

Columbia Law School

Scholarship Archive

Columbia Center on Sustainable Investment
Staff Publications

Columbia Center on Sustainable Investment

9-2020

Equipping the Nigerian National Petroleum Corporation for the Low-Carbon Transition: How Are Other National Oil Companies Adapting?

Perrine Toledano

Columbia Law School, Columbia Center on Sustainable Investment, ptoled@law.columbia.edu

Martin Dietrich Brauch

Columbia Law School, Columbia Center on Sustainable Investment, martin.brauch@columbia.edu

Tehtena Mebratu-Tsegaye

Columbia Law School, Columbia Center on Sustainable Investment, tm2675@columbia.edu

Francisco Javier Pardinás Favela

Columbia University, School of Public International Affairs, jiaceo@columbia.edu

Follow this and additional works at: https://scholarship.law.columbia.edu/sustainable_investment_staffpubs



Part of the [Agriculture Law Commons](#), [Environmental Law Commons](#), [International Law Commons](#), [Land Use Law Commons](#), [Law and Economics Commons](#), [Oil, Gas, and Mineral Law Commons](#), [Securities Law Commons](#), and the [Transnational Law Commons](#)

Recommended Citation

Perrine Toledano, Martin D. Brauch, Tehtena Mebratu-Tsegaye & Francisco J. Pardinás Favela, *Equipping the Nigerian National Petroleum Corporation for the Low-Carbon Transition: How Are Other National Oil Companies Adapting?*, (2020).

Available at: https://scholarship.law.columbia.edu/sustainable_investment_staffpubs/120

This Article is brought to you for free and open access by the Columbia Center on Sustainable Investment at Scholarship Archive. It has been accepted for inclusion in Columbia Center on Sustainable Investment Staff Publications by an authorized administrator of Scholarship Archive. For more information, please contact scholarshiparchive@law.columbia.edu.

Equipping the Nigerian National Petroleum Corporation for the Low-Carbon Transition

How Are Other National Oil Companies Adapting?



Columbia Center
on Sustainable Investment

Perrine Toledano, Martin Dietrich Brauch,
Tehtena Mebratu-Tsegaye, and Francisco Javier Pardinás Favela

Table of Contents

1.	Introduction	6
2.	The Low-Carbon Transition and COVID-19 Crisis: Hastened Fall of the Oil and Gas Sector and Rise of Renewable Energies	7
2.1.	Implications of the Oil Crisis for Nigeria	8
2.2.	Implications of the Oil Crisis for National Oil Companies	11
3.	Energy Transition Strategies of Selected NOCs and Lessons Learned for NNPC	12
3.1.	Climate Governance Framework	12
3.2.	Addressing Transition Risks	13
3.3.	Seizing the Transition Opportunity	15
4.	Analysis of Governance Aspects of the Nigerian National Petroleum Corporation	18
4.1.	SOE role and funding. Does the government clearly define the SOE’s role and establish a working funding mechanism for the company? (Precept 6.1)	18
4.2.	SOE corporate governance. Do the SOE’s corporate governance systems limit political interference in the company’s technical decisions, while ensuring effective oversight? (Precept 6.2)	23
4.3.	SOE transparency and accountability. Are SOE decision-making and operations transparent and accountable? (Precept 6.3)	26
5.	Recommendations	28
6.	Conclusion	30
	Annex: TPI Questionnaire	31

Acknowledgment

The authors are extremely grateful for Tom Mitro’s very insightful review of an earlier version of this report and for the research inputs from Dr Taiwo Ogunleye, Fisoye Delano, and Najim Animashaun.

List of Acronyms and Abbreviations

CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilization, and Storage
CDM	Clean Development Mechanism
CDP	Carbon Disclosure Project
CER	Certified Emission Reduction
GCI	Gasoline Compression Ignition
HVAC	Heating Ventilation and Air Conditioning
IEA	International Energy Agency
IEEFA	Institute for Energy Economics and Financial Analysis
IFPen	French Institute of Petroleum
IPO	Initial public offering
JV	Joint Venture
LCOE	Levelized Cost of Electricity
MCC	Mobile Carbon Capture
MIT	Massachusetts Institute of Technology
MOU	Memorandum of Understanding
NEAL	New Energy Algeria
NNPC	Nigerian National Petroleum Corporation
NOC	National Oil Company
NPV	Net Present Value
OGCI	Oil and Gas Climate Initiative
OPEC	Organization of the Petroleum Exporting Countries
PV	Photovoltaic
RED	Renewable Energy Division
SINARAN	Solar Installation and Application on Petronas Rooftops & Assets Nationwide
TPI	Transition Pathway Initiative

Key Messages

- Nigeria is in trouble: its oil dependency is not sustainable. The country's oil has lost its competitiveness and oil prices tend to remain below its production cost. Nigeria's inefficient refineries are draining public money. Public and private debt in Nigeria is indexed on oil prices. The country's sovereign debt rating was downgraded in March 2020 in the midst of the COVID-19 pandemic and could be downgraded further if low oil prices are sustained as expected by rating agencies. These circumstances tend to compromise Nigeria's ability to borrow to face the challenges of the health, economic, and climate crises.
- Moreover, the oil industry is now one of the worst-performing sectors in the financial market. Hit hard by the current COVID-19 crisis, the industry is affected by pessimistic scenarios on the return of demand and prices to past levels, putting oil-producing countries in dangerous economic, financial, and political situations. In the post-Paris Agreement world, marked by the low-carbon energy transition, renewables play a leading role, whereas the prominence of oil is set to diminish. As the world moves forward, the industry is a reminder of the past.
- The oil crisis looms large in Nigeria due to the country's heavy dependence on revenues from the sector. Revenues from the Nigerian National Petroleum Corporation (NNPC) can represent more than five times the country's health expenditure, nearly seven times its foreign aid receipts, and more than fifteen times the value of the country's sovereign wealth fund. Because of the scale of NNPC revenues, the Nigerian government's largest spending decisions are associated with the oil sector rather than the low-carbon energy transition and associated public goods.
- Various national governments have had differing and apparently mutually exclusive objectives for their national oil companies (NOCs): maximizing fiscal revenues transferred to the country's treasury; achieving commercial effectiveness to extend the company's oil portfolio; delivering public goods and services; providing public employment, infrastructure or energy; or promoting the local private sector. The climate change agenda and the COVID-19 crisis force a reconciliation of these objectives: no NOC will be able to maximize fiscal transfers or commercial effectiveness without embracing the energy transition, which in turn represents the most critical public service to be delivered to citizens. Thus, NNPC's business model must embrace the energy transition.
- Other NOCs have taken meaningful steps to become players in the low-carbon energy transition domestically or

internationally. Five NOCs, in particular, have stepped up research and investment in renewables; green hydrogen; and carbon capture, utilization, and storage (CCUS) technology, while targeting a reduction of their carbon footprint: Saudi Arabia's Saudi Aramco, Norway's Equinor, Brazil's Petrobras, Malaysia's Petronas, and Algeria's Sonatrach. While COVID-19 has hastened Nigeria's oil decline, it also creates an opportunity to advance the energy transition, leveraging NNPC as a key player of its realization, similarly to Algeria, Brazil, Malaysia, Norway, and Saudi Arabia.

- The five NOCs approach the energy transition differently and with different ambitions, and their climate governance framework is not always clear or elaborated. Even so, they have made the energy transition core to their strategies. They address the transition risk and seize the transition opportunities in a meaningful way, supporting their national governments' commitments under the Paris Agreement.
- The five NOCs have also undergone reforms of various aspects of their corporate governance. Even if not always sufficient, these reforms position them to be players of the energy transition.
- The Nigerian government has started diversifying out from oil, and there are some signs that NNPC is embracing governance reforms and could help the government in achieving its ambition to participate in the energy transition. However, much more is needed to ensure that NNPC uses the energy transition as a business and development opportunity. This is an extraordinary task that only a well governed NNPC can take up.

Critical reform efforts should focus on:

- Hiring expertise to develop an energy transition plan for Nigeria and run an institutional analysis of the role to be played by each key public or private institution in the energy transition including NNPC.
- Reforming NNPC to ensure it can play this role, by:
 - making NNPC independent from political interference at all operational and management levels, reducing opportunities for corruption,
 - enshrining transparency and internal as well as external oversight in NNPC's governance framework,
 - legally clarifying its funding mechanism and revenue retention model,
 - institutionalizing principles of climate change governance,

- if profound reform is not feasible for lack of political champions inside the government or within NNPC, a better avenue would be to privatize NNPC or at least some of its subsidiaries.
- Setting up a separate division of NNPC or, in case of NNPC privatization, an independent entity with clear objectives related to the energy transition that are measured by transparent and auditable metrics. This division or entity would be in charge of developing a timeline to eliminate routine flaring and minimize non routine venting and flaring for existing fields; developing criteria to award new fields in accordance with a stranded asset risk analysis; and establishing carbon emission standards.
- Identifying funding sources for this new division or entity in advance and in ways that incentivize desired results.

The current crisis is a moment for reform on which Nigeria and NNPC should embark. While it is an incredible policy and political challenge, it is not unsurmountable. Other NOCs are showing the way, and policy guidance is already out there to guide countries and companies.

1. Introduction

The fossil fuel industry is in trouble. Fossil fuels are responsible for more than 65% of human-made global warming, and two-thirds of known reserves need to be left underground and be stranded.¹ While 20 years ago oil and gas companies dominated the financial market, today they are being displaced by technology companies, nearly disappearing from the S&P 500,² which evidences the decline of the industry. The competitiveness of renewable energy has now been established, and the energy demand is on trend to shift permanently to clean and modern sources of energy.

The economic downturn resulting from the COVID-19 pandemic is the latest blow inflicted on the oil industry.³ All scenarios anticipate that oil price levels will not return to historical trends, and some even predict that oil prices will not return to pre-COVID-19 levels.

Consequently, Nigeria is also in trouble given its heavy dependence on oil revenues. The Nigerian government cannot rely on these revenues to finance its stimulus package to keep the economy afloat during the COVID-19 crisis and most likely will not be able to rely on them for the recovery and beyond, given that Nigeria's oil is not competitive enough at today's oil price levels.

It is time for Nigeria to embrace the low-carbon energy transition and diversify out of the oil and gas industry before it sinks. The Nigerian government has started to make efforts in that direction. In June 2020, it removed the price cap for gasoline and associated subsidies⁴ and established the goal to increase renewable energy power generation to 30% of the installed capacity by 2030. Also, by 2030, the country plans to have 5.3 GW of mini-grids (up from 1 MW in 2015) and 2.8 GW of solar home systems (up from 30 MW in 2015).⁵

In particular, Nigeria needs to rethink the role of its National Oil Company (NOC)—the Nigerian National Petroleum Corporation (NNPC)—to support this ambition, turning critical and challenging times into an opportunity for both the company and the country. The government already anticipated this role in 2005 by requiring NNPC to open the renewable energy division.⁶ This entity or a separate one with similar mandate, now needs to be given the means to play a strategic role.

Other NOCs have taken meaningful steps to become players in the energy transition domestically or internationally. We review the energy transition strategies adopted and measures taken by Algeria's Sonatrach, Brazil's Petrobras, Malaysia's Petronas, Norway's Equinor, and Saudi Arabia's Saudi Aramco. Their experience can serve as a source of guidance and inspiration for Nigeria's reform of NNPC, even though they must also make significant progress to align with the trajectory required by the Paris Agreement.

Becoming a player in the energy transition and supporting governments in achieving the Paris Agreement will entail shifting the business model of these companies over time, which is always a strategic and operational challenge that only well governed companies can take on successfully. To this end, we also analyze the corporate governance structures of these five NOCs and compare them to that of NNPC to draw lessons.

The current crisis is a moment for reform on which Nigeria and NNPC should embark. While it is an incredible policy and political challenge, it is not unsurmountable. Other NOCs are showing the way, and policy guidance is already out there to guide countries and companies.

2. The Low-Carbon Transition and COVID-19 Crisis: Hastened Fall of the Oil and Gas Sector and Rise of Renewable Energies

In 2019, the energy sector—composed mostly of oil and gas companies—was the worst-performing one on the S&P 500 index. In 1980 the energy industry accounted for 25% of the index’s value (with 7 out of the 10 top companies being oil and gas companies),⁷ while as of July 2020 oil and gas companies accounted only for 2.8% of the index⁸ (Figure 1). In August 2019, Exxon Mobil’s weight in the S&P 500 index dropped to 1%, dropping out of the top 10 companies.⁹ In fact, no oil and gas company remains in the top 10.

Moreover, the COVID-19 pandemic has caused an unprecedented global crisis, with lower oil prices and, for one day, even negative future prices.¹⁰ Even after the global economy restarts and under optimistic scenarios, oil prices are expected to recover to pre-COVID-19 prices in 2021 or 2022 at a USD 50/bbl. to USD 60/bbl. range. Under another scenario, that

price level will be reached in 2024. In a pessimistic scenario, prices do not return to past levels.¹¹

The oil industry will face a challenging macroeconomic environment with a predicted decline in global demand for hydrocarbons from 2030 onward due to the low-carbon energy transition,¹² which represents “significant business and credit risk” for oil companies.¹³ Even in the Middle East, where oil is low cost and abundant, some governments have made the energy transition the strategic priority. Saudi Arabia recently tripled its renewable energy target, and the United Arab Emirates launched its “Energy Plan 2050,” aiming to cut carbon dioxide emissions by 70%, improve energy efficiency by 40%,¹⁴ and reach a 50% stake in clean energy by 2050.¹⁵

Bloomberg NEF forecasts that renewable energy sources could meet half of the world’s energy demand by 2050.¹⁶ Today solar energy represents 2% of global electricity generation and wind 5%; by 2050 solar could rise to 22% and wind to 26% (Figure 2). Dramatic technological advances in batteries and energy storage accompany this development. Bloomberg NEF estimates that USD 13.3 trillion will be invested in new power generation assets by 2050, with renewables account-

The oil and gas industry underperformed against the S&P 500 over the past 15 years.

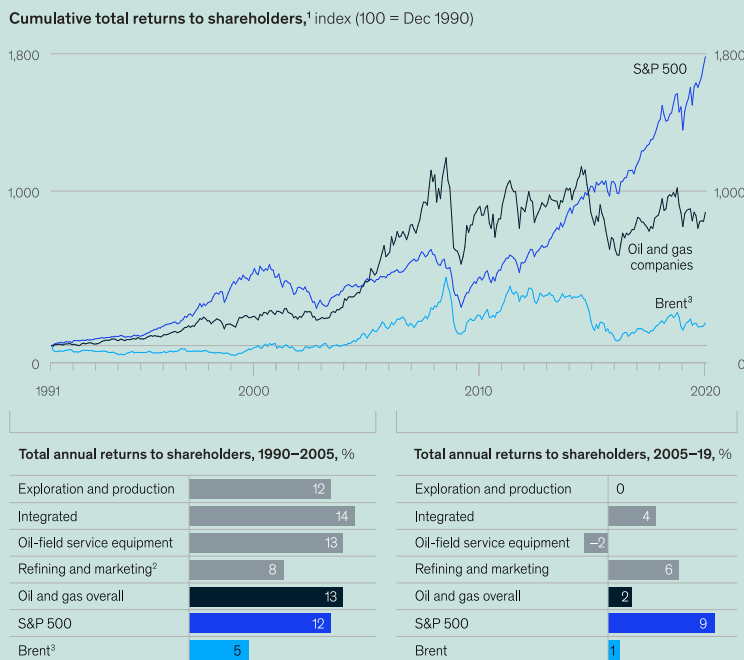


Figure 1: Oil and gas industry underperformance vs S&P 500

Source: McKinsey.⁴²

¹National oil companies are allocated as per their business model. At least 1 year of data required for inclusion.
²Excludes marketing pure plays.
³Represents change in ICE Brent price.
 Source: S&P Capital IQ; McKinsey analysis

ing for 77% of this investment.¹⁷ The main enabler of this shift is the radical drop in cost of solar and wind energy, making these technologies more competitive than fossil fuels on a non-subsidized basis.¹⁸ Moreover, new technological advances, continuous economies of scale, and competition continue to reduce the levelized cost of electricity (LCOE) for wind and solar energy. In late 2019, electricity costs from new solar photovoltaic (PV) plants were 83% lower than ten years earlier.¹⁹

Renewable energy investments also provide for a higher job multiplier than fossil fuels. Every USD 1 million in spending in energy infrastructure generates “7.49 full-time jobs in renewables infrastructure, 7.72 in energy efficiency, but only 2.65 in fossil fuels.”²⁰

In a post-COVID-19 reality and with the low-carbon energy transition, lower oil prices and the demise of the global oil sector, oil-producing countries, including Nigeria, could face a dangerous financial situation.²¹

2.1. Implications of the Oil Crisis for Nigeria

Nigeria’s oil dependency is not sustainable as the country’s oil has lost its competitiveness against international oil companies and oil prices tend to remain below production costs.

2.1.1. Nigeria’s Oil Is No Longer Competitive

Approximately ten years ago, Nigeria was among the most valuable countries by net present value (NPV) for Shell’s global upstream portfolio but today it’s ranked fifth. It also has slipped in the rankings for Chevron and Eni and hardly makes it to the top 10 of ExxonMobil’s upstream portfolio. Only Total still considers Nigeria among its top three countries for investment. As a consequence, few of the deep-water prospects have been developed. The main reason is related to production costs. In ten years, global deep-water project costs have fallen by 50% and averaged less than USD 10/boe for 2018 financial investment decisions. Currently, costs of Nigeria’s deep-water pre-financial investment decision projects are among the highest in the world (Figure 3).²²

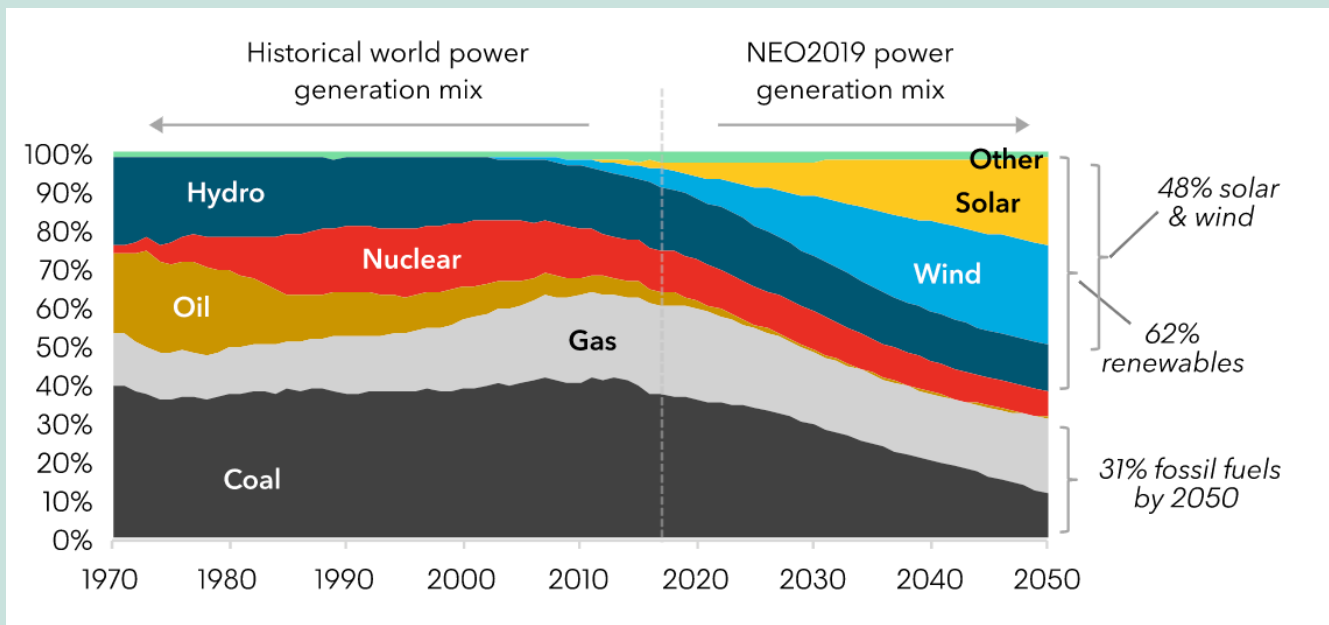


Figure 2: Global power generation mix (1970–2050)

Source: Bloomberg NEF.⁴³

This decline in investment attractiveness is reflected in the latest ranking of the Organization of the Petroleum Exporting Countries (OPEC), showing that Nigeria has had the lowest per capita revenue from oil exports every year in the past 20 years.²³

Oil price crashes due to the COVID-19 crisis could delay investment further.²⁴ The Nigerian government has changed its original benchmark of USD 57 per barrel for the 2020 budget to USD 30 per barrel, responding to the oil price crash.²⁵ With production costs above the long-term oil price that may stabilize around 40 USD/boe,²⁶ Nigeria will see more high-cost project shut-ins and the failure of the government’s plan to reach an increasing daily production of 3 million barrels.²⁷ Even in an optimistic scenario, oil prices will hardly bounce back to cover the Nigerian deficit.

Furthermore, Nigeria’s cost structure has alarmed its legislators. According to Senator Adeola, “while cost of oil production in Saudi Arabia is USD 4 per barrel and USD 3 per barrel in Russia, it is USD 21.2 per barrel in Nigeria, indicating very poor marginal profit of about USD 3 per barrel based on the new oil price benchmark of USD 25 per barrel.”²⁸

Nigeria’s capacity to refine and process crude oil also remains behind. The country’s refining capacity is significantly low (capacity utilization at 8.67%) and therefore cannot process the oil produced. The country must then import refined oil from other markets, putting the national economy at risk due to exchange rate shocks.²⁹

2.1.2. Nigeria’s Economy is Dangerously Dependent on Oil and NNPC’s Oil Revenues

Nigeria’s economy is dependent on oil, which accounted for 95% of the country’s exports in 2019. In 2019, oil revenues represented 52.7% of government revenues.³⁰

Moreover, Nigeria depends considerably on NNPC’s oil sales revenues. In 2013, a high price year, funds collected from NNPC made up 74% of government revenues, and between 2011 and 2017 this number ranged between 45% and 74%.³¹ In 2015, NNPC’s sales revenues were more than 5 times the country’s health expenditure, nearly 7 times its foreign aid receipts, and more than 15 times the value of the country’s sovereign wealth fund (Figure 4).³²

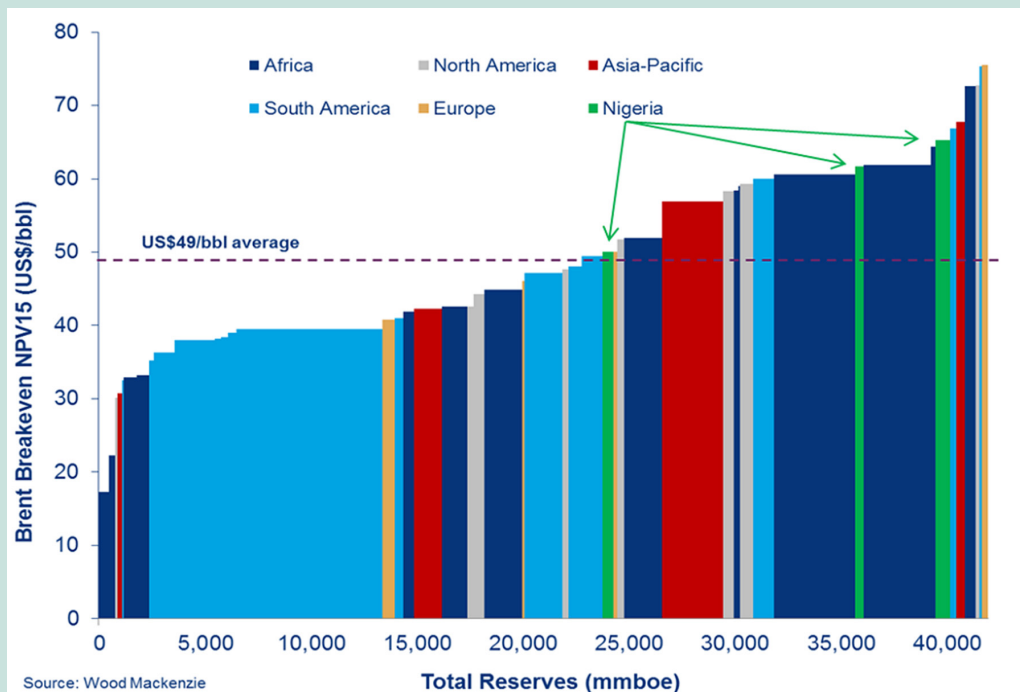


Figure 3: Nigeria’s Pre-Financial Investment Decision Projects

Source: Wood Mackenzie, 2018.⁴⁴

NNPC transfers only part of its revenues to the government, keeping the rest for operations and investment at its discretion and bypassing the budgetary processes; at the same time, NNPC still needs government approval to pay for cash calls (see Section 4.1.3).³³ NNPC's reinvestment in its traditional core activities represents an opportunity cost, as every dollar spent by NNPC on oil—rather than being spent by the government on green investments—delays Nigeria's energy transition and deepens its oil dependency. Because of the scale of NNPC's spending needs, the Nigerian government's largest spending decisions are associated with the oil sector rather than the energy transition and associated public goods.

In addition, public and private debt is indexed on oil prices. NNPC suffers from long-term liabilities accumulated in opaque conditions, while by the end of 2019, the oil and gas sector “represented about 30% of Nigerian banks' gross loans.”³⁴ A decrease in oil price and the associated closure of oil fields represent a systemic risk for the country, at least in the short term, until the country's macroeconomic environment and fiscal pace is decoupled from the oil price.

Because Nigeria's economy is so dependent on oil, Nigeria is expected to experience currency devaluation and prolonged recession. The oil price slump, the current macroeconomic climate, and the pressure resulting from the COVID-19 crisis will affect the country's indebtedness and payment capacity. For example, Nigerian banks' credit profiles are expected to worsen as their assets deteriorate with high exposure to the oil sector.³⁵

Nigeria's sovereign debt rating was downgraded in March 2020 in the midst of the COVID-19 pandemic and could be downgraded further if the low oil prices are sustained as expected by rating agencies.³⁶ This compromises Nigeria's ability to borrow to face the challenges of the health, economic, and climate crises.

The International Energy Agency (IEA) has already warned that Nigeria “is considerably less prepared to tackle this [oil price] slump as gross domestic product has shrunk by almost a third in five years. The economy had been projected to grow 2.5% this year, slower than its population, until the coronavirus tipped it into a likely recession.”³⁷



Figure 4: NNPC and Nigeria – comparison

Source: NRGJ.⁴⁵

2.2. Implications of the Oil Crisis for National Oil Companies

A major challenge during and after the COVID-19 crisis for National Oil Companies (NOC) will come from governments being pressured to reallocate budgetary resources from their oil companies for investments in health, education, and fiscal stimulus to reactivate the economy.³⁸ Given that oil revenues make up a critical component of national budgets, this pressure is being passed on to NOCs, in particular those that have a high cost of production and struggle with low oil prices—which is precisely the current situation of Nigeria’s NNPC.³⁹ Even so, a forward-looking government could seize the momentum to turn the crisis into an opportunity to overhaul the NOC’s contribution to the country and turn it into a leader of the energy transition.

Various governments have had differing and apparently mutually exclusive objectives for their NOCs: maximizing fiscal revenues transferred to the country’s treasury; achieving commercial effectiveness to extend the company’s oil portfolio; delivering public goods and services; providing public employment, infrastructure or energy; or promoting the local private sector.⁴⁰ The climate change agenda and the COVID-19 crisis reconcile all these objectives: no NOC will be able to maximize fiscal transfers or commercial effectiveness without embracing the energy transition, which in turn represents the most critical public service to be delivered to citizens.

Many national governments are full owners or majority shareholders of NOCs that jointly make up approximately half of global oil reserves.⁴¹ If operated efficiently, NOCs can help countries ensure a smooth decarbonization and play an important role in achieving the Paris Agreement on climate change.

3. Energy Transition Strategies of Selected NOCs and Lessons Learned for NNPC

This section takes a deep dive into the decarbonization strategy of five NOCs that have stepped up research and investment in renewables, green hydrogen, and carbon capture and storage (CCS) technology while targeting a reduction of their carbon footprint: Saudi Arabia's Saudi Aramco, Norway's Equinor, Brazil's Petrobras, Malaysia's Petronas, and Algeria's Sonatrach. While COVID-19 has hastened Nigeria's oil decline, it also creates an opportunity to attain the energy transition, leveraging NNPC as a key player of its realization, similarly to Algeria, Brazil, Malaysia, Norway, and Saudi Arabia.

The Climate Accountability Institute ranks the top 20 companies by carbon dioxide emissions since 1965; 12 of them are NOCs, Saudi Aramco ranks 1st with 4.38% of global emissions; Sonatrach ranks 18th with 0.91%; and Petrobras ranks 20th with 0.64%.⁴⁶

Three of the five reviewed NOCs—Saudi Aramco, Equinor, and Petrobras—are part of the Oil and Gas Climate Initiative (OGCI) and in May 2020 along with their peers (BP, Chevron, CNPC, Eni, Exxon Mobil, Occidental, Repsol, Shell, and Total) reiterated their commitment to “reducing emissions; implementing and scaling-up of innovative low carbon solutions; advancing opportunities to scale up commercially viable, environmentally responsible, and safe carbon capture, use and storage; and supporting governments as they design efficient policies that can accelerate energy transitions.”⁴⁷

The five assessed NOCs approach the energy transition differently and with different ambitions, but they have all made it core to their strategies. While their climate governance framework is not always clear or elaborated, they are all addressing the transition risk and seizing the transition opportunities in a meaningful way. All five NOCs are supporting their national government's commitment to achieve the NDCs. In the sections that follow, we compare the various elements of their strategies to NNPC's.

3.1. Climate Governance Framework

NNPC

NNPC's climate governance framework is uncertain. In 2005, following a presidential directive, NNPC opened a Renewable Energy Division (RED), with the vision of becoming a leader in renewable energy business toward a low-carbon economy. The RED was set up with the following objectives: engaging in the production of biofuels and becoming a dominant player

in that business; entering the business of renewable energy production; earning certified emission reduction (CER) credits under the Kyoto Protocol's Clean Development Mechanism (CDMs); and participating in global carbon emission reduction initiatives.⁴⁸

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

The Transition Pathway Initiative (TPI) measures companies' performance in levels of sophistication and effectiveness of their climate governance frameworks. In particular, the initiative measures whether a company has acknowledged climate change as a business issue (level 1), has built internal capacities to set greenhouse gas emission reduction targets and is transparent on scopes 1 and 2 (level 2), has integrated them into operational decision making (level 3), and has brought climate change to the core of its strategy assessment (level 4). (See Annex for the complete TPI questionnaire).⁴⁹

TPI has assessed both Equinor and Petrobras. The other three companies analyzed here—Petronas, Saudi Aramco, and Sonatrach—have reported neither to TPI nor to CDP (formerly the Carbon Disclosure Project), an alternative framework to assess climate governance.

Equinor holds level 4 (strategic level) by achieving the following: setting long-term quantitative targets for reducing its greenhouse gas emissions, remunerating senior executives on the basis of climate change performance, incorporating climate change risks and opportunities in its strategy, undertaking climate scenario planning, disclosing an internal price of carbon, and ensuring consistency between its climate change policy and the positions taken by trade associations of which it is a member.⁵⁰

Petrobras holds level 3, meaning that it has integrated the management of greenhouse gas emissions and of risks and opportunities related to the low-carbon transition into its operational decision making. However, it still has some challenges such as supporting domestic and international efforts to mitigate climate change (level 3), remunerating senior executives based on climate change performance, incorporating climate change risks and opportunities in their strategy, and ensuring consistency between its climate change policy and the positions taken by trade associations of which it is a member (level 4).⁵¹

Lacking a detailed TPI assessment, the Petronas Carbon Commitments document provides information on the company's climate governance framework. These commitments include zero continuous flaring and venting of hydrocarbon in the design of new upstream and downstream facilities and projects; zero continuous venting and reduction of continuous

flaring in existing operations when feasible; a carbon price in project-decision making together with the option of carbon offsets where economically feasible; the incorporation of carbon capture, utilization, and storage (CCUS) technologies at the design phase for high-CO₂ field development; and the consideration of adopting renewable energy technologies in all facilities and projects where operationally and economically feasible.⁵²

For Saudi Aramco and Sonatrach, there is little information on their climate governance frameworks. For Saudi Aramco, more information should become available with its listing on the Saudi stock exchange. At the minimum, we know that Saudi Aramco acknowledges climate change as a pressing issue⁵³ and a risk to its operations.⁵⁴ Moreover, since 2018 Saudi Aramco’s greenhouse gas emissions have been verified and certified by an external party.⁵⁵ As for Sonatrach, it has committed to expand its capabilities in renewable energies to support the Algerian government⁵⁶ and to improve its energy efficiency.⁵⁷

3.2. Addressing Transition Risks

Addressing the transition risk means anticipating government policies that will penalize high-carbon content in operations, in line with the country’s commitment to the Paris Agreement. A transition strategy needs ambitious targets on carbon intensity reduction, ideally aligned with science-based targets.⁵⁸

NNPC

NNPC lacks a strategy to address the transition risk and decrease the carbon intensity of its production while its carbon intensity on scopes 1 and 2 is above the global average (see Figure 5).

While the quantity of associated gas flared decreased from 2,742 mmscfd or 64% of the produced associated gas in 2001 to 19% or 880 mmscfd in 2018 (Figure 6), it remains very high by international standards—the global average is 1.1%⁵⁹—contributing to making Nigeria the world’s 7th flaring country in 2018.⁶⁰ In addition, there is accounting of underreporting of flaring.⁶¹

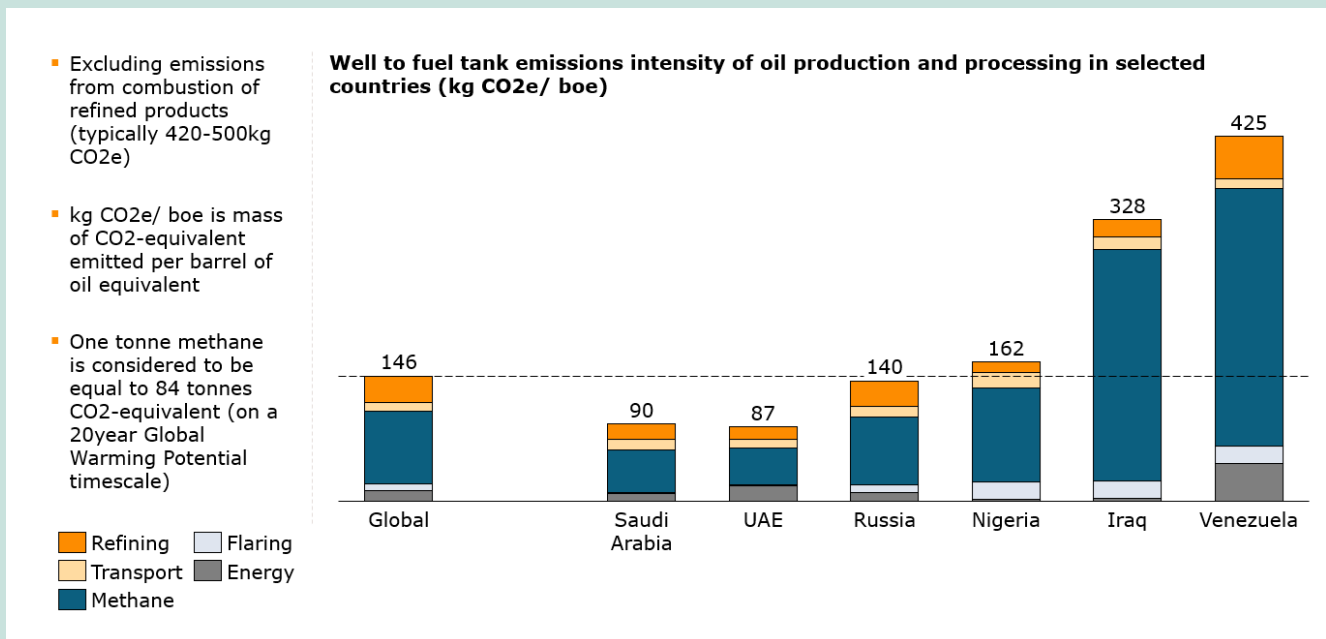


Figure 5: Emission Intensity of Oil Production and Processing in Selected Countries

Source: IEA, Oil Climate Index, Carnegie Endowment, Capterio analysis¹⁰⁵

Figure 7 shows the companies that flared the highest volume of associated gas in 2018. Many of these assets are under JV contracts with NNPC.

The 178 gas flare sites in the Niger Delta flare around 1 billion scf of gas, which could satisfy more the needs of the current power generation and domestic industry.⁶² Therefore, failing to eliminate flaring is not only an environmental issue but also a missed economic opportunity.⁶³ As the majority equity holder in joint ventures (JV) or concessionaire in production sharing contracts, NNPC should drive the investment to end gas flaring. This investment is substantive and means maximizing the opportunity of CO₂ use in enhanced oil recovery, using gas to power current oil fields and developing additional functioning and reliable gas infrastructure in Nigeria and Western Africa.⁶⁴ The Nigerian government set a 2020 flare-out target date (10 years before that of the World Bank's initiative that Nigeria endorsed),⁶⁵ and NNPC and its JV partners might incur penalties for non-compliance.⁶⁶

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

Although all five NOCs analyzed here have committed to reducing their carbon intensity, they do not always have targets or ambitious enough targets. All of them do have 2030 as a flare-out date; this date has been established by the World Bank's Zero Routine Flaring by 2030 Initiative, that all reviewed NOCs, but Petronas, endorsed.⁶⁷

Equinor's strategy, even though it is the most comprehensive and aggressive one among the NOCs analyzed, is still not on par with what is required to achieve the Paris Agreement.⁶⁸ The strategy involves targets on reducing the carbon intensity of its operations and its value chain by 2050. Equinor aims to achieve carbon-neutral operations and eliminate routine flaring by 2030, reducing absolute emissions in Norway to near zero by 2050; for the value chain it aims at reducing the net carbon intensity from the energy produced to energy consumed by at least 50% by 2050 (Figure 8).⁶⁹ Equinor has a company-wide upstream flaring intensity target of 0.2% by 2020 for the operated assets and a zero routine flaring target by 2030 at the latest. In Norway's operations, there is no routine flaring.⁷⁰

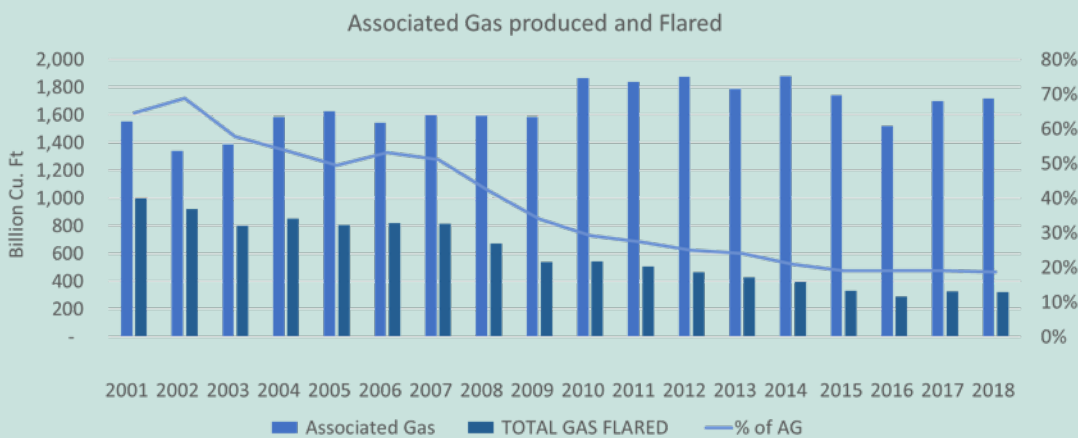


Figure 6: Associated Gas Produced and Flared, 2001-2018

Source: Department of Petroleum Resources (DPR).¹⁰⁷

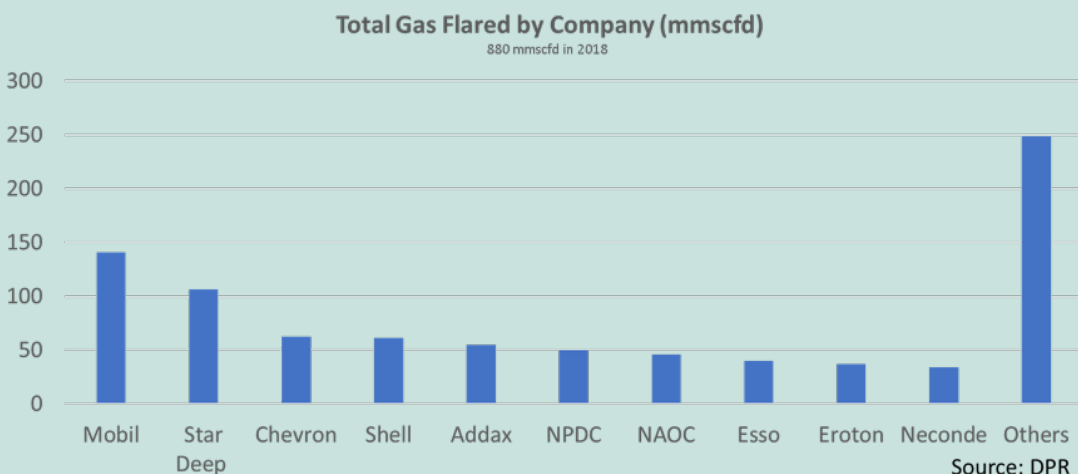


Figure 7: Total Gas Flared by Company

Source: Department of Petroleum Resources (DPR).¹⁰⁶

In the last decade (2009–2019), Petrobras reduced the volume of emissions by more than 40% and aims at reducing its carbon intensity even more by 2025 to reach 15 kg CO₂e/boe in exploration and production and 36 kg CO₂e/CWT in refining.⁷¹ In 2019, Petrobras reduced its flared gas by 12% as compared to 2018 and targets zero routine flaring by 2030.⁷² The carbon intensity of Petrobras’s operations is among the lowest of all oil and gas companies.⁷³ Even so, as is the case for Equinor, this intensity still exceeds what is needed to achieve the Paris Agreement.⁷⁴

Petronas reduced its carbon footprint by 13%, from 56.50 million tCO₂e in 2017 to 49 million tCO₂e in 2018; it aims at zero continuous venting by 2024 and zero continuous flaring by 2030, while not specifying a target for overall emissions reduction.⁷⁵

Sonatrach reported a 2% reduction of flared gas in 2018 compared to 2017 levels, and a 3% reduction compared to 2014. The flaring rate is now at 5%, and the goal is to reach less than 1% of gas production in 2021.⁷⁶ However, like Petronas, Sonatrach does not have a target for overall emissions reduction.

Saudi Aramco’s direct and indirect emissions have decreased between 2017 and 2018, showing improvement in energy intensity: reductions of 4% in direct emissions, 10% in indirect emissions, and 3.6% in energy intensity. The flaring intensity also dropped by 4% from 2018 to 2019;⁷⁷ flaring intensity is now at less than 1%.⁷⁸

3.3. Seizing the Transition Opportunity

All five NOCs are turning the climate change imperative into a business opportunity, and three of them—Equinor, Petronas, and Sonatrach—even contemplate shifts in business models anchored in strategies to substantially increase the share of renewable energy installed capacity in their portfolios. To seize the transition opportunity, NOCs may (1) build on their competitive advantages, (2) aim at transforming the market by pioneering and demonstrating solutions, and (3) dedicate a sizeable R&D budget and venture capital to low-carbon solutions.

3.3.1. Building Competitive Advantages

NNPC

NNPC’s RED builds on NNPC’s existing capacity in making oil products to specialize in biofuels. It has launched an automotive biofuel program for the production of ethanol and biodiesel that would be blended with conventional fuels and has mobilized agriculture crop fields for the production of biofuels.⁷⁹ NNPC’s RED is also developing plans for on-grid and off-grid solar energy PV technology, for deployment in retail stations and NNPC facilities. NNPC’s RED is doing data gathering for CDM Opportunities in the Oil and Gas Sector as well in the solar sector.⁸⁰

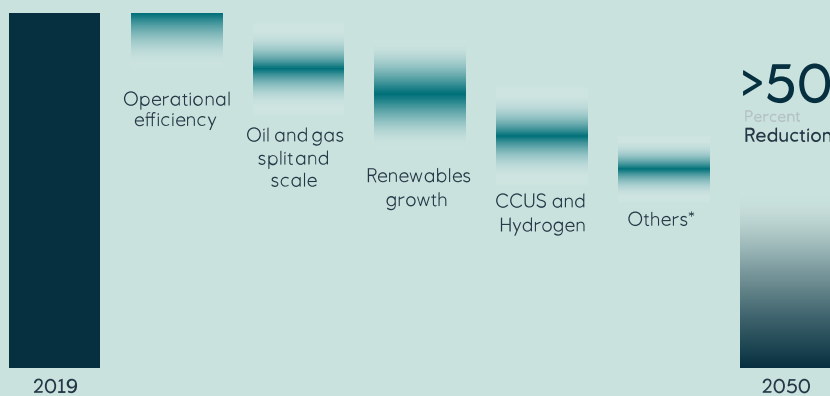


Figure 8: Equinor carbon intensity reduction

Source: Equinor.¹⁰⁸

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

All five NOCs face the energy transition by situating their competitive advantage and striving to build on it to become competitive during the energy transition. While some are already becoming strong leaders in renewable energies, others are slowly building capabilities in renewable energies and in the meanwhile are focusing on improving the carbon efficiency of their operations.

Equinor is building on its expertise in offshore platforms to become a market leader in offshore wind. To this end, it has set aggressive short- and medium-term targets to add 4 to 6 GW by 2026 (10 times higher than today's capacity) and 12 to 16 GW by 2035. Over the past years some transformational projects include Dogger Bank (United Kingdom) and Empire Wind (United States). Dogger Bank is expected to be the world's largest offshore wind farm with a total installed capacity of 3.6 GW. Empire Wind, with a capacity of 816 MW, will provide wind electricity to one million homes in New York City. Equinor is also pioneering with Hywind Tampen, which will feature the world's first offshore oil fields to be powered by floating offshore wind.⁸¹

Equinor's diversification strategy has also aimed at solar projects, although solar is not the company's competitive advantage. Equinor has a minority stake in Scatec Solar and is present in two solar projects in South America (in Argentina and Brazil) but is hoping to grow in the market.⁸²

Petronas seeks to increase renewable energy capacity to 3,000 MW by 2024, leveraging capabilities it has been developing since 2012. For instance, in 2012 it developed its first solar project by commissioning a 685-kW solar PV system on the rooftop of the Suria KLCC shopping mall in Kuala Lumpur, satisfying 30% of the building's electricity demand. Afterwards, it developed a 10 MW solar plant in Gebeng, Pahang, and a solar PV system in Arexons in Italy. In 2018 Petronas installed solar PV panels at the Pengerang Integrated Complex in Johor with a capacity of 207 KW. It plans to implement the Solar Installation and Application on Petronas Rooftops & Assets Nationwide project (SINARAN), with a potential of 30 MWp on rooftops of Petronas facilities.⁸³

By 2030 Sonatrach aims to “develop production capacities of electricity from renewable energy; master [PV] energy technology becoming more profitable and cheaper; and save natural gas volumes consumed in electricity by production units to direct them toward export.”⁸⁴ The company is focusing on building a competitive advantage on solar. Currently, it spends 2% of its total investments in solar; however, it targets to have 80% of its own electricity needs satisfied by solar by 2030 and plans to expand its solar generation to 4 GW by 2030,

contributing to the Algerian government's goal to have 22 GW of solar capacity by 2030.⁸⁵

Already in 2002 Sonatrach, Sonelgaz, and the private group SIM created the New Energy Algeria (NEAL), a company with the mission of developing and promoting renewable energy in Algeria. In 2006, NEAL, in partnership with Abener Energia and Holding SVH, set up Solar Power Plant One to operate the power plant Hassi R'mel, generating 25 MW of solar power out of 150 MW generated by thermal energy. In November 2018 Sonatrach partnered with Eni to commission a solar power plant that will partly power the needs of the oil field of Bir Rebba Nord, saving 6 million of m³ of gas per year.⁸⁶

While Equinor, Petronas, and Sonatrach are already investing in renewable energies and plan to be market leaders in that sector on the domestic market as well as internationally, Petrobras and Saudi Aramco are focusing their efforts on improving the carbon efficiency of their operations, while slowly building capabilities in renewable energies.

Petrobras's Business and Management Plan 2019–2023 anticipates investments of USD 400 million in renewable energy and gas, while allocating USD 500 million to mitigation projects for its thermal operations and having less than 1% of its energy portfolio (measures in MW) invested in renewable energies.⁸⁷ However, in 2019, Petrobras signed a memorandum of understanding (MOU) with Equinor to develop offshore wind projects jointly in Brazil, supported by R&D.⁸⁸

Saudi Aramco is specializing in CCUS to enhance oil recovery, using the latest technologies to make the solutions cost effective. For instance, the Hawiyah Gas Plant captures 30 million standard cubic feet of CO₂ every day, and the CO₂ is later piped to the Uthmaniyah oil field and injected into the oil reservoir to enhance oil recovery. Saudi Aramco is also capturing and taking advantage of wasted energy. For instance, it acquired Novomer's Converge in 2016, a polypropylene carbonate polyols product line, to convert waste CO₂ into high-value materials.⁸⁹

Saudi Aramco is building its capability in renewable energies by equipping its own facilities with solar: it installed Saudi Arabia's first wind turbine at the Turaif oil refinery plant. It has a 100,000 m² carpark solar panel system with a power generation capacity of 10.5 MW.⁹⁰ It has also made an announcement, prior to the public offering, to dedicate between USD 30 billion to USD 50 billion of capital expenditure in renewable energies by 2023–2025, making up 1.7% of the total investment that Saudi Aramco plans to invest by 2025.⁹¹

3.3.2. Transforming the Market

NNPC

It remains unclear whether NNPC's Automotive Biofuel program involves a close partnership with the automotive sector and downstream markets.⁹²

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

Equinor, Saudi Aramco, and to a lesser extent Petrobras and Petrobras are pioneering and demonstrating the viability of innovative technologies to transform the downstream markets.

Equinor and Saudi Aramco have been working with the industries combusting the fuel to reduce their footprint through CCUS solutions. For instance, Equinor has partnered with Shell, Total, and the Norwegian government in the Northern Lights project, which involves the pipeline transport and permanent storage of CO₂ from various third-party onshore industries (such as cement and waste to energy) in a reservoir in the North Sea. Northern Lights is expected to have an initial annual storage capacity of 1.5 million tonnes CO₂. This project follows the Norwegian government's ambition to develop a full-scale CCUS value chain in Norway by 2024.⁹³ Saudi Aramco is looking to transform the transportation market by using Mobile Carbon Capture (MCC) technology, which "enable[s] the unloading of CO₂ at fuel stations for sequestration or recycling into other forms of material or energy." It can capture up to 25% of the CO₂ emitted from a vehicle's exhaust and store it on board the vehicle until offloading. The technology is piloted with Volvo trucks and is targeting 50% of CO₂ emissions reduction, with 10% coming from improved engine and fuel technology (see below) and 40% from the MCC.⁹⁴

Saudi Aramco, Equinor, Petrobras and Petronas have worked with industrial partners on other solutions as well. Saudi Aramco is working with two carmakers and technology institutes on developing fuel-efficient engines using the gasoline compression ignition (GCI) engine and opposed piston engine technologies. The GCI technology is expected to be market ready by 2021.⁹⁵ Similarly Petronas is working with Daimler Automotive on low-carbon fuel and carbon efficient engines through the use of a cooling lubricant technology.⁹⁶

While Petrobras is developing biofuels as jet fuels through their BioQav product (a jet fuel produced from various sources of biomass to be mixed with conventional jet fuel),⁹⁷ Equinor is working on developing hydrogen solutions for hard-to-abate sectors. Equinor is partnering with Vattenfall and Gasunie in converting Vattenfall's Magnum gas-fired power plant in the Netherlands to run on hydrogen by 2023—the first project of the kind in the world.⁹⁸

Since 2012, Saudi Aramco leads a non-industrial energy initiative to mainstream energy efficiency among companies and households—the Lead by Example program. The goal of the initiative is to "demonstrate viable energy efficiency solutions for other companies and communities to emulate and concentrates on six key focus areas: water heaters, lighting, vehicles, heating ventilation and air conditioning (HVAC), home ownership, and smart electricity meters." Under this initiative, Saudi Aramco aims at reducing its own non-industrial energy consumption by 2020 by 35% versus a 2013 baseline. As of 2019, it had achieved 90% progress toward this goal.⁹⁹

3.3.3. Supporting Innovation in the Market

NNPC

NNPC does not report any research-related activity.

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

Looking forward and keeping up with the challenges of the energy transition, the five NOCs analyzed have increased their R&D investments, partnered with research institutions or invested in venture capital structures.

Equinor expects to increase its investments in low-carbon solutions, renewables, and energy efficiency from 20% to 25% of R&D funds by the end of 2020. In 2019 more than 65% of these funds went into CCUS and renewables.¹⁰⁰ Petrobras's R&D investments focus on renewables and biofuels. Petrobras invests R&D in CCUS and fuel efficiency.¹⁰¹ Saudi Aramco is partnering with academic and research partners experts in sustainable energy, among them are the Massachusetts Institute of Technology (MIT), Stanford University, Imperial College, Tsinghua University, the Korean Advanced Institute of Science and Technology, and French Institute of Petroleum (IFPen).¹⁰² Sonatrach partnered with Eni to collaborate in research for renewable energy, and petrophysics, with the Korean Institute of Industry for environmental technology and with ENGIE for solar applications.

Equinor is investing USD 200 million in small and medium enterprises through venture capital funding to support the development of new technologies in both renewables and carbon-efficient oil and gas. Recent projects include the waste heat to power technology that has the potential to reduce the CO₂ emissions from offshore gas turbines by 15–25%.¹⁰³ Saudi Aramco's corporate venture capital will invest USD 500 million in renewable energy solutions and energy efficiency for oil and gas. As part of Saudi Aramco's strategic investments, it signed an MOU with the Abu Dhabi National Oil Company (ADNOC) and Masdar, an Abu Dhabi-based renewable energy and sustainable urban development company, to deliver improved performance and efficiency in the oil and gas value chain, clean electricity generation, and carbon capture.¹⁰⁴

4. Analysis of Governance Aspects of the Nigerian National Petroleum Corporation

To play an effective role in the energy transition, NOCs need to be financially robust and operationally sound. Adhering to principles of good governance is a prerequisite to commercial and operational success. For this reason, we present in this section a comparative analysis of certain governance aspects of NNPC¹⁰⁹ as well as five other NOCs: Algeria’s Sonatrach, Brazil’s Petrobras, Malaysia’s Petronas, Norway’s Equinor, and Saudi Arabia’s Saudi Aramco.

Our analysis is guided by the principles set out in the Natural Resource Charter Benchmarking Framework (Benchmarking Framework), a tool for benchmarking various aspects of a country’s performance on managing its extractives resources against global best practices.¹¹⁰ The analysis focuses on Precept 6 of Benchmarking Framework; by examining the mandates, missions, and governance and operating models of the NOCs, we aim to draw lessons that could be applied to improve the governance of NNPC.

4.1. SOE role and funding. Does the government clearly define the SOE’s role and establish a working funding mechanism for the company? (Precept 6.1)

4.1.1. Commercial role. Does the government clearly define a commercial role for the SOE that reflects the company’s actual financial and technical capacity? (Precept 6.1.1)

NNPC

NNPC is a vertically integrated wholly state-owned enterprise through which the Federal Republic of Nigeria participates in the oil and gas industry. NNPC has few limits on the commercial activities it is authorized to engage in. The NNPC Act 1977 describes the entity as being empowered to take part in “all” commercial activities that relate to the petroleum sector.¹¹¹ NNPC has exercised its commercial mandate in accordance with various objectives over time, including: to participate as an operator, to invest in order to increase reserves, to increase

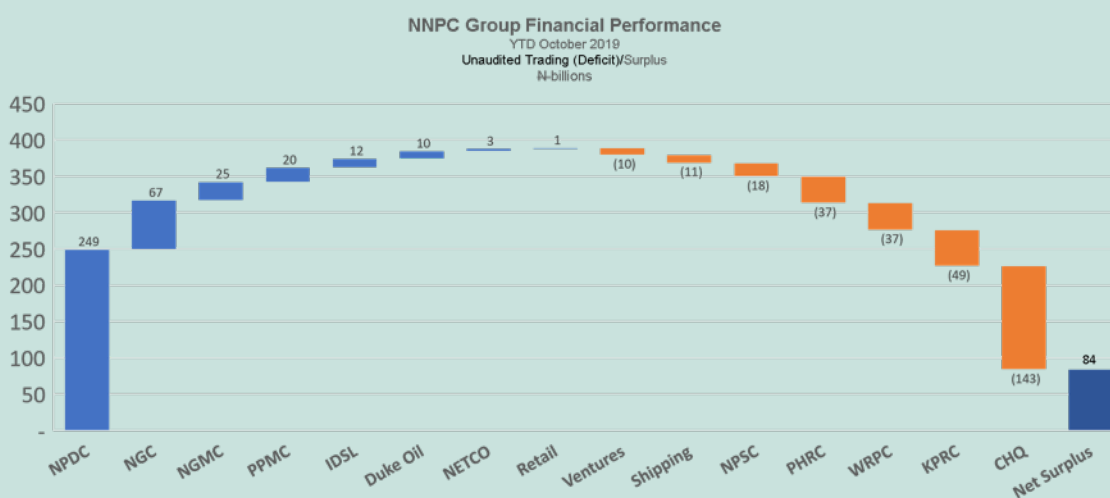


Figure 9: NNPC Group Financial Performance (YTD October 2019)

Source: NNPC Monthly Financial and Operations Report October 2019.

oil and gas production in the country, and to maximize Nigerian employment and local service company content. However, it is not clear that other important objectives have been or are being considered, including those designed to maximize the rate of return to NNPC's investments, to maximize or smooth government revenues, to reduce imports of refined products, to minimize safety and environmental risks, protect community and consumer safety, and reduce pollution and carbon emissions.¹¹²

NNPC's broad discretion to determine the contours of its commercial mandate has led to the creation of 17 wholly-owned subsidiaries, 16 partially-owned subsidiaries or associated companies, and 7 corporate service units that engage in activities that span the oil and gas value chain, including exploration and production, gas development, refineries, petroleum products and gas transportation, and distribution to retail.¹¹³ Beyond the oil and gas value chain, NNPC has subsidiaries that focus on renewable energy, healthcare provision, real estate investment, among others.¹¹⁴

NNPC's subsidiaries vary in their performance. The Nigerian Petroleum Development Company, which drives NNPC's core business of exploration and production, is considered one of the most profitable areas of the business,¹¹⁵ while downstream, NNPC's refineries—Port Harcourt Refinery, Warri Refinery, and Kaduna Refinery—consistently underperform, face high maintenance issues and operate at tremendous loss.¹¹⁶ Similarly, NNPC's Crude Oil Marketing Division, which is in charge of crude oil sales, is beset with governance challenges that undermine the government's ability to maximize revenue from oil sales (Figure 9).¹¹⁷ The variable performance of NNPC's subsidiaries may be reflective of each subsidiaries' financial and technical capacity to carry out its assigned activities.¹¹⁸

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

In the international NOCs analyzed as follows, there is a degree of political control as well as non-commercial roles. Even so, all five governments are at least formally committed to the policy that the NOCs are to be run as enterprises with profit-seeking objectives and to be provided with substantial administrative, commercial, technical, and operational decision-making autonomy. All five NOCs are vertically integrated, engage in activities associated with international oil companies, lead the oil and gas sector in their respective domestic markets, and some of them (namely, Equinor, Petrobras, and Petronas) operate in a number of countries other than their respective home states, resembling private international oil companies.¹¹⁹

Originally established in 1936 as a private company, Saudi Aramco became a NOC wholly owned by the government in

1980, after a process of increasing participation acquisitions by the Saudi government.¹²⁰ It operates as a joint-stock company since 2018,¹²¹ when the government offered 1.5% of the company's share capital for sale in the public market.¹²² Saudi Aramco is the world's largest integrated oil and gas company¹²³ and the "most valuable publicly traded company in history."¹²⁴ Even though it is subject to a degree of political interference, it operates with substantial financial and operational autonomy and "on an essentially technocratic basis with decisions being made on the basis of commercial, economic, and technical criteria."¹²⁵

The Brazilian government created Petrobras in 1953 as a majority state-owned joint-stock company, granting it a national monopoly in the exploration, production, refining, and transportation of petroleum.¹²⁶ Private equity participation was aimed at guaranteeing a certain level of capitalization.¹²⁷ Petrobras was not created to be a source of fiscal resources to the government or to make available politically oriented services such as local employment.¹²⁸ Initially operating the importation of crude oil for local refining and distribution,¹²⁹ Petrobras developed Brazil's oil industry practically from scratch.¹³⁰ Since a 1995 constitutional amendment allowing private participation in all levels of the oil industry,¹³¹ Petrobras is subject to domestic and foreign competition. Based on a core strategic decision, the company has developed a long-term comparative advantage in deep-water exploration, becoming a world leader in the segment.¹³²

In 1963, the Algerian government created Sonatrach as a state-owned commercial company responsible for the transportation and marketing of hydrocarbons, extending its mandate in 1966 to the exploration, production, and transformation of oil products. Sonatrach's exploration and development efforts have made it a global leader in oil and gas exploration; through joint ventures and other strategies, it has diversified and expanded internationally.¹³³

Norway created Statoil (currently Equinor) in 1972 with 100% state ownership. Since its inception, the Norwegian government's plan was for Equinor to be autonomous in business matters,¹³⁴ as a cost-effective and commercially operated entity.¹³⁵ Its partial privatization in 2001, permitting the sale of shares totaling up to one-third of the company's value,¹³⁶ was intended to give the company added flexibility and to strengthen its ability to compete internationally.¹³⁷ Equinor is currently a public limited company 67% owned by the state. Its relationship with the state is conducted at arm's length. It was neither granted a monopoly nor burdened with excessive fiscal or non-core non-commercial obligations.

Malaysia established Petronas in 1974 as a public limited corporation with commercial objectives, and ownership of and

exclusive rights over Malaysia’s hydrocarbon resources. There is no indication that it receives differential tax treatment compared to private oil companies. Petronas is a business with profit as a prime objective.¹³⁸ It has taken a strategic decision to expand abroad, especially to markets perceived by other companies as risky.

4.1.2. Non-commercial roles. Does the government clearly define the company’s non-commercial roles? Does this definition limit conflicts of interest? (Precept 6.1.2)

NNPC

NNPC engages in commercial, regulatory, and policy functions, without clearly delineating between commercial and non-commercial roles.¹³⁹ Its multiple roles creates significant conflicts of interest, and researchers report that this results in NNPC operating “as though it is above being regulated.”¹⁴⁰ The Department of Petroleum Resources has relied on NNPC’s superior technical capacity to inform policy and regulatory decisions, which facilitates NNPC’s significant influence over policy making.¹⁴¹ In addition, NNPC engages in a quasi-fiscal role. For example, a 2014 audit of NNPC’s oil sales revealed quasi-fiscal expenditure including loans to foreign governments, payments for a presidential helicopter, and payments for World Cup-related travel.¹⁴² Moreover, NNPC has been tasked with the non-commercial role of promoting local content in the oil sector. This has resulted in NNPC using its position in JV joint management meetings to influence budgeting decisions to award contracts to Nigerian sub-contractors.¹⁴³

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

While commercially oriented, all five NOCs analyzed also perform or have historically performed non-commercial roles. Among these, regulatory roles include licensing, setting performance standards, ensuring legal compliance of other companies, and approving their exploration and production decisions. Quasi-fiscal roles performed by NOC include servicing national debt, providing infrastructure and public services such as health and education, and granting fuel subsidies.¹⁴⁴

Non-commercial roles may not always be clearly articulated, in cases such as those of Saudi Aramco, Petronas, and Sonatrach. Even so, to the extent they were mandated with non-commercial roles, the reviewed NOCs have leveraged these national policy objectives to develop international comparative advantages (for example: expertise in deep-water fields for Petrobras). Following international best practices, all reviewed NOCs but Petronas have transitioned out of the regulatory roles given to them historically. They have also

generally succeeded in operating independently from government interference, although recent conflict of interest and corruption cases in which Petrobras was implicated cannot be ignored.

Although Equinor has been a commercially-driven enterprise from its inception, between 1972 and 1981 it assumed functions of managing the state’s equity interest in oil and gas licenses and pipelines and serving as a conduit for economic development, including through technology transfer¹⁴⁵ and local content requirements.¹⁴⁶ This non-commercial role was phased out in 1985, with the creation of a separate entity—Statens Direkte Økonomiske Engagement (State’s Direct Financial Interest [SDFI])—to acquire most of the Norwegian state’s interest in production licenses.¹⁴⁷ Norway removed this role from Equinor and partially privatized it in 2001 to give the company greater flexibility and ability to compete internationally.¹⁴⁸ The relationship between Equinor and the government is a distant one between the company as a government entity and revenue generator, and changing political goals.¹⁴⁹ Equinor is said to be free from pressures faced by many other NOCs, both in terms of the non-commercial activities that the company has to directly engage in and a continual adjustment of the company’s strategy to conform to shorter-term domestic policy goals.¹⁵⁰

Besides the objective to obtain commercial success, Saudi Aramco has also had the objective of supporting the Saudi national mission—including ensuring the survival of the Al Saud ruling family, seeking economic prosperity for political stability, and providing financial levers to sustain the government’s legitimacy. Saudi Aramco’s managers seek projects that can achieve commercial success and generate social benefits, but this approach has generated tension at times, when the Saudi government sought to maximize social benefit at the expense of commercial success.¹⁵¹

The Brazilian government originally tasked Petrobras with the goal of achieving self-sufficiency in both oil production and refining capacity.¹⁵² More recently, Brazil’s federal government sought greater security of supply and directed Petrobras to explore in Brazil’s deep offshore Campos basin. Petrobras has been commercially profitable and internationally competitive while also responding to the government’s national security mandates. When Petrobras was partially privatized in 1997, the government established the National Petroleum Agency to take over many of the non-commercial regulatory roles performed by the company.¹⁵³ At the same time, Petrobras provides a cautionary lesson in government interference. It was also put under pressure to spend in non-core areas and subsidize fuels.¹⁵⁴ The Operation Car Wash bribery scandals resulted in former Brazilian president Ignacio Lula Da Silva being convicted and imprisoned for bribery schemes;

Petrobras was implicated in these schemes and was fined by U.S. authorities.¹⁵⁵

Petronas is a business with profit as a prime objective and has remained relatively independent of the government in its day-to-day operations.¹⁵⁶ However, the company has conducted non-commercial activities. It acts as an industry regulator and is the exclusive owner and grantors of licenses to the private sector.¹⁵⁷ It also has quasi-fiscal activities such as being a private banker for the government by acquiring interests in a shipping company and a national carmaker, or a property developer in building the Petronas Towers and the administrative capital of Putrajaya.¹⁵⁸ It has often translated these policy objectives into commercial opportunities. For example, when Malaysia's petroleum fields were maturing in the 1990s, the government's desire to guarantee security of supply resulted in Petronas expanding overseas.¹⁵⁹

Sonatrach's responsibilities grew in the 1960s and 1970s, as Algeria's oil assets abroad were nationalized, and the company operated as the instrument of the Algerian state's monopoly of gas and transport of hydrocarbons. However, the company's direct control of these assets was reduced in the 1980s, being spun off to subsidiaries. In 2005, new legislation liberalized the oil and gas sector, revoking Sonatrach's monopoly over upstream activities (even though a minimum participation of Sonatrach at 51% is still required), and creating independent regulatory bodies—the National Agency for the Valorization of Hydrocarbon Resources (ALNAFT) and the Hydrocarbons Regulatory Authority (ARH). These two bodies took over Sonatrach's regulatory and licensing roles, and Sonatrach maintains its status as an operator only. Foreign partners in pro-

duction contracts with Sonatrach no longer collect their taxes with Sonatrach as an intermediate, now paying them directly to ALNAFT.¹⁶⁰ However, the company contributes to Algeria's low RGI score in reporting on non-commercial activities,¹⁶¹ and allegations of corruption have damaged the company in recent years.¹⁶²

4.1.3. Funding mechanism. Does the government ensure that the SOE has a workable funding mechanism? (Precept 6.1.3)

NNPC

The level of budget and financial autonomy is among the indicators of workable funding mechanisms in NOCs. Based on these factors, NNPC is not considered to have a workable funding mechanism that allows predictable and sufficient revenue flows to fund its operations, though there have been improvements in recent years.¹⁶³

In terms of budget autonomy, the board of directors' decision-making powers are subject to presidential/cabinet approval, and the board has limited and circumscribed decision-making power on financial matters.¹⁶⁴ Indeed, NNPC is amongst the group of NOCs that transfer the most to the government, with low retention of revenues. Based on publicly available data for 2011–2014, NNPC transferred an average of USD 50 per barrel to the government.¹⁶⁵ However, due to unclear accounting of revenues and the network of NNPC subsidiaries with some of them sitting offshore, the accurate amount of NNPC's accumulated revenues remains unknown to the public. In addition, there are no clear rules of transfer

Table 1: NOCs, Achievement of Goals, and Regulatory and Fiscal Roles

Company achievement of government technical and economic goals	Company	Company plays regulatory role (as of today)?	Company plays quasi-fiscal role (as of today)?
High	Equinor	No	No
	Saudi Aramco	No	Yes
	Petrobras	No	Yes
	Petronas	Yes	Yes
Medium	Sonatrach	No	Yes
Low	NNPC	Yes	Yes

Source: Prepared by the authors based on NRGJ.²⁶⁹

of revenues to the government as a legal conflict remains between section 162 of Nigeria's Federal Constitution of 1999, on the one hand, which requires all government-collected revenues to enter the Federation Account, and section 7 of the NNPC Act of 1977 on the other, which allows the corporation to maintain a "fund" to finance its activities, without further specification.¹⁶⁶ As such, NNPC has interpreted this rule over the years with little effect in improving its ability to perform. For example, once clear source of revenue waste and inefficiency is the Domestic Crude Allocation (DCA). Every day, the Nigerian government allocates 445,000 barrels to NNPC for sales to the domestic refineries through its subsidiary, the Pipelines and Product Marketing Company (PPMC). Because the four Nigerian refineries can only process around 100,000 barrels per day, NNPC reroutes most of the DCA to the export market or petroleum for product swaps. NNPC then exerts discretionary withholding on these export revenues to finance its activities with the percentage being sent to the federal level varying from year to year (for example, it was 73% in 2004 and 58% in 2012).¹⁶⁷

NNPC has also consistently struggled to meet its JV cash call obligations.¹⁶⁸ Previously, the Nigerian government managed funds relating to upstream joint venture petroleum operations and NNPC's equity share of a JV and funded cash calls by means of annual budget appropriation.¹⁶⁹ The federal government no longer funds cash calls directly; instead, they are now funded by aggregate revenues from NNPC's "subsidiaries and business units, deductions from oil revenue due to the federation, and third-party financing for approved projects to finance its operations."¹⁷⁰ This aggregation of revenues occurs in the absence of clear rules and outside of the formal budgeting process.¹⁷¹

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

All five international NOCs play a sophisticated commercial role with financing needs associated with large-scale investment. Appropriately they all retain a moderate to high level of autonomy on revenues to finance their activities and have considerable autonomy and decision-making power on financial, budgetary, and investment matters while being submitted to strong oversight and reporting mechanisms (see Precepts 6.2.2 and 6.3). Most of the NOCs (Petrobras, Petronas, Equinor, and Saudi Aramco) are listed on stock exchanges,¹⁷² and some (Petrobras, Petronas, and Equinor) can issue bonds in the international financial market to finance their capital expenditures.¹⁷³

Equinor has a general policy to keep a liquidity reserve, as well as committed, unused credit to ensure that it has sufficient financial resources to meet short-term requirements.¹⁷⁴ It finances its capital expenditures both internally and external-

ly.¹⁷⁵ The long-term funding of Equinor is raised when a need is ascertained for such financing based on its business activities, cash flows, and required financial flexibility or when market conditions are considered to be favorable.¹⁷⁶

Petrobras is allowed to retain much of the oil revenue¹⁷⁷ and has a degree of financial autonomy,¹⁷⁸ although it is required to submit its proposed annual budget to the Ministry of Economy and the Ministry of Mines and Energy for review,¹⁷⁹ and to the Brazilian Congress for approval. The Brazilian government controls Petrobras's budget and establishes limits on its investments and long-term debt.¹⁸⁰ Petrobras is required to maintain a legal reserve, to which it must allocate 5% of net income for each fiscal year until the amount for such reserve equals 20% of its paid-in capital.¹⁸¹

Petronas retains profits on earnings, paying royalties and taxes like international companies;¹⁸² it also pays high dividends to the State and does not obtain funds from the national treasury.¹⁸³ Some have criticized this revenue retention model as being too onerous on Petronas, with the dividend payout ratio sometimes reaching 74% in addition to other taxes.¹⁸⁴ Its board of directors decides upon bond sales, and there are no official restrictions on borrowing.¹⁸⁵

Saudi Aramco has an all-inclusive and disciplined internal approval process for capital expenditures, new projects, and debt incurrence.¹⁸⁶ It controls its own operating revenue,¹⁸⁷ which is the primary source of funding for its activities,¹⁸⁸ and evaluates future projects based on strategic, operational, commercial and financial targets. The company's unique reserves and resources base, operational flexibility, field management, and strong cash-flow generation serve as a foundation for its low gearing and flexibility to allocate capital.¹⁸⁹ The board of directors obtains loans, issues bonds, and enter into other financing instruments on behalf of the company.¹⁹⁰ Accordingly, Saudi Aramco enjoys comfortable financial operating conditions,¹⁹¹ even if the Saudi Government relies on Saudi Aramco for a significant portion of its revenue.¹⁹²

Sonatrach is, among the five analyzed, the NOC that retains the least of its revenues to finance its activities, transferring roughly 60% of its revenues to the government.¹⁹³ It relies heavily on international partners for funding and expertise to conduct its operations, and in recent years it is facing difficulties to attract foreign investors given low oil and gas prices, political protests and security risks in Algeria, and increased competition. A 2019 amendment to the hydrocarbon law aims at restoring the attractiveness of the country's oil sector to foreign investment by improving contract terms and reducing the tax burden on Sonatrach and its international partners from 85% to 60%–65%.¹⁹⁴

4.2. SOE corporate governance. Do the SOE’s corporate governance systems limit political interference in the company’s technical decisions, while ensuring effective oversight? (Precept 6.2)

4.2.1. Role of state shareholders. Does the government clearly establish the identity and role of state shareholders in the SOE? (Precept 6.2.1)

NNPC

NNPC is a wholly owned state enterprise, and the President of Nigeria exercises decision-making power, with few checks and balances to temper political interference in NNPC’s operations.¹⁹⁵ For example, NNPC is granted limited powers to contract and spend, a role typically exercised through operational units.¹⁹⁶ Approving power in these matters is concentrated in the president.¹⁹⁷ In general, there are reportedly high levels of political interference in NNPC’s operations, including in the discretionary allocation of licensees, crude oil lifting contracts, fuel importation contracts, and in the appointment of senior employees.¹⁹⁸

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

All five international NOCs analyzed provide clarity on the identity and role of state shareholders. In some of them—notably Equinor but also Petrobras, Petronas, and Saudi Aramco to a large extent—corporate governance systems are in place that limit political interference in the company and ensure effective oversight. In turn, Sonatrach operates with a lower degree of independence from the government.

Petrobras’s bylaws provide that it is a mixed-capital company controlled by Brazil’s Federal Government, for an indefinite term.¹⁹⁹ The bylaws indicate that the government may guide the activities of Petrobras “to contribute to the public interest that justified its creation, aiming at meeting the objective of the national energy policy,”²⁰⁰ as long as certain conditions are met: policy objectives are required by law or regulation and provided for in a contractual arrangement; costs and revenues of investment projects to achieve such objectives are broken down and disclosed; and the obligations and responsibilities assumed by the company abide by specified market conditions.²⁰¹

As regards Equinor, the Norwegian State’s ownership policy is that the principles in the Norwegian Code of Practice for Corporate Governance will apply to State ownership. The Norwegian Ministry of Petroleum and Energy (MPE) manages the

State ownership interest in Equinor. The MPE will customarily decide how the Norwegian State will vote on proposals submitted to general meetings of the shareholders.²⁰²

Since Saudi Aramco became an NOC, successive Saudi kings and governments have protected its commercial culture and shielded its day-to-day operations from undue political interference. Even if ultimate control of the company lies with the ruling family, a sophisticated system of public administration has delegated authority in practice. The Supreme Council on Petroleum and Mineral Affairs (SCPMA)—composed of the king, the crown prince, eight ministers, and the CEO of Saudi Aramco—formally regulates the oil sector and oversees Saudi Aramco’s activities. In practice, SCPMA’s supervisory role has been minimal, simply endorsing the decisions made by Saudi Aramco’s board of directors and trusting that the company’s strategy will align with the country’s goals.²⁰³

The Prime Minister’s office is the sole shareholder in Petronas and collects annual dividends and taxes from the company.²⁰⁴ Although the management of Petronas has a close relationship the Malaysian government, particularly the Prime Minister’s Office, Prime Ministers have usually been careful not to appear to be too deeply involved in day-to-day activities of the company. In part, there is recognition that the appearance of an overly interfering government would have a negative effect on world markets. At the same time, it is to be expected that when the national interest is paramount or there is need to tap into the financial resources of Petronas, there will be state involvement.²⁰⁵

Sonatrach is formally a joint-stock company but in practice a public company wholly owned and tightly controlled by the Algerian government.²⁰⁶ While striving to ensure that Sonatrach performed efficiently, the Algerian government has maintained financial, administrative, and legal control and influence over the company’s revenues and operations, often undercutting its performance.²⁰⁷ Since the restructuring of the company in 1998, its General Assembly—chaired by the Ministry of Energy and Mines—reports to the National Energy Council (NEC), which oversees the country’s energy policy agenda and holds operational and legal control over Sonatrach, even if not involved in its daily operations. The NEC is headed by the Algerian president and includes as members the central bank governor, a representative of the Presidency, and three leading ministers.²⁰⁸

4.2.2. Board models. Does the SOE have an empowered, professional and independent board? (Precept 6.2.2)

NNPC

The NNPC Act stipulates that NNPC's board consists of a chairperson, the Director-General of the Federal Ministry of Finance and Economic Development, the managing director of NNPC, and three people appointed by the National Council of Ministers based on their ability, experience or specialized knowledge of the oil industry or of business or professional attainments and can make useful contributions to the work of NNPC.²⁰⁹ The majority of NNPC's directors are not independent of the government. The Minister of Petroleum Resources, a role currently held by the President, is specified by the Act as the chairperson of the board,²¹⁰ and the board operates mainly at direction of the President.

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

All international NOCs analyzed are professionally run by technically competent management, following corporate governance structures and practices comparable to the OECD Principles of Corporate Governance.²¹¹ However, in Sonatrach, Petrobras, Petronas, and Saudi Aramco, there are government representatives in the boards of directors, the CEO is appointed by the government, and a board member may also be CEO. The involvement of government officials weakens the independence of the NOCs' boards of directors, which should be composed of members selected based on their technical expertise rather than political considerations.²¹²

The work of the governing bodies in Equinor is based on a well-defined separation of roles and responsibilities between the shareholders, the Board of Directors and the Management.²¹³ The Board of Equinor is independent of the Management of the Company.²¹⁴ The Chief Executive Officer (CEO) of Equinor is appointed by the Board who also stipulates his/her salary.²¹⁵ The board of directors consists of nine to eleven members. The corporate assembly are required to elect Board of directors, including the chair and the deputy chair for up to two years.²¹⁶ The State has no appointed board members or members of the Corporate Assembly in Equinor.²¹⁷ The Norwegian Company Law stipulates that the company's employees are represented by three Board members. The Members of the Board elected by the employees have three deputy members who attend board meetings in the event an employee-elected member of the board is unable to attend. The other Board members elected by other shareholders do not have deputy members. The management is not represented on the Board of Directors.²¹⁸

As regards Saudi Aramco, the Saudi Kingdom is required to directly nominate six candidates for election to the membership of the board of directors, while the other five directors ought to be independent as mandated by the law and regulations of the Kingdom.²¹⁹ The State, like all other holders of ordinary shares, has the right to vote at the Ordinary General Assembly for the election of all board members other than the President and CEO of the Company. Similarly, the voting right of the State at the Ordinary General Assembly on the dismissal of the members of the Board can apply to independent directors and members who have not been nominated by it.²²⁰

Petrobras's Board of Directors consists of a minimum of seven and a maximum of eleven members, elected at the General Shareholders Meeting for a term of up to two years, with the possibility of a maximum of three consecutive re-elections.²²¹ As the holder of least 50% plus one share of the voting capital of the company,²²² Brazil's Federal Government has the power to elect a majority of the board members.²²³ In addition, the Ministry of Economy has the right to indicate one of them.²²⁴ The Board of Directors must be composed of at least 40% of independent members.²²⁵ The Executive Office includes one Chairperson, chosen by the Board of Directors from among its members, and up to eight Executive Officers, elected by the Board of Directors, among natural persons residing in the Brazil, for a term of up to two years, with the possibility of a maximum of three consecutive re-elections; they can be dismissed at any time.²²⁶

Until 2009, the board of directors of Petronas was composed of the Director General of the Economic Planning Unit, the General Secretary of the Ministry of Finance, the Director of the Economic and Coordination Unit, and the independent advocate and solicitor. However, since 2010, the Non-Executive Directors are now appointed and re-appointed by the Annual General Meeting. All the Non-Executive Directors are considered by the Board to be wholly independent. The Malaysian Prime Minister appoints the chairperson of the board.²²⁷ Petronas has a Board Selection Criteria and Guiding Principles for the Appointment/Re-appointment of Directors so as to ensure that the Board is refreshed timely and with the right composition. It also has an Independent Directors' Guidelines (Guidelines) whereby the Independent Directors' Review is part of an annual exercise. The Guidelines regulate amongst others, the tenure of Independent Non-Executive Directors and the criteria for Independent Directors. The positions and roles of Chairperson of the board and CEO are held by two different individuals in order to promote greater accountability.²²⁸

In Sonatrach, several individuals from various Algerian ministries—two from the Ministry of Energy, two from the Ministry of Finance, and one from the Algerian Central Bank—serve as members of the board of directors, along with several of the

company’s senior managers and its CEO, who serves at the same time as chair of the board of directors.²²⁹ In turn, the Executive Committee consists of the chair and CEO as well as other senior managers of the company, including vice-presidents and executive directors.²³⁰ As chair of Sonatrach’s General Assembly, the Ministry of Energy and Mines nominates the company’s chair and CEO and approves its Executive Committee. Ultimately, the Algerian president has the final say in the appointment of managers, vice-presidents, and other personnel.²³¹

4.2.3. Staff integrity. Does the SOE invest in staff integrity and capacity? (Precept 6.2.3)

NNPC

The Talent Management Department in Abuja manages staff training for all the strategic business units and corporate services units. NNPC has a Training Academy in Kaduna. NNPC also has a secondment arrangement for on-the-job-training with joint venture operators, contractors and other partners both locally and overseas. The 2019 Benchmarking Report notes:²³²

The NNPC has one of the more robust remunerations and professional development structures among Nigerian public service organizations. The NNPC’s Leadership Academy was established to provide technical, managerial and executive training within and outside the corporation.

However, a survey of NNPC staff reveal difficulties in translating training into practical technical capacity and integrity performance. Olive Egbuta in her study on “Leadership Succession Practices and Employees’ Career Development in The Nigerian National Petroleum Corporation” surveyed a sample of NNPC employees and recorded the following opinions:²³³

There is a constant leadership changes and the way it is done makes the rest of the employees feel insecure and believe the same faith may befall them. Government interference in NNPC is huge. The government decides who comes in and who goes out leading to staff diminishing commitment to the organization. [The Group Managing Director role] is no longer considered as career based but highly political, therefore it is no longer news to hear of sacking but routine.

The study also found that over two thirds of survey respondents do not believe that NNPC has an established career path for employees and professional groups, or that training and development opportunities are explicitly linked to the strategic direction of NNPC.²³⁴

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

The five international NOCs analyzed operate with clear rules and institutional frameworks for staff development and integrity. In Petronas, Equinor, and Saudi Aramco, CEOs are typically promoted from within the companies, rewarding professional growth and fostering capacity building, stability, and longer-term thinking. In all NOCs, there are mechanisms for career development for staff, institutionalized integrity training and compliance frameworks, clearly defined recruitment processes, and plans for leadership and succession.

Saudi Aramco makes significant contributions to the development of human capital, with estimated expenditures of around USD 500 million per year on human resources. For example, first-year employees attend the company’s Industrial Training Center in Dharan, and the most promising ones are awarded full scholarships for overseas training.²³⁵ Petrobras maintains programs that provide ethical, technical, and leadership training to its employees.²³⁶ In addition, it strives to continually improve its corporate governance and compliance practices, based on codes of conduct and good practice as well as channels for employees and other stakeholders to report potential breaches.²³⁷

Equinor’s code of conduct regulates the company’s practices toward its employees (including with respect to diversity and privacy), operations (including guidance on avoiding corruption and conflicts of interests), business partners, the environment, and stakeholders such as governments and local communities.²³⁸ In Petronas, executives must comply with good governance best practices and training requirements set out in the Malaysian Code on Corporate Governance.²³⁹ The company has also instituted a Code of Conduct and Business Ethics Guide, with guidance on conflicts of interest, fighting corruption, financial integrity, workplace culture, among others.²⁴⁰ Sonatrach’s code of conduct of 2010 outlines the company’s values; sets out its commitments to employees, commercial partners, and the environment. The code includes ethics norms applicable to all employees, subject to enforcement by an ethics committee.²⁴¹

4.3. SOE transparency and accountability. Are SOE decision-making and operations transparent and accountable? (Precept 6.3)

4.3.1. SOE operational and payment data. Does the SOE disclose key operational and payment data? (Precept 6.3.1)

NNPC

According to the Resource Governance Index and EITI, the government publicly discloses how much revenue it receives from NNPC, and NNPC publicly discloses how much revenue it transfers to the government.²⁴² Information on NNPC's aggregate production volume is also publicly available, as is information on its aggregate sales volume.²⁴³ But NNPC does not publicly disclose the amount spent on non-commercial activities, disaggregated information on the sale of production by NNPC and subsidiaries (for example, beneficial ownership on off-takers, beneficial owners operating in commodity trading),²⁴⁴ or the cost of its operations.²⁴⁵ NNPC does not disclose detailed annual reports either. However, for the first time, in 2020, NNPC disclosed the audited statement of its accounts and that of its subsidiaries, disclosing the state of profitability of profit and loss of the entire group.²⁴⁶ Time will tell if this becomes a normal and regular occurrence.

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

The NOCs analyzed disclose key operational and payment data, including, in some cases details about their subsidiaries to varying degrees. The extent to which the companies are listed on a stock exchange with strong disclosure requirements or belonging to countries member to the EITI influences the extent of the disclosure.

Petrobras and Equinor, being listed on stock exchanges with rigorous corporate reporting requirements (New York, Oslo, and Sao Paulo), offer an important amount of key operational data. Similarly, Petronas has become more transparent over time thanks to its bond issuance²⁴⁷ while some of its subsidiaries have been listed on the Kuala Lumpur stock exchange since the mid-1990s.²⁴⁸ For years, Saudi Aramco has been opaque, but in April 2019 as part of the initial public offering (IPO) effort, disclosed a significant amount of key operational data and transfers to the government.²⁴⁹ Sonatrach, however, is not listed on any stock exchange, and has ranks the lowest of the five NOCs analyzed in the Resource Governance Index; however, it still ranks higher than NNPC.²⁵⁰ Post-IPO disclosures for Saudi Aramco remain to be seen as a result of its listing on the Saudi stock exchange.

Belonging to the only country being subject to European transparency directive²⁵¹ and EITI compliant member, Equinor is tremendously more transparent than the other NOCs. Its disclosures detail its payments by projects in jurisdiction, the financial relationship between government and state enterprises, production volumes disaggregated by field, revenues from oil sales and how the oil is marketed on an aggregate basis.²⁵²

Irrespective of the reporting requirements to which companies are subject, they all remain not transparent enough on commodity trading. In addition, Sonatrach and Petrobras remain unclear on their transfers to the government, and all of the NOCs playing a non-commercial role remain unclear on such activities.²⁵³

4.3.2. SOE financial reporting and audits. Does the SOE subject itself to independent financial audits, and publish the results? (Precept 6.3.2)

NNPC

The NNPC Act requires NNPC's annual financial statements to be audited by an independent auditor, however NNPC has not regularly published the audited reports.²⁵⁴ NNPC has publicly disclosed unaudited operational and financial data on a monthly basis,²⁵⁵ and for the first time, in 2020, NNPC published the audited statement of its accounts included disaggregated by subsidiaries.²⁵⁶

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

Of the four NOCs, the two privatized or partially privatized ones—Petrobras and Equinor—subject themselves to independent financial audits and publish the results of those audits, as required by the stock exchanges where they are listed. Petronas does not follow this practice for the parent company of the group, but its publicly listed subsidiaries do. Petrobras and Saudi Aramco, which remain largely government owned, prepare and publish financial statements according to international financial reporting standards, but without engaging independent external auditors to prepare them. Petronas is only subjected to state auditors.²⁵⁷ As a result of its public offering, Saudi Aramco will need to conduct independent audits and disclose reports to comply with stock exchange requirements. Sonatrach, however, subjects its financial reports to internal audits only, publishing the auditors' certification.²⁵⁸

4.3.3. SOE legislative oversight. Does the legislature oversee SOE performance without unduly constraining its decision making? (Precept 6.3.3)

NNPC

In exercising their role in legislating in the public interest, setting national priorities and strategies, and approving government budgets, parliamentarians need information on the impact of NOCs on revenues and can help oversee the operation of these companies.²⁵⁹ NNPC is not required to submit annual reports to the legislature on its annual activities.²⁶⁰ Legislative oversight is reactive rather than proactive, often in response to allegations of wrongdoing, and has not generally led to accountability for wrongdoing or poor performance.²⁶¹ More recently, in the context of the current oil crisis, Nigeria's high cost of oil production and associated poor marginal profit has alarmed its current legislators who have demanded increased transparency around the cost structure. The Nigerian Senate has challenged NNPC to be more transparent with federally funded projects.²⁶²

Saudi Aramco, Equinor, Petrobras, Petronas, and Sonatrach

All five international NOCs analyzed are subject to Parliament oversight in some way. Petrobras is the most constrained and submit its budget for legislative approval and been reporting its performance to Brazil's National Congress on a quarterly basis since 2016.²⁶³ In turn, Sonatrach, Petronas, Equinor, and Saudi Aramco are not required to seek government approval of their budgets. Petronas shares its budget with the legislature, whereas the others do not. Sonatrach only shares its budget with the regulatory authority, ALNAFT.²⁶⁴

In all companies, in exceptional cases the legislature can intervene. For instance, the Norwegian State may be required to seek approval from the Norwegian Parliament's (the Storting) before voting on certain proposals for Equinor: for instance, projects with important economic and social externalities, or costs exceeding USD 840 million²⁶⁵ or if Equinor issues additional shares and such issuance would significantly dilute the Norwegian State's holding, or if such issuance would require a capital contribution from the Norwegian State in excess of government mandates.²⁶⁶

5. Recommendations

The persistent critical issues in NNPC's governance have both hampered oil sector development and deprived Nigeria from public resources. The oil, climate, and COVID-19 crises and the ramp-up of the low-carbon transition exacerbate this reality, with the NOC providing sub-optimal returns to its stakeholders. It is therefore time for the Nigerian government and legislature to reconsider NNPC's role in the context of the energy transition and accordingly implement profound reform of the company. While the government has been called upon many times in the past to reform NNPC,²⁶⁷ the current crisis provides a unique opportunity and political momentum to forge ahead with much-needed reform to avoid long-term damage to the country.

We encourage the Nigerian government to take the following practical steps:

- 1. Hire experts to develop an energy transition plan for Nigeria.** The plan to be developed must assess how to phase out the exploitation of oil and avoid the asset-stranding risk, developing a feasible and bankable roadmap for the exploitation of associated gas during the remaining exploitation of oil, and analyzing the type of renewable energy generation deployment that is necessary to satisfy the country's energy needs (utility scale, home systems, mini grid, among others).
- 2. Run an institutional analysis of the role to be played by each key public or private institution in the energy transition.** Defining what role NNPC could usefully play in the energy transition means understanding the roles of the other key actors as well, such as national power utilities, the ministry of energy, private investors in power generation, technology and research institutions, international donors, and international and national banks. Responsibilities should be clearly allocated and institutions' roles defined accordingly.
- 3. Fundamentally reform NNPC, or privatize.** NNPC cannot play a useful role in the energy transition without deep reform seeking, in particular, to make it independent from political interference at all operational and management levels, reduce opportunities for corruption, enshrine transparency and internal as well as external oversight in NNPC's governance framework, build capacity within the company to operate in the renewable energy sector, and legally clarify its funding mechanism and revenue retention model. As is done in the utility sector, the government could also sign a management contract with clear performance indicators with NNPC. Public listing of the company on a stock exchange is an avenue to consider. If such profound reform is not feasible for lack

of political champions inside the government or within NNPC, a better avenue would be to privatize NNPC or at least some of its subsidiaries.

- 4. Include principles of climate change governance in the NNPC reform agenda.** Whether NNPC remains a public entity or is privatized, the government should impose climate change governance principles as recommended by TPI (see annex) on NNPC's management (and any other company operating in an emission-intensive industry).
- 5. Consider setting up a separate strategic division of NNPC or in case of NNPC privatization, an independent entity** with clearly delineated objectives and responsibilities focused on the low-carbon energy transition.
 - a. Organizational and strategic objectives:** Consider whether and how the division or entity should focus on:
 - Reducing carbon emission from existing and future oil and gas projects;
 - Planning how to limit the number and type oil and gas projects to facilitate the low-carbon transition;
 - Developing new business in renewable energy;
 - Coordinating with private investors or with other government agencies;
 - Ensuring alignment of activities with the objectives of the Paris Agreement and Nigeria's climate commitments; among others.

To prevent vested interests from stalling progress, the division or entity should be staffed with new hires with relevant skills and experience, including, for example, entrepreneurship, small businesses, venture capital, customer service and marketing, logistics, environmental economics, change management, project management, environmental science, information technology, among others.
 - b. Organizational processes:** Aspects to be considered include:
 - Establishing clear and relevant target metrics and performance results that are closely tied with the objectives of the entity and its role in the energy transition. Results should be made publicly available, independently audited, and used in evaluating effectiveness, such as:
 - Carbon intensity trajectory as compared to Paris Agreement-aligned emissions pathways;

- Quantity of methane leaks and gas flaring from oil and gas production;
 - Number of oil and gas fields with carbon capture and storage;
 - Number and percentage of households with home-based solar systems;
 - Percentage of overall power generation using renewables, natural gas, heat recovery systems, and carbon capture;
 - Percentage of building consumption using electricity, natural gas, and heat recovery systems;
 - Percentage of transportation consumption using electricity, liquefied petroleum gas, sustainable biofuels, and carbon capture.
- Establishing a compliance timeline for existing fields to stop gas flaring, control methane leaks, eliminate the use of diesel to power operations and facilities, make mandatory the use associated gas or renewable energies, and establish carbon emission standards.
 - Assessing the stranded asset risk and on this basis, establishing strict criteria for approvals of new oil and gas projects. These should include: prohibiting gas flaring, withdrawing fiscal incentives, and ensuring methane leak controls in place. New oil and gas projects should not increase Nigeria's stranded asset risk.
 - Establishing an independent oversight agency for contracting processes and awards, subjected to public disclosure requirements.
- c. Funding:** Funding sources for this new division or entity should be identified in advance and in ways that incentivize desired results. The following options could be considered:
- Establishing a formula for the specific source of funding for this division or entity, for example, from existing petroleum revenues, but with that source declining over time in order to avoid incentivizing more oil production. Funding from oil revenues would be replaced over time as the new division or entity achieves its commercial objectives and becomes self-sustaining.
 - Establishing joint ventures or funding mechanisms with Niger Delta Power Holding Company (NDPHC), NNPC's RED and Gas and Power divisions, the International Finance Corporation (IFC), the African Development Bank (AfDB), the European Union, USAID's Power Africa and private investors (such as the renewable energy divisions of the International Oil Companies) to assist with new energy transition projects and to assist smaller Nigerian oil companies with carbon emission compliance.

6. Conclusion

In contrast to the governments of Algeria, Brazil, Malaysia, Norway, and Saudi Arabia, the Nigerian government cannot yet rely on NNPC to harness the energy transition. NNPC's energy transition program is weak and lacks strategic and operational means.

Moreover, the government cannot rely on NNPC to be an oil and gas market player for the remaining time before fossil fuels become stranded. Its cost of extraction is too high for today's price levels, and its carbon intensity is higher than the global average, which is problematic for the environment as well as on a commercial basis as worldwide carbon pricing initiatives proliferate.

It is therefore imperative for NNPC to seize the energy transition as a business opportunity to save itself as well as Nigeria from its oil dependence. However, NNPC can only do so if it embarks on a long overdue reform of its governance. The disclosure of NNPC's audits that occurred in early 2020 for the first time in its history is a promising sign that the company may be turning a corner.

The experience and governance systems of the five NOCs reviewed for this report should not be followed blindly,²⁶⁸ as many of them should also considerably improve their governance and energy transition strategies. Even so, they remain ahead of NNPC in both areas and as such can serve as benchmarks or, at the very least, sources of inspiration.

Moreover, the benchmarking framework developed by the NRC for the governance of NOCs used in this report and that of TPI to assess the quality of the climate and energy transition governance and management (see Annex 1) are invaluable tools to guide the reform of the NNPC. We hope that these frameworks and the comparative experiences highlighted will support reflection around much-needed NNPC reform.

As Nigerian policymakers focus on mitigating the fallout from the painful recession triggered by the COVID-19 pandemic reform of NNPC should fall near the very top of the agenda. Such efforts will position NNPC to sustainably contribute to Nigeria's economy and energy independence in the long term.

Annex: TPI Questionnaire

Level 0: Unaware of Climate Change as a Business Issue

1. Does the company acknowledge climate change as a significant issue for the business?

Level 1: Acknowledging Climate Change as a Business Issue

2. Does the company recognize climate change as a relevant risk and/or opportunity for the business?

3. Does the company have a policy (or equivalent) commitment to action on climate change?

Level 2: Building Capacity

4. Has the company set greenhouse gas emission reduction targets?

5. Has the company published information on its Scope 1 and 2 greenhouse gas emissions?

Level 3: Integrating into Operational Decision Making

6. Has the company nominated a board member or board committee with explicit responsibility for oversight of the climate change policy?

7. Has the company set quantitative targets for reducing its greenhouse gas emissions?

8. Does the company report on Scope 3 emissions?

9. Has the company had its operational (Scope 1 and/or 2) greenhouse gas emissions data verified?

10. Does the company support domestic and international efforts to mitigate climate change?

11. Does the company disclose its membership and involvement in trade associations engaged in climate issues?

12. Does the company have a process to manage climate-related risks?

13. Does the company disclose Scope 3 use of product emissions?

Level 4: Strategic Assessment

14. Has the company set long-term quantitative targets for reducing its greenhouse gas emissions?

15. Does the company's remuneration for senior executives incorporate climate change performance?

16. Does the company incorporate climate change risks and opportunities in their strategy?

17. Does the company undertake climate scenario planning?

18. Does the company disclose an internal price of carbon?

19. Does the company ensure consistency between its climate change policy and the positions taken by trade associations of which it is a member?

Endnotes

- 1 Lisa Sachs, Nicolas Maennling, and Perrine Toledano, “How Oil and Gas Companies Can Help Meet the Global Goals on Energy and Climate Change” (Columbia Center on Sustainable Investment, June 20, 2017), http://ccsi.columbia.edu/files/2017/01/170620-Energy-and-Climate-Draft-Full-Master_v2.pdf.
- 2 “S&P 500® – S&P Dow Jones Indices,” accessed July 20, 2020, <https://www.spglobal.com/spdji/en/indices/equity/sp-500/#-data>.
- 3 “Oil demand is estimated to have dropped as a result of COVID-19 by 30% over the period March and April 2020. This drop is the equivalent loss in world demand of 30 million barrels per day of crude oil.” Anees Azzouni, “The Impact of Oil Demand Collapse and Persistent Oversupply on the Oil and Gas Industry, Markets, and the Transition to a Low Carbon World Regime” (Energy Consultant at Azzouni & Associates, Inc., May 21, 2020), <https://www.linkedin.com/pulse/impact-oil-demand-collapse-persistent-oversupply-gas-industry-anees>.
- 4 Eklavya Gupte, “Nigeria’s President Confirms Removal of Gasoline Subsidies,” *S&P Global Platts*, June 5, 2020, <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/060520-nigerias-president-confirms-removal-of-gasoline-subsidies>.
- 5 350 Africa Org, “Nigeria, Renewable Energy in Africa: An Opportunity in a Time of Crisis,” n.d., <https://7lo0w1yurlr3boz-jw1hac3st-wpengine.netdna-ssl.com/files/2020/07/Nigeria.pdf>.
- 6 “Renewable Energy,” Nigerian National Petroleum Corporation, accessed June 25, 2020, <https://www.nnpcgroup.com/NNPC-Business/Midstream-Ventures/Pages/Renewable-Energy.aspx>.
- 7 Justin Worland, “The Reason Fossil Fuel Companies Are Finally Reckoning with Climate Change,” *Time*, January 16, 2020, <https://time.com/5766188/shell-oil-companies-fossil-fuels-climate-change> and Tom Sanzillo, “IEEFA Update: Oil and Gas Stocks Place Dead Last in 2019, Again, despite 30% Price Rise,” *Institute for Energy Economics & Financial Analysis* (blog), January 9, 2020, <https://ieefa.org/ieefa-update-oil-and-gas-stocks-place-dead-last-in-2019-again-despite-30-price-rise>.
- 8 “S&P 500® – S&P Dow Jones Indices.”
- 9 Kevin Crowley and Brandon Kochkodin, “Exxon Poised to Drop From S&P 500’s Top 10 for First Time Ever,” *Bloomberg*, August 30, 2019, <https://www.bloomberg.com/news/articles/2019-08-30/exxon-poised-to-drop-from-s-p-500-s-top-10-for-first-time-ever>.
- 10 Sheela Tobben, “Negative Oil Prices: What Does Oil Below Zero Really Mean?,” *Bloomberg*, April 20, 2020, <https://www.bloomberg.com/news/articles/2020-04-20/negative-prices-for-oil-here-s-what-that-means-quicktake>.
- 11 Barbosa et al., “Oil and Gas after COVID-19.”
- 12 Barbosa et al., “Oil and Gas after COVID-19.”
- 13 Worland, “The Reason Fossil Fuel Companies Are Finally Reckoning with Climate Change.”
- 14 Patrick Heller, “Fiscal Futures: Are National Oil Companies Champions or Obstacles for Energy Transition?,” *International Budget Partnership* (blog), May 22, 2019, <https://www.internationalbudget.org/2019/05/fiscal-futures-are-national-oil-companies-champions-or-obstacles-for-energy-transition>.
- 15 “Energy – The Official Portal of the UAE Government,” United Arab Emirates Government, accessed June 11, 2020, <https://u.ae/en/information-and-services/environment-and-energy/water-and-energy/energy>.
- 16 Ramanan Krishnamoorti, “What Does The Oil Price Crisis Mean For The Energy Transition?,” *Forbes*, March 13, 2020, <https://www.forbes.com/sites/uhenergy/2020/03/13/what-does-the-oil-price-crisis-mean-for-the-energy-transition>.
- 17 BloombergNEF, “New Energy Outlook 2019,” *BloombergNEF* (blog), accessed June 15, 2020, <https://about.bnef.com/new-energy-outlook>.
- 18 “Costs,” International Renewable Energy Agency, accessed June 15, 2020, <https://www.irena.org/costs>.
- 19 BloombergNEF, “Falling Clean Energy Costs Can Provide Opportunity to Boost Climate Action in COVID-19 Recovery Packages,” *BloombergNEF* (blog), June 10, 2020, <https://about.bnef.com/blog/falling-clean-energy-costs-can-provide-opportunity-to-boost-climate-action-in-covid-19-recovery-packages>.
- 20 Cameron Hepburn, Brian O’Callaghan, Nicholas Stern, Joseph Stiglitz, and Dimitri Zenghelis, “Will COVID-19 Fiscal Recovery Packages Accelerate or Retard Progress on Climate Change?,” *Oxford Review of Economic Policy*, May 8, 2020, graa015, <https://doi.org/10.1093/oxrep/graa015>.
- 21 Siddharth Dixit, Yewande Kofoworola Ogundeji, and Obinna Onwujekwe, “How Well Has Nigeria Responded to COVID-19?,” *Brookings* (blog), July 2, 2020, <https://www.brookings.edu/blog/future-development/2020/07/02/how-well-has-nigeria-responded-to-covid-19>.

- 22 Simon Flowers, “How to Stop Nigeria’s Oil Industry Losing Relevance,” *The Edge*, December 4, 2018, <https://www.wood-mac.com/news/the-edge/how-to-stop-nigerias-oil-industry-losing-relevance>.
- 23 Liam Denning, “OPEC’s Next Domino to Fall Could Be Nigeria,” *Bloomberg*, May 12, 2020, <https://www.bloomberg.com/opinion/articles/2020-05-12/opec-s-next-oil-price-victim-could-be-nigeria>.
- 24 Flowers, “How to Stop Nigeria’s Oil Industry Losing Relevance.”
- 25 Olatokewa Ayoade, “The Economic Repercussion of Coronavirus Pandemic on Nigerians,” *Pulitzer Center*, June 10, 2020, <https://pulitzercenter.org/reporting/economic-repercussion-coronavirus-pandemic-nigerians>.
- 26 International Monetary Fund, “World Economic Outlook, April 2020: The Great Lockdown” (International Monetary Fund, April 14, 2020), <https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020>.
- 27 Emmanuel Abara Benson, “Nigeria Plans to Support Oil Price with Lower Production Cost per Barrel,” *Nairametrics* (blog), March 12, 2020, <https://nairametrics.com/2020/03/12/nigeria-plans-to-support-oil-price-with-lower-production-cost-per-barrel>.
- 28 Deji Elumoye, “Nigeria: Senate Slams NNPC Over High Cost of Crude Oil Production,” *allAfrica.com*, June 2, 2020, <https://allafrica.com/stories/202006020330.html>.
- 29 United Nations University Institute For Natural Resources In Africa, “Africa’s Development in the Age of Stranded Assets” (Discussion Paper, UNU-INRA, 2019), https://i.unu.edu/media/inra.unu.edu/publication/5247/Discussion-paper-Af-ricas-Development-in-the-age-of-stranded-Assets_INRAReport2019.pdf.
- 30 UNU-INRA, “Africa’s Development in the Age of Stranded Assets.”
- 31 Natural Resource Governance Institute, “The National Oil Company Database,” (Natural Resource Governance Institute, April 2019), 1–2, https://resourcegovernance.org/sites/default/files/documents/national_oil_company_database.pdf.
- 32 Patrick R. P. Heller and David Mihalyi, “Massive and Misunderstood: Data-Driven Insights into National Oil Companies” (Natural Resource and Governance Institute, April 2019), https://resourcegovernance.org/sites/default/files/documents/massive_and_misunderstood_data_driven_insights_into_national_oil_companies.pdf.
- 33 Natural Resource Governance Institute, “The National Oil Company Database.”
- 34 Fitch Ratings, “Nigerian Banks at Severe Risk from Oil Price Slump, Coronavirus,” *Fitch Wire* (blog), April 1, 2020, <https://www.fitchratings.com/research/banks/nigerian-banks-at-severe-risk-from-oil-price-slump-coronavirus-01-04-2020>.
- 35 Fitch Ratings, “Nigerian Banks at Severe Risk from Oil Price Slump, Coronavirus.”
- 36 Babajide Komolafe, “Fitch Ratings Signals Downgrade of Nigeria’s Sovereign Rating,” *Vanguard News* (blog), March 11, 2020, <https://www.vanguardngr.com/2020/03/fitch-ratings-signals-downgrade-of-nigerias-sovereign-rating/>.
- 37 Joe Parkinson and Benoit Faucon, “Oil Slump, Coronavirus Create a Perfect Storm for Nigeria’s Economy,” *Wall Street Journal*, April 27, 2020, <https://www.wsj.com/articles/oil-slump-coronavirus-create-a-perfect-storm-for-nigerias-economy-11588000761>.
- 38 Barbosa et al., “Oil and Gas after COVID-19.”
- 39 Elumoye, “Nigeria: Senate Slams NNPC Over High Cost of Crude Oil Production.”
- 40 Natural Resource Governance Institute, “The National Oil Company Database.”
- 41 International Energy Agency, “The Oil and Gas Industry in Energy Transitions,” World Energy Outlook special report (International Energy Agency, January 2020), <https://www.iea.org/reports/the-oil-and-gas-industry-in-energy-transitions>.
- 42 Filipe Barbosa, Giorgio Bresciani, Pat Graham, Scott Nyquist, and Kassia Yanosek, “Oil and Gas after COVID-19: The Day of Reckoning or a New Age of Opportunity?,” *McKinsey*, May 15, 2020, <https://www.mckinsey.com/industries/oil-and-gas/our-insights/oil-and-gas-after-covid-19-the-day-of-reckoning-or-a-new-age-of-opportunity>.
- 43 Bloomberg NEF, “New Energy Outlook 2019.”
- 44 Flowers, “How to Stop Nigeria’s Oil Industry Losing Relevance.”
- 45 Heller and Mihalyi, “Massive and Misunderstood: Data-Driven Insights into National Oil Companies.”
- 46 Climate Accountability Institute, “Top Twenty Rank 1965-2017,” accessed July 1, 2020, <https://climateaccountability.org/pdf/TopTwenty%20Rank%201965-2017.png>; Matthew Taylor and Jonathan Watts, “Revealed: The 20 Firms behind a Third of All Carbon Emissions,” *The Guardian*, October 9, 2019, <https://www.theguardian.com/environment/2019/oct/09/revealed-20-firms-third-carbon-emissions>.
- 47 Oil and Gas Climate Initiative, “Open Letter from the CEOs of the Oil and Gas Climate Initiative,” *OGCI* (blog), May 26, 2020, <https://oilandgasclimateinitiative.com/ceo-open-letter-2020>.
- 48 “Renewable Energy,” Nigerian National Petroleum Corporation.
- 49 “The TPI Tool,” Transition Pathway Initiative, accessed July 20, 2020, <https://www.transitionpathwayinitiative.org>.
- 50 “Equinor,” Transition Pathway Initiative, accessed June 16, 2020, <https://www.transitionpathwayinitiative.org/tpi/companies/equinor>.

- 51 Adapted from “Petrobras,” Transition Pathway Initiative, accessed June 16, 2020, <https://www.transitionpathwayinitiative.org/tpi/companies/petrobras>.
- 52 Petronas, *Energising Growth: Sustainability Report 2018* (Kuala Lumpur: Petronas, 2018), <https://www.petronas.com/sites/default/files/downloads/PETRONAS%20Sustainability%20Report%202018.pdf>.
- 53 “Advancing human progress and economic development while tackling the global climate issue is the great challenge of our time.” See Saudi Aramco, “Carbon Management,” accessed June 22, 2020, <https://www.saudiaramco.com/en/creating-value/technology-development/globalresearchcenters/carbon-management>.
- 54 Saudi Aramco, *This is Energy, This is Aramco: Saudi Aramco Annual Report 2019* (2020), <https://www.saudiaramco.com/-/media/publications/corporate-reports/saudi-aramco-ara-2019-english.pdf>.
- 55 “Carbon Capture, Utilization & Storage,” Saudi Aramco, accessed June 17, 2020, <https://www.saudiaramco.com/en/making-a-difference/planet/carbon-capture-utilization-and-storage>.
- 56 Algeria Future Energy, “Algeria Energy Summit 2018 Summary,” October 2018, <https://www.algeria-future-energy.com/wp-content/uploads/2019/02/FINAL-Algeria-Post-Event-Summary-2018.pdf>.
- 57 “SONATRACH Participation in the 24th Edition of the World Energy Congress. 09-12 September 2019 Abu Dhabi,” Sonatrach, accessed July 1, 2020, <https://sonatrach.com>.
- 58 Science Based Targets, “Science Based Targets,” accessed July 20, 2020, <https://sciencebasedtargets.org>.
- 59 “Reducing GHG Emissions – Targets and Measures,” Equinor.
- 60 “Global Gas Flaring Reduction Partnership (GGFR),” World Bank, accessed July 20, 2020, <https://www.worldbank.org/en/programs/gasflaringreduction>.
- 61 Ignatius Chukwu, “Revealed: Under-Reported Gas Flaring Leads to over \$1bn Losses,” *Businessday NG*, accessed July 27, 2020, <https://businessday.ng/energy/oilandgas/article/revealed-under-reported-gas-flaring-leads-to-over-1bn-losses>.
- 62 UNU-INRA, “Africa’s Development in the Age of Stranded Assets.”
- 63 “A Regulatory, Operational and Commercial Framework for the Utilization of Associated Petroleum Gas - Columbia Center on Sustainable Investment,” Columbia Center on Sustainable Investment, accessed July 20, 2020, <http://ccsi.columbia.edu/work/projects/a-regulatory-operational-and-commercial-framework-for-the-utilization-of-associated-gas>.
- 64 Perrine Toledano and Belinda Archibong, “Nigeria Associated Gas Utilization Study” (Columbia Center on Sustainable Investment, September 2016), <http://ccsi.columbia.edu/files/2014/06/Nigeria-APG-Utilization-Study-Sept-2016-CCSI.pdf>.
- 65 “Nigeria’s Flaring Reduction Target: 2020,” World Bank, accessed July 20, 2020, <https://doi.org/10/nigerias-flaring-reduction-target-2020>.
- 66 Federal Republic of Nigeria, “Flare Gas (Prevention of Waste and Pollution) Regulation 2018,” Official Gazette 105, No. 88 (July 9, 2018), <https://ngfcp.dpr.gov.ng/media/1120/flare-gas-prevention-of-waste-and-pollution-regulations-2018-gazette-cleaner-copy-1.pdf>.
- 67 This World Bank initiative brings together governments, oil companies, and development institutions who agree to cooperate to eliminate routine flaring no later than 2030. See “Zero Routine Flaring by 2030,” World Bank, accessed July 11, 2020, <https://www.worldbank.org/en/programs/zero-routine-flaring-by-2030>.
- 68 “Equinor,” Transition Pathway Initiative.
- 69 “Our New Climate Roadmap,” Equinor, accessed June 15, 2020, <https://www.equinor.com/en/how-and-why/climate.html>.
- 70 “Reducing GHG Emissions – Targets and Measures,” Equinor, accessed July 11, 2020, <https://www.equinor.com/en/how-and-why/sustainability/reducing-ghg-emissions.html>.
- 71 “Petrobras: 5 Facts about Our Sustainable Operations That You Will like to Know,” Petrobras, accessed June 16, 2020, <https://petrobras.com.br/en/news/5-facts-about-our-sustainable-operations-that-you-will-like-to-know.htm>; and Petrobras, *2019 Sustainability Report*, <https://api.mziq.com/mzfilemanager/v2/d/25fdf098-34f5-4608-b7fa-17d60b2d-e47d/9180c530-0eb6-e460-c56e-92441b216d65?origin=1>.
- 72 Petrobras, *2019 Sustainability Report*.
- 73 “Petrobras: 5 Facts about Our Sustainable Operations That You Will like to Know.”
- 74 Adapted from “Petrobras,” Transition Pathway Initiative.
- 75 Petronas, *Energising Growth*.
- 76 Sonatrach, *Rapport Annuel 2018*, <https://sonatrach.com/wp-content/uploads/2020/03/RAPPORT-ANNUEL-2018.pdf>.
- 77 Saudi Aramco, *This is Energy, This is Aramco*.
- 78 “Meet the Excellence behind Saudi Aramco’s Low Carbon Intensity,” Saudi Aramco, accessed July 14, 2020, <https://www.saudiaramco.com/en/magazine/elements/2020/low-carbon-intensity>. Considering scopes 1 and 2 emissions only, Saudi Aramco’s carbon intensity is comparatively low (Figure 5 above), but not low enough given the company’s proved liquid

reserves—five times greater than those of the five largest oil majors combined. (Source: Will Kennedy and Kelly Gilblom, “Saudi Aramco Pitches Itself as the Low-Carbon Investors’ Choice,” *WorldOil*, March 12, 2019, <https://www.worldoil.com/news/2019/12/3/saudi-aramco-pitches-itself-as-the-low-carbon-investors-choice>.)

79 “Renewable Energy,” Nigerian National Petroleum Corporation. We note that turning land use into crops for biofuels could actually generate emissions if this is at cost of deforestation and might pose problems for staple food production if not done carefully. See Richard Martin and Michael Reilly, “The Problem with Biofuels,” *MIT Technology Review*, January 1, 2016, <https://www.technologyreview.com/2016/01/27/163572/the-problem-with-biofuels>.

80 “Renewable Energy Division,” Nigerian National Petroleum Corporation, accessed June 25, 2020, <https://nnpcgroup.com/Ventures/Pages/RenewableEnergy.aspx>.

81 “Our New Climate Roadmap,” Equinor.

82 “Our New Climate Roadmap,” Equinor.

83 Petronas, *Energising Growth*.

84 Sonatrach, *Rapport Annuel 2018*.

85 Valérie Marcel, “National Oil Companies of the Future,” *Responsabilité & Environnement* 95, July 27, 2019, <http://www.annales.org/re/2019/re95/2019-07-27.pdf>.

86 Sonatrach, *Rapport Annuel 2018*.

87 CDP, “Petróleo Brasileiro SA – Petrobras – Climate Change 2019,” accessed June 17, 2020, <http://www.cdp.net>.

88 Petrobras, *2019 Sustainability Report*.

89 “Carbon Capture, Utilization & Storage,” Saudi Aramco.

90 Saudi Aramco, *This is Energy, This is Aramco*.

91 Bloomberg News, “Saudi Aramco’s Renewable Energy Push Seen Widening Appeal of IPO,” *Renewable Energy World*, March 6, 2017, <https://www.renewableenergyworld.com/2017/03/06/saudi-aramco-s-green-energy-push-seen-widening-appeal-of-ipo>.

92 Given the need for substantial capital and technology investment needed for the program to succeed, the limitations of domestic financing sources, and the potentially low level of attractiveness of the program to international financiers, Nigeria may need to rely on financing from international financing institutions, such as the World Bank or the African Development Bank.

93 “Our New Climate Roadmap,” Equinor.

94 “Carbon Capture, Utilization & Storage,” Saudi Aramco.

95 Infineum Insight, “Infineum Insight – Shaping Future Mobility,” accessed July 20, 2020, <https://www.infineuminsight.com/en-gb/articles/passenger-cars/shaping-future-mobility>.

96 Petronas, *Energising Growth*.

97 Petrobras, *2019 Sustainability Report*.

98 “Our New Climate Roadmap,” Equinor.

99 Saudi Aramco, *This is Energy, This is Aramco*.

100 “Our New Climate Roadmap,” Equinor.

101 Petronas, *Energising Growth*.

102 “Strategic Investments,” Saudi Aramco, accessed June 17, 2020, <https://www.saudiaramco.com/en/creating-value/technology-development/strategic-investments>.

103 “Equinor Innovate – Our Innovation Challenges,” Equinor, accessed June 15, 2020, <https://www.equinor.com/en/how-and-why/innovate.html>.

104 “Strategic Investments,” Saudi Aramco.

105 Capterio, “Saudi Aramco Post-IPO: Lower Carbon to Up Value,” *Capterio* (blog), November 5, 2019, <https://capterio.com/insights/2019-11-5-how-saudi-aramco-can-ensure-continued-value-post-ipo-keep-driving-down-the-carbon-intensity-of-production>.

106 Department of Petroleum Resources, “2018 Nigerian Oil and Gas Industry Annual Report,” <https://www.dpr.gov.ng/wp-content/uploads/2020/01/2018-NOGIAR-1.pdf>.

107 Department of Petroleum Resources, “2018 Nigerian Oil and Gas Industry Annual Report.”

108 “Our New Climate Roadmap,” Equinor.

- 109 This analysis of aspects of NNPC’s governance is based on a desktop review of publicly available documents, and draws heavily on the findings of a benchmarking exercise that was carried out by the Nigeria Natural Resource Charter and the Center for the Study of the Economies of Africa in 2019: Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report” (Nigeria Natural Resource Charter, February 18, 2020), <http://www.nigerianrc.org/nnrc/wp-content/uploads/2020/02/2019-Benchmarking-Exercise-Report.pdf>.
- 110 David Manley and Rob Pitman, “Natural Resource Charter Benchmarking Framework” (Natural Resource and Governance Institute, 2017), https://resourcegovernance.org/sites/default/files/documents/natural-resource-charter-benchmarking-framework-report-2017-web_0.pdf.
- 111 Federal Republic of Nigeria, Nigerian National Petroleum Corporation Act 1977, preamble, <https://www.ecolex.org/details/legislation/nigerian-national-petroleum-corporation-act-lex-faoc067455>.
- 112 Email communication with former oil and gas executive with experience working in Nigeria, July 30, 2020.
- 113 This tally is accurate as of October 2019. “Corporate Information,” Nigerian National Petroleum Corporation, n.d., <https://nnpcgroup.com/About-NNPC/Pages/Corporate-Information.aspx#>.
- 114 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 138; “NNPC Properties Limited,” Nigerian National Petroleum Corporation, n.d., <https://www.nnpcgroup.com/Ventures/Pages/NNPCProperties.aspx>; “NNPC Ventures,” Nigerian National Petroleum Corporation, n.d., <https://www.nnpcgroup.com/Ventures/Pages/default.aspx#>.
- 115 Oladehinde Oladipo, “Here’s What We Learnt from NNPC’s First Audited Accounts in Almost a Decade,” *Businessday NG*, June 16, 2020, <https://businessday.ng/short-take/article/heres-what-we-learnt-from-nnpcs-first-audited-accounts-in-almost-a-decade>. “Audited Financial Statements 2018,” Nigerian National Petroleum Corporation, accessed August 21, 2020, <https://nnpcgroup.com/pages/afs.aspx>.
- 116 Warri Refining and Petrochemical Company Limited, “Financial Statements Year Ended 31 December 2018,” n.d., <https://www.nnpcgroup.com/afs/Documents/2018%20Audited%20Financial%20Statements/WRPC%202018%20SIGNED%20FS.pdf>; Port Harcourt Refining Company Limited, “Financial Statements Year Ended 31 December 2018,” n.d., <https://www.nnpcgroup.com/afs/Documents/2018 Audited Financial Statements/PHRC 2018 SIGNED FS.pdf>; Kaduna Refining and Petrochemical Company Limited, “Annual Report Year Ended 31 December 2018,” n.d., <https://www.nnpcgroup.com/afs/Documents/2018%20Audited%20Financial%20Statements/KRPC%202018%20%20SIGNED%20FS.pdf>; CLS Stockbrokers, “Refinery Operations Still Loss-Making: Capacity Utilisation of the Four Refineries Still 0%,” *Nairametrics*, December 17, 2019, <https://nairametrics.com/2019/12/17/refinery-operations-still-loss-making-capacity-utilisation-of-the-four-refineries-still-0>; “Nigeria: NNPC’s Refineries Record Losses for Nine Consecutive Months,” *This Day*, December 17, 2019, <https://www.thisdaylive.com/index.php/2019/12/17/nnpcs-refineries-record-losses-for-nine-consecutive-months>.
- 117 Alexandra Gilles, Christina Katsouris, and Aaron Sayne, “Inside NNPC Oil Sales: A Case for Reform in Nigeria” (Natural Resource Governance Institute, November 20, 2015), <https://resourcegovernance.org/analysis-tools/publications/inside-nnpc-oil-sales-case-reform-nigeria>.
- 118 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report.”
- 119 Patrick Heller, Paasha Mahdavi, and Johannes Schreuder, “Reforming National Oil Companies: Nine Recommendations” (Natural Resource Governance Institute, November 20, 2015), 6, https://resourcegovernance.org/sites/default/files/documents/nrgi_9recs_eng_v3.pdf.
- 120 Amy Myers Jaffe and Jareer Elass, “Saudi Aramco: National Flagship with Global Responsibilities” (The James A. Baker III Institute for Public Policy, Rice University, March 2007), 24, https://www.bakerinstitute.org/media/files/page/9f100176/noc_saudiaramco_jaffe_elass_revised.pdf.
- 121 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 151, last accessed November 30, 2019, <https://argaamplus.s3.amazonaws.com/79d2e750-d71d-4d30-8ab4-b5b396b3125f.pdf>.
- 122 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 151.
- 123 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” xxxii.
- 124 Ariel Cohen, “Saudi Aramco IPO Hits \$2 Trillion Mark Amid Guarded Forecast,” *Forbes*, December 18, 2019, <https://www.forbes.com/sites/arielcohen/2019/12/18/saudi-aramco-ipo-hits-2-trillion-mark-but-forecast-still-guarded/#3a4c-f71e42e6>.
- 125 Paul Stevens, “Saudi Aramco: The Jewel in the Crown,” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, eds. David G. Victor, David R. Hulst, and Mark C. Thurber (Cambridge: Cambridge University Press, 2011), 216, <https://doi.org/10.1017/CBO9780511784057.008>.
- 126 María Kielmas, “Oil Investment in Latin America” in *International Oil and Gas Investments: Moving Eastwards?*, Thomas W. Walde and George K. Ndi (eds.) (London: London Graham & Trotman/Martinus Nijhoff, 1994).

- 127 Ewell E. Murphy, Jr., “Oil Operations in Latin America: The Scope for Private Enterprise,” *International Lawyer* 2, no. 3 (1967-1968), 464, <https://scholar.smu.edu/cgi/viewcontent.cgi?article=4372&context=til>.
- 128 Adilson de Oliveira, “Brazil’s Petrobras: Strategy and Performance” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, eds. David G. Victor, David R. Hults, and Mark C. Thurber (Cambridge: Cambridge University Press, 2011), 515, <https://doi.org/10.1017/CBO9780511784057.015>.
- 129 Kielmas, “Oil Investment in Latin America.”
- 130 Murphy Jr., “Oil Operations in Latin America.”
- 131 Marilda Rosado de Sá Ribeiro, “The New Oil and Gas Industry in Brazil: An Overview of the Main Legal Aspects,” *Texas International Law Journal* 36 (2001), 141; Luisa Palacios, “The Petroleum Sector in Latin America: Reforming the Crown Jewels,” (Les Études du CERI No. 88, Centre d’études et de recherches internationales, Sciences Po, September 2002), 17, https://inis.iaea.org/collection/NCLCollectionStore/_Public/48/026/48026263.pdf?r=1&r=1; Jay G. Martin, “Privatization of Latin America Energy,” *Natural Resources and Environment* 14, no. 103 (1999), 103.
- 132 Brazil’s oil sector was opened to foreign competition in 1997. See Palacios, “The Petroleum Sector in Latin America,” 18; Oliveira, “Brazil’s Petrobras,” 527–535; and Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 7.
- 133 “Sonatrach” in *International Directory of Company Histories*, ed. Jay P. Pederson, vol. 181 (Farmington Hills: St. James Press, 2016); Madjid Benchikh, “La nouvelle loi pétrolière algérienne : direction publique et économie de marché,” *L’Année du Maghreb* II (2005-2006), accessed July 20, 2020, <http://journals.openedition.org/anneemaghreb/103>; International Comparative Legal Guides, “Algeria: Oil & Gas Laws and Regulations 2020,” <https://iclg.com/practice-areas/oil-and-gas-laws-and-regulations/algeria>.
- 134 Kenneth W. Dam, “The Evolution of North Sea Licensing Policy in Britain and Norway,” *The Journal of Law and Economics* 17, no. 2 (1974), 235, <https://www.journals.uchicago.edu/doi/pdfplus/10.1086/466792>.
- 135 Willy H. Olsen, “Petroleum Revenue Management: An Industry Perspective” (paper delivered at Workshop on Petroleum Revenue Management, October 23–24, 2002, organized by the Oil, Gas, Mining and Chemicals Department of the WBG and ESMAP), 7, last visited on April 9, 2004, <http://www.worldbank.org/ogmc/files/willyolsenspeechpdf>.
- 136 “Statoil ASA,” last visited September 14, 2007, <http://www.regjeringen.no/en/dep/oed/Subject/State-participation-in-the-petroleum-sec/Statoil-ASA.html?id=457152>.
- 137 Olsen, “Petroleum Revenue Management—An Industry Perspective,” 2.
- 138 Fred R. Von Der Mehden and Al Trone, “Petronas: A National Oil Company with an International Vision” (The James A. Baker III Institute for Public Policy – Rice University, March 2007), 27, https://www.bakerinstitute.org/media/files/page/9dd51576/noc_petronas_tronervdm.pdf.
- 139 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 140; Mark C. Thurber, Ifeyinwa M. Emelife, and Patrick R. P. Heller, “NNPC and Nigeria’s Oil Patronage Ecosystem,” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, eds. David G. Victor, David R. Hults, and Mark C. Thurber (Cambridge: Cambridge University Press, 2011), 701–52, <https://doi.org/10.1017/CBO9780511784057.019>; Alexandra Gillies, “Reforming Corruption out of Nigerian Oil? Part One: Mapping Corruption Risks in Oil Sector Governance,” (U4 Brief 2009:2, 2009), 2 <https://www.cmi.no/publications/3295-reforming-corruption-out-of-nigerian-oil-part-one>.
- 140 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 140.
- 141 G. Ugo Nwokeji, “The Nigerian National Petroleum Corporation and the Development of the Nigerian Oil and Gas Industry: History, Strategies and Current Directions” (The James A. Baker III Institute for Public Policy – Rice University, March 2017), 23–26, https://www.bakerinstitute.org/media/files/page/9b067dc6/noc_nnpc_ugo.pdf.
- 142 Extractive Industries Transparency Initiative, “Validation Nigeria 2016 – Documentation” (Extractive Industries Transparency Initiative), January 11, 2017, <https://eiti.org/document/validation-nigeria-2016-documentation>; Extractive Industries Transparency Initiative, “Guidance on Quasi-Fiscal Expenditures (6.2),” n.d., <https://eiti.org/guidance-on-quasifiscal-expenditures-62>.
- 143 Email communication with former oil and gas executive with experience working in Nigeria, July 24, 2020.
- 144 Based on Ralf Boscheck, “The Governance of Oil Supply: An Institutional Perspective on NOC Control and the Questions It Poses,” *International Journal of Energy Sector Management* 1 (2007), 366–389; Silvana Tordo, Brandon S. Tracy, and Noora Arfaa, “National Oil Companies and Value Creation,” (Washington, D.C.: World Bank, Working Paper No. 218, 2011) 60, <https://openknowledge.worldbank.org/handle/10986/5922>; Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 6.
- 145 Richard Gordon and Thomas Stenvoll, “Statoil: A Study in Political Entrepreneurship” (The James A. Baker III Institute for Public Policy – Rice University, March 2007), 23, https://www.bakerinstitute.org/media/files/page/9ffcb110/noc_statoil

- [gordon_stenvoll.pdf](#); Columbia Center on Sustainable Investment, “Local Content: Norway – Petroleum,” 2016, http://ccsi.columbia.edu/files/2017/07/Local-Content_Norway_Nov2016.pdf.
- 146 Columbia Center on Sustainable Investment, “Local Content: Norway – Petroleum.”
- 147 Gordon and Stenvoll, “Statoil,” 23.
- 148 Olsen, “Petroleum Revenue Management-an Industry Perspective,” 2.
- 149 Gordon and Stenvoll, “Statoil,” 49–51.
- 150 Gordon and Stenvoll, “Statoil,” 49–51.
- 151 Stevens, “Saudi Aramco,” 184–187.
- 152 Martin, “Privatization of Latin America Energy.”
- 153 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 12.
- 154 Samantha Pearson and Joe Leahy, “Petrobras: Unfulfilled Potential,” *Financial Times*, October 17, 2013, <https://www.ft.com/content/290a359a-2f39-11e3-ae87-00144feab7de>; Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 14.
- 155 Petrobras, “Form 20-F, Annual Report, Pursuant to Section 13 or 15(D), of the Securities Exchange Act of 1934, for the fiscal year ended December 31, 2018, Commission File Number 001-15106, Petróleo Brasileiro S.A. – Petrobras,” <https://www.sec.gov/Archives/edgar/data/1119639/000119312519093231/d692671d20f.htm>.
- 156 Von Der Mehden and Troner, “Petronas,” 27.
- 157 Malaysia, Act No. 144, “Petroleum Development Act 1974” (Online Version, June 1, 2013), <http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act%20144%20-%20Petroleum%20Development%20Act%201974.pdf>.
- 158 Leslie Lopez, “Petronas: Reconciling Tensions Between Company and State,” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, eds. David G. Victor, David R. Hults, and Mark C. Thurber (Cambridge: Cambridge University Press, 2011), 827–828, <https://doi.org/10.1017/CBO9780511784057.021>.
- 159 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 6.
- 160 “Sonatrach” in *International Directory of Company Histories*, ed. Jay P. Pederson, vol. 181 (Farmington Hills: St. James Press, 2016); Benchikh, “La nouvelle loi pétrolière algérienne”; International Comparative Legal Guides, “Algeria.”
- 161 “Algeria: Oil and Gas,” Natural Resource Governance Institute, 2017 Resource Governance Index Country Profiles, <https://resourcegovernanceindex.org/country-profiles/DZA/oil-gas>.
- 162 Nick Butler, “New Head of Sonatrach Is an Opportunity for Algeria,” *Financial Times*, February 17, 2020, <https://www.ft.com/content/5bd9859c-4e4b-11ea-95a0-43d18ec715f5>; Business Insights Essentials, “Sonatrach Merry-Go-Round Continues,” February 14, 2020, <https://www.gale.com/c/business-insights-essentials>.
- 163 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies.”
- 164 Section 130(2), 148(1) of the Constitution 1999. Section 1(2) NNPC Act 1977. Public Procurement Act. Fiscal Responsibility Act.
- 165 Heller and Mihalyi, “Massive and Misunderstood.”
- 166 Gilles, Katsouris, and Sayne, “Inside NNPC Oil Sales.”
- 167 Abraham Wapner, “Downstream Beneficiation Case Study: Nigeria” (Columbia Center on Sustainable Investment, March 2017), http://ccsi.columbia.edu/files/2013/10/Nigeria-Case-Study-May-2017_CCSI-Final-2.pdf.
- 168 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 141.
- 169 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 146; NEITI, “Oil and Gas Industry Audit Report 2018,” 71–74 <https://www.neiti.gov.ng/index.php/neiti-audits/oil-and-gas/category/203-oga-2018-report>.
- 170 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 141.
- 171 Gilles, Katsouris, and Sayne, “Inside NNPC Oil Sales.”
- 172 While the Petronas holding is not listed on the Malaysian stock exchange, three of its subsidiaries are.
- 173 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 13.
- 174 Equinor, *2018 Annual Report and Form 20-F*, 76, <https://www.equinor.com/content/dam/statoil/documents/annual-reports/2018/equinor-2018-annual-report.pdf>.
- 175 Equinor, *2018 Annual Report and Form 20-F*, 77.
- 176 Equinor, *2018 Annual Report and Form 20-F*, 76.
- 177 Juan M. Ramírez-Cendrero and María. J. Paz, “Oil fiscal regimes and national oil companies: A comparison between Pemex and Petrobras,” *Energy Policy* 101 (2017), 476, <http://dx.doi.org/10.1016/j.enpol.2016.11.009>; Petrobras, “Financial Statements for December 31, 2018, 2017 and 2016 with report of independent registered public accounting firm,” last accessed September 28, 2019, 94, https://www.investidorpetrobras.com.br/enu/67/DFF4T18USIngles_0.pdf.
- 178 Tordo, Tracy, and Arfaa, “National Oil Companies and Value Creation,” 60.

- 179 Petrobras, “Form 20-F...for the fiscal year ended December 31, 2018,” 34.
- 180 Peter D. Cameron and Michael C. Stanley, “Oil, Gas, and Mining: A Sourcebook for Understanding the Extractive Industries” (Washington, DC: World Bank, 2017), <https://openknowledge.worldbank.org/handle/10986/26130>; Ribeiro, “The New Oil and Gas Industry in Brazil,” 141; Palacios, “The Petroleum Sector in Latin America,” 18.
- 181 Petrobras, “Form 20-F...for the fiscal year ended December 31, 2018,” 159.
- 182 Mark Thurber, David Hults, and Patrick R.P. Heller, “The Limits of Institutional Design in Oil Sector Governance: Exporting the ‘Norwegian Model’” (ISA Annual Convention 2010, New Orleans, LA, February 18, 2010), 16 https://resourcegovernance.org/sites/default/files/Thurber_Hults_%20and_Heller_ISA2010paper_11Feb10.pdf.
- 183 Von Der Mehden and Troner, “Petronas,” 16.
- 184 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies.”
- 185 Petronas, *Energising Growth*, 17.
- 186 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 46.
- 187 Valérie Marcel and John V. Mitchell, *Oil Titans: National Oil Companies in the Middle East* (London: Brookings Inst. Press/Chatham House, 2006), 133.
- 188 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 163.
- 189 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 46.
- 190 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 99.
- 191 Jaffe and Elass, “Saudi Aramco: National Flagship with Global Responsibilities,” 46–47.
- 192 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 20.
- 193 Heller and Mihalyi, “Massive and Misunderstood.”
- 194 Nick Butler, “New Head of Sonatrach Is an Opportunity for Algeria”; Eklavya Gupte and Illies Sahar “Toufik Hakkar Takes over as New CEO of Algeria’s Sonatrach | S&P Global Platts,” February 6, 2020, <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/020620-toufik-hakkar-takes-over-as-new-ceo-of-algerias-sonatrach>; “Sonatrach seeks foreign expertise to explore shale potential.” Country Report: Algeria 23 Mar. 2020: NA. Business Insights: Essentials. Web. 20 July 2020, <http://bi.gale.com.ezproxy.cul.columbia.edu/essentials/article/GALE%7CA619130260?u=columbiau>; “New Sonatrach head urges co-operation with foreign firms.” Country Report: Algeria 10 May 2019: NA. Business Insights: Essentials. Web. 20 July 2020, <http://bi.gale.com.ezproxy.cul.columbia.edu/essentials/article/GALE%7CA609699650?u=columbiau>
- 195 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report.”
- 196 Thurber, Emelife, and Heller, “NNPC and Nigeria’s Oil Patronage Ecosystem,” 28, 30.
- 197 Thurber, Emelife, and Heller, “NNPC and Nigeria’s Oil Patronage Ecosystem,” 18.
- 198 Thurber, Emelife, and Heller, “NNPC and Nigeria’s Oil Patronage Ecosystem,” 28.
- 199 Federative Republic of Brazil, Law No. 6404, December 15, 1976, http://www.planalto.gov.br/ccivil_03/leis/L6404compilada.htm; Federative Republic of Brazil, Law No. 13,303, June 30, 2016, http://www.planalto.gov.br/ccivil_03/ato2015-2018/2016/lei/l13303.htm; and Federative Republic of Brazil, Decree No. 8945, December 27, 2016, http://www.planalto.gov.br/ccivil_03/ato2015-2018/2016/Decreto/D8945.htm.
- 200 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 3(3), <https://www.sec.gov/Archives/edgar/data/1119639/000119312519093231/d692671dex11.htm>.
- 201 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 3(4).
- 202 Equinor, *2018 Annual Report and Form 20-F*, 47, 103.
- 203 Stevens, “Saudi Aramco,” 188–192, 216.
- 204 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 15; Malaysia, Act No. 144, “Petroleum Development Act 1974.”
- 205 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 14, 27.
- 206 John Entelis, “Sonatrach: The Political Economy of an Algerian State Institution,” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, eds. David G. Victor, David R. Hults, and Mark C. Thurber (Cambridge: Cambridge University Press, 2011), 557–598, <http://doi:10.1017/CBO9780511784057.01>.
- 207 Entelis, “Sonatrach,” 584.
- 208 Entelis, “Sonatrach,” 569–570.
- 209 Federal Republic of Nigeria, Nigerian National Petroleum Corporation Act 1977, Section 1(2).
- 210 Federal Republic of Nigeria, Nigerian National Petroleum Corporation Act 1977, Section 1(3).

- 211 Organisation for Economic Co-operation and Development, *G20/OECD Principles of Corporate Governance 2015* (Paris: OECD Publishing, 2015), <https://doi.org/10.1787/9789264236882-en>. See also Tordo, Tracy, and Arfaa, “National Oil Companies and Value Creation.”
- 212 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 16.
- 213 Equinor, *2018 Annual Report and Form 20-F*, 101.
- 214 Equinor, *The Equinor Book* (Equinor, 2018), 33, <https://www.equinor.com/content/dam/statoil/documents/equinor-book/the-equinor-book-v1-2018.pdf>.
- 215 Equinor, “Articles of Association for Equinor ASA (Effective from 14 May 2020),” Art. 6, <https://www.equinor.com/content/dam/statoil/documents/corporate-governance/equinor-articles-of-association-2020-05-14.pdf>.
- 216 Equinor, “Articles of Association for Equinor,” Art. 4.
- 217 Equinor, *2018 Annual Report and Form 20-F*, 103.
- 218 Equinor, *2018 Annual Report and Form 20-F*, 108.
- 219 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 96.
- 220 Saudi Aramco, “Saudi Arabian Oil Company (Saudi Aramco) Domestic Offering Prospectus,” 97.
- 221 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 18.
- 222 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 1(1).
- 223 Petrobras, “Form 20-F...for the fiscal year ended December 31, 2018,” 22.
- 224 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 19(V).
- 225 Federative Republic of Brazil, Law No. 13,303, June 30, 2016, Art. 22(1); Federative Republic of Brazil, Decree No. 8945, December 27, 2016, Art. 36(1); Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 18(5).
- 226 Petrobras, “Bylaws of Petróleo Brasileiro S.A. – Petrobras,” Art. 20.
- 227 Petronas, *2010 Petronas Annual Financial Report*, 29, <https://www.petronas.com/sites/default/files/2018-08/petronas-annual-report-2010.pdf>.
- 228 Petronas, *Energising Growth*, 105, 107.
- 229 Entelis, “Sonatrach,” 569; Sonatrach, *Rapport Annuel 2018*.
- 230 Sonatrach, *Rapport Annuel 2018*.
- 231 Entelis, “Sonatrach,” 569.
- 232 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report.”
- 233 Olive U. Egbuta, “Leadership Succession Practices and Employees’ Career Development in the Nigerian National Petroleum Corporation,” *Journal of WEI Business and Economics* 8 (2019), 15.
- 234 Egbuta, “Leadership Succession Practices and Employees’ Career Development in the Nigerian National Petroleum Corporation,” 12–13.
- 235 Stevens, “Saudi Aramco,” 199–197.
- 236 “Careers | Default,” Petrobras, accessed July 27, 2020, <https://petrobras.com.br/en/about-us/careers>.
- 237 “Compliance, Ethics and Transparency,” Petrobras, accessed July 27, 2020, <https://petrobras.com.br/en/about-us/profile/compliance-ethics-and-transparency>.
- 238 Equinor, “Code of Conduct,” n.d., <https://www.equinor.com/content/dam/statoil/documents/ethics/equinor-code-of-conduct.pdf>.
- 239 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 17; Securities Commission Malaysia, *Malaysian Code on Corporate Governance*, April 2017, <https://www.sc.com.my/api/documentms/download.ashx?id=70a5568b-1937-4d2b-8cbf-3aefed112c0a>. For more details, see Michael Yeoh and Farizal Hj. Mohd. Razalli, “Reinventing Corporate Governance in Corporate Malaysia: The Challenges Ahead,” in *Malaysia: Recent Trends and Challenges*, eds. S.H. Saw and K. Kesavapany (Institute of Southeast Asian Studies Press, 2006); Dayana Mastura Baharudin and Maran Marimuthu, “Comparison of MCG 2012 and MCG 2017: Board Tenure and Board Independence Across the Malaysian Oil and Gas PLCs,” *Business Management and Strategy* 10, no. 2 (2019).
- 240 Petronas, “PETRONAS Code of Conduct and Business Ethics,” 2013, <https://www.petronas.com/sites/default/files/downloads/sustainability-cobe-guide-050214.pdf>.
- 241 Sonatrach, “Code de Conduite de Sonatrach,” n.d., <https://www.resourcedata.org/dataset/rgi-code-de-conduite-de-sonatrach/resource/97d1bf0f-1cc1-45c2-8cde-a1f9196b96fd>.
- 242 “Nigeria: Oil and Gas,” Natural Resource Governance Institute, 2017 Resource Governance Index Country Profiles.
- 243 “Commodity Trading,” Extractive Industries Transparency Initiative, n.d., <https://eiti.org/commodity-trading>.
- 244 “Commodity Trading,” Extractive Industries Transparency Initiative.
- 245 “Nigeria: Oil and Gas,” Natural Resource Governance Institute, 2017 Resource Governance Index Country Profiles.

- 246 Emmanuel Addeh, “Nigeria: In Historic Move, NNPC Releases Audited Results to Public,” *This Day*, June 16, 2020, <https://www.thisdaylive.com/index.php/2020/06/16/in-historic-move-nnpc-releases-audited-results-to-public>.
- 247 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 20; Lopez, “Petronas,” 827–828.
- 248 “Main Market,” Bursa Malaysia, n.d., https://www.bursamalaysia.com/trade/trading_resources/listing_directory/main_market.
- 249 Sam Meredith, “Saudi Aramco Bond Offering Attracts Massive \$100 Billion in Investor Interest,” *CNBC*, April 9, 2019, <https://www.cnbc.com/2019/04/09/saudi-aramco-bond-sale-investors-flock-to-worlds-most-profitable-firm.html>.
- 250 Natural Resource Governance Institute, “2017 Resource Governance Index,” (Natural Resource Governance Institute, 2017), https://api.resourcegovernanceindex.org/system/documents/documents/000/000/046/original/2017_Resource_Governance_Index.pdf?1498599435.
- 251 European Commission, “Public Country-by-Country Reporting,” n.d., https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/public-country-country-reporting_en.
- 252 Extractive Industries Transparency Initiative, “The EITI, NOCs and the Sale of the Government’s Oil,” EITI International Secretariat, March 26, 2015, https://eiti.org/files/documents/EITI_Brief_NOC_FirstTrade_March2015.pdf.
- 253 Natural Resource Governance Institute, “2017 Resource Governance Index.”
- 254 Natural Resource Governance Institute, “2017 Resource Governance Index.”
- 255 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 144; “Nigeria: Oil and Gas,” Natural Resource Governance Institute, 2017 Resource Governance Index Country Profiles, <https://resourcegovernanceindex.org/country-profiles/NGA/oil-gas>; Nigerian Extractive Industries Transparency Initiative, “NEITI Commends, Charges NNPC on Openness,” January 25, 2017, <https://www.neiti.gov.ng/index.php/component/k2/item/274-neiti-commends-charges-nnpc-on-openness>.
- 256 Addeh, “Nigeria: In Historic Move, NNPC Releases Audited Results to Public.”
- 257 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 21.
- 258 Sonatrach, *Rapport Financier 2018*, <https://sonatrach.com/wp-content/uploads/2019/10/COMPTE-CONSOLIDES-GROUPE-SONATRACH-EXERCICE-2018-FR-EN.pdf>.
- 259 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 22.
- 260 “Nigeria: Oil and Gas,” Natural Resource Governance Institute.
- 261 Nigeria Natural Resource Charter, “2019 Benchmarking Exercise Report,” 146.
- 262 Elumoye, “Nigeria: Senate Slams NNPC Over High Cost of Crude Oil Production.”
- 263 International Monetary Fund Fiscal Affairs Department, Brazil: Technical Assistance Report-Public Investment Management Assessment (International Monetary Fund, 2018).
- 264 Algerian Republic, Law No. 05-07 regarding hydrocarbons, April 28, 2005, Art. 47, http://www.alnaft.gov.dz/images/loi_n05_07_relative_aux_hydrocarbures_et_ses_textes_d_application.pdf.
- 265 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 22.
- 266 Equinor, *2018 Annual Report and Form 20-F*.
- 267 Najim Animashaun, “Nigeria: The Urgent Need to Reform NNPC,” *The Guardian Nigeria*, July 10, 2020, <https://guardian.ng/opinion/nigeria-the-urgent-need-to-reform-nnpc>; EITI, “Nigeria Uses EITI to Reform Industry, Build Accountability,” *Extractive Industries Transparency Initiative* (blog), February 27, 2019, <https://eiti.org/news/nigeria-uses-eiti-to-reform-in-dustry-build-accountability>; Christina Katsouris, “Buhari’s Second Chance at Oil and Gas Reform in Nigeria,” *Chatham House* (blog), April 4, 2020, <https://www.chathamhouse.org/expert/comment/buhari-s-second-chance-oil-and-gas-reform-nigeria>.
- 268 For instance, some criticism is mounting on the viability of NOC’s and country’s strategies to become leaders in CCS. See Clark Butler, “IEEFA Australia: Carbon Capture and Storage Is a Poor Investment,” *Institute for Energy Economics & Financial Analysis* (blog), July 1, 2020, <https://ieefa.org/ieefa-australia-carbon-capture-and-storage-is-a-poor-investment>.
- 269 Heller, Mahdavi, and Schreuder, “Reforming National Oil Companies,” 7.



ccsi.columbia.edu

Columbia Center on
Sustainable Investment

Jerome Greene Hall
435 West 116th Street
New York, NY 10027
Phone: +1 (212) 854-1830
Email: ccsi@law.columbia.edu

The Columbia Center on Sustainable
Investment is a leading applied research
center and forum dedicated to the study,
discussion and practice of sustainable
international investment.