

National Oil Companies and Energy Transition in the Middle East and North Africa

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Key messages

- The global push to transition to cleaner energy sources poses a challenge in many Middle Eastern and North African (MENA) countries, which depend upon high oil prices to balance budgets and fund social services.
- National oil companies (NOCs) must adapt their strategies to help their economies become more resilient in the context of global energy transition.
- Several prominent MENA NOCs control large, undeveloped reserves with low production costs. These companies have several strategic options available. By contrast, MENA NOCs with small proven reserves or whose remaining reserves will be more expensive to develop face more severe challenges. They may struggle to profit from new projects or spread their risk across a more diverse portfolio.
- With rising uncertainty and the prospect of long-term price decline, MENA NOCs and their governments must pay more attention to corporate governance and clear public communication, in order to enhance efficiency and clarify expectations of the political and economic roles that NOCs play.

ABOUT THIS DOCUMENT

This briefing accompanies the NRGi report *Risky Bet: National Oil Companies in the Energy Transition*, available on NRGi's website: www.resourcegovernance.org/riskybet

EXECUTIVE SUMMARY

The world is beginning to transition from an energy system dominated by fossil fuels toward a cleaner mix with a higher prevalence of renewable sources. The ultimate pace of this “energy transition” is uncertain, but a growing number of oil companies are revising downward their long-term assumptions about fossil fuel consumption and prices, and private capital has been progressively moving away from the sector. Such a transition is vital for the fight against climate change and creates opportunities for cleaner and more reliable energy that can benefit people in the Middle East and North Africa (MENA), a region rich in renewable energy potential.

The uncertainty around energy transition poses a challenge to the economic status quo of many MENA countries, however, which have grown to depend upon high oil and gas prices to finance public services and which have built energy systems dominated by fossil fuels.

National oil companies (NOCs) are at the center of the petroleum economies of MENA countries. They are tasked with investing in oil and gas projects, delivering fiscal revenues to governments and providing a wide range of public services. The region’s NOCs include some of the world’s most sophisticated oil companies, but many MENA NOCs have struggled with corporate governance, transparency and efficient management. The prospect of lower long-term oil and gas prices creates a risk to NOCs’ business models. Their revenues could fall dramatically and their ability to perform their assigned roles could decline. In a worst-case scenario, NOCs could spend large sums of public revenues on oil and gas projects that ultimately prove to be economically unviable.

The region's NOCs are exploring various strategies for adapting their business models to these shifts:

- *From extractive companies to energy companies.* Some MENA NOCs have signaled an intention to invest in the wider energy value chain. So far, committed investment in this space has been small and concentrated in technologies such as carbon capture and storage that prop up demand for fossil fuels.
- *From volume to value.* MENA NOCs are under increasing pressure to focus on efficiency and high-value projects, as the margin for error in the sector shrinks.
- *Shift to gas.* Many analysts believe that reductions in global demand will be later and less dramatic for gas than for crude oil. Like other oil companies, MENA NOCs have expressed the intention to recalibrate their portfolios in the direction of gas.
- *Downstream diversification.* NOCs have announced ambitious plans to expand their investments in refining and petrochemicals to create additional outlets for their crude oil and new revenue streams.

These strategies carry various risks, and MENA NOCs vary in their ability to manage them. Global leaders including Saudi Aramco and Qatar Petroleum have a built-in advantage: they retain large reserves that can be developed cheaply. This gives them margins of maneuver for new business lines and positions them to be the “last one standing” even as others shift away from oil and gas. Companies with small proven reserves or whose remaining reserves will be more expensive to develop face more severe challenges, with little assurance that they will be able to develop profitable new projects or spread risk across a more diverse portfolio. Algeria's Sonatrach faces particular challenges: more than 25 percent of the company's budgeted upcoming capital expenditure is for projects that are unlikely to break even if global energy transition progresses rapidly enough to meet the climate goals agreed in the United Nations Framework Convention on Climate Change (the “Paris Agreement”).

MENA NOCs and governments must address these challenges head-on and build strategies that are more resilient to various energy transition scenarios. Four steps are key:

- **Governments and NOCs should emphasize public communication and developing shared national narratives on energy transition** to adjust public expectations around the oil sector, clarify priorities and promote better NOC performance.
- **Governments and NOCs should conduct rigorous risk analysis around capital allocation decisions** to target investment effectively and avoid excessive spending on projects that would fail to generate returns if energy transition is rapid.
- In countries where public spending depends upon large transfers from NOCs to the government, **governments should reexamine the NOCs' roles and long-held assumptions about public expenditures**, including around fossil fuel subsidies and NOC spending.
- **NOCs should redouble their investment in transparency and corporate governance reform**, as shrinking profit margins across the industry mean there is less margin for error and efficiency and integrity will be more important than ever.

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INTRODUCTION: NATIONAL OIL COMPANIES, ENERGY TRANSITION AND LONG-TERM RISK

No region in the world is more dependent on oil and gas than the Middle East and North Africa (MENA). The petroleum sector is a major employer in the region, the primary source of fiscal revenue on which many governments function, the dominant generator of exports and the source of energy that powers economies. As the world looks toward an energy future that is less reliant on fossil fuels, governments in the region must adapt to avoid economic disruption.

No one can predict with certainty the pace at which global energy transition will progress or how changing demand will impact oil and gas prices. But amid debates over the long-term fallout from the coronavirus pandemic, several major international oil companies have revised downward their price assumptions for 2025 and beyond and written down assets by more than USD 80 billion.¹ Climate analysts stress that any serious movement toward keeping global temperature rise under 2 degrees will result in a long-term decline in oil prices.² Investors are also beginning to move their money out of the energy sector. Publicly listed fossil fuel companies generated lower returns in the decade from 2010 to 2019 than the overall equity market, with significantly more volatility.³ Institutional investors with assets totaling more than \$11 trillion have pledged to divest their fossil fuel holdings.⁴

The prospect of long-term decline in the value of hydrocarbons poses a major challenge to many MENA countries, which depend upon high oil prices to balance budgets and maintain social services.⁵ NOCs in most MENA countries lead the extraction of oil and gas deposits, finance the development of these deposits, control production costs, and distribute financial proceeds to the state. They are the primary agents that MENA governments use to produce oil, investing public resources in the pursuit of economic returns.

MENA governments and their NOCs recognize the need for adaptation. Several countries have launched vision statements or reform plans aimed at diversifying NOC portfolios, increasing efficiency and reducing their exposure to market decline. Some seek to establish their NOCs as important players in national efforts to generate and distribute renewable energy as a mechanism to diversify domestic energy systems and free up a larger share of fossil fuels for export.⁶

These efforts face significant obstacles. While some NOCs have significant new reserves that can be developed profitably even in a low-price scenario, others may struggle to replenish reserves economically. Many NOCs have also been slow to build strong systems of corporate governance and accountability, and the pressures that governments place on NOCs to marry commercial and non-commercial mandates can complicate efforts to streamline their businesses.

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- 1 Jillian Ambrose, "Seven top oil firms downgrade assets by \$87 bn in nine months," *The Guardian*, 14 August 2020. These firms include BP (which reduced its long-term price assumption to \$55 per barrel and wrote down \$17.5 billion in assets), Shell (\$22 billion write-down) and Total (\$8 billion write-down).
- 2 Carbon Tracker, *Breaking the Habit: Why None of the Large Oil Companies Are Paris-Aligned, and What They Need to Do to Get There* (2019), carbontracker.org/reports/breaking-the-habit.
- 3 Imperial College Business School and International Energy Agency, *Energy Investing: Exploring Risk and Return in Capital Markets*, May 2020, www.imperialcollegelondon.app.box.com/s/c2nj02f7apdz16tjw48y0kytdsutjq75.
- 4 Billy Nauman, "Sharp rise in number of investors dumping fossil fuel stocks," *Financial Times*, 9 September 2019, www.ft.com/content/4dec2ce0-d0fc-11e9-99a4-b5ded7a7fe3f.
- 5 The International Monetary Fund projected the 2020 "fiscal break-even price" for oil to be above \$60 per barrel in seven of the ten MENA economies it assessed, with several countries needing oil to exceed \$75 to break even. International Monetary Fund, *Regional Economic Outlook: Middle East and Central Asia – Statistical Appendix*, October 2019, www.imf.org/en/Publications/REO/MECA/Issues/2019/10/19/reo-menap-cca-1019.
- 6 Today, MENA's energy systems are dominated by fossil fuels, with the region having the least diversified primary energy mix in the world. See Carole Nakhle, *Clean Energy and Fossil Fuels in the Middle East: A Virtuous Cycle?* Natural Resource Governance Institute, 7 July 2020, www.resourcegovernance.org/blog/clean-energy-fossil-fuels-middle-east-virtuous-cycle.

This briefing derives from in-depth research and interviews on the challenges and reform plans of three MENA NOCs: Saudi Aramco, Qatar Petroleum and Algeria’s Sonatrach.⁷ We draw out implications for other NOCs in the region. Our aim is to inform the strategies of governments and NOCs on how to manage NOC portfolios and the evolution of state-NOC accountability mechanisms. We also hope that non-governmental analysts and civil society organizations will use this briefing as a tool to help understand and scrutinize public reform plans.

I. DIVERSE RISKS AND OPTIONS

Countries in the region vary considerably, which impacts the different risks they face and NOCs’ potential responses. Table 1 reflects one dimension—the variance among NOCs’ organizational maturities, capabilities, global breadth and market power—that shapes their ability to develop new assets, diversify portfolios and enhance efficiency.

NOC maturity level	Examples	Key characteristics
Mature global leaders	Qatar Petroleum, Saudi Aramco, ADNOC (UAE)	Mature organizational structures, strong global networks and reach, partially or wholly vertically integrated. In the case of Saudi Aramco and Qatar Petroleum, these NOCs also enjoy structural advantages or dominance in a particular market segment, with performance as good or better than leading international oil companies (IOCs).
Established mid-tier players	Kuwait Petroleum Corporation, Sonatrach (Algeria)	Mixed capabilities to compete in the market, sometimes with strengths in specific niches. Moderate financial strength with pockets of strong competence, but with need for partnering to fill gaps. Often have regional presence beyond their own countries.
Emerging companies	ETAP (Tunisia), Basra Oil Company (Iraq), EGPC (Egypt)	Nascent capabilities, with heavy reliance on partners and limited negotiating capacity with IOCs. Limited balance sheets and debt financing options. Often limited to their own countries and can be heavily reliant on a small number of geological assets, though often with ambitions to grow.

Table 1. Categories of national oil companies in the Middle East and North Africa.

Figure 1 shows the costs necessary to bring the undeveloped reserves in the NOCs’ portfolios to market. The figure illustrates the oil prices that would be needed in order for potential upcoming NOC upstream projects to break even.⁸ We include an illustrative line at \$40, which is approximately the real long-term oil price that some studies have estimated would be realized under the IEA’s “Sustainable Development Scenario” if the world achieves the Paris Agreement goal to keep global temperature rise to “well below 2 °C” above pre-industrial levels.⁹

Projects above this price line are at the highest risk of failing to break even if the shift away from fossil fuels is dramatic. There is substantial variation among companies.

7 We conducted interviews between May and June 2020.

8 This “break-even price” is calculated as the sum of all costs the project is expected to incur, plus a 10 percent return to pay debt and equity investors, divided by the sum of all oil and gas expected to be produced over the life of the project. The future expected costs are discounted to account for inflation and for the idea that the value of money in the future is worth less than money today.

9 For a detailed discussion on long term oil price forecasts in a Paris-compliant world, see David Manley and Patrick Heller, *Risky Bet: National Oil Companies in the Energy Transition*, Natural Resource Governance Institute, February 2021. www.resourcegovernance.org/riskybet.

Many MENA NOCs—notably including the mature global leaders described in Table 1—are likely to invest in projects that are estimated to be profitable even at low prices. But there is substantial variation in break-even prices within the portfolios of individual NOCs, and some companies, for instance, Sonatrach and Tunisia’s *Entreprise Tunisienne d’Activités Pétrolières (ETAP)*—have significant projects with high costs. This underscores the importance of project selection and investment strategy. Worldwide, NRGi analysis shows that upwards of \$400 billion in NOC spending may not return a profit under the Sustainable Development Scenario, of which more than \$66 billion in spending would be in MENA.¹⁰ Of the three companies studied in this brief, Sonatrach’s portfolio is the most vulnerable to this decline, with \$12 billion in project spending (more than 25 percent of the company’s budgeted capital expenditure) slated for projects with a break-even price between \$40 and \$70.¹¹

Figure 1. Range of break-even prices of upcoming MENA national oil company investments¹²

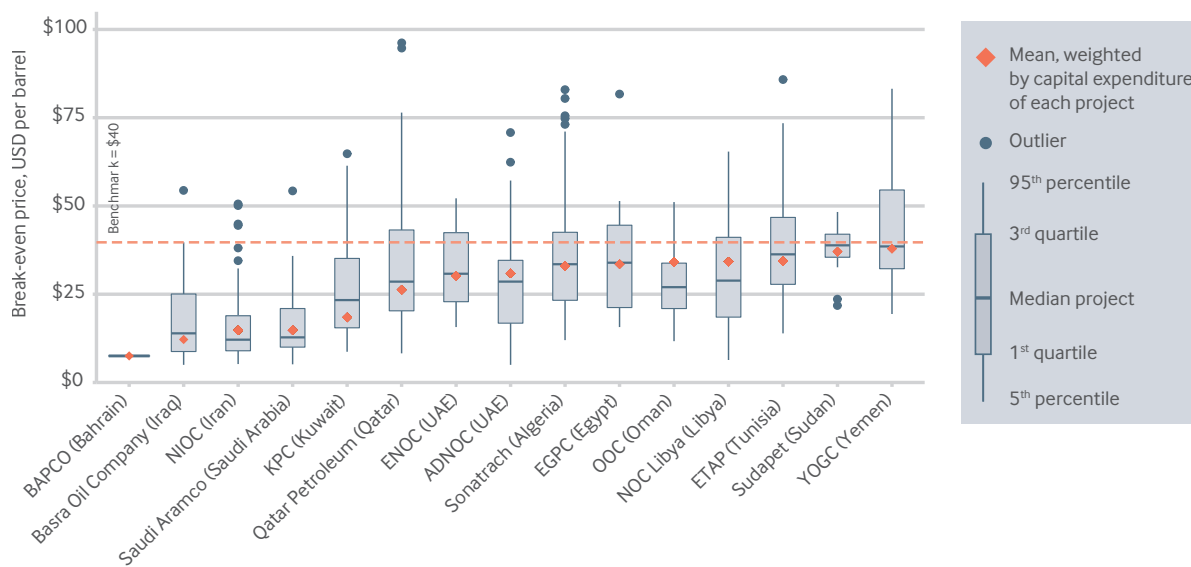


Figure 1 underscores the range of strategic options available to some NOCs in the region. Mature global leaders Saudi Aramco (for crude oil) and Qatar Petroleum (for LNG) have access to world-class, low-cost reserves that position these companies well to be the “last one standing” even if global hydrocarbons consumption declines substantially; low production costs also enable companies to expand into growth markets such as chemicals and plastics. Their international networks, well-established management procedures and strong balance sheets allow them to more easily:

- invest in the diversification of their asset bases
- pursue international geographic expansion
- diversify into different segments of the energy value chain (fuels, petrochemicals, oil derivative products such as lubricants, electricity and energy solutions)

Other NOCs face substantially more dire challenges. Companies with dwindling proven reserves and a heavy share of high-cost geological assets among their potential future investments face serious possibilities of “stranded investments,” and could struggle to maintain expected production volumes, revenues and fiscal transfers. Sonatrach

10 Manley and Heller, 14. The analysis uses data from the Rystad UCube database on the break-even prices of projects in NOCs’ projected upstream capex portfolio to assess whether these projects would generate a positive financial return under various long-term oil price scenarios.

11 Manley and Heller, pp. 15.

12 Range of breakeven prices are not weighted by production. *Upcoming projects defined as projects that Rystad Energy believe companies will develop from 2020 to 2030 under their base case price scenario.*

provides a salient example, with some upcoming projects facing high break-even prices and growing domestic consumption of gas (at subsidized prices) that reduces the share available for revenue-generating exports. These challenges reverberate through companies' portfolios, limiting access to finance and partnerships that would aid their diversification.

Emerging NOCs, such as Tunisia's ETAP, face additional challenges if they seek to take on new exploration (by investing public financial resources) without a large asset base (to mitigate the risk that new exploration efforts will fail to discover viable hydrocarbons deposits). It will be harder for emerging NOCs to grow and develop economies of scale in an industry that is contracting globally. The growth path for these companies into larger and more sophisticated activities is unlikely to be as linear as political leaders in their countries sometimes assume. Leaders may need to reexamine plans to push the development of these companies into major, integrated market players, and instead focus on maximizing the return to citizens from a narrower and focused portfolio.

Beyond NOC business and investment strategies, all MENA governments need to reexamine the fiscal relationships between NOCs and the state, as long-held expectations about available fiscal transfers (of taxes, dividends and other payments by NOCs to their governments) may prove untenable. The International Monetary Fund (IMF) estimates Algeria's fiscal break-even price—the oil price necessary in order to meet expected spending while balancing the national budget—at \$92 per barrel.¹³ But even low-cost producers are not exempt, with Saudi Arabia's fiscal break-even at \$78 and many others above both the current market price and those predicted in several long-term forecasts. Economic prudence thus demands that Ministries of Finance and other government leaders combine strategies on how the NOC generates revenues with a more sustainable approach to taxing NOCs and managing public expenditure.

Table 2 shows estimated fiscal break-even prices across the region, as well as export dependence in various MENA economies. Other things equal, the vulnerability of a country's economy to a possible future decline in petroleum prices is highest where the fiscal break-even price is high and/or the overall economy is highly dependent on the oil and gas sector.

Country	Fiscal break-even price, USD per barrel 2018 ¹⁴	Petroleum dependence – fuel exports as a share of merchandise exports ¹⁵
Algeria	\$99	95%
Bahrain	\$118	53%
Iran	\$114	71%
Iraq	\$49	100%
Kuwait	\$48	91%
Libya	\$78	98%
Oman	\$101	75%
Qatar	\$50	94%
Saudi Arabia	\$84	77%
Tunisia	N/A	6%
United Arab Emirates	\$78	75%

It will be hard for emerging national oil companies to grow in an industry that is contracting globally. The growth path for these companies is unlikely to be as linear as political leaders in their countries sometimes assume.

Table 2. Fiscal break-even price and petroleum dependence in MENA countries

13 Not to be confused with a project break-even price (see Figure 1), a "fiscal break-even price" is the minimum oil price the IMF estimates a government needs to meet its expected spending while balancing its budget each year. www.cfr.org/content/newsletter/files/Breakeven_Oil_Summary.pdf.

14 International Monetary Fund, *Regional Economic Outlook: Middle East and Central Asia – Statistical Appendix*, October 2019, www.imf.org/en/Publications/REO/MECA/Issues/2019/10/19/reo-menapcca-1019. Fiscal break-even price is the oil price at which the fiscal balance is zero.

15 World Bank, data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN, most recent year with data availability.

II. COMPANY STRATEGIES FOR MANAGING THE TRANSITION, AND HOW TO ASSESS THEM

NOCs and their government shareholders are pursuing a variety of strategies to increase their resilience to the energy transition. Some of these strategies mirror those pursued by international oil companies (IOCs), whose shareholders increasingly demand a more robust approach to the energy transition. NOCs face a broader set of responsibilities than private companies. Their governments may task them not just with pursuing commercial returns, but with generating fiscal revenues to keep states afloat and performing a wide range of other public functions. This complicates the work of NOCs and can make it harder for government shareholders to set clear benchmarks to hold NOCs accountable for their performance.

In this section, we identify four of the most prevalent oil company strategic approaches to build resilience to energy transition. We derived this list from interviews, our examination of the evolving practice of the case study NOCs, and the historical and evolving experiences of other NOCs and IOCs.

A. From extractive companies to energy companies

Many IOCs have announced investments that will expand their business model from hydrocarbon fuels to the wider energy value chain. These include renewable power generation, battery storage technology to charge electric vehicles at petrol stations, and utility companies to sell power directly to businesses and households.¹⁶ Several MENA NOCs have announced similar intentions. Most prominently, Saudi Aramco announced a goal of becoming “the world’s pre-eminent integrated energy and chemicals company,” and has invested \$1 billion in Saudi Aramco Clean Ventures, across a range of technologies.

Overall, though, this approach represents a very small share of MENA NOC investments. Even Saudi Aramco’s spending represents a small fraction of its total investment. MENA NOCs have so far doubled down on hydrocarbon fuels and largely avoided major investments in electricity and other energy transition technologies. The focus of most MENA NOCs is on becoming more competitive in the core business in order to survive in a lower price and demand scenario. Where they are investing in clean energy technology, the predominant bias of MENA NOCs is toward technologies that can prop up demand for their products (such as carbon capture or hydrogen, which is transported and used by customers in the same way as natural gas.)¹⁷ Still, governments and NOCs should consider future options and civil society actors should closely scrutinize NOC pronouncements on energy ventures. Table 3 provides some context for analysis of two common tactics.

Middle Eastern and North African national oil companies that are investing in clean energy technology are predominantly biased toward technologies that can prop up demand for their products.

16 An important caveat: There is significant variety in the approaches announced by IOCs, with some targeting significant growth of these new lines of business and others remaining focused on the status quo. Planned spending on renewable technology remains a very small share of overall planned investment of most IOCs.

17 See, e.g., Ian Simm, “Saudi Arabia Commits to Hydrogen ‘New Future,’” *Petroleum Economist*, August 20, 2020; Al Jazeera, “Qatar Building Large CO2 Storage Plant,” 8 October 2019, www.aljazeera.com/economy/2019/10/8/qatar-building-large-co2-storage-plant.

Tactic	Preconditions for success	Risks ¹⁸	Mitigation techniques
Corporate venturing (Investing in a range of businesses/ technologies, with the expectation that most will fail but a small number will be disproportionately successful)	<ul style="list-style-type: none"> ✓ Significant financial resources (>\$500m) ✓ Strong research and development capability to pursue and integrate technological change ✓ Long-term vision and willingness to adapt 	<ul style="list-style-type: none"> ▲ Can divert financial and human resources from core business ▲ High failure rate that can imperil overall portfolio ▲ Potential conflict of interest between fossil fuels and renewable investments ▲ Potential corruption in investment decisions 	<ul style="list-style-type: none"> 💡 Ringfence resources for non-hydrocarbon investments. 💡 Decide whether to focus on radically different technology (e.g. batteries) or technology supporting hydrocarbon demand (e.g., carbon capture). 💡 Strong corporate governance on investment decisions 💡 A “wait and see” approach may make sense for some—let others take the risk, then build on their learning once costs are lower.
Lateral move to the power value chain (E.g., by developing in-house renewables business lines (e.g., Saudi Aramco, Sonatrach), partnering w/ other state entities to develop/promote renewables, or forming joint ventures with power producers (e.g., Qatar Petroleum joint venture with Qatar Electricity & Water))	<ul style="list-style-type: none"> ✓ Clear strategy, mandate and division of responsibilities for renewables among government entities ✓ Sufficient domestic or regional power markets to provide demand for external offtake ✓ Removal of subsidies that impede the development of the domestic power market ✓ Partnerships to attract right skills and capital 	<ul style="list-style-type: none"> ▲ Lower profits than typically assumed for hydrocarbons can distort incentives of company leaders ▲ Vested interests can reduce political will for long-term investment and capture efforts ▲ Track record of past efforts by IOCs and NOCs is mixed 	<ul style="list-style-type: none"> 💡 Where demand is large for power in NOC’s own operations, NOCs can invest in replacing that power with renewables in order to free up hydrocarbons for export. 💡 In countries with limited domestic power demand, NOC can enter joint ventures with foreign players, to leverage resources without significant investment in capability.

Table 3. From extraction to energy – tactics and implications

B. From volume to value

Globally, the rise of shorter-cycle shale projects and the uncertain long-term demand outlook has prompted many NOCs and IOCs to shift their business model “from volume to value.”¹⁹ The shift is away from a supply-based industry focused on volumes of oil, and toward a demand-sensitive industry where only the projects with the best risk-weighted return on capital are sanctioned. IOCs are no longer focused on exploring and producing as many projects as they can find above a minimum threshold return. Lower oil and gas prices and the speculation that the world may soon pass (or may have already passed) “peak demand” mean that IOCs no longer prioritize maximizing reserves on their balance sheets, as they no longer have the benefit of higher valuations from those reserves.²⁰

18 For additional discussion of some of the potential benefits and risks of empowering NOCs to drive energy-sector development, see Patrick Heller and David Manley, “Fiscal futures: Are national oil companies champions or obstacles for energy transition,” International Budget Partnership, 22 May, 2019, www.internationalbudget.org/2019/05/fiscal-futures-are-national-oil-companies-champions-or-obstacles-for-energy-transition.

19 Ernst & Young, *From Volume to Value: The Transformation of National Oil Companies*, 2017, assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/oil-and-gas/ey-noc-transformation.pdf.

20 Haakin Brunell, Christopher Handscomb and Frithjof Lund, *Organizing to Enable the Shift from Volume to Value*, McKinsey & Company, December 2014, www.mckinsey.com/industries/oil-and-gas/our-insights/organizing-to-enable-the-shift-from-volume-to-value. BP’s 2020 Energy Outlook projected that global oil demand will peak early in the 2020s. See Muqsit Ashraf, “Big Oil Must Make Seismic Changes to Survive,” *Financial Times*, 8 November 2020.

The degree to which MENA NOCs mirror this shift varies. Countries with large proven remaining reserves – including Saudi Arabia for oil and Qatar for gas – do not face the same predicament as IOCs. They have already invested substantial capital, and have incentives to maintain or increase supply, to “cash in on reserves” before a terminal decline in oil demand, and/or to drive higher-cost producers out of the market. These NOCs therefore may aim to maximize market share and production now while they can still find a market, lest their reserves be stranded in the ground.

By contrast, NOCs with higher-cost future reserves will only be able to thrive in the future if they discover and develop lower-cost projects that enable them to profit. The common thread is efficiency; as lower prices place increasing strains on national budgets, all NOCs must seek more cost-effective modes to find and extract oil and gas.

Tactic	Preconditions for success	Risks	Mitigation techniques
Investing only in the most valuable projects (Applies to NOCs with uncertain reserves, less so to NOCs with dominant positions)	<ul style="list-style-type: none"> ✓ Targeting market share is only viable for NOCs with large reserves that can be developed at low breakeven prices; others must focus on most valuable projects ✓ NOCs without large low-cost reserves must make investment decisions (both for sanctioning projects as well as exploration) with extreme caution. Focus may be on expanding existing (“brownfield”) projects with limited risk 	<ul style="list-style-type: none"> ▲ For countries that cannot rely on large existing reserves, a failure to develop new low-cost projects can have devastating impacts on NOC viability and the government’s ability to pay for public services ▲ Spending public money through NOCs on uncertain projects can increase dependence on oil 	<ul style="list-style-type: none"> 💡 Conduct rigorous analysis of risk profile of future projects. 💡 Reform corporate governance and require strong benchmarking to bolster efficiency. 💡 For countries with high-cost/uncertain reserves, it may be prudent to reduce upstream investment, instead relying more on IOC partners or “sweat” existing assets while returning capital to the state via taxes and dividends.
Maximizing efficiency of operations	<ul style="list-style-type: none"> ✓ With shrinking margins across the industry and lower long-term rents, all companies must reduce costs 	<ul style="list-style-type: none"> ▲ Some industry costs are outside NOC control ▲ Management of some NOCs can be politicized, resulting in a wide range of non-commercial spending 	<ul style="list-style-type: none"> 💡 Invest in company integrity, strong performance benchmarking. 💡 Make decisions about tradeoffs between commercial and non-commercial spending.

Table 4. From volume to value: tactics and implications

C. Shift to gas

Many analysts believe that reductions in global demand for gas will be later and less dramatic than those for crude oil.²¹ These forecasts are common despite the reality that today gas faces more direct competition from green energy than oil does. This is because of other forces bolstering gas, especially the electrification of energy. Within the electricity mix, many countries have pushed for a shift of power systems toward gas. They see gas as advantageous because: (1) burning natural gas results in lower greenhouse gas emissions compared to coal and oil (though methane leaks in gas extraction often limit these benefits), (2) natural gas can play a role as a complement

21 See, e.g., International Energy Agency, *World Energy Outlook 2019*; McKinsey & Co., *Global Gas and LNG Outlook to 2035*, 4 September 2019.

to renewable energy, and (3) they perceive gas to be abundant and affordable.²² Many IOCs are recalibrating their upstream portfolios away from crude oil toward gas.²³

MENA NOCs today have a varying degree of influence and success in gas markets. Many MENA companies have expressed intentions to further expand their gas footprint and role in the value chain. These include:

- Qatar Petroleum (already a global liquefied natural gas (LNG) leader but pushing to further its dominance via additional investment)
- Sonatrach (a regional gas-dominated incumbent which is tapping its unconventional reserves base and seeking to open up new exploration)
- Saudi Aramco (which today only uses its gas domestically but is targeting expansion and export)

The NOCs most likely to succeed are those with the available domestic reserves and technology to unlock gas at competitive cost, commercial capability to become LNG traders (not just suppliers), ability to expand internationally to secure a flexible and diverse portfolio, and ability to harness financial resources to take positions in the gas value chain.

Tactic	Preconditions for success	Risks	Mitigation techniques
Redirecting investment portfolios to emphasize gas, including in exploration, LNG infrastructure and trading	<ul style="list-style-type: none"> ✓ Sufficient capital allocation in gas relative to crude ✓ Scale and diversification in the company's gas asset base to reduce risk exposure and ensure margins remain resilient ✓ Establishment of LNG trading capability is key: function of volumes and a diversified and flexible supply base 	<ul style="list-style-type: none"> ▲ Prospect of sinking capital (LNG trains, e.g., cost USD billions each) in what is currently an over-supplied market with low prices and depressed returns as more players and projects (especially in the U.S.) enter the market ▲ Subsidies for domestic gas can impede market development and also hinder renewables development 	<ul style="list-style-type: none"> 💡 Adopt techniques to monetize associated gas (gas found in a hydrocarbon reservoir alongside crude oil) instead of reinjecting or flaring gas. 💡 Develop capabilities in clean technologies that move in lockstep with gas (such as renewable electricity or hydrogen).
Partnerships and international expansion	<ul style="list-style-type: none"> ✓ Openness by NOCs to move into geographies and value chains where their experience is limited ✓ Partnerships can build on existing relationships to facilitate learning and risk-sharing 	<ul style="list-style-type: none"> ▲ Taking NOC out of "comfort zone" can spread resources thin 	<ul style="list-style-type: none"> 💡 Establish strong corporate governance and decision-making procedures on partner/project selection. 💡 Invest in state-to-state or state-to-IOC diplomacy that can help leverage the country's geopolitical influence.

Table 5. Shift to gas: tactics and implications

22 The question of whether gas is a "bridge fuel" to cleaner energy is a source of significant controversy. Building large gas-fired power infrastructure can risk locking in carbon-intensive energy systems and impeding the growth of renewables in countries where uptake is low. For a discussion of the risks associated with gas-dominated power systems, see David Manley, Thomas Scurfield and Aaron Sayne, "Gas-to-Power Challenges Point to Expansion of Renewables," Natural Resource Governance Institute, 29 May 2020, resourcegovernance.org/blog/gas-to-power-challenges-expansion-renewables-ghana-algeria.

23 See Beth Mitchell, "Challenging the Core Oil and Gas Business," KPMG, www.home.kpmg/uk/en/home/insights/2018/08/energy-transition-climate-change-next-step-for-oil-gas-and-petrochemicals.html.

D. Downstream diversification

Large IOCs have traditionally vertically integrated in order to hedge between value chain segments by selling products from one segment to another. MENA NOCs have in the past only had a limited downstream footprint (with the notable exception of Saudi Aramco) due to the higher profits obtained from upstream. In the unfolding energy transition, however, MENA NOC executives have begun to see diversification downstream as key to ensuring a market outlet for their upstream products. Crude refining is one core area of downstream expansion. Success in refining is driven by process efficiency with low profit margins; it can offer a company an outlet to sell its own upstream product, as is the case with Saudi Aramco, which sells approximately a third of its crude to its own refineries.²⁴

Petrochemicals are the other major area of focus, and MENA NOCs have committed significant resources to the petrochemical segment, which is likely to grow dramatically both in absolute terms and as a share of the petroleum market. Petrochemical feedstocks composed 13 percent of oil demand in 2018; Wood Mackenzie projects this to increase to close to 20 percent by 2035.²⁵ Companies look to petrochemicals as a means to compensate for potential losses elsewhere associated with reduced demand for crude.

Pursuing downstream vertical integration will only work for NOCs with secure access to enough cost-effective feedstock to achieve scale and remain competitive. As with several other strategies discussed here, NOCs such as Saudi Aramco and Qatar Petroleum have built-in advantages. Spending on downstream integration can be perilous for NOCs, like Sonatrach, with a more limited domestic market or concerns over the scale and certainty of reserves. Investing in a large-scale domestic project without secure access to feedstocks runs the risk that the project may fail, at significant cost. Refining and petrochemical plants are capital-intensive investments, counting in the billions of dollars, with long payback periods. There is a material possibility of over-investment in the sector, as all major IOCs, NOCs and large chemical companies pursue growth. Sonatrach faces this risk as it considers three new refining units with capacity of 5 mbpd each within Algeria. Spending on these projects could end up stranded if reserves are insufficient or too expensive.

24 Saudi Aramco, *Saudi Arabian Oil Company (Saudi Aramco) Prospectus*, www.aramco.com/-/media/images/investors/saudi-aramco-prospectus-en.pdf.

25 "Over \$200B to be Invested in U.S. Petrochemicals Industry," *Business & Industry Connection*, 3 June 2019, www.bicmagazine.com/industry/refining-petchem/over-200b-to-be-invested-in-us-petrochemicals-industry.

Tactic	✓ Preconditions for success	⚠ Risks	💡 Mitigation techniques
Investment in refining	<ul style="list-style-type: none"> ✓ Feasible for NOCs which can achieve scale and diversification of their asset base ✓ Access to cost-effective and secure feedstock is essential to remain competitive 	<ul style="list-style-type: none"> ▲ Refineries are expensive and capital-intensive and can compound asset stranding risk if country not well-positioned ▲ If oriented to domestic consumption, refining can reinforce political economy that impedes renewables growth 	<ul style="list-style-type: none"> 💡 For NOCs with limited capital or uncertain reserves, domestic greenfield refineries are highly risky.
Investment in petrochemicals	<ul style="list-style-type: none"> ✓ Commodity chemicals require globally competitive feedstocks ✓ Advanced chemicals require research and development, specialist technical sales teams, and partnerships to unlock new products 	<ul style="list-style-type: none"> ▲ Capital intensity and increased competition in petrochemicals raises red flags for less competitive NOCs 	<ul style="list-style-type: none"> 💡 NOCs without large feedstock should avoid large investments. 💡 NOCs with strong feedstock should invest in partnerships or mergers and acquisitions to build economies of scale.

Table 6. Downstream diversification: tactics and implications

III. IMPLICATIONS FOR POLICY, GOVERNANCE AND NATIONAL OIL COMPANIES' ACCOUNTABILITY TO CITIZENS

MENA countries cannot simply count on a status quo approach to managing the sector or their NOCs. They face the possibility of lower long-term profits and the persistence of fiscal systems predicated upon large fiscal flows from NOCs to governments. Accordingly, all countries are looking for ways to adjust their companies' strategies and improve efficiency.

Not all NOCs are impacted equally. Companies without massive available low-cost reserves have less recourse across the board to resilience strategies like those available to giants such as Saudi Aramco or Qatar Petroleum. Mid-tier companies such as Sonatrach and emerging NOCs such as ETAP therefore find themselves in an unenviable position.

Responsibility for addressing these challenges cannot rest within the NOC itself. Rather it requires a concerted public examination of the role of the company – and indeed the oil and gas sector itself – in the future of the economy, and the country's tolerance for various kinds of risks.²⁶ Here are four recommendations for citizens, governments and NOCs (focused heavily on the NOCs with the most uncertain portfolios):

A. Governments and NOCs should emphasize transparency, public communication and development of a shared national narrative on energy transition.

On average, the NOCs in MENA are more opaque than their peers in almost any other region, with the Resource Governance Index showing an average assessment

²⁶ For a discussion of the importance of MENA economies going beyond a narrow focus on "diversification" and pursuing a more comprehensive "transformation," see Rabah Arezki, "Getting there," *Finance & Development* 54:4, December 2017.

of company transparency and accountability mechanisms as “poor.”²⁷ Ten of the 16 NOCs in the region did not publish sufficient information for NRGi to populate the most important economic indicators in our National Oil Company Database. This opacity impacts NOCs’ ability to address the recommendations in this report. Researchers and leading international organizations repeatedly emphasize that strong reporting systems are one of the most important tools to bolster management incentives for operational efficiency.²⁸ The international partners that NOCs need to access finance, share risk and develop new capacities increasingly insist on a more robust approach to disclosure. These pressures have motivated executives at Saudi Aramco and Qatar Petroleum to dramatically increase transparency in recent years.²⁹

Strong public communication by NOCs and ministries of energy and finance is more important than ever because of the uncertainties surrounding energy transition. NOC executives and government officials must weigh trade-offs between various strategic choices to build resilience to a decline in hydrocarbons that could threaten long-term prosperity and stability. Some governments in the region must signal to citizens that the source of their historical prosperity is depleting. NOCs and their government shareholders need to extensively engage with the private sector, trade bodies, unions, advocacy groups and non-state actors to communicate that oil and gas is a sunset industry, and change is coming, though at a highly uncertain pace. This can foster an honest dialogue and realistic debate about the case for change, and the new path that the NOC and country must take. Social unrest is a possibility in countries where sections of society actively distrust the way the government is approaching this uncertain future.

National oil companies and their government shareholders need to extensively engage with the private sector, trade bodies, unions, advocacy groups and non-state actors to communicate that oil and gas is a sunset industry, and change is coming, though at a highly uncertain pace.

B. Governments and NOCs need to conduct rigorous risk analysis around capital allocation decisions.

Past models and roadmaps have become less relevant as the energy transition unfolds. Algeria, for example, faces an urgent need to replace dwindling reserves if it is to maintain anything close to the kinds of fiscal revenues upon which public expenditure has been based. But finding new reserves with low costs of extraction is difficult, and potential downstream projects are costly. In order to make decisions about what Sonatrach should do—invest heavily in new exploration, cede risk (and potential upside benefits) to private partners, shift to a greater focus on drawing down brownfield assets—the Algerian government needs a rigorous assessment of the country’s priorities, optimal uses of public financing and tolerance for different kinds of risks.

Governments should mobilize task forces to identify and diagnose the issues at stake, including:

- Exposure of the NOC’s portfolio and the risks associated with spending on high-cost projects which may not generate financial returns if oil and gas prices fall dramatically
- Known and potential liabilities associated with impaired fixed assets (refineries, pipelines) and decommissioning
- The prospective carbon intensity of the undeveloped assets in the NOC’s

27 Natural Resource Governance Institute, Resource Governance Index 2017, www.resourcegovernanceindex.org. “At 44/100, MENA’s SOEs’ average score ranks second to last after Sub-Saharan Africa.”

28 Organization for Economic Cooperation and Development, *Guidelines on Corporate Governance of State-Owned Enterprises*, 2015, 24 – 25.

29 As part of NRGi’s process of implementing and disseminating the Resource Governance Index in the region, a few NOCs have expressed interest in learning more about international best practice in NOC transparency, in order to enhance their practices. See, e.g., Qatar Petroleum, *Annual Review 2018*, 15-16, qp.com.qa/en/MediaCentre/Lists/QPPublications/Attachments/5/QP%20Annual%20Review%202018%20-%20English.pdf.

portfolio—both from the process of extraction and from the ultimate burning of the resource—which may impact the company’s prospects of partnering with IOCs that are under increasing pressure to demonstrate reductions in the emissions associated with their production

- The country’s climate commitments and energy goals, including for renewable energy, and the impact of oil and gas policy on achieving those goals
- The financial trajectory of the country’s economy and government budget, and safeguards available such as foreign exchange reserves and sovereign wealth funds
- Structural impediments to economic diversification and employment due to the prevailing hydrocarbon development model and role of the NOC

C. Where fiscal break-even prices are unsustainable, governments should reexamine the NOC’s role and long-held assumptions about public expenditures.

The oil prices needed to balance the budgets of many MENA countries under current assumptions about public expenditure are simply not realistic under most long-term scenarios; recent downward revisions in price assumptions by prominent IOCs should serve as a wake-up call for NOCs and their governments. On one hand, a more sustainable approach requires that ministries of finance or other agencies with cross-cutting economic management responsibilities scrutinize the rules governing the amount of revenues that NOCs transfer to the state. In 2018, the median NOC in the National Oil Company Database transferred 22 percent of its gross revenues to the state via taxes, dividends and other fiscal transfers, spending the rest on operations and capital investments. Transfers among the five MENA NOCs for which data was available ranged from 31 percent of gross revenues (Sonatrach) to 53 percent (Kuwait Petroleum Corporation).³⁰ As the long-term prospects for oil and gas decline, authorities in countries at particularly high risk of project failures may consider raising NOCs’ fiscal obligations to the state to accelerate the conversion of oil into fiscal revenues that the state can spend in other sectors to diversify the economy.³¹

Some MENA governments might revise their view of the relationship between NOCs and private partners and investors. Authorities may seek to enlarge the role that IOCs play in exploration and development, in order to generate investment in the future of the sector without increasing the NOC’s risk exposure. More dramatically, governments could sell off some NOC shares, converting these company assets to government cash. Such decisions would carry their own trade-offs, but oil market uncertainty requires governments to seriously assess the prospects of NOCs facing unsustainable break-even price scenarios.

The other side of the public finance balance sheet is even more important, however, and governments must also examine public expenditure patterns, which may necessitate frank discussions about the prevailing social contract between citizen and state that has historically been underwritten by hydrocarbon revenues. Fossil fuel consumer subsidies can play a particularly unsustainable role, costing governments considerably, increasing consumption of fuels that could otherwise be exported for profit, and harming the competitiveness of renewable energy.³²

Authorities in countries at particularly high risk of project failures may consider raising national oil companies’ fiscal obligations to the state to accelerate the conversion of oil into fiscal revenues.

30 Natural Resource Governance Institute, *National Oil Company Database*, May 2020. The five MENA companies are Sonatrach (which transferred 31 percent of its gross revenues to the state in 2018), ETAP (32 percent), Qatar Petroleum (40 percent), Saudi Aramco (46 percent) and KPC (53 percent).

31 For a more detailed discussion of the pros and cons of different approaches to NOC taxation, see Manley and Heller, 35.

32 A 2014 IMF report estimated that MENA countries account for about half of global energy subsidies, an amount equivalent to 8 percent of regional GDP and 22 percent of government revenue. International Monetary Fund, *Energy Subsidies in the Middle East and North Africa: Lessons for Reform*, March 2014.

D. As profit margins shrink across the industry, efficiency and integrity are more important for MENA NOCs than ever.

Many NOCs have struggled with commercial efficiency, both because their governments call on them to perform a range of non-commercial functions and because they lack the kinds of market pressures that incentivize strong commercial performance.³³ NOCs have also been at the center of some of the world's most severe corruption scandals. Such challenges are always costly for the public. But during boom times they can go unnoticed, and high prices (and therefore revenues) can help governments paper over any waste of public resources. As the oil and gas sector reels from the impact of the coronavirus pandemic and faces a future with lower and more uncertain revenues, MENA governments cannot afford inefficiency and waste.

Strong corporate governance and reporting, a clearly defined mandate, well-qualified and independent boards, and strong management accountable for measured performance against clear benchmarks are all essential tools for managing this challenge. As the global energy transition progresses and NOCs are thrust into unfamiliar positions, new and different priorities are emerging. NOCs will always have a broader public mandate than IOCs and will inevitably play an important role in MENA countries' plans to navigate the energy transition. It is critical for government shareholders to develop clear definitions of the goals for these companies as they evolve, measure trade-offs as precisely as possible, and insist on the highest possible standards of integrity in the execution of strategy.

33 Stacey L. Eller, Peter R. Hartley and Kenneth B. Medlock III, "Empirical Evidence on the Operational Efficiency of National Oil Companies," *Empirical Economics* 40 (2010); Christian Wolf, "Does Ownership Matter? The Performance and Efficiency of State Oil versus Private Oil," *Energy Policy* 37 (2009): 2642—52; Nadeja Victor, *On Measuring the Performance of National Oil Companies—Program on Energy and Sustainable Development Working Paper 64* (Stanford University Program on Energy and Sustainable Development, 2007).

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ACKNOWLEDGMENTS

The authors wish to thank Carole Nakhle, Ali al-Saffar and Aaron Sayne for their comments on an earlier draft of this briefing, as well as those who graciously granted their time to be interviewed for the research.

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