asking a few questions can help assess where this step would be beneficial.

- What value would the NOC add to national renewable energy delivery (e.g., financing, capacity, technology), and what weaknesses would it bring?
- How significant is the domestic potential for renewable energy, and how important is NOC support in enabling it?
- Does NOC involvement risk obstructing progress by other entities?

Answering these questions helps to avoid simplistic assumptions about an NOC's renewables potential and to assess whether NOC involvement adds value.

CONCLUSION

So how can climate and development advocates—whether in civil society, government or NOCs themselves—implement these ideas and engage with NOCs in reform efforts?

NOC decisions are shaped primarily by drivers within their countries, from their home governments and other domestic actors. As the name suggests, national oil companies are less susceptible to international influences than IOCs; this limits choice of advocacy tactics and complicates coordination. Advocates must therefore appeal to national political interests. Furthermore, the countries with the most significant NOCs tend to be countries with weaker civil society and difficult politics.

However concerted efforts can progressively widen narrow cracks of opportunity. Advocates can tailor strategies to the NOC's circumstances and the consequent opportunities. And just as there is significant diversity among NOCs, no NOC is itself a homogenous monolith. Different managers or business divisions within an NOC have various ambitions for advancing within the company, increasing their power base or delivering positive financial results. They may champion a renewable energy project, a new division or a change in strategy, which if successful can alter the internal politics of the NOC. The same is true of factions within governments, or of competing ministries or public institutions.

Furthermore, different aspects of strategy can be mutually reinforcing. We can draw lessons from experiences influencing IOCs, where investor concerns have encouraged political and regulatory change, which in turn has boosted public concern, and made space for litigation—which further amplifies the investor concerns.

Alongside efforts at the national level, two areas stand out where concerted international action could accelerate change. First, better sharing of best practice in economic diversification can help address producer country government and NOC apprehensions and unlock ways forward in this challenging area. Second, reforms to international finance, trade and governance standards that are necessary can give producer countries a fair shot at diversifying.

Across these efforts, it is important to think ahead about the end game. Does the NOC have a useful role in a low-carbon world (in renewable energy, public revenue management, or something else)? If it does, then a key dimension of the strategy will be to build the constituency for change within the NOC itself—perhaps a business division or a champion in senior management. If no ultimate role is seen for the NOC, the advocacy strategy must address how to handle the NOC's opposition to its decline.

Meaningful climate change mitigation will not succeed unless it includes national oil companies—the hidden half of global oil and gas production. The same urgency that characterizes the broader climate movement must apply to state-sponsored oil and gas production, and to helping producer countries develop the alternatives necessary for a just transition.

AUTHOR NOTES

This briefing is the output of a series of discussions organized by the Natural Resource Governance Institute and the International Institute for Sustainable Development on “National Oil Companies and Climate Change,” which included public webinars and accompanying in-depth meetings among an expert discussion group. The authors of the briefing are Alexandra Gillies (Natural Resource Governance Institute), Patrick R.P. Heller (corresponding author, Natural Resource Governance Institute), Paasha Mahdavi (University of California, Santa Barbara), David Manley (Natural Resource Governance Institute), Valérie Marcel (Payne Institute for Public Policy), Lourdes Melgar (Baker Institute for Public Policy), Francisco Monaldi (Baker Institute for Public Policy), Greg Muttitt (corresponding author, International Institute for Sustainable Development), Angela Picciariello (ODI) and Joachim Roth (International Institute for Sustainable Development).

The authors are grateful to Aisha Al-Sarihi, Lee Bailey, Nafi Chinery, Giuliano Garavini, Laury Haytayan, Hannah McKinnon, Stuart McWilliam, Aaron Sayne, Amir Shafaie and Peter Wooders for their feedback on initial drafts of the briefing.

ABOUT IISD

The International Institute for Sustainable Development (IISD) is an award-winning independent think tank working to accelerate solutions for a stable climate, sustainable resource management, and fair economies. Our work inspires better decisions and sparks meaningful action to help people and the planet thrive. We shine a light on what can be achieved when governments, businesses, non-profits, and communities come together. IISD’s staff of more than 120 people, plus over 150 associates and consultants, come from across the globe and from many disciplines. With offices in Winnipeg, Geneva, Ottawa, and Toronto, our work affects lives in nearly 100 countries.

ABOUT NRG

The Natural Resource Governance Institute, an independent, non-profit organization, helps people to realize the benefits of their countries’ oil, gas and mineral wealth through applied research, and innovative approaches to capacity development, technical advice and advocacy. Learn more at www.resourcegovernance.org

ANNEX: TABLE OF NATIONAL OIL COMPANIES ALONG FIVE DIMENSIONS

As is discussed in section 4 of this briefing, categorizing an NOC along five key characteristics can inform reform priorities and advocacy strategies. Developing a detailed engagement plan with a particular NOC requires an in-depth examination of each of these factors. The table below provides a snapshot of prominent NOCs as a comparative starting point, using proxies for the five dimensions, with one square representing the lowest value for a particular characteristic and four squares representing the highest:

Country	Company	 Climate impact	 Production cost	 National dependence	 National income level	 Openness
Algeria	Sonatrach	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■	■ ■	■
Angola	Sonangol	■ ■ ■	■ ■	■ ■ ■ ■	■ ■	■ ■
Argentina	YPF	■ ■	■	■	■ ■ ■	■ ■ ■ ■
Azerbaijan	SOCAR	■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■	■ ■
Brazil	Petrobras	■ ■ ■ ■	■ ■ ■	■	■ ■ ■	■ ■ ■ ■
Cameroon	SNH	■	■ ■ ■ ■	■ ■	■ ■	■ ■
Chad	SHT	■	■ ■	■ ■ ■ ■	■	■
China	CNOOC	■ ■ ■	■ ■ ■ ■	■	■ ■ ■	■ ■
China	CNPC	■ ■ ■ ■	■	■	■ ■ ■	■ ■
China	Sinopec	■ ■ ■ ■	■ ■	■	■ ■ ■	■ ■
Colombia	Ecopetrol	■ ■ ■	■ ■ ■ ■	■	■ ■ ■	■ ■ ■ ■
Congo (Rep.)	SNPC	■	■ ■ ■ ■	■ ■ ■ ■	■ ■	■
Côte d'Ivoire	Petroci	■	■ ■ ■	■	■ ■	■ ■
Dem. Rep. of Congo	Sonahydroc	■	■ ■ ■ ■	■	■	■
Ecuador	Petroecuador	■	■	■ ■ ■ ■	■ ■ ■	■ ■
Ghana	GNPC	■	■ ■ ■	■ ■	■ ■	■ ■ ■
India	ONGC	■ ■ ■	■ ■ ■ ■	■	■ ■	■ ■ ■
Indonesia	Pertamina	■ ■ ■	■ ■ ■	■ ■	■ ■	■ ■ ■
Iran	NIOC	■ ■ ■ ■	■	■ ■ ■ ■	■ ■	■
Iraq	Basra Oil Company	■ ■ ■ ■	■	■ ■ ■ ■	■ ■ ■	■
Kazakhstan	KazMunayGas	■ ■ ■	■ ■ ■	■ ■ ■ ■	■ ■ ■	■ ■
Kuwait	KPC	■ ■ ■ ■	■	■ ■ ■ ■	■ ■ ■ ■	■ ■
Malaysia	Petronas	■ ■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■
Mexico	Pemex	■ ■ ■ ■	■ ■ ■	■ ■	■ ■ ■	■ ■ ■
Mozambique	ENH	■	■ ■ ■ ■	■	■	■ ■
Myanmar	MOGE	■	■ ■ ■	■	■ ■	■
Nigeria	NNPC	■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■ ■	■ ■
Norway	Equinor	■ ■ ■	■ ■	■ ■ ■	■ ■ ■ ■	■ ■ ■ ■
Qatar	Qatar Petroleum	■ ■ ■ ■	■	■ ■ ■ ■	■ ■ ■ ■	■ ■
Russia	Gazprom	■ ■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Russia	Rosneft	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■	■ ■ ■	■ ■ ■
Saudi Arabia	Saudi Aramco	■ ■ ■ ■	■	■ ■ ■ ■	■ ■ ■ ■	■ ■
Tunisia	ETAP	■	■ ■ ■ ■	■	■ ■	■ ■
Ukraine	Naftogaz	■ ■	■ ■ ■	■	■ ■	■ ■ ■
UAE	ADNOC	■ ■ ■ ■	■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■
Venezuela	PDVSA	■ ■ ■ ■	■ ■ ■	■ ■	■ ■ ■	■
Vietnam	PetroVietnam	■ ■	■ ■	■	■ ■	■

Proxies based on the following measures:

Climate impact. Daily oil and gas production, in barrels of oil equivalent per day, from national oil company public reports as recorded in the National Oil Company Database²⁸ (where available) and the Rystad Energy UCube database (where the NOC does not publish production data).

- Number set as follows: 1 = less than 100,000 boe/day; 2 = 100,000 – 500,000 boe/day; 3 = 500,000 – 2 million boe/day; 4 = greater than 2 million boe/day

Production cost. Share of upcoming capital expenditures that require oil prices of \$40 per barrel or higher to break even, per data from Rystad Energy UCube database.²⁹

- Number set as follows: 1 = less than 10% of capex with breakeven price above \$40; 2 = 10 – 20% of capex with breakeven price above \$40; 3 = 20 – 40% of capex with breakeven price above \$40; 4 = greater than 30% of capex with breakeven price above \$40

National dependence. Revenues from oil and gas as a percentage of general government revenue, from IMF Article IV reports (where available) and reports from the Extractive Industry Transparency Initiative (where IMF reports are not available).

- Number set as follows: 1 = less than 10% of general government revenues from oil and gas; 2 = 10 – 20% of general government revenues from oil and gas; 3 = 20 – 40% of general government revenues from oil and gas; 4 = greater than 40% of general government revenues from oil and gas

National income level. Categorization of country income level per the World Bank.³⁰

- Number set as follows: 1 = low-income; 2 = lower-middle income; 3 = upper-middle income; 4 = high-income

Openness. We created a combined metric to approximate the openness of the NOC itself and the wider openness of the country. This measure includes the following factors:

- Does the company or major subsidiary list shares on an international stock exchange?
- Has the company published audited financial statements for any year from 2018 onward?
- Country score on the Resource Governance Index (most recent available year of data, 2021 or 2017)³¹
- Country percentile among all countries on Voice and Accountability Indicator from the Worldwide Governance Indicators³²

28 Natural Resource Governance Institute, *National Oil Company Database* (May 2021), nationaloilcompanydata.org.

29 For a detailed discussion of this measure of company risk, see Manley and Heller, *Risky Bet*, 3 – 15.

30 World Bank, "World Bank Country and Lending Groups," datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

31 Natural Resource Governance Institute, *2017 Resource Governance Index*, resourcegovernanceindex.org/data/both/issue?region=global&years=2017%2C2021.

32 World Bank, *Worldwide Governance Indicators* (2021), info.worldbank.org/governance/wgi.