Research Paper

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# The Cost of an Emerging National Oil Company

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# Contents

# Summary


- The fall in oil prices since mid-2014 has profoundly changed the prospects for national oil companies (NOCs). If, as seems likely, prices remain low for a number of years, investors will be far more cautious, international oil companies will see reduced cash flows, and many exploration projects will be put on hold or cancelled. NOCs, and the oil and gas industry as a whole, must reconsider their strategies.
- This will have an impact on the ambitious plans that some emerging producers had nurtured for national participation in the petroleum sector, forcing them to refocus on an affordable strategy for developing upstream capabilities.
- Governments of emerging and prospective producer countries, and their NOCs, need to understand the cost of various NOC roles, and how these can be financed at different stages of developing the resource base. This will enable them to formulate clear and appropriate strategies for the future.
- The current environment offers an opportunity for governments to refocus their efforts on defining a mandate that supports their national vision and priorities. This requires an evaluation of the resource base, national capabilities (including those of the NOC) and possible revenue streams, so that the NOC can be tasked with a role it can execute and the state can afford.
- Governments must approve clear revenue streams for NOCs.
- NOCs should focus on costs, as well as on strong accounting and reporting standards.
- Governments and NOCs should be strategic about capacity-building, so that efforts and scarce resources are dedicated to building the right skills and using them on the job.

# Preface

This research paper is a product of the New Petroleum Producers Discussion Group, a project which aims to enhance the capacity of emerging oil and gas producers to establish context-appropriate rules and institutions for good governance of their petroleum sectors and to engage credibly with international partners.[1] The project engages with a wide range of countries in the Eastern Mediterranean, North Africa, sub-Saharan Africa, Southeast Asia and the Caribbean, where exploration interest surged during the high oil price era. This prompted domestic debates about how to structure and govern the nascent petroleum sector with the aim of maximizing long-term benefits to the nation.

Data were collected from annual reports of national oil companies (NOCs) and interviews with NOC executives.[2] A first version of the paper was published by KPMG Global Energy Institute in 2014, and its analysis and conclusions are revisited in the context of the drop in oil prices.[3] Insights on the impact of the commodity downturn on NOC strategic directions were drawn from the New Petroleum Producers Discussion Group meeting in Dar es Salaam in July 2015.[4]

While this paper is published under the auspices of the New Petroleum Producers Discussion Group project, its recommendations are not sanctioned by the Discussion Group until they have been debated and the group's consensus has been reflected in the Guidelines for Good Governance in Emerging Oil and Gas Producers (which are updated after each meeting). As such, the author assumes all responsibility for any opinions expressed, as for any errors and omissions.

[1] More information about the project can be found at http://www.chathamhouse.org/about/structure/eer-department/new-petroleum-producers-discussion-group-project.
[2] Jamal Srouji and the author collected data from annual reports and other publicly available sources in 2013 and 2015–16. The author interviewed the following people in 2014: Sam Addo Nortey, Principal Audit Officer, Ghana National Petroleum Corporation; Ken Mugambi, Head of Corporate Planning and Strategy, National Oil Corporation of Kenya; Obeth Mbuipaha Kandjoze, when he was Managing Director, National Petroleum Corporation of Namibia (now Minister of Mines & Energy, Namibia); Eddy Belle, CEO, PetroSeychelles. Off-the-record discussions were also held with executives at a leading oil services company and several NOCs between 2014 and 2016.
[3] Marcel, V., Lobo, A. and Saludeen, D. (2014), 'Unlocking the potential of Africa's NOCs', https://home.kpmg.com/xx/en/home/insights/2014/11/unlocking-potential-africas-nocs.html.
[4] Summary notes for the meeting are available at https://www.chathamhouse.org/event/third-meeting-new-petroleum-producers-discussion-group.

# Introduction

Major oil and gas discoveries during the last decade opened new energy frontiers in East Africa and offshore West Africa, as well as in the Caribbean and the Mediterranean. These regions saw a surge of exploration interest from foreign oil companies of various sizes.

However, the fall in oil prices since mid-2014 has profoundly changed the prospects for NOCs. If, as seems likely, prices will remain low for a number of years, NOCs, and the oil and gas industry as a whole, must reconsider their strategies and ambitions. Investors will be far more cautious, international oil companies will see reduced cash flows, and many exploration projects will be put on hold or cancelled.[5] Companies are focusing on developing reserves rather than exploring for new ones.

This will have an impact on the ambitious plans that some emerging producers had nurtured for national participation in the petroleum sector, forcing them to refocus on an affordable strategy for developing upstream capabilities. Domestic aspirations in countries with recent discoveries are still strong, however. Many national oil companies were created, or existing ones restructured, to take on greater responsibility for exploiting new-found reserves. Some of these NOCs were called on to develop operator capabilities. As an operator, an NOC has legal authority to explore for and produce petroleum resources in a given field. In practice this requires the company to have the capability to propose a development plan, raise money and manage a large project, including supervising international partners and contractors.

Given those very high expectations – along with a need to demonstrate to the public an ability to exploit reserves efficiently and transparently – some governments have tasked NOCs with roles they cannot play because of limited capabilities. And without a clear view of revenue streams in the pre-production phase, those NOCs struggle to make staffing decisions, develop strategies to deliver these roles and raise finance.

There is often a mismatch between available finance in emerging producer countries and national aspirations for the extent of NOC activities in the early stages of development. The current environment offers an opportunity for governments to refocus their efforts on defining a mandate that the country can afford.

This paper examines the cost of various NOC roles in new or prospective producer countries and how they can be financed at different stages of developing the resource base. Governments of emerging producer countries, and their NOCs, need to understand what is possible today in order to develop clear and appropriate strategies for getting to where they want to be tomorrow.

[5] Mitchell, J., Marcel, V. and Mitchell, B. (2015), *Oil and Gas Mismatches: Finance, Investment and Climate Policy,* London: Chatham House, https://www.chathamhouse.org/sites/files/chathamhouse/field/field_document/20150709OilGasMismatchesMitchellMarcelMitchellUpdate.pdf.

# Range of Roles for Emerging NOCs

Many emerging producer countries have established NOCs to ensure national participation in the petroleum sector, beyond simple collection of licence payments, royalties and taxes. For some countries – Uganda and Timor-Leste, for instance – the establishment of the NOC is quite new. Many others – including Lebanon, São Tomé e Príncipe and Sierra Leone – continue to debate the option. Emerging producers with NOCs established decades ago must now consider how to restructure them to achieve current objectives. The Tanzania Petroleum Development Corporation (TPDC) was incorporated as early as 1969. The National Oil Corporation of Kenya (National Oil) and the Empresa Nacional de Hidrocarbonetos (ENH) of Mozambique were created in 1981; Suriname's Staatsolie in 1980; the Ghana National Petroleum Corporation (GNPC) in 1983; and the National Petroleum Corporation of Namibia (NAMCOR) in 1991. Over the years, the mandate of these NOCs has changed, usually alternating between a focus on the upstream and the downstream depending on whether promoting new exploration or securing adequate supplies of refined products was more important at the time.

For some governments the objective is for their NOC to become an upstream operator. In principle, relying too much on foreign oil companies may not be in the national interest since they may not invest as much in developing local human capital and infrastructure. An NOC operator would be expected to transfer more revenue to the Treasury than a foreign oil company. Governments also look to established peers, such as Brazil or Malaysia, whose success they attribute to their capable and internationalized NOCs.

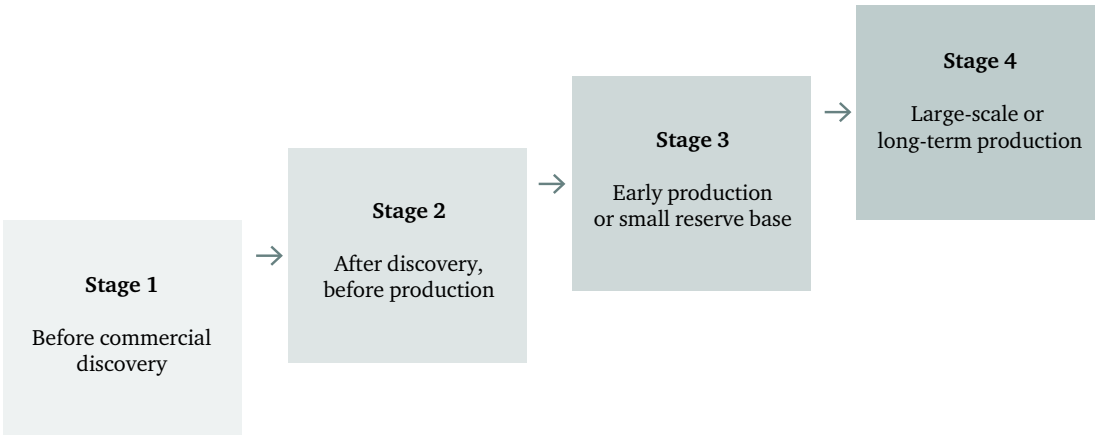
In many emerging producer countries, petroleum laws provide the NOC with a legal right to take on operator responsibilities for fields; some laws specifically mandate it to become an operator, while others provide only a vaguely phrased mandate. A problem arises when these national priorities are not implemented because they are well above the capabilities of the NOC. Moreover, a lack of clear policy directives or capacity in government institutions can lead the NOC to assume a role in the petroleum sector without a political mandate.

NOCs succeed when governments are clear about the role they are meant to play and are committed to both supporting them and keeping a watchful eye over them.

## NOC roles and resources in four key stages of resource development

This section outlines typical NOC roles and the human and financial resources deployed to carry them out at four key stages in resource development (see Figure 1). The range of practice (actual spend and manpower) for each role is discussed, with a particular focus on the first two stages. But it is important to note that these may not be optimal. First, the analysis of NOC financial and human resource deployment is largely based on data from the period 2010–14, when high oil prices and strong exploration activity led to a significant growth in NOC ambitions. During this period of high oil prices and strong exploration activity NOC ambitions grew significantly. Most NOCs have since seen their budgets cut as a result of falling oil prices and slowing upstream activity from the fourth quarter of 2014. Second, many NOCs have not relied on manpower mapping exercises to clarify what resources and skills are needed to execute the role assigned to them. The impact of a continuing era of low prices on NOCs at each of these stages is also considered.

**Figure 1: Four key stages in resource development**




## Stage 1: Before commercial discovery

| Stage 1 NOCs – common circumstances before commercial discovery | | |
|---|---|---|
| **Role** | **Human resources** | **Finance** |
| Minority equity stakeholder, and sometimes a governance role in the petroleum sector. | Small workforce required for NOCs without a governance role and not active in the downstream. Technical staff increases with exploration activity when NOC has a governance role. | Government allocation is a core source of funding. Downstream sales and payments from operators can help. Funding is inconsistent. |

### Roles

During the exploration phase the NOC's role is usually to represent the state in the upstream through minority stakes in licences awarded to foreign oil companies. NOCs in these instances hold an equity stake – usually between 5 per cent and 20 per cent – which is most often carried financially by the foreign oil companies, at least until discoveries are made and sometimes until production begins. As such, the oil companies that are majority shareholders handle the costs of exploration and development, and sometimes that carried cost is refunded through the revenues of first oil. Governments may grant the NOC a guaranteed minority stake through the petroleum law, or the NOC may be left to negotiate its stake with foreign oil companies. Many NOCs in the early stages of developing the resources are also tasked with a 'governance role'. This may involve promotion of the acreage, collection and management of geological data, licensing and/or monitoring foreign oil company activities.

## Human resources

NOCs in the pre-discovery phase vary considerably in the size of their workforce, ranging from less than a dozen upstream experts to 50 or even more.

Differences in terms of levels of exploration activities and concessionaire responsibilities explain much of the variation in scale of companies. PetroSeychelles, for instance, which handles promotion for the Seychelles, has a staff of 11. Exploration interest there only restarted in 2012, after the last exploratory well was drilled in 1995. But the small size of the NOC is also attributable to its self-restraint. 'We are not in a growth stage because we must stay lean until we make discoveries,' explained the company's CEO, Eddy Belle.[6]

In contrast, the National Oil Company of Liberia (NOCAL), which has overseen three licensing rounds since 2009, expanded its staff from 37 in 2010 to 146 in 2014. An executive of the company estimated the share of staff involved in carrying out the governance role to be three-quarters of the total.[7] However, this increase in staff was not warranted by the workload in the upstream and became too costly, especially as payments from new contracts signed were delayed by slow ratification. President Ellen Johnson Sirleaf said that 'despite the obvious decline in revenue that began in late 2013, NOCAL continued hiring staff at an alarming rate with exorbitant benefits, resulting in the current wage bill of over $7 million (US) per annum'.[8] In August 2015, following the Board of Directors' recommendation, NOCAL addressed the funding crisis by laying off more than 80 per cent of its workforce, reducing it from 162 to 43 (including three vice presidents and its CEO). It now has an interim three-man senior management team along with some technical staff, who were given short-term contracts, renewable every two months.[9]

Other companies also expanded their workforce, spurred by ambitions to develop upstream operator capabilities. NAMCOR of Namibia, for instance, doubled its staff to 99 between 2013 and 2014.[10] The increase was not attributable to its governance role: while the company advises the ministry and handles data management on behalf of the government, it is not the concessionaire, and exploration activity is limited.

Several NOCs have a significantly larger workforce because of their downstream activities. Uruguay's Administración Nacional de Combustibles, Alcoholes y Portland (ANCAP), which has a workforce of 2,837 people, operates a refinery and has a dominant national position in the marketing of products. But the company also nurtures upstream ambitions, and established an exploration and production training centre in 2014.

Investing in capacity-building in Stage 1 allows the NOC to prepare for a greater operational role at a later stage. Similarly, allowing it to take a majority stake in a licence in the pre-discovery stage, with a view to conducting seismic studies and eventually farming out part of the stake to a qualified operator, offers greater opportunities to build skills. But these strategies are risky. The country can gain more if the projects succeed, but it will lose more if they fail. At this stage the risk that a project (or all projects) will fail is greater, so a decision to invest very heavily in NOC engagement is much more perilous.

[6] Interview with Eddy Belle, CEO PetroSeychelles, March 2014.
[7] Interview with a NOCAL company executive, April 2014.
[8] Butty, J. (2015), 'Liberia's National Oil Company Sacks Entire Staff', Voice of America, 26 August 2015, http://www.voanews.com/content/liberias-national-oil-company-sacks-entire-staff-of-200/2932682.html.
[9] Interview with a company executive (via email), January 2016.
[10] Interview with Obeth Kandjoze, May 2014.

## Finance

Day-to-day operating expenses – including capacity-building and training – are the greatest cost for NOCs in Stage 1 because their share of costs in projects is usually carried during this exploration phase.

The issue of high spend on developing capacity in the upstream in countries without a proven resource base will certainly come to the fore if exploration activity does not yield expected results. In the short term activity levels will drop, as drilling programmes are put on hold. And in the long term those NOCs cannot be guaranteed future work in the upstream without an established reserve lifespan. Sources of finance are also limited because there are no upstream revenues from production.

> Most pre-production NOCs rely on government funding, for everything from initial start-up capital to emergency lending in times of trouble. For this reason, budgeting can be uncertain.

Most pre-production NOCs rely on government funding, for everything from initial start-up capital to emergency lending in times of trouble. For this reason, budgeting can be uncertain. Funds periodically dry up as more pressing development priorities divert public money from the high-risk and uncertain prospects of the petroleum sector. Disruptions to budgetary allocations have prompted some NOCs to lobby government to do things differently. In a number of African countries, the fuel import mandate[11] and the levy on the sale of petroleum products were devised as means of generating some revenues for the NOC outside the government budget. Some NOCs received as much as a third of their revenues this way.

Even though downstream and retail businesses are cyclical and often produce low profit margins, they can contribute a big chunk of finance to the small budgets of Stage 1 NOCs. Naturally, in countries where the downstream is regulated and the NOC bears some or all of the expense of subsidies for petroleum products, downstream activities are not profitable. In Uruguay, for instance, ANCAP is not authorized by the state to pass on fuel cost increases to domestic consumers, and the NOC has had to take on debt to offset losses. However, as its full name indicates (see above), ANCAP's business is relatively diversified.

During the active exploration period of 2010–14, payments from operators, such as data sales and signing bonuses, provided emerging NOCs with a large part of their revenue – approximately two-thirds for pre-production African NOCs. However, as the current low price period shows, this sort of funding is fickle and dependent on outside interest in exploring. Before oil prices fell, Liberia was receiving around US$18 million from data sales.[12] Signing bonuses and revenue from bidding rounds were also robust. The slowdown of exploration is causing much of these upstream payments to evaporate, with significant impacts on NOC budgets.

NOCs may also face competition, from ministries of petroleum and regulatory agencies, for whatever upstream payments continue to trickle in. Liberia recently reformed its petroleum sector with a view to establishing a new agency to handle licensing and regulation, funded through several upstream revenue streams that NOCAL had previously collected.

[11] A fuel import mandate allows the NOC to import a share of the country's gasoline imports (usually 25–50 per cent), which it can sell to domestic retailers for a commission.
[12] NOCAL (2013), 2012/2013 Budget Performance, http://www.nocal.com.lr/about-nocal/budgets_annual_reports (accessed 20 Nov. 2014).

As noted, revenue streams for the NOC role at the pre-discovery stage are often fluctuating and unreliable, which makes forward planning difficult and limits the NOCs' ability to be competitive, commercial actors. Conversely, the difficulty of securing finance in the pre-discovery stage has the advantage of keeping NOC ambitions in check and limits public expenditure on a high-risk investment.

These difficulties will be compounded should oil prices remain low over the medium to long term. As exploration decreases, so do operator payments. This will have a knock-on effect on NOCs' budgets and level of activity. As the prospects of discoveries fade, they will also face greater competition from other government institutions for scarce payments from operators. In this context, governments and NOCs will need to be realistic in designing licensing terms and also about NOC ambitions.

## Stage 2: After commercial discovery, before production

| Stage 2 NOCs – common circumstances after commercial discovery but before production | | |
|---|---|---|
| **Role** | **Human resources** | **Finance** |
| Increased equity stakes in licences, and some lose their governance role in the petroleum sector. Some set sights on operator role. | Invest in upstream commercial and technical capabilities. | Rely on revenues from Stage 1 for running costs. Much higher capital requirements when required to pay their share of operating costs in licences with discoveries or when increasing their stakes. Turn to equity and loan markets. |

### Roles

After discovery, new opportunities appear. The range of practice begins to widen with respect to the NOCs' role, with some stepping back from governance functions and commercial ambitions growing.

Indeed, some NOCs transition away from responsibilities related to their governance role. For the National Oil Corporation of Kenya, for instance, recent discoveries significantly increased its administrative burden. It is currently transferring its previous governance role to the state. Its Head of Corporate Planning and Strategy, Ken Mugambi, explained, 'We are already struggling with limited capacity on the commercial side so we want to focus our limited resources on that.'[13] National Oil has for some years had majority rights to exploration acreage in Block 14T, located within the Tertiary Rift Basin. According to its three-year strategic plan in 2013, the company planned to scale up the work programme with a view to drilling one exploration well within the plan period.[14]

The risk of conflict of interest also motivates the state's drive to take back the governance role. In practice, the risk of conflict of interest is limited at this stage because the NOC does not operate in any field. As a minority equity stakeholder in the country's licences, its interests tend to converge with those of the state: both wish to see the operators actively explore while controlling costs and safeguarding high standards of operation. However, the prospect of production means the NOC is likely to take on a greater commercial role and the government may want to avert any risk of regulatory capture.

While NOCs may willingly transition away from some governance roles, that is not always the case and they usually try to retain responsibility for managing geological data.[15] Data sales can generate significant revenues when there is exploration interest. Managing these data also helps NOCs (or the

[13] Marcel, Lobo and Saludeen (2014), 'Unlocking the potential of Africa's NOCs'.
[14] Company website, http://www.nationaloil.co.ke/site/2.php?id=4 (accessed 12 Nov. 2015).
[15] Discussions among emerging producers at the National Seminar for Tanzania, 2 July 2015, https://www.chathamhouse.org/sites/files/chathamhouse/events/conferences/Summary%20Note%20National%20Seminar_in%20Template%20with%20logos.pdf.

regulatory agencies) build their technical and geological capacity. Some investment is required to house and analyse the data effectively. NAMCOR, for instance, has invested about $1.4 million on a storage facility and software.[16]

After discoveries, most NOCs continue to hold minority stakes that are financially carried by foreign oil company partners, but some begin to build more ambitious commercial agendas. They may seek to increase their stakes or acquire stakes in new licences as oil flows. For example, in 2009 GNPC increased its interest in the recently discovered Jubilee field to 13.75 per cent (10 per cent carried, 3.75 per cent equity participation), with the help of a commercial loan from the World Bank.

Some NOCs and governments see an even bolder future than minority stakes. In a number of countries, NOCs have been given somewhat vaguely phrased mandates to operate in the upstream. For instance, TIMOR GAP is 'entrusted with the development of business activities for upstream exploration and production' and TPDC is to 'undertake Tanzania's commercial aspects of petroleum in the upstream' (*sic*).[17]

## Human resources

Shifting the focus to commercial and upstream activities requires the development of a different set of skills. Discoveries in Kenya brought a major change in the role of National Oil. The majority of its manpower was in the downstream and new capacity was required in the upstream. Building on a technical upstream team of 20–25 people, the company recruited a further 34 people, who were sent on postgraduate oil and gas courses abroad.[18]

Ghana's GNPC is another example. As the technical and business adviser of the Ministry of Energy (it was *de facto* regulator for the sector) during a period of active exploration work in 2000, with its own commercial activities outside the petroleum sector, the company had a staff of 900. In 2002, as a result of the government's decision to focus on its core upstream business, it scaled down to fewer than 100 staff.[19] The workforce increased again after oil discoveries were made, rising twofold from 117 employees in 2008 to over 250 in 2013.

## Finance

After discoveries NOCs often continue to rely on government allocations for their regular running costs, along with whatever revenues they already had: import mandates, levies, downstream sales and/or data sales.

Depending on the licensing terms, some NOCs begin to pay their share of operating costs ('back-in participation') once reserves are commercially proven. National Oil in Kenya is contemplating a variety of finance mechanisms to fund its minority stake in proven fields. These include shareholder loans, reserve-based lending and partially floated bonds.[20]

GNPC also illustrates this type of financial and operational flexibility. Owing to its minority equity stake in fields in the development phase, it was estimated to have investment requirements of over

[16] Interview with Obeth Kandjoze, May 2014.
[17] TIMOR GAP, E.P. Annual Report 2014; Tanzania Petroleum Act 2015.
[18] Interview with Ken Mugambi, Head of Corporate Planning & Strategy, National Oil, May 2014.
[19] Interview with Sam Addo Nortey, Principal Audit Officer for the company and member of the Ghana EITI Steering Committee, October 2014.
[20] Interview with Ken Mugambi, May 2014.

$1 billion over the next 10 years: a study carried out by the World Bank in 2013 expected GNPC's investment requirements to average over $200 million annually during the peak years of 2014–17, considering costs associated with the simultaneous development of the TEN and Sankofa fields.[21] GNPC structured its deals to allow for capital requirements to be financed by oil company partners as needed. It would then agree to a smaller share of future output. This is essentially a carried interest.

For those NOCs seeking to increase their equity participation, access to equity and debt markets improves in Stage 2. External finance empowers NOCs to generate additional revenues and execute a more ambitious programme. However, it can be difficult to attract financing at good terms at this stage. This difficulty is compounded today by lower oil prices, which decrease the value of oil assets. Financial markets are also more risk-averse than previously and this may become increasingly the case as rates start to rise.[22] As always, contracting debt also increases risks for both the company and the state for a revenue stream that often remains small or uncertain. The risk of proved discoveries being shelved or delayed indefinitely is greater now than before. Governments will need to be realistic about what their countries can afford.

## Stage 3: Early production or small reserve base

| Stage 3 NOCs – common circumstances in early production | | |
|---|---|---|
| **Role** | **Human resources** | **Finance** |
| Reassessment of NOC role common. Some maintain governance role, some head towards operator role. | Workforce increases if NOC develops operator capabilities. | New revenues from production, but low commodity prices impact on revenues and asset value. |

### Roles

When countries enter the production phase, many NOCs rethink their corporate business strategy. Some NOC operational ambitions may grow and therefore so would their workforce. Some maintain governance roles after production begins, but most emerging producer NOCs today are required to transfer regulatory and licensing responsibilities to the state.

### Human resources

The size of the workforce in Stage 3 depends, of course, on the roles and activities of the NOC, and also on its history. Staatsolie is a well-established, vertically integrated small-scale Surinamese operator, with a workforce of 1,046.[23] It is active in exploration in shallow waters, produces 17,000 barrels of crude oil per day, refines 15,000 bd, and markets, sells and transports crude and refined products. It also has a governance role and handles the assessment of the hydrocarbon potential, promotion of acreage and monitoring of foreign oil companies' activities on behalf of the state. Nevertheless, in Staatsolie's case, the team responsible for the governance role is kept deliberately small, at 10 people – four geoscientists, two people working on finance and business, a data engineer, a data technician, a secretary and the manager. The annual budget for this department is $820,000.[24]

[21] World Bank (2013), *Energizing Economic Growth in Ghana*, http://documents.worldbank.org/curated/en/2013/06/18027411/energizing-economic-growth-ghana-making-power-petroleum-sectors-rise-challenge (accessed 4 Feb. 2016).
[22] Mitchell et al. (2015), *Oil and Gas Mismatches*.
[23] As of November 2015; Staatsolie website, http://www.staatsolie.com/en/about-us/ (accessed 5 Feb. 2016).
[24] Marny Daal-Vogelland, Manager Petroleum Contracts, Staatsolie (responsible for NOC's governance role), comments by email, 9 February 2016.

### Finance

NOCs with small production volumes have been much harder hit by the fall in oil price since 2014 than NOCs in Stages 1 and 2 (whose countries benefit from lower fuel import costs). They are more at risk in the lower oil price environment than established, larger producers, as they are more likely to have a concentrated portfolio, maybe just one asset, which may not be viable at lower price levels.

Lower prices have an impact on these producers' revenues and cash flows. They also negatively affect asset value, threatening project viability in some cases and reducing the NOCs' capacity to raise funds on the capital markets. In this context lenders may require greater securities for loans. These factors contribute to limit investment in projects and capacity development.

GNPC is one such NOC negatively affected by the drop in prices. Its $700 million prepayment facility from March 2014 was cut back to $350 million in 2015 because allocated cargoes could no longer meet repayment debt service obligations. Operations in Ghana are also affected. Operators are cutting expenditure, slowing planned activities, reducing exploration activity beyond minimum work obligations, and cutting non-petroleum projects such as capacity-building activities. Indeed, in certain fields, the low oil price regime undercuts the scenarios which underpinned development plans.[25]

On the other hand, operational costs may fall over time as demand for industry-specific inputs falls. And GNPC's own exposure to capital costs relative to that of foreign oil company operators is limited because its interest is carried or is a small participating interest. GNPC also sees opportunities in the relinquishment of licences by foreign oil operators, as it hopes to acquire stakes of these licences under better terms.[26] However, these opportunities depend on the NOC's ability to secure the necessary finance.

> If low oil prices persist, access to and the cost of funds on financial markets will become increasingly problematic for new producers.

If low oil prices persist, access to and the cost of funds on financial markets will become increasingly problematic for new producers. NOCs will need the skills to make the most of cost reductions in the service sector and to negotiate finance under good terms.

## Stage 4: Large-scale or long-term production

### Roles

When countries enter the large-scale production stage, the opportunities and challenges NOCs face in terms of human resource development and access to capital are significantly distinct from the previous stages. A key difference is that these NOCs can factor scale and time of production into their decision-making, whereas planning for NOCs in previous stages involved a large degree of uncertainty about the resource base. This new horizon can justify the development of upstream operator capabilities by the NOC.

[25] GNPC representative, Presentation at the New Petroleum Producers Discussion Group meeting, 'Adapting expenditure plans in response to falling oil prices', 1 July 2015, Dar es Salaam.
[26] Ibid.

## Human resources

Ramping up the right skills to take on the operatorship of fields is a common challenge.

A typical operator producing 100,000 barrels per day requires about 100 technical staff. As the resource base matures and evolves, the focus of expertise for those staff will also change. In the exploration phase the skills focus will be on geology and geophysics; during development it will be on drilling and completion experience. Later production stages will demand reservoir and production skills. In addition to technical staff, the operator will need accountants, marketers, economists and other administrative staff.[27]

Statoil is illustrative of larger operators. It needed 14 years to acquire the skills to become the major operator it is today. During that period, it hired 8,000 staff and it took eight years to turn a profit.[28]

Others have had head starts. Sonangol P&P, the upstream subsidiary of Sonangol, took three years to move from operatorship of very small fields to a complex field in Angola (Block 3). The parent company had already been active in the upstream for many years, building its skill base to carry out the concessionaire role when its subsidiary moved to become an operator. Sonangol P&P also benefited from its parent company's revenue stream, and was supported by external consultants.

## Finance

While NOCs in large-scale producing countries potentially have access to much greater financial resources than those in earlier stages, their financial situation is by no means universally comfortable. Broadly speaking, NOCs with government budget allocations continue to struggle financially, while those able to retain earnings from upstream sales can more easily secure the level of finance required for capital expenditure programmes. Companies in between, such as GNPC, can hold on to a defined percentage of earnings from sales and transfer the remainder to the state. They are financially constrained but benefit from greater predictability for planning purposes. Finding the right balance is a common challenge, as too much autonomy for NOCs can lead them to abuse public funds for pet projects, while too much state control inhibits their commercial drive and ability.

In an era of persistent low oil prices, the ambitions of large producers will be affected too. With a reduced revenue stream and other pressing budget priorities, governments may lack the patience to continue investing in the petroleum sector through the downturn. This also affects NOCs that retain earnings: there is the risk that the government may ask for increased dividends. Even in good times, most NOCs have had to supplement their revenue through partnerships with foreign oil companies and through deals on financial markets, where they must compete with private oil companies. They must reassure investors about risk and reward. And this is more difficult today than during the period 2010–14.

[27] Schlumberger Business Consulting (2013), Oil and Gas Human Resource Benchmark 2013.
[28] 'Guidelines for Good Governance in Emerging Oil and Gas Producers' (2015), Chatham House, https://www.chathamhouse.org/publication/oil-gas-good-governance-guidelines.

# Recommendations for Emerging NOCs

National participation in the development of the country's resource base is an important goal for emerging producers. However, as shown above, during Stages 1 and 2 (and even in Stage 3) of the development of the petroleum sector, many NOCs lack the resources to fulfil their mandate and struggle to participate in a meaningful way in operations (or in their oversight). Others pursue ambitious strategies that are neither affordable nor directed by government.

How can the efforts of NOCs be refocused on a mandate that their countries can afford and that will give them the best chances of fulfilling it?[29]

- **Governments need a clear view of what different NOC roles cost**

There is no one-size-fits-all plan. The resources and time needed for various roles will depend on the capacity of the NOC and on the capacity and depth of the government and the country's pool of workers. Key questions include:

- Is there a capable state administration and an effective legislative framework that allows for effective regulation of the industry?
- Is there a history of oil industry experience?
- Are there existing or potential relationships with foreign oil companies and service providers?
- How prevalent is specialized higher education in geosciences, geology, engineering?
- What is the level of primary and secondary national education?[30]

It can take a minimum of seven years, and in many cases more than 15, to develop solid home-grown operator capacity – and this is assuming the most conducive national environment. In practice very few countries that produce oil at a low or middle level have seen their NOC take on operatorship of their fields.

The resources required for an NOC to carry out an effective governance role (concessionaire or managing data) depend to a large extent on the level of petroleum activity in the country. In any case, they are greater than the resources required for a non-operator NOC without a governance role, which can carry out its mandate (e.g. overseeing the carried minority interest) with a very limited staff and budget.

- **Government and the NOC should choose a role for the NOC that it can realistically play, and one that the government can afford**

Key to this is shaping ambitions and a mandate around the size of revenues reasonably extractable from the resource base. It may very well be that the resource base is not big enough to justify the costs of developing a technically competent operator.

[29] The five recommendations outlined in this section are taken from Marcel, Lobo and Saludeen (2014), 'Unlocking the potential of Africa's NOCs'. They are valid in a both a high- and a low-price environment.
[30] Adapted from 'Guidelines for Good Governance in Emerging Oil and Gas Producers', p. 23.

This study has highlighted possible revenue opportunities in the pre-discovery, post-discovery and production phases. Given the difficulty of financing the NOC in Stage 1, governments may want to consider carefully whether they have the resources to set up an NOC at all before discoveries are made. As for more ambitious mandates, governments should be clear that no revenue stream will be sufficient for an NOC to engage in a growth strategy towards operatorship until there are significant proved discoveries in the country, which increase the value of its minority stakes – and until the debt incurred to fund these minority stakes has been paid off by production revenues.

For these reasons, the goal of operating in the upstream should be delayed until discoveries promise a reserve lifespan that is longer than the time it would take to develop these capabilities.

Until such a threshold is reached, one possible upstream role for NOCs is simply to oversee their carried minority stake. This is the minimal role an NOC can play but, like other minority non-operators, it still requires expertise and staff. Secondary commercial roles may include managing service providers. These NOCs must stay low-cost, and bigger ambitions on the part of the government and NOC must be deferred. If the NOC is assigned a governance role, it may be allowed to expand within the boundaries of what is affordable and justified by the level of activity in the sector.

It is now more frequently accepted that an NOC can act as an agent of the state for simple tasks in the early stages of resource development – for instance, promoting opportunities to foreign partners, and data management.[31] Historically this was viewed negatively, as potentially creating a conflict of interest for the NOC which would be both regulator and commercial actor. However, the conflict is circumscribed when the NOC's commercial role in the upstream is very limited (and it is not responsible for technical and investment decisions regarding a field), and even more limited when there are no discoveries.

Moreover, there are advantages to an NOC taking on a state role. Concentrating responsibilities helps to build sector capacity. It can also exert effective national control over the sector more rapidly – providing both a domestic audience and foreign partners with a single, clear voice about direction, intent and expectations. The NOC can build the technical capacity required to oversee the sector more quickly when its hiring procedures are simplified relative to those of the civil service, and it can offer training and benefits packages and meritocratic promotion to attract and retain talent.

Another advantage is the simplification of the governance system, limiting decision-making and promoting policy cohesion among those decision-makers. This also promotes efficiency.[32]

No matter what its role, the NOC's budget and ambitions for agenda-setting must be constrained by realistic expectations for revenue from resources. During exploration, for example, the NOC will require funds to deepen its competences in geology and geological engineering. Costs should be controlled, however, until discoveries are made.

Only when discoveries are big is it necessary to debate a larger operational role for the NOC. In such cases an examination of any potential conflict of interest in this concentration of decision-making will be required. In most circumstances, it is advisable to transfer regulatory responsibilities to a government agency at this stage.

[31] This is a recommendation of the New Petroleum Producers Discussion Group.
[32] The advantages and risks involved in an NOC-dominated governance system are addressed in detail in Heller, P. R. P. and Marcel, V. (2012), *Institutional Design in Low-Capacity Oil Hotspots*, Revenue Watch Institute, http://www.revenuewatch.org/publications/institutional-design-low-capacity-oil-hotspots.

- **Governments must approve an explicit financing model for NOCs**

There is much focus in emerging producer countries about the petroleum sector's potential to generate revenues, but it is also a capital-intensive industry. The Ministry of Finance and Treasury must decide how much revenue to take from petroleum sales (or operator payments when in pre-production) and how much to leave with the NOC to reinvest in equity shares or in building its capacity. State authorities must also decide how much to invest in the (risky) national petroleum sector and how much to dedicate to other national priorities, such as investment, savings and debt management. A national vision for development that includes the role of the petroleum sector will help to set policy priorities and guide such decisions about capital allocations.

Political clarity about the scope of the NOC's mandate and the budget required to carry out this role should also help revenue authorities specify which revenue streams will finance it. It is often the case that the NOC's revenue streams – downstream levies, import mandates, payments from operators and budgetary allocations – are given and then taken back, depending on political will. Another big pitfall is that when revenues are inadequate, NOC create new revenue streams that may be outside their core business. This commercial activity is sometimes unsupervised by state authorities.

To prevent this, an upfront financing model is necessary. Clarity is needed on the activities the NOC can pursue and the revenues it can generate from those activities.

For NOCs of countries in the production phase, a key question relates to finding the right balance between the need for state control over NOC finances and a degree of NOC operational spending autonomy. Broadly speaking, NOCs with government budget allocations frequently struggle financially, while NOCs able to retain earnings from upstream sales can more easily secure the level of finance required for capital-expenditure programmes.[33] But to be successful with the NOC revenue retention model, governments must ensure they monitor NOC costs, processes and performance.

- **NOCs should focus on costs and strong accounting and reporting standards**

The fall in oil price and slowing exploration programmes combine to create a difficult environment for the financing of NOC budgets. Many NOC ambitions will need to be reined in. And spending should closely match company strategy. Lower oil prices also present an opportunity for NOCs to drive new levels of efficiency, focus on their mandate and, in doing so, become better-performing companies.

Improved accounting and financial disclosure, as well as risk management, are also beneficial. They are critical, of course, for the NOC's greater accountability to the state. But the state must also develop its own capacity to police the NOC. Early-stage accountability is key, and the state needs to be able to increase its oversight of the NOC as the sector and the operator grow.[34]

Rigorous accounting and higher reporting standards also reduce risks for investors. In a context of constrained external finance, NOC financial strategies will be as critical as operational strategies.

[33] Another important factor in the financial enablement of NOCs is the national economic context. When the national economy is more diversified and the government is less dependent on petroleum export revenues, it is easier for NOCs to ring-fence their budgets when prices fall.
[34] Heller and Marcel (2012), *Institutional Design in Low-Capacity Oil Hotspots*.

- **Governments and NOCs should be strategic about capacity-building**

Having identified their human-resource needs, almost all the NOC executives surveyed for this study pointed to skills shortages as a key factor holding back their growth strategy. Training is a high priority:

- NOCAL's manpower training budget for 2013–14 was $8 million, for a staff of 146.[35] This amounts to $54,794 per employee and represents 28 per cent of the company's total expenditure.
- TPDC spent $2.49 million on training for a staff of approximately 110,[36] which amounts to $18,459 per employee per year.
- Before prices fell GNPC planned to spend $34 million per year to develop its capacity (starting from 252 employees, with plans to grow).[37]
- ANCAP spent $40.89 million on training for 2,031 employees across its various activity sectors; this amounts to $20,142 per employee receiving training and $14,412 per employee.[38]

Foreign-operator payments cover a share of this training budget. Still, the difference between these and other more established NOCs is stark. Ecopetrol, the national oil company of Colombia, spent $14.67 million on the development of 6,774 employees in 2012 ($2,166 per employee).[39] In the case of the small operator Staatsolie, the training budget for the department handling the governance role was $5,000 per employee until the fall in prices resulted in budget cuts.[40]

Another key goal is to make the spending count. One African NOC executive acknowledged that most training was 'untargeted, scattered, uncoordinated'. Training programmes tend to be driven by the wishes of employees, rather than the company's strategy. One particular, and expensive, problem is that skills acquired during abroad training often were not utilized once the employee returned home.[41]

Avoiding this problem involves:

1. Identifying skills gaps;
2. Selecting training that covers those gaps;
3. Testing the acquisition of the training (i.e. 'What did you learn?');
4. Applying the new skills in the workplace.

Identifying skills gaps requires a clear view of what skills will be called on at each stage of development of the resource. Determining the skills needed for each role the NOC is tasked with is a challenging exercise. NOCs also need to consider factors such as the type of geology, the level of interest from foreign oil companies and number of active work programmes, existing human capacity, and also available financing. These factors can change significantly over time and NOCs must therefore carry out manpower planning exercises to map out the skills needed at each stage

[35] NOCAL, Fiscal Year Budget 2013–2014.
[36] *Report of the Controller and Auditor General on the Financial Statements of the Tanzania Petroleum Development Corporation for the Year Ended 30th June, 2012* (2013), The United Republic of Tanzania National Audit Office.
[37] New Petroleum Producers Discussion Group, Chatham House, 12–13 May 2014, London.
[38] ANCAP, *Reporte de Sustentabilidad 2014*, http://www.ancap.com.uy/BalanceSocialAmbiental/2014/Reporte%20FINAL.pdf.
[39] *Integrated Sustainable Management Report 2012* (2013), http://www.ecopetrol.com.co/english/documentos/Report_Ecopetrol_English.pdf (accessed 5 Feb. 2014).
[40] Marny Daal-Vogelland, comments by email, 9 February 2016.
[41] Interviews in the Middle East and North Africa region between 2003 and 2006, and in Africa between 2009 and 2014.

of development of the resource base. As a principle, skills development should be focused on developing current (and next-stage) capacities.

In laying out a strategy for the acquisition of technical skills, NOCs should not discount the value of partnerships with foreign oil companies. This was a key lesson on capacity-building from more established NOCs.[42] These companies can transfer skills to NOC employees through secondment programmes and by working side by side in the development committee meetings where operators and partners discuss and make technical decisions concerning the development of a field.

[42] Marcel, V. with Mitchell, J. V. (2006), *Oil Titans; National Oil Companies in the Middle East,* London: Chatham House/Washington, DC: Brookings, Chapter 1.

# Conclusion

Most emerging producer countries wish to see their NOCs play a strong role in the upstream sector, eventually competently overseeing foreign operators and, one day, competing with them at home and abroad. But governments must first look carefully at what such a role entails in practice, in order to assess the capacity and finance required and to determine whether that role brings value to the country. This assessment must be repeated over time, as the resource base develops.

In addition to the context provided by the stages of development of the resource base, governments and NOCs must consider the impact of the market context on NOC roles and strategies. The fall in oil prices, and the prospect of prices remaining 'low' for some years, are causing private-sector companies to focus their activities on the highest-quality/lowest-cost projects. They are also reducing the scope of capital expenditure to match their lower expectations of cash flow and financial capacity.

The new NOCs need to adjust their plans and ambitions to the new realities of price and competition for investment. In this context, emerging NOCs and governments will need to have realistic investment terms. They will also benefit from building collaborative relations with foreign oil companies (in order to better understand the market and their investors), as well as from keeping their house in order: ease of doing business, good governance, transparency and accountability all contribute to making a country more attractive to investors and its NOC a better partner.

# Annex: Profile of Selected Emerging NOCs[43]

| NOC | Policy or regulatory role | Operational role | Current activities | Stage of upstream development | Number of employees |
|---|---|---|---|---|---|
| **ANCAP, Uruguay** | Yes, regulator and concessionaire | Designed geophysical data acquisition programme | Integrated company with strong downstream and retail segments | Exploration | 2,837 (at end 2014) |
| **ENH, Mozambique** | No (separate regulator INP) | Medium- to long-term goal. Holds minority carried stakes | Upstream | Development of significant gas finds | 111 |
| **GNPC, Ghana** | Previously adviser to the Minister of Energy and informal regulatory role. Regulatory responsibilities now handled by a new independent regulator (Petroleum Commission) | Plans to be standalone operator in 7 years and world-class operator in 15 years | Upstream | Ghana's total oil production averaged 108,000bd in 2015[44] | 253 (at end 2013) |
| **NAMCOR, Namibia** | Yes, data management and petroleum storage | Seeks to farm in partners for its 44% stake in Kudu gas to power project; company strategy to develop operator capabilities | Upstream, storage, retail, import | Development plan for Kudu gas field; exploration | 99 (50% technical) |
| **Natoil Uganda** | No (separate regulator already established) | Long-term focus of strategy | Upstream | Development phase for sizable onshore oil finds, not yet on stream | To be established |
| **NOCAL, Liberia** | Was regulator and concessionaire until amendment of Petroleum Act in 2014 removed these roles | Not at present | Upstream | Potential commercial oil discovery | 43 (in 2016) |

[43] This table is expanded and updated from Marcel, Lobo and Saludeen (2014), 'Unlocking the potential of Africa's NOCs'.
[44] Energy Information Agency (2015), Ghana Country Analysis, http://www.eia.gov/beta/international/analysis.cfm?iso=GHA (accessed 4 Feb. 2016).

| NOC | Policy or regulatory role | Operational role | Current activities | Stage of upstream development | Number of employees |
|---|---|---|---|---|---|
| **National Oil, Kenya** | Yes, has played part regulatory role; but wants to shed this, apart from data sales, to focus on commercial role | Operates exploration block (Block 14T) but no activities yet; no immediate plans to operate other fields in which it holds a minority stake, but has future plans to grow operatorship | Integrated company with strong downstream and retail segments | Working on development plans for discoveries made in 2012 (to prove final commerciality) | 250 (20% technical upstream) |
| **PetroSeychelles** | Regulator and concessionaire | Not at present | Upstream | Exploration | 11 (2 technical upstream) |
| **Staatsolie, Suriname** | Regulator and concessionaire | Integrated company, operating own fields in exploration, development and production | Upstream and downstream | Production of 17,000bd; exploration activities, including by foreign oil companies | 1,046 |
| **TIMOR GAP** | Separate regulator; NOC carries out geological studies on behalf of government | Building an integrated oil and gas company to cover upstream and downstream activities, as well as services to the sector | Upstream, downstream and awaiting approval to develop retail stations. To operate Tasi Mane, a multi-phase integrated project composed of a supply base, a complex refinery and liquefied natural gas plant (planning phase) | Production from Bayu-Undan and Kitan fields located in the Joint Petroleum Development Area in the Timor Sea. Exploration on-going in the Timor-Leste Exclusive Area | 101[45] |
| **TPDC** | Regulator and concessionaire roles to be transferred to new regulatory agency (PURA) | Mandated by the 2015 Petroleum Law to participate in upstream activities; company's long-term goal is to be standalone operator | Upstream and downstream gas | Developing large offshore gas discoveries, not yet online; some gas production already from smaller offshore fields | 400[46] |

[45] TIMOR GAP, E.P. Annual Report 2014, p. 12.
[46] Company website, http://www.tpdc-tz.com/tpdc/aboutus.php (accessed 4 Feb. 2016).

# Acronyms and Abbreviations

| | |
|---|---|
| ANCAP | Administración Nacional de Combustibles, Alcoholes y Portland (Uruguay) |
| ENH | Empresa Nacional de Hidrocarbonetos (Mozambique) |
| GNPC | Ghana National Petroleum Corporation |
| INP | Instituto Nacional de Petróleo (Mozambique) |
| NAMCOR | National Petroleum Corporation of Namibia |
| NOC | national oil company |
| NOCAL | National Oil Company of Liberia |
| National Oil | National Oil Corporation of Kenya |
| PURA | Petroleum Upstream Regulatory Authority (Tanzania) |
| TEN | Tweneboa–Enyenra–Ntomme (Ghana) |
| TPDC | Tanzania Petroleum Development Corporation |

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