
The New Nation Builders

Creating the African National Oil Company (NOC) of the future



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Foreword

The energy sector is experiencing significant change and upheaval. Whether it is in oil & gas or utilities, we are witnessing tectonic shifts in strategies, business models and ways of working. It is against this backdrop that we consider the future of African national oil companies (NOCs). After all, not only do African NOCs have to navigate this disruption and tackle the challenges of uncertainty, as do their international oil company (IOC) counterparts, but given their sovereign importance as nation builders they must also identify the future pathways to evolve.



In this paper, we look at the challenges of disruption facing African NOCs, what it means for them and how they should position themselves for a sustainable future. The sustainability of NOCs will depend on their ability to transform into national energy companies, responding to the demands placed on them by consumers, governments and NGOs to respond to climate change and a new energy future. Whether we are talking about fledgling NOCs with limited hydrocarbon resources or established NOCs sitting on large reserves, all of these companies will need to figure out how to seize the opportunities emerging from this disruptive environment.

At PwC, we work closely with our clients to understand their challenges and to identify and put in place dynamic and long-lasting solutions. We use our industry and functional expertise to understand what is driving change and help position our clients to weather and adapt to this change. We hope this paper will frame the challenges facing our clients and provide a platform to discuss how we can work together with African NOCs to build a better future.

Chris Bredenhann
Africa Advisory Oil & Gas Leader



Summary



NOCs in Africa stand on the brink of significant disruption – and of substantial opportunity – as a new era of structurally lower oil prices challenges business models that have long relied largely on exploration and production of hydrocarbons, especially ‘black gold’ (oil).



African countries that have for decades depended on their NOC as a key source of government revenue will need to rethink business models to avoid being captive to a single energy source and to allow them to rebalance budgets.



This will become an increasing priority with the emergence of social and political challenges amid slowing regional economies: Sub-Saharan growth slowed sharply in 2016 and averaged 1.4% – the lowest in two decades¹. This year has seen equally slow growth.



Three factors mean that established NOCs must seize the opportunity to diversify beyond historical reliance on oil: rapid moves globally towards an increasingly low-carbon energy industry; meeting burgeoning demand for domestic power; and a need to meet crude and refined product requirements through storage and transport in domestic African economies.



For fledgling NOCs these factors make it all the more important that their sponsor governments carefully assess the rationale for establishing and developing national champions in oil & gas – and find the right model for this new environment.



Adoption of digital technologies will be key to the transformation and not only benefit established NOCs, but could also allow early-stage NOCs to ‘leapfrog’ stages of development much in the way telecoms and financial services are already doing across the continent.



Developing a new generation of digitally-enabled talent as well as creating new ways to engage robustly with domestic regulators and governments will be key to this journey.



Partnering with IOCs offers significant advantages as NOCs pursue a new strategy of diversification, allowing them to source and develop new capabilities.

¹International Monetary Fund. *Regional Economic Outlook*. May 2017. www.imf.org/en/Publications/REO/SSA/Issues/2017/05/03/sreo0517

Disruption is reshaping energy – and the NOCs



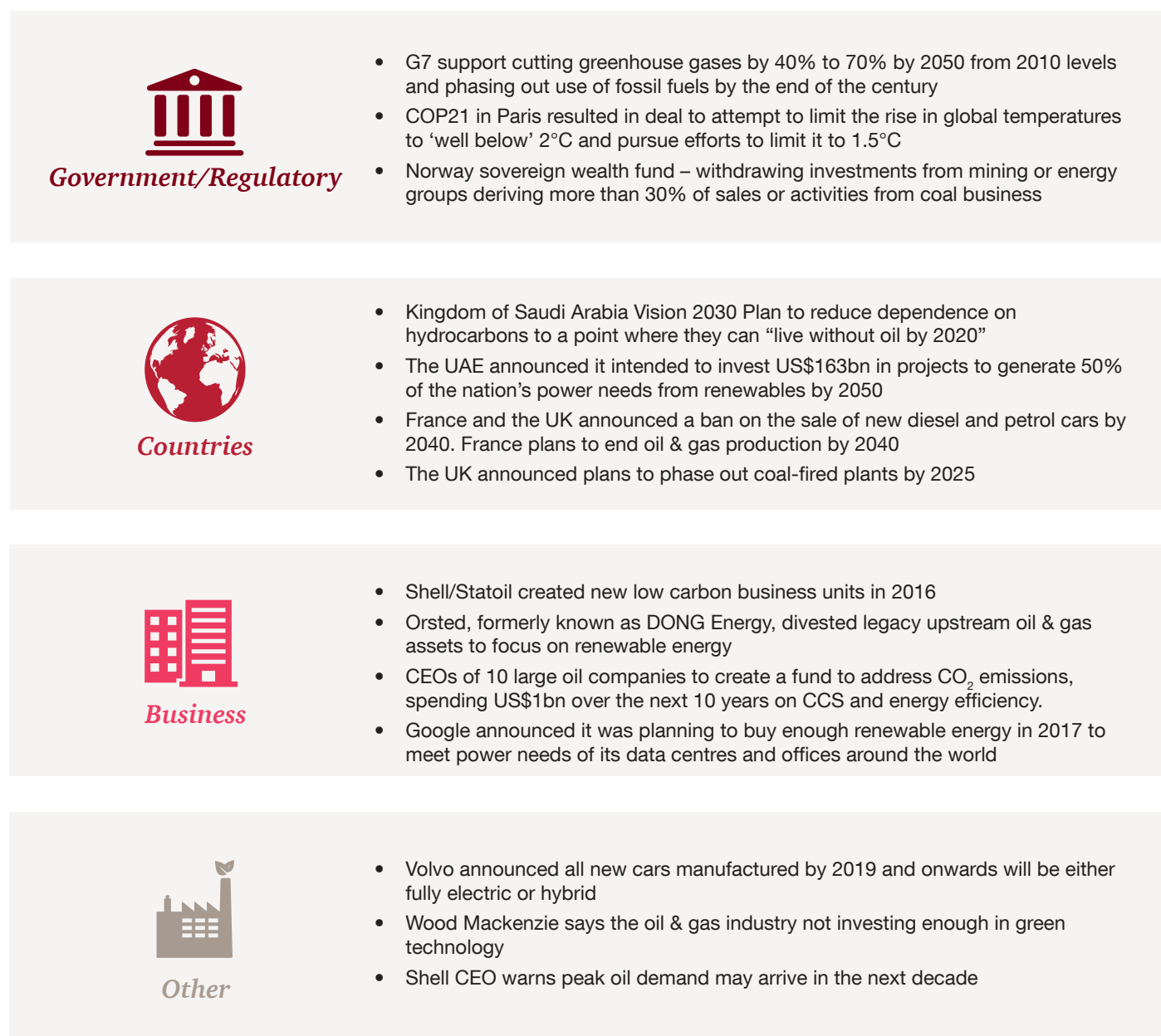
‘Lower for longer’ oil price

- While Brent crude recently has approached an over two-year high of \$60 a barrel, it has traded for some time around a lower level that has driven an industry consensus around the idea that the oil price may be “lower for longer”.
- It is open to debate whether this means “lower forever,” but it is clear, nonetheless, that a shift in the oil price is for real – and has implications for industry participants.
- Part of the reason why we are witnessing lower oil prices is linked to the emergence of the US as a leading oil producer. Production flexibility has also enabled the US to play the role of an alternative swing producer.
- As a result, IOCs are maintaining their focus on cost reduction. While capital expenditure is slowly recovering, the industry continues to seek standardisation and simplification to keep costs down.
- IOCs are also seeking lower-cost, lower-risk resources with a more immediate, albeit more modest payback. Many of the IOCs are pivoting away from more technically-challenging frontier plays and focusing instead on onshore unconventional in the US.
- All this means that it will prove more challenging for NOCs seeking investment in their hydrocarbon plays from the IOCs.
- For African governments that depend heavily on oil revenues, lower oil prices will challenge government fiscal targets, straining their ability to deliver on public services and dampening economic growth – with potential social and political consequences, as recent events in Venezuela have shown.

Energy transition to a lower carbon world

- Growing decarbonisation is a medium to long-term challenge with significant implications for the sector, as shown in Figure 1.
- Some IOCs (including BP, Shell and Statoil) are adapting to this change by establishing new business units focused on low-carbon energy, as well as investing in wind and solar.
- Reduced demand for oil will impact the coffers of governments dependent on hydrocarbon resources. Some countries in emerging markets are already beginning to address this, with Saudi Arabia’s landmark Vision 2030 a case in point. Moreover, as the pace of decarbonisation grows, some NOCs may need to tackle the challenge of stranded assets.

Figure 1 Recent landmark decisions shaping the low-carbon transition



The onset of digitisation across oil & gas

- The oil & gas industry has been slow to adopt and deploy digital solutions.
- However, with lower oil prices likely for the foreseeable future, digital technologies connecting equipment and field operations through the Internet of Things (IoT), the tasks of automating processes and access to data, as well as helping with cost-cutting, will be essential if the industry is to improve productivity while curbing costs.
- While the IOCs may initially lead the charge in the deployment of digital solutions, technology will still be key to NOCs improving performance and reliability both in the field and in the back office. While there may be ongoing concerns around data security, NOCs looking to enhance their overall performance will be beneficiaries of this technology.

African NOCs: From nation builders to national energy companies

Many countries in Africa – like others in Asia and Latin America – have established NOCs as part of their aspiration to use national energy resources to fuel national development. That has mostly meant setting up government-controlled companies engaged in upstream activities – essentially oil & gas exploration, especially in resource-rich countries.

Many such initiatives trace their roots to the nation-building that took place in the early years of newly-independent countries in the 1960s and the decades that followed. Algeria set up Sonatrach a year after the former French colony declared independence in 1962, while the Tanzania Petroleum Development Corporation (TPDC) was established in 1969, eight years after that country's independence.

More recent examples are emerging as countries continue to view stewardship over domestic natural resources as a strategic priority at a time when there have been a series of recent new discoveries and exploration possibilities. One recent example is the establishment, in 2015,

of the Uganda National Oil Company (UNOC).

However, in all cases, the low oil price environment will likely force many governments to weigh carefully what the most appropriate mandate should be for an NOC – whether well-established, or fledgling. Projects may not proceed as originally planned due to the lower oil price environment, so NOCs will have to carry out realistic assessments of where their strengths may lie and of likely revenue streams.

For smaller or newer NOCs, limited financial capabilities may be an added constraint and could lead to a reassessment of mandates, in particular whether upstream activities make sense.

Figure 2 NOCs in Africa



Saudi Arabia's Vision 2030

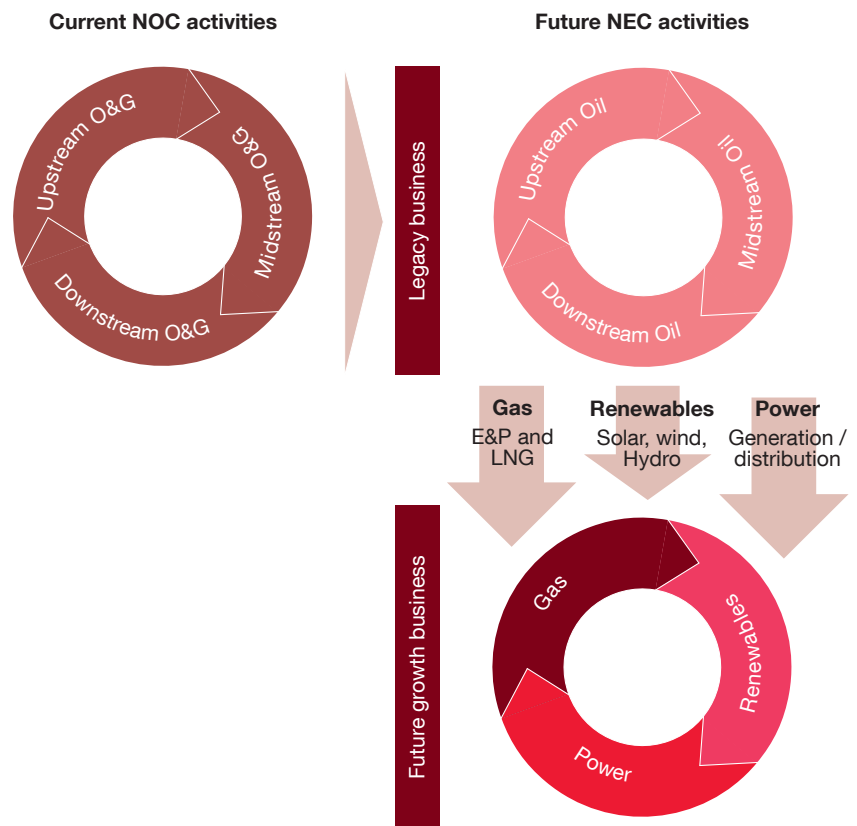
Announced in 2016, Saudi Arabia's Vision 2030 prescribes a range of unprecedented reforms to help diversify the Kingdom's economy and reduce its dependence on hydrocarbons. The new era of 'low oil' has reduced government revenues and sparked a new type of exploration for ways to diversify revenues.

At the time of the announcement, the Deputy Crown Prince, Mohammed bin Salman Al Saud, said he wanted the Kingdom "to live without oil by 2020." Aside from diversifying the economy, other reforms included:

- Shares in Saudi Aramco, the national oil company, to be sold;
- Building a renewables sector with an initial target of generating 9.5GW of renewable energy;
- Setting up a sovereign wealth fund; and
- Increasing participation of women in the workforce.

We think it is still possible to stay true to a nation-building mission, while adapting business models to this new environment. The opportunity is to reinvent the NOC – whether established or fledgling – as a national energy company (NEC) and in so doing reinvent what nation-building itself can mean for the energy sector in 21st century Africa.

Figure 3 A potential future NEC model



Potential Model for a Future NEC

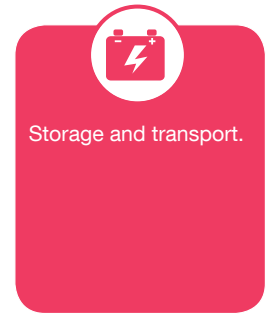
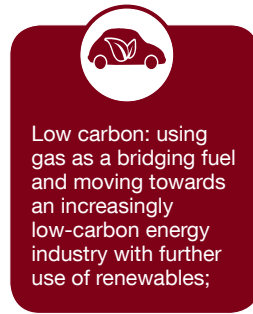
In the above illustration, we give an example of how a NOC might migrate from traditional activities in oil & gas to a greater focus on new energy and power. While there are no current examples of NOCs having evolved in this way, there are some energy companies already making this transition. Orsted used its legacy hydrocarbons business to generate cash flow to fund its future growth business in wind turbines. In 2017, Orsted divested its remaining oil & gas assets to Ineos so it could focus entirely on clean energy.

In our model, the NEC might retain its legacy operations in oil across the value chain with a view to growing its renewables, gas and power businesses over the medium term. Given the importance of gas as a 'bridging' fuel to the low carbon economy, an NEC would continue with E&P activities in gas, as well as potentially expanding LNG operations.

Complementing this growth, an NEC might also simultaneously grow investments in selected renewable energy sources such as wind, solar and hydro. Additionally, it could move further down the value chain becoming increasingly involved in power generation, transmission and distribution. Over time, we envisage the weighting of the overall business to shift from the legacy operations to the growth activities.

In a lower carbon world, established NOCs should therefore consider focusing on a broader market role of being providers of energy rather than simply of oil & gas (a suggested model to illustrate this is highlighted in Figure 3). The dynamics playing out in Saudi Arabia, where a massive shift away from reliance on hydrocarbons is underway, with Vision 2030, is a good example.

We see three components of the new NEC, each offering a potentially promising avenue for diversification and growth beyond historical reliance on the ‘black gold’ of oil:



To move towards this vision, NOCs may need to adopt partnership models to transform and operate successfully as NECs. In a budget-constrained environment with reduced access to talent and capabilities, partnering with IOCs will be key to delivering change.

NOCs will also need to engage more robustly with regulators and governments in order to ensure that they are playing an active role in the industry and not settling for a back-seat position. This is often a necessity as NOCs hold the most knowledge about the industry from a government position.



Low carbon

While Africa accounted for 3% of all new investment in renewable energy totalling \$7.2bn in 2016, the sector has promise.²

Almost half the growth in electricity generation on the continent up to 2040 is set to come from renewables, according to the International Energy Agency (IEA). And an era of rapid technological change is coming at a pivotal time in the expansion of African power infrastructure, opening up the prospect of more affordable off-grid energy solutions in rural areas.

Indeed, 70% of respondents in a 2015 PwC survey of leading executives and companies in the sector throughout the continent believed there was a medium-to-high probability that advances and cost reductions in green renewable off-grid technology would deliver an exponential increase in rural electrification levels by 2025.³

The shift towards lower carbon is also already taking place in mature western markets. In May 2017, Orsted sold its upstream oil & gas business to British petrochemicals group Ineos in a deal worth more than \$1.1 billion, as the Danish group is refocusing on renewable energy. Some are following similar pursuits in Africa. The Central Energy Fund, holding company of PetroSA (the South African NOC), has established an energy projects division to pursue commercially viable renewables investments.

For those African nations that decide to replicate Saudi Arabia's Vision 2030 – or a version of it – and diversify, NOCs might profitably focus on ensuring a supply of energy from multiple low-carbon sources.

In many instances, gas may provide the answer as a bridging fuel to move to a ‘cleaner’ energy source. Gas has been discovered in abundance around the continent, and some NOCs are already exploiting it. Nigeria's NNPC has a division focused on LNG, for example. The group is also investing in renewables, with divisions looking at biofuels among other cleaner energy sources.

NOCs might profitably focus on ensuring a supply of energy from multiple low-carbon sources

² BNEF – Global Trends in Renewable Energy Investment 2017

³ PwC. From fragile to agile: Africa oil & gas review. 2015. www.pwc.co.za/en/assets/pdf/oil-and-gas-review-2015.pdf

Recommended actions:

- Study the opportunities for a gas-to-power initiative, even with the potential to sell power across borders.
- Consider the potential to pool gas demand for a smaller group of countries/regions in order to make the investment more commercially feasible.
- Explore partnership opportunities in gas infrastructure.
- Develop and affirm new energy strategy at group level.
- Establish business units to develop renewable energy investments (like Statoil or Shell).
- Prepare business for different financial performance – renewables have smaller margins than exploration and production.
- Develop capability sets – some engineers in upstream projects may have the necessary skills to be redeployed on renewables.



Domestic power needs: A nation-building priority

While African economies have slowed in the last two years, the medium- and long-term needs for domestic power generation are enormous. Around 70% of households in sub-Saharan Africa still do not have access to electricity.

According to the IEA, two out of every three dollars put into the sub-Saharan energy sector since 2000 have been committed to the development of resources for export, much of that oil. If some of those funds were directed towards domestic priorities, led by NOCs, progress could be made towards national goals of improving the livelihoods of millions of Africans.

At the same time, the IEA says the amount of gas that is being wastefully flared off rather than used is so large, that if used to provide power instead, it would be enough to meet current sub-Saharan electricity needs for more than a decade.

Significant shifts to move towards gas and feed domestic power needs have recently taken place. Shell's Nigerian business has joined forces with Shoreline Energy, a Nigerian group, to spend \$300 million developing and marketing natural gas in Lagos, the Nigerian commercial capital. Italy's Eni is investing in gas infrastructure in Ghana to feed the domestic market, while Total of France is building a floating offshore gas storage facility in Côte d'Ivoire.

Recommended actions:

- Where gas exists as a resource, NOCs should consider internal (with national power companies), and external (with independent power producers [IPPs]) partnerships to guarantee gas offtake for national power production.
- Consider transmission and distribution participation to supply end-users within the country and support industry growth.
- Where gas does not exist as a resource, consider a role as a gas product purchaser (see Figure 6) to aggregate for third-party use. This will not only involve owning and developing gas infrastructure for distribution to national power companies, IPPs and industrial end-users, it will also require the development of new skills in most cases. This could potentially be achieved via strategic partnerships and skills transfer.

Led by NOCs, progress could be made towards national goals of improving the livelihoods of millions of Africans



Storage and transport

Another potential role for NOCs outside the upstream and downstream space lies in midstream. Investing in storage facilities or pipelines makes a lot of sense, and partnership models can also come into play.

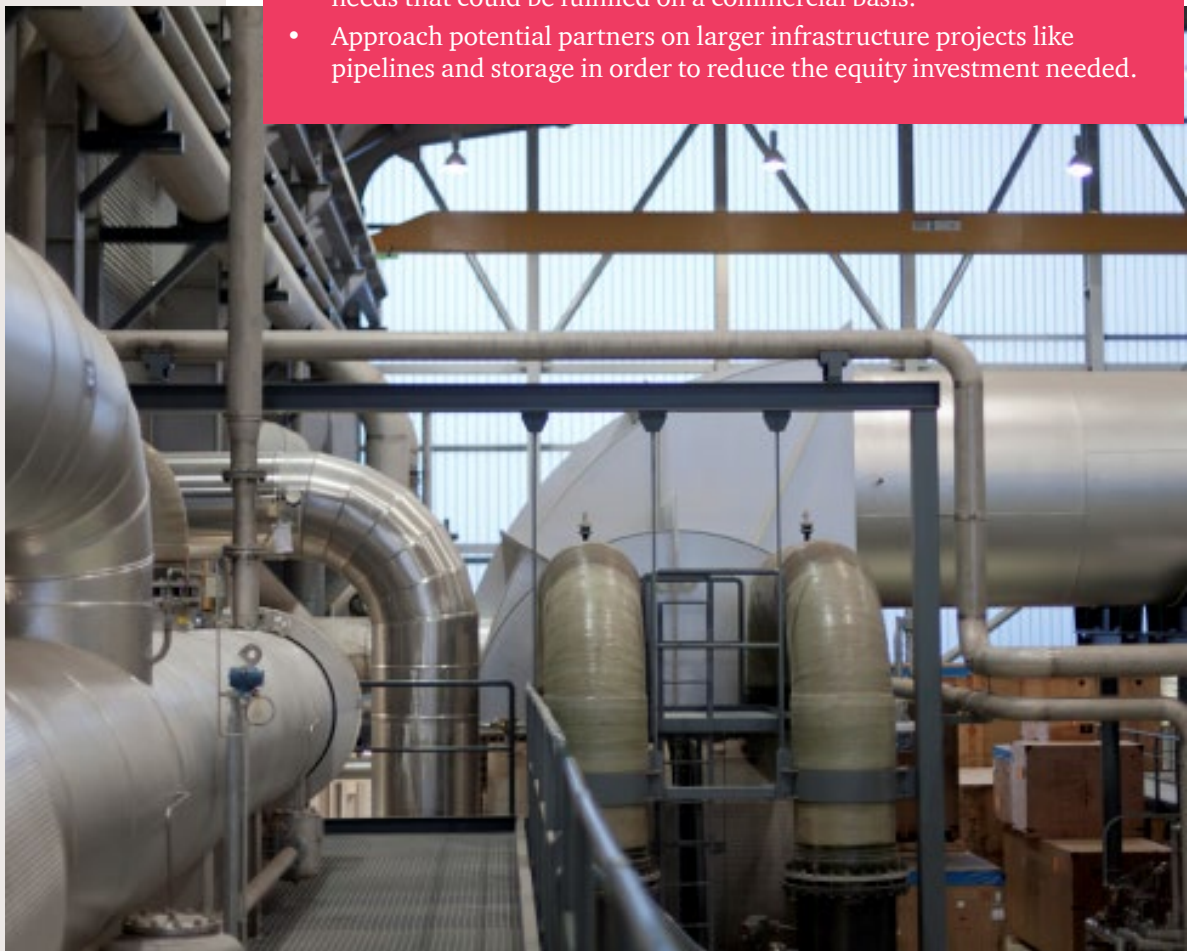
The Uganda National Oil Company (UNOC) is, for example, developing plans to build a heated crude pipeline to evacuate waxy product from the inland areas to the coast. It is working to establish equity partners in the project rather than take on all the risk itself. Another pipeline example is the Rompco gas pipeline running from Mozambique to South Africa. This is a joint venture between Sasol as well as the Mozambican and South African governments.

Storage is another opportunity. Not only does this potentially align with the role of securing strategic stock, it can also provide a commercial opportunity. Namibia's Namcor is working to build a strategic stock terminal and will also be looking to bring in half of the country's automotive fuel needs. Botswana Oil Limited (BOL) is also undertaking a similar initiative with the objective of securing supply for the country.

With access to African markets, NOCs are in a unique position to provide access to private investors. They should keep in mind that sharing the wealth means sharing the risk. Now is the time to rethink investments and diversify risk. As an NEC, storage and transport can prove to be commercially feasible, long-term investments used to generate cash for other riskier portions of the portfolio.

Recommended actions:

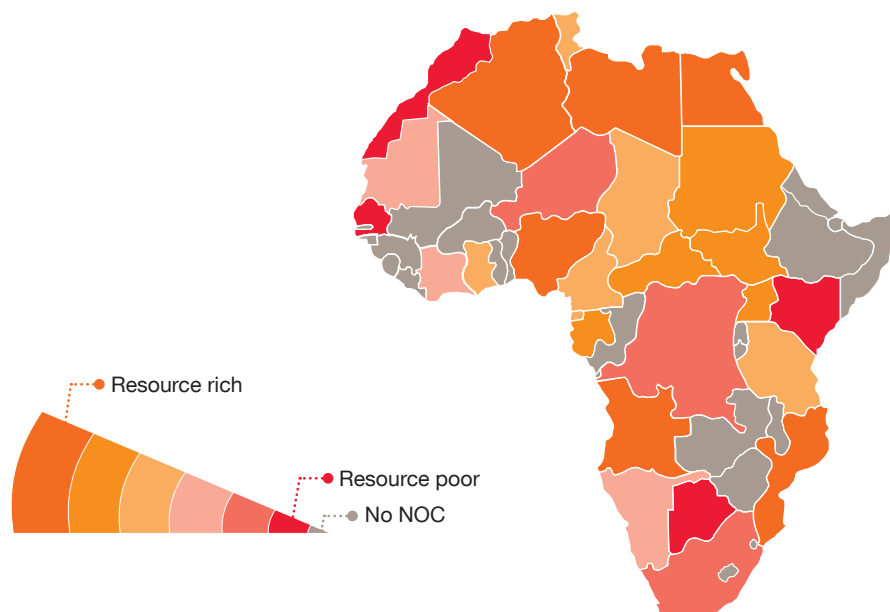
- Consider the potential for a role as a product purchaser or product aggregator in a commercial context.
- Analyse the landscape, and determine if there are additional midstream needs that could be fulfilled on a commercial basis.
- Approach potential partners on larger infrastructure projects like pipelines and storage in order to reduce the equity investment needed.



Making the transition to NEC






Where a NOC is operating in a resource-rich country (see Figure 4), we see five roles they can fulfil as they make the transition to NEC, moving from ‘emerging player’ to ‘foreign ambassador’.

Figure 4 Distribution of proven (P1) reserves



Source: Oil & Gas Journal, Rystad Energy

Figure 5 Roles for resource-rich nations

	 Emerging players	 Capability builders	 Resource custodians	 Nation builders	 Foreign ambassadors
Description	New NOCs in countries with discovered reserves but a fledgling upstream oil & gas sector as yet	NOCs with an established industry and a need to build core capabilities	NOCs with an established industry and well-developed core capabilities	NOCs with a remit that extends beyond the oil & gas sector	NOCs with a remit that involves international expansion
Examples	<ul style="list-style-type: none"> • ENH (Mozambique) • GEPetrol (Equatorial Guinea) • Petrosen (Senegal) • SHT (Chad) • SNH (Cameroon) • SNHG (Gabon) • SNPC (Congo) • Sudapet (Sudan) • UNOC (Uganda) • TPDC (Tanzania) 	<ul style="list-style-type: none"> • GNPC (Ghana) • SNPC (Congo) • SNHG (Gabon) • ETAP (Tunisia) 	<ul style="list-style-type: none"> • EGPC (Egypt) • NOC (Libya) • NNPC (Nigeria) 	<ul style="list-style-type: none"> • Sonatrach (Algeria) • Sonangol (Angola) 	<ul style="list-style-type: none"> • Sonatrach (Algeria) • Sonangol (Angola)
Key focus areas	Establishing basic frameworks for the industry and establishing initial production	Acquiring core technical and project management core capabilities to increase production	Adding value to existing production and applying technology to maximise recoveries	Supporting national development through employment, education and diversification	Establishing a position in selected countries and regions

Source: BMI, Global Data, respective company websites



The pathway for younger NOCs

In the past, the rationale for establishing an NOC wherever there were sizeable hydrocarbons reserves, may have been legitimate. However, as we witness the impact of the energy transition across different continents and demand for some hydrocarbons decline, the rationale is no longer quite so robust.





The scale of strategic roles is inevitably narrower when there is a lack of resource to drive and fund activity. The fall in oil prices since 2014 has made it harder for countries that are starting out on this road, and matching financial resources with ambition is already proving a struggle for some.

Given the significant investment required in terms of financial and human resources to equip workforces for a specialised industry such as oil & gas, what happens when the reserves run out or demand wanes? For those countries with a large reserves base (like Nigeria, Algeria, Angola and Mozambique) this may not be an issue.

Countries with smaller reserves should think carefully before committing to the path of establishing an NOC. An alternative for those countries to consider might be allowing the IOCs and private sector to monetise the reserves while developing the appropriate fiscal regime to generate revenue for the government.

There are four broad roles that a fledgling NOC is likely to play in a resource-poor country, which are highlighted in Figure 6.

Figure 6 Roles for resource-poor countries

	 Product purchaser	 Product aggregator	 Hydrocarbon refiner	 Nation builders
Description	NOCs with only a focus on participating in the fuels import and sales market	NOCs with a remit to own all imports of fuels to manage and ensure sufficient national access	NOCs with a focus on downstream activity to support national fuel consumption	NOCs with a remit that extends beyond the oil & gas sector
Examples	<ul style="list-style-type: none"> • Cohydro (DRC) • NOCK (Kenya) • ONHYM (Morocco) • SMH (Mauritania) • SONIDEP (Niger) 	<ul style="list-style-type: none"> • Namcor (Namibia) • BOL (Botswana) 	<ul style="list-style-type: none"> • PetroCI (Côte d'Ivoire) • PetroSA (South Africa) • Petrosen (Senegal) 	<ul style="list-style-type: none"> • PetroSA (South Africa)
Key focus areas	Importing, distributing and marketing fuel products	Utilising sole import rights to distribute and market fuel products	Refining crude oil domestically, distributing and marketing fuel products	Supporting national development through employment, education and diversification

Source: BMI, Global Data, respective company websites

Case studies

In this section, we highlight six NOCs at various stages of maturity, highlighting how they have graduated to the various stages featured in Figures 4 and 5.



Namcor (National Oil Company of Namibia)

Transformation to product aggregator through downstream growth.

Activities

- Exploration and production company whose flagship project is developing with foreign partners the Kudu field, about 170 km offshore Namibia, with the aim of providing gas to avert a looming power shortage in the country.
- Brings in modest upstream revenues through sale of geophysical and seismic data.
- Has taken steps to diversify downstream activities and is active in the sourcing, selling and distribution of petroleum products domestically.

Ambitions

- Namcor aims to enter the fuel retail market this year with the first ever fully-owned Namcor branded service stations.
- Final investment decision (FID) is expected on the Kudu field, in which the FPSO specialist, BW Offshore, has a majority stake, by Q4 of 2017. Namcor holds a 44% cent interest, and FID here could spur additional activity in the sector. Namcor has also increased its equity share on other offshore blocks, which could signal increased prospectivity.

Strengths

- Strong Board with sound financial and commercial background and deep knowledge of the geology of onshore and offshore Namibia.
- Good organisational design with upstream and downstream operating as separate divisions. Cash flow and cash-equivalent balances are also positive, and the company is currently profitable.

Challenges

- Balance sheet somewhat weak with respect to fixed assets as all assets are only managed, while owned by the government.
- Difficulty of breaking into a downstream retail market dominated by four major international industry players: Total, Engen, Vivo Energy (a Vitol and Helios Investment Partners JV), and Puma Energy (a Trafigura Group and Sonangol JV)
- Need to address a skills gap within the organisation.

Lessons learned

- Other NOCs operating in countries where there is limited commercial opportunity to develop upstream could look to Namcor's example as they consider developing a downstream footprint specifically in storage, distribution, marketing and retail.



GNPC (Ghana National Petroleum Corporation)

A capability builder cementing a differentiated technical capability.

Activities

- Focuses on upstream activities including exploration, production and development of hydrocarbon resources. Large offshore reserves have recently been discovered putting them on the map for oil & gas.

Strengths

- GNPC's commercial capability is strong, with good ability to analyse opportunities such as farm-ins and block acquisitions.
- They have also demonstrated good technical know-how, capable in active involvement in geological services, upstream operations, development, reservoir and production services, well test planning, engineering and shore-based operations.

Challenges

- The wider socio-economic mandate brings a challenge of balancing what GNPC keeps and what the government uses for budgetary support and investment in social purposes – the Petroleum Revenue Management Act in Ghana defines how the revenues are split between these uses.
- Internally, the group has identified the need to enhance its systems and processes. An operational restructuring project is underway to not only streamline processes but drive more international standards of operation and increased effectiveness in carrying out business with their private sector counterparts.

Ambitions

- To become a full-fledged operator, building on three production successes in which GNPC's role has until now been largely technical: the Jubilee Field, Tweneboa, Enyenra, Ntomme (TEN) fields, and the Offshore Cape Three Points (OCTP) block.
- Commercial understanding of the gas and LNG opportunity has led to this being a strategic priority for GNPC. Domestic gas exists in Ghana, which would help in meeting power needs through proliferation of gas-to-power. To support the growth of the industry, GNPC has been mandated by government as the gas aggregator. Gas supply and midstream activity in transmission and distribution is the role they are looking to carve out in the market.
- Though not a formal mandate, government looks to GNPC to create a wider positive socio-economic impact. Revenues are invested into social projects and growth of the Ghanaian economy.

Lessons learned

- GNPC is a capability builder that has invested in its core activities, particularly in developing the group's people – from industry, technical and commercial know-how to supporting local content. The group is now looking to build on its technical capability to be able to operate fields itself and to define a role in the upstream and midstream space, taking advantage of the growth potential in the gas market. GNPC is pursuing a role that will be based on its differentiated capability in technical know-how.
- NOCs with limited financial resources should consider appropriately defining their role in the market and not necessarily looking to participate in every element of the value chain.



NNPC (Nigerian National Petroleum Corporation)

A resource custodian restructuring to manage business complexity.

Activities

- A large and complex NOC with a long history in an oil-rich nation that is largely dependent on hydrocarbon production.
- NNPC is vertically integrated and operates through subsidiaries that include the entire range of oil industry operations, including exploration and production, gas development, refining, distribution, petrochemicals, engineering and commercial investments.

Strengths

- The group's comprehensive business operations across the value chain have enabled it to develop strong technical and operational capabilities and to mitigate operational costs and reduce dependence on third parties.
- This, and NNPC's commercial flexibility and understanding of local requirements, has supported the successful establishment of a range of product-sharing agreements.
- NNPC maximises participation of locals through implementing the Nigerian Content Policy. Local content development has become a key strength.

Challenges

- A proposed new Petroleum Industry Bill (PIB) is set to define the legal and regulatory framework for the Nigerian oil & gas industry. This has been in the works for years, creating uncertainty. Passing it would create an enabling environment and encourage IOCs to make additional investments in the sector, particularly in exploration.
- Part of the bill has been passed by the senate; however, this will need to go through the house of representatives before assent by the president. The Bill calls for a restructuring of the business to split NNPC's regulatory and operational roles. This is an important governance step. NNPC's role will change further as the bill is finalised.

Ambitions

- NNPC wants to leverage its position in having the largest reserves in the region to becoming the pre-eminent oil & gas company in its technical and commercial capability and supply of hydrocarbons across Africa.
- The group also focuses on the development of social, industrial and economic welfare in Nigeria.
- NNPC maximises participation of locals through implementing the Nigerian Content Policy – local content development has therefore become a key strength of their operation.
- To establish an energy investment fund for downstream infrastructure development.
- Downstream, NNPC intends to reform refineries to improve margins and increase the volume of petrol being trucked out to fuel stations across major cities to ease distribution operations.

Lessons learned

- NOCs should consider the way they are structured right from the start to ensure increasing complexity is managed as the group grows. Regulatory bodies should also be separated from the NOC. This will remove potential conflicts of interest and help encourage foreign investment through transparency.
- Political involvement in NNPC management can risk rapid turnover in key staff, creating difficulties in consistency and ability to execute strategic initiatives.
- As with other NOCs, NNPC's financial position has been a problem given the low oil price environment. Even though NNPC obtains funds from diverse sources, including the government, financial institutions and dividends, the low oil price has led to an inability to meet cash calls on a number of joint ventures.
- Issues relating to business irregularities (for example, sales of crude by non-approved entities) may have impacted the inflow of investment.



Sonatrach (Algeria)

A foreign ambassador driving regional refocus and operational change.

Activities

- As Algeria's state-owned integrated oil & gas company, Sonatrach is the largest company in the country by revenue, exploring for, developing and transporting hydrocarbons and by-products. Sonatrach operates pipeline facilities to transport crude oil, condensate, LPG and natural gas.
- Sonatrach has a strong footprint regionally, supplying oil & gas to Europe and North Africa and growing its business in sub-Saharan Africa.

Strengths

- Given hydrocarbons account for 95% of export earnings in Algeria, Sonatrach has strategic importance for the nation.
- The group has a highly capable management team that has developed a long-term strategic plan. This strategic thinking is a shift in the paradigm for African NOCs and has been well-received by IOCs.

Lessons learned

- Despite Sonatrach's successes, it has been slow to recognise and remedy operating model issues – it has been trying to deploy ERP system changes for many years without success. NOCs should be aware of the impact of operational ineffectiveness and the need to execute change successfully, as it can have, not just operational, but financial and reputational cost as well.
- Sonatrach's transition to foreign ambassador points the way for other NOCs, in particular in how it has made investments in power and renewables.

Ambitions

- The group has a regional diversification strategy, which means having not only 'north-south' focus, but also a 'south-south' focus with the aim of becoming a major player across Africa. Sonatrach also has the financial muscle to deliver on this.

Challenges

- Sonatrach's operating model has to evolve, as not all of the group's entities are as aligned and communicating as they should be, in part due to the lack of a common IT platform. However, Abdelmoumen Ould Kadour, Chief Executive since March this year, is making changes by urging employees to simplify bureaucracy and focus on the core business of production.
- From a cost perspective, a low focus on sustainability has led to operating costs not being managed enough.
- However, there are also external pressures that create barriers to cost-cutting. As the first Algerian company and a major national employer, Sonatrach has significant social responsibilities.
- Process issues are related also to financial governance. Sonatrach's financial IT systems and reporting tools are weak and leave the company unable to provide a clear and accurate view of financial statements.
- The group finds it hard to retain talent and has not invested enough in knowledge management capabilities.



Sonangol (Sociedade Nacional de Combustíveis de Angola)

A nation builder reassessing strategic activities to focus on core business.

Activities

- Sonangol's role in Angola is pivotal given that oil accounts for 98% of the country's exports and 75% of state revenue. It has a clear role as a nation builder.
- The group's mandate is being sharpened to focus on its core business of hydrocarbon exploration and production.
- The group is looking to improve operational efficiency while containing costs by focusing on oil fields already under development rather than pursuing new exploration opportunities.

Challenges

- Sonangol's greatest challenge relates to its role as nation builder. The group is vulnerable to 'overstretch' in the business given its wide-ranging roles, responsibilities and business interests. Its extensive investments can range from entities where it only has a financial stake, and so does not have investment oversight capability, to entities in which it has decision-making or management roles that can take capacity away from Sonangol.
- The oil price decline has deepened the impact of these challenges and the need to address them.
- While Sonangol intends to remain in certain businesses (such as banking), the group is looking to divest those with less economic or strategic rationale (such as shipyards) and to develop greater separation between their oil & gas business and remaining businesses.
- Sonangol has recognised the need for separation from the regulatory body, which is currently part of the business. It is looking to improve operational efficiency while containing costs by focusing on oilfields already under development rather than pursuing new exploration opportunities.

Strengths

- Sonangol is seen as one of the lower-risk state entities of Angola. Despite being indebted, the group has been able to demonstrate an improved balance sheet given reduced debt burdens since 2015 (from \$13.6bn to \$9.8bn in the fourth quarter of 2016, with a targeted reduction of a further \$8bn in 2017)*, and inclusion of hydrocarbon concessions awarded by government.
- A highly capable management team, which has looked to create an international level of capability through employing people with industry focus and more commercial mindsets – including chairwoman Isabel dos Santos and board members from other companies in the industry.
- The core business is structured such that each board member takes oversight of a number of areas from across the group. This allows more rapid decision-making and greater alignment of activities – which is particularly differentiated given Sonangol's involvement in a wide range of industries.

Lessons learned

- While Sonangol has understandable responsibilities as a nation builder, it is equally clear that the extent of businesses in which it is involved has made management of its core business more challenging. A transformation programme is underway to address this.
- Other NOCs should consider how best to manage their role in national development, in particular by ensuring that there is strategic rationale for their involvement in non-core activities so as to prevent resource and operational overstretch and inefficiencies.

**Source: BMI Angola Oil & Gas Report (Q4 2017)*



ENH (Empresa Nacional de Hidrocarbonetos [Mozambique])

Emerging player defining its role and driving a path to nation-building.

Activities

- Established in 1981, ENH is a wholly-owned state entity involved in research, exploration, production and marketing of petroleum products.
- The group is also involved in distribution and onshore logistics development projects.

Challenges

- ENH finds it hard to drive commercial decision-making as the group has political requirements, including the need to support local content, which dilute the commercial priority.
- Strategic and operational decisions are made at the political level, leaving management with limited autonomy.
- A lack of investment capital is also limiting. ENH contributions are provided through debt or through the free-carry structure. The group's capacity to raise money is challenged, given a weak balance sheet and the perceived risk and associated interest rates being prohibitively high.
- A lack of local technical skills and capability is hampering the growth of the business.

Lessons learned

- ENH's ambition to rapidly become a nation builder has exposed the challenges that other, young NOCs are likely to face: defining a strategic focus and delivering on it with the right financial resources, with the government as owner and regulator.
- NOCs should look to separate the state from the NOC sufficiently that there can be effective management, delivered with enough autonomy, to respond to commercial imperatives and market trends – while balancing the need to fulfil nation-building responsibilities. Local content requirements should also progress to become more stringent over time. This would encourage early-stage investment in the industry and allow time for local capability to develop the necessary skills.

Ambitions

- ENH wants to become an integrated oil & gas company, while fulfilling its mandated role as domestic gas aggregator with a focus on Mozambique and southern Africa in the short/medium term.
- Discoveries of large reserves of gas in the Rovuma Basin in the Indian Ocean since 2010 – by Anadarko Petroleum of the US and Italy's Eni – could transform Mozambique into a global supplier of liquefied natural gas (LNG), especially to Asian markets. Indeed, ENH wants to operate globally in the longer term.
- A medium-term target for ENH is to drive Mozambique towards self-sufficiency in hydrocarbon consumption by 2021, including developing refining capacity. The country currently imports most of its refined product.
- ENH is pressing ahead with midstream gas projects and plans to develop downstream retail activity as well.
- ENH's activities are conducted through several subsidiaries and are driven by a partnership approach given the group's limited technical capabilities.
- The 5-20% participation right (allowing equity carry in operations at any phase), stipulated by Mozambique's Gas and Petroleum Law, has ensured the group's involvement in all exploration activity.

The role of digital in reshaping business models

African NOCs – whether established or emerging – should think about where and how best to invest in digitisation as they redefine business models.

Digitally-enabled technology systems are expected to significantly reduce the cost-per-barrel of future hydrocarbon resource exploitation. So-called digitisation involves physical devices communicating directly with each other – machine-to-machine – with little or no human intervention.

To the oil & gas business, digital includes smart elements such as sensors, measuring devices, and actuators embedded in drills, wellheads or even tank-gauging systems, exchanging data in real time. The use of IoT sensors can help oil companies have real-time control that could increase the safety, reliability and yield of thousands of wells around the globe.

Such data exchange enables expansive monitoring, integrated operations, remote configuration and optimisation, and even self-management. Wireless networking connects these elements, and through use of purpose-built applications, sends their combined and integrated data to servers for processing, storage and analytics.

In order to make the most out of digital, companies need the right capabilities to gain the right to win. To become a digital player, oil & gas leaders need to assess their business abilities in data management, operational analytics, asset optimisation, field surveillance, integrated field planning and delivery and operations automation.

A single drilling rig, for example, can generate one terabyte of data each day. In a control room, personnel have the opportunity to see and interact with an accurate virtual representation of the field and all its components. Field data can be processed continuously in real time, with applications automating decision-making, performing predictive analyses, reacting to alarms, and monitoring and controlling production process – with or without human intervention.

Yet the industry has been slower than other sectors to adopt digital solutions and has tended to remain focused on increasing production, recovery and throughput for years. The new era of low oil is now forcing operators to shift focus from top-line to bottom-line growth, towards improving cost structures and margins in order to be competitive in current conditions and prioritising efficiency gains over production growth.

Digital also has a role in renewables and in shifting towards a low carbon energy industry. Energy distribution will move towards a ‘networked grid’, with usage monitored by tools created by the IoT, with businesses and consumers as active participants. Real-time management of energy will become easier, allowing a Plant Manager to oversee how much solar energy a factory may need – in real time and from a tablet, according to experts at Invenenergy Future Fund, part of North America’s largest privately-held independent energy provider.

A decline in renewable energy costs is happening alongside lowered cost of sensors, communication and data storage technologies – all of which spells opportunities for the right marriage of digital and renewables. It also spells opportunity for African NOCs looking to leapfrog in the new digital world.

Ultimately, digital is no longer an enabler but a game changer. African oil & gas organisations that respond to the need for reshaped business models by building digital capabilities will be well-positioned to win in the new market reality.

Tough questions to ask about the future



As we have illustrated in this paper, African NOCs are going through a major period of disruption. Perhaps some fundamental questions for CEOs, heads of Strategy and Corporate Planning to pose might be the following:

On strategy...

- How are you preparing for industry-wide disruption in the African energy sector?
- Have you undergone a scenario planning exercise to map out possible future outcomes and assess the strategy required to navigate this disruption?
- What are the different business models you can explore to build a sustainable NOC of the future?

On digital...

- Should you be a digital leader or a fast-follower? Can you afford to take the risk of lagging behind competitors?

On partnerships...

- Who should you partner with to develop the kind of capabilities that best complement your strategy?



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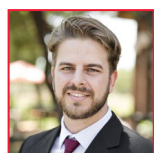


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