

African oil and gas: driving sustainable growth



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Introduction

Africa is on an upward growth curve, and Africa's growth is both real and sustainable. Its growth is underpinned by a longer term process of social, political and economic reform that has occurred across much of the continent since the end of the Cold War and the Apartheid era; a period during which inflation has been brought under control, foreign debt and budget deficits reduced, state-owned enterprises privatized, regulatory and legal systems strengthened, and many African economies opened up to international trade and investment.

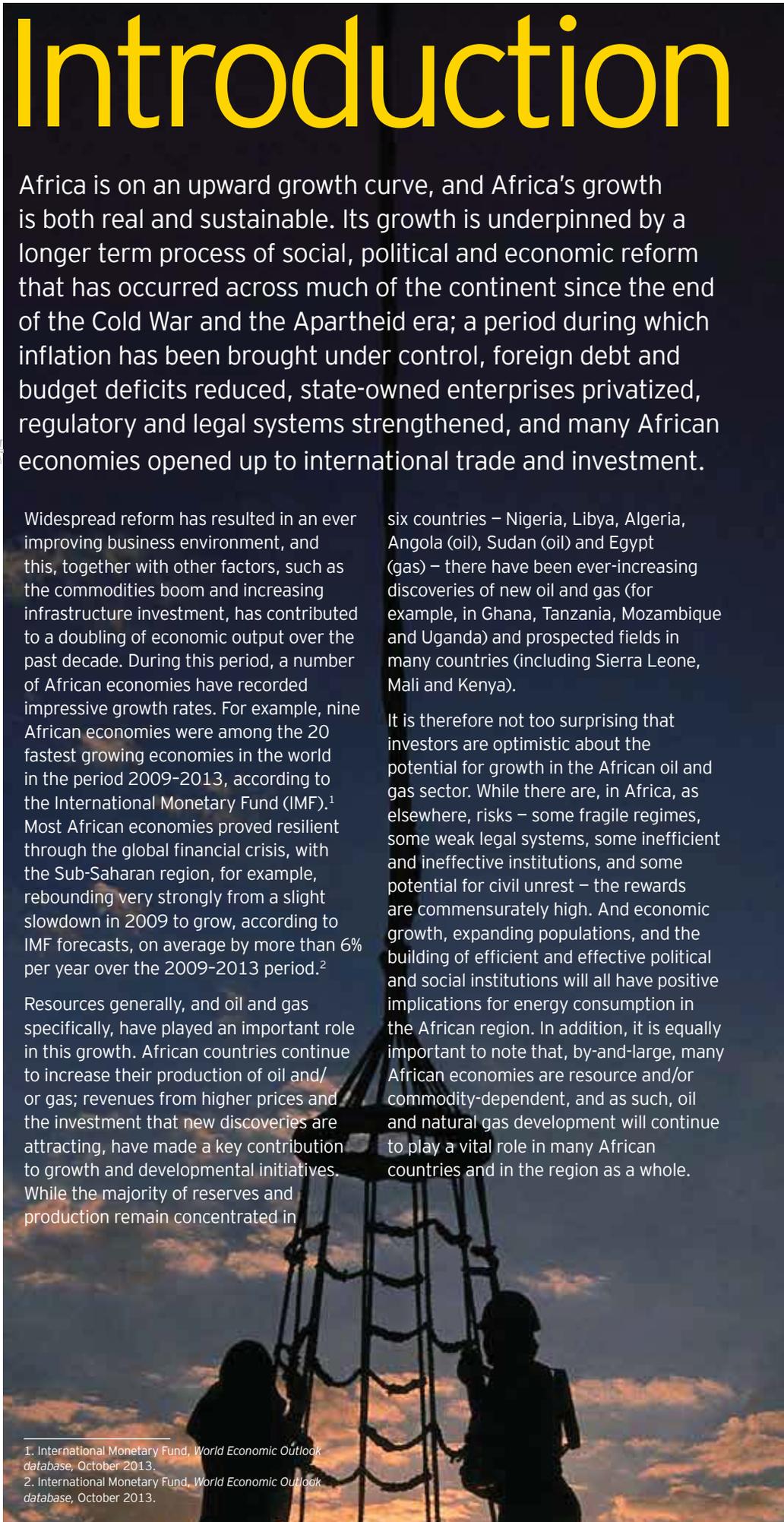
Widespread reform has resulted in an ever improving business environment, and this, together with other factors, such as the commodities boom and increasing infrastructure investment, has contributed to a doubling of economic output over the past decade. During this period, a number of African economies have recorded impressive growth rates. For example, nine African economies were among the 20 fastest growing economies in the world in the period 2009-2013, according to the International Monetary Fund (IMF).¹ Most African economies proved resilient through the global financial crisis, with the Sub-Saharan region, for example, rebounding very strongly from a slight slowdown in 2009 to grow, according to IMF forecasts, on average by more than 6% per year over the 2009-2013 period.²

Resources generally, and oil and gas specifically, have played an important role in this growth. African countries continue to increase their production of oil and/or gas; revenues from higher prices and the investment that new discoveries are attracting, have made a key contribution to growth and developmental initiatives. While the majority of reserves and production remain concentrated in

six countries – Nigeria, Libya, Algeria, Angola (oil), Sudan (oil) and Egypt (gas) – there have been ever-increasing discoveries of new oil and gas (for example, in Ghana, Tanzania, Mozambique and Uganda) and prospected fields in many countries (including Sierra Leone, Mali and Kenya).

It is therefore not too surprising that investors are optimistic about the potential for growth in the African oil and gas sector. While there are, in Africa, as elsewhere, risks – some fragile regimes, some weak legal systems, some inefficient and ineffective institutions, and some potential for civil unrest – the rewards are commensurately high. And economic growth, expanding populations, and the building of efficient and effective political and social institutions will all have positive implications for energy consumption in the African region. In addition, it is equally important to note that, by-and-large, many African economies are resource and/or commodity-dependent, and as such, oil and natural gas development will continue to play a vital role in many African countries and in the region as a whole.

1. International Monetary Fund, *World Economic Outlook database*, October 2013.
 2. International Monetary Fund, *World Economic Outlook database*, October 2013.



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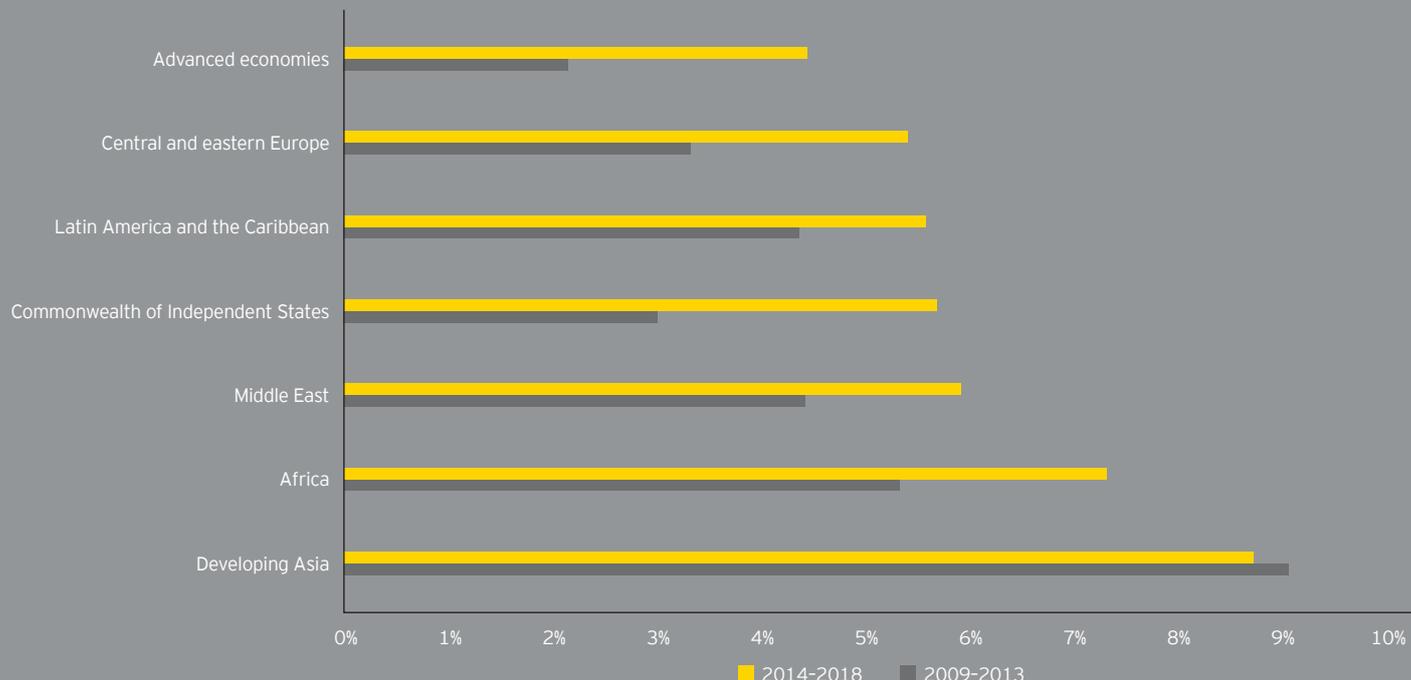
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Highlights of the 2013 Africa Attractiveness Survey

The purpose of EY's most recent Africa Attractiveness Survey was to understand the perceptions and realities of Foreign Direct Investment (FDI) into and across Africa. The results of our survey highlight what over 500 business leaders had to say about Africa's growth story, the latest foreign direct investment (FDI) trends and the region's growth potential. Some key points from our report:

- ▶ Despite some ongoing skepticism, the past decade has been one of robust and sustained economic growth.
- ▶ In the period since 2000, in the face of at times a tough global economy, the overall size of the African economy has more than doubled in purchasing power parity terms.
- ▶ High growth rates of individual economies are set to continue, with the IMF forecasting that 10 of the world's 20 fastest-growing economies in the period to 2018 will be in Africa.
- ▶ Twenty-seven African countries have already attained "middle income" status, and at the expected growth rates, as many as 40 countries (or 75% of countries on the continent) could reach that status by 2025.
- ▶ The directional trend of several economic, political and social factors give us confidence that a critical mass of African economies are poised to drive the structural transformation required over the coming decades to not only sustain, but even accelerate, growth and development.
- ▶ In terms of expected growth over the next five years, Africa will trail only developing Asia. Growth for total Africa in the period to 2018 is expected to average 7.3% (North African growth is expected to average 6.6%, while Sub-Saharan growth is expected to average 7.7%).

Global economic growth by region (5 yr CAGR averages)



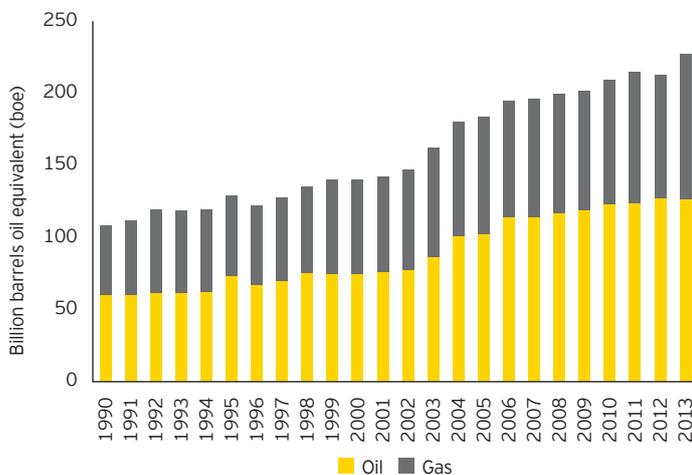
Source: International Monetary Fund, *World Economic Outlook*, October 2013

The African oil and gas landscape

Reserves and production

As of the end of 2013, according to the *Oil & Gas Journal*, proved African oil and natural gas reserves are estimated to be almost 228 billion barrels of oil-equivalent (boe), with total reserves up sharply from the 2012 total of 213 billion boe, due largely to revisions in proved gas reserves. Oil reserves account for about 56% of the region's total reserves, but gas reserves are growing far faster.

African oil and gas proved reserves (1990-2013)



Source: US Department of Energy, US Energy Information Administration and *Oil & Gas Journal*



African reserves are currently dominated by Nigeria, Algeria and Libya, which collectively accounted for almost 72% of the region's total proved reserves in 2013, but the identified resource and reserve base is progressively becoming more diversified.



Proved reserves of African oil and gas (end-2013)

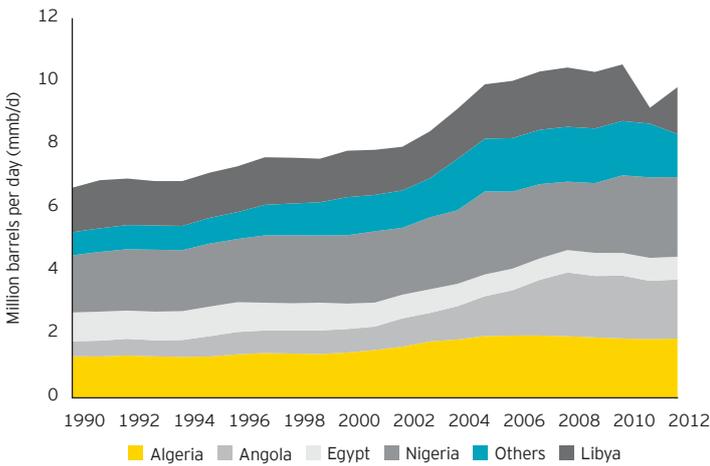
	Oil (million bbls)	Gas (bcf)	Total (billion boe)
Nigeria	37140	180737	67.3
Libya	48470	54701	57.6
Algeria	12200	159054	38.7
Egypt	4400	77200	17.3
Mozambique	-	100000	16.7
Angola	9060	9711	10.7
S Sudan	3500	2200	3.9
Uganda	2500	500	2.6
Gabon	2000	1000	2.2
Congo (Brazzaville)	1600	3200	2.1
Sudan	1500	800	1.6
Chad	1500	-	1.5
Equatorial Guinea	1100	1300	1.3
Cameroon	200	4770	1.0
Tunisia	425	2300	0.8
Ghana	660	800	0.8
Namibia	-	2200	0.4
Rwanda	-	2000	0.3
Ivory Coast	100	1000	0.3
Mauritania	20	1000	0.2
Congo (Kinshasa)	180	35	0.2
Niger	150	-	0.2
Ethiopia	1	880	0.1
Tanzania	-	230	*
Somalia	-	200	*
S Africa	15	-	*
Benin	8	40	*
Morocco	1	51	*
Total Africa	126730	605909	227.7

*Less than 50 million boe

Source: *Oil & Gas Journal*

After declining in 2011 with the Libyan civil war, African oil production (including crude oil, condensates and natural gas liquids) is estimated to have increased to about 9.8 million barrels per day (b/d) in 2012.

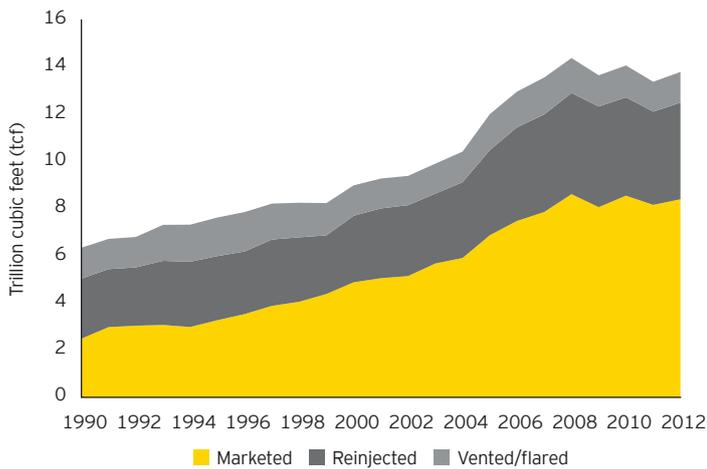
African oil production (includes crude oil, condensates and NGLs)



Source: US Department of Energy, *Oil & Gas Journal*

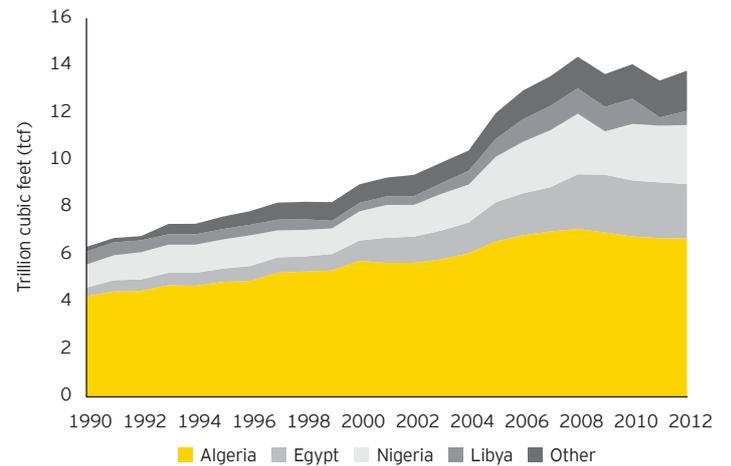
Total natural gas production (including marketed, re-injected, vented and flared gas) reached 13.8 trillion cubic feet (tcf) in 2012, while marketed production of African gas in 2012 was estimated at about 8.4 tcf.

African natural gas production



Source: US Department of Energy, *Oil & Gas Journal*

African natural gas production (includes marketed, reinjected and vented/flared gas)



Source: US Department of Energy, *Oil & Gas Journal*

Production is highly concentrated for both oil and natural gas in Africa, with the five largest producers accounting for more than 86% of the region's oil production and more than 90% of the region's gas production. However, despite current levels of concentration, 23 African countries were producers of oil and/or gas in 2012, and oil and gas will be a key driver of growth across much of Africa going forward. There are ever-increasing discoveries of new oil and gas (for example, in Ghana, Tanzania, Mozambique, Kenya and Uganda) and bright prospects are seen for many other countries (including Sierra Leone, Morocco, Gabon, Côte d'Ivoire, Liberia, Mali and Kenya).

Before the Libyan production curtailments, African oil production had been growing steadily over the past decade. Conventional forecasts see African oil supply growth continuing over the next 25 years, albeit more slowly than it had recently – with forecast ranges of growth over the period of between 0.5 and 2.0 million b/d. African natural gas supply has similarly grown strongly in the recent decade, and forecasts of supply growth are dramatically stronger than for oil, with supply expected to double by 2035.³

3. US Department of Energy/Energy Information Administration, international energy database, accessed 15 January 2014; International Energy Agency, *World Energy Outlook 2013*, November 2013; and US Department of Energy/Energy Information Administration, *International Energy Outlook 2013*, July 2013.

As yet further evidence of Africa's tremendous potential, the International Energy Agency (IEA) in its most-recent *World Energy Outlook*, expects that more than US\$2.2 trillion will need to be invested in African oil and natural gas supply infrastructure over the 2013-2035 period – an average of almost US\$100 billion per year, more than the IEA expects will be invested in the Middle East, the Former Soviet Union, or even in Asia over the same period.⁴

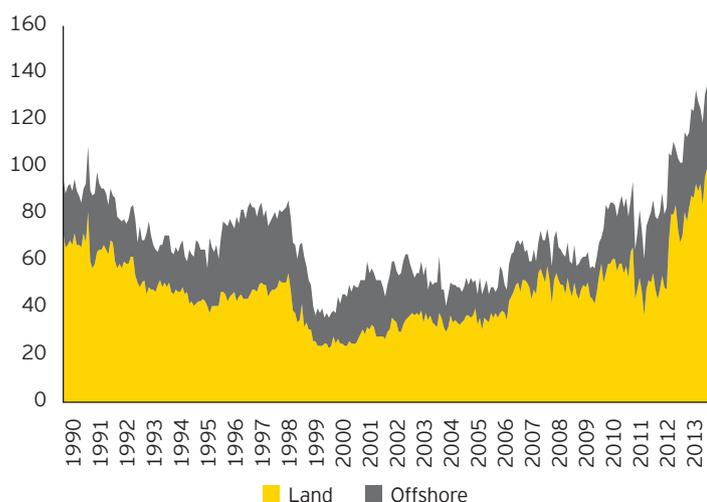
Current African oil and gas production is led by the major integrated companies, particularly the Italian and French majors, ENI and Total SA, both of which have long and deep relationships in the region. The continent's "new frontiers" have however, been largely driven by the active mid-sized and smaller regional independents. We are seeing increasing broader interest by the major companies and in particular, by the big Asian NOCs.

Exploration and drilling activity

African drilling activity accounts for a relatively small portion of the global industry total – typically ranging between 4-7% of the global total. As measured by drilling rig activity, interest in African oil and gas broadly declined from the early-1980s until the mid-1990s, broadly paralleling the global trend as well. Interest picked up in the mid-1990s only to slide once again in the late-1990s. However, beginning in late-1999 drilling activity has increased fairly steadily, except for the brief, but sharp downturn following the collapse of oil and gas prices in late-2008. As of the end of 2013, Baker Hughes reported 138 active rotary rigs in Africa, out of a global total of 3478 rigs. Rig activity in Africa is dominated by land drilling, but in recent years, offshore activity has notably increased, particularly off West Africa.

Oil and gas drilling in Africa

(average active rigs: monthly 1990-2013)



Source: Baker Hughes, Inc.

4. International Energy Agency, *World Energy Outlook 2013*, November 2013.

Other oil and gas activity

Accompanying the sustained growth in the upstream segment of the African oil and gas industry is strong growth in the associated midstream and downstream 'infrastructure' parts of the business – terminals, storage capacity and, most critically, pipelines and refineries. New pipeline capacity may be necessary particularly where new production is "land-locked" such as in the case of Chad, South Sudan and Uganda. In the case of refining capacity, according to estimates from the International Energy Agency (IEA), the region's crude distillation unit (CDU) capacity is expected to increase by about 10% in the period to 2017, with investments by Chinese investors dominating the proposed expansions. Typically in exchange for access to various upstream projects, Chinese firms have been investing in infrastructure developments across a wide range of oil producing African countries. New Chinese-backed refineries have recently been commissioned in Chad and Niger, and have been proposed in Egypt, Sudan and Nigeria.⁵ In addition, China's CNOOC is one of the partners (with Tullow and Total SA) in the proposed new refinery in Uganda, which will process the country's new crude oil production.⁶

Also notable in the African oil downstream is the restructuring that is underway in the refining and marketing segments, with the large international, integrated companies (i.e., ExxonMobil, Royal Dutch Shell, BP, Chevron and Total SA) each divesting parts of their downstream network in Africa, including some refining interests, as well as some storage, retail and marketing assets. Buyers of these assets have included local/regional petroleum marketing companies, such as South Africa's Engen Petroleum, Vivo Energy and Kenya's Kenol, as well as international trading companies, such as Puma/Trafigura and Vitol, and several integrated Asian players like India's Essar Oil and South Korea's SK Energy.

5. International Energy Agency, *Medium-Term Oil and Gas Markets 2012*, June 2012

6. IHS Global Insight, Inc., *Ugandan Government and Tullow Planning 20,000 b/d Refinery in Albertine Graben*, 6 June 2011

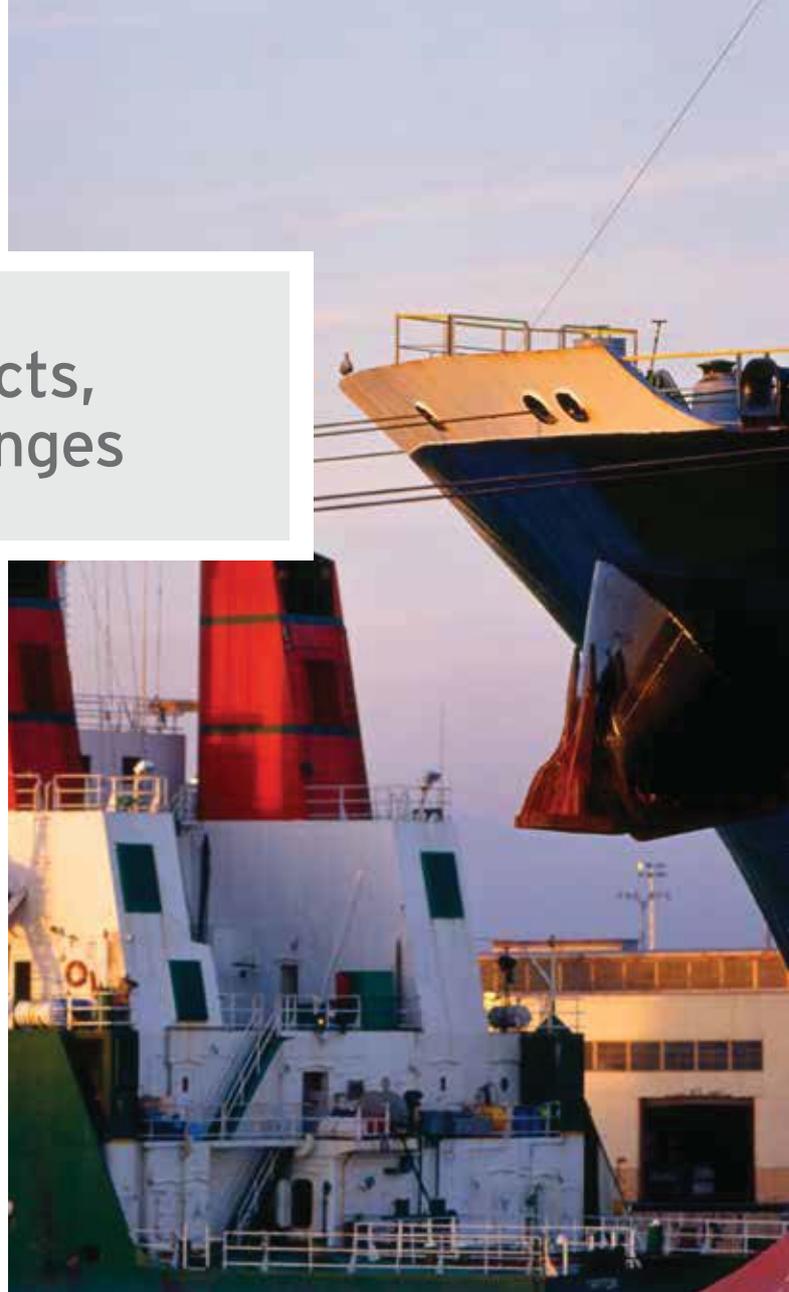
Looking forward: prospects, opportunities and challenges

There is a distinct wave of optimism pulsing through the African oil and gas industry. Particularly so in the eastern part of the continent, which has historically seen little oil and gas development, recent discoveries could transform the landscape, fuelling widespread economic and social development. But significant challenges remain, particularly in terms of infrastructure development and political stability/transparency. Some have noted that in many parts of the continent, governments are getting tougher on the industry: imposing local content restrictions, pressuring companies to accelerate development and threatening to withdraw licenses if there is insufficient activity, attempting to collect capital gains taxes for farm-outs, denying/reducing tax rebates and/or levying higher import duties, and imposing tighter environmental terms. But all-in-all, the challenges seem to be outweighed by the potential rewards.

More specifically, from a sub-regional perspective, we would point to the following:

North Africa

The current political uncertainty in North Africa may have significant implications for the region's oil and gas industry, particularly so in two of the "old lions," Algeria and Libya, where industry revenues dominate the country's economy, as well as in Egypt. Prior to the so-called Arab Spring, the sub-region had seen generally declining political risk and an increase in investment in the oil and gas industry, particularly on the gas side. But until the political situation is settled, operations, particularly in Libya and Egypt, are likely to be constrained and/or disrupted and new investment postponed. The sub-region's industry has broadly remained open to the IOCs, particularly the European "majors," as well as to the specialized independents, both large and small. Investment is usually through production sharing agreements (PSAs) with the state oil companies.

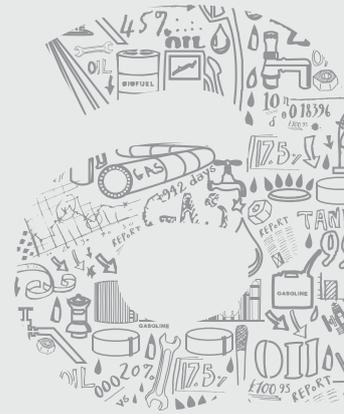


The political issues aside, two exploration "hot spots" are emerging in the sub-region:

- ▶ Onshore Algeria/Tunisia, with recent encouraging discoveries made in southern Tunisia near the Libyan/Algerian borders
- ▶ Offshore deepwater Morocco, where some big acreage portfolios are being assembled, encouraged by generally attractive terms; interest and activity is increasing as well in the neighboring/contested waters off Western Sahara

West Africa

Dominated by one of the "old lions" (Nigeria) and one of the "new lions" (Angola), West African activity has taken off in the last decade, driven particularly by advances in offshore/deepwater



technology. Angola became the newest member of the OPEC cartel in January 2007, and has become one of Africa’s leading producers, threatening to overtake the long-time leading producer, Nigeria. With the prominence of the deepwater in the sub-region’s industry, it is dominated by deep-pocketed supermajors, typically working under JV arrangements or through consortia. Nevertheless, there is also growing participation of NOCs from outside the region (e.g., Petrobras and Sinopec) and by mid-sized and smaller independents. Local content laws are further increasing participation from smaller local/regional firms.

Other players include the Republic of the Congo, which is still one of Africa’s largest producers, but whose oil production is in decline, while potential gas development is limited by a lack of infrastructure. That could change however, if the World Bank’s proposed African Gas Initiative, which focuses on gas reserves in Angola, Cameroon, Congo, Gabon and Cote d’Ivoire, continues to go forward. The Congo is also thought to have some deepwater offshore potential. Central Africa’s other major player, Chad, has seen some recent success, led by ExxonMobil and China’s CNPC, but suffers from a somewhat challenging geology that makes development costly.

The sub-region also includes a number of smaller producers whose industry is generally in decline owing to mature fields (e.g., Gabon and Cameroon), and some whose oil and gas industry is in its ascendancy, with a few recent big successes that may bode well for the future. Notably, Equatorial Guinea hopes to leverage the Marathon-led discoveries and developments into rapid economic growth, while the Anadarko/Tullow success in Ghana’s Jubilee area will transform the country’s oil and gas industry. These successes are also thought to bode well for neighboring developments in the West African/Atlantic Transform Margin in offshore Sierra Leone, Cote d’Ivoire and, potentially, Liberia.

Emerging exploration “hot spots” in this sub-region include:

- ▶ The West African transform margin mentioned above, again building on the Jubilee success
- ▶ The Angola and Gabon pre-salt prospects, which are seen as analogues to the notable Brazilian pre-salt discoveries. In terms of fiscal regimes, Gabonese development is generally seen as slightly more attractive.

East Africa

The rapid growth of one of Africa’s “new lions,” Sudan, has been uniquely driven primarily by Asian state-owned investors, notably CNPC, Petronas and ONGC, who quickly filled the void when “Western” investment dried up on account of political/ reputational risk and international sanctions. After becoming one of Africa’s leading oil producers, the country then saw the secession of the southern portion of the country and the establishment of the world’s newest nation, South Sudan. However, the secession has not gone smoothly, with the inevitably controversial division/ management of the oil and gas resources.

The sub-region is also home to what could be a game-changer for the African oil and gas industry: the “newest lion cubs” – the deepwater gas prospects off Tanzania and Mozambique. Led first by US independent, Anadarko, along with some of the smaller regional specialists, and then joined by some of the larger IOCs and a few Asian NOCs, discoveries over the last 2-3 years have confirmed the area as one of the world’s most promising gas provinces.

The emerging exploration “hot spots” in this sub-region include:

- ▶ East African deepwater, with more than 150 tcf of gas resources discovered to date which will support the six proposed LNG trains. Expected/yet-to-find gas in the Mozambique/Tanzania area could potentially support as many as 24 LNG trains.
- ▶ East African onshore with some preliminary discoveries in Uganda and Kenya, the broad Kenya-Ethiopia Rift Valley is thought to hold big prospects

How can EY help?

Our presence in Africa

At EY, we draw upon our global and local knowledge to help you retain the confidence of investors, manage your risk, strengthen your controls, grasp opportunities and achieve your potential. Our clients find that our single point of contact coordination model significantly enhances their ability to operate, particularly across multiple countries in Africa.

EY is highly integrated across Africa, which is very significant for our clients as we run our business by service line, sectors and functions, instead of by country, which means for you as a client:

- ▶ Consistent quality standards everywhere
- ▶ "Single point of contact" service
- ▶ The right EY resource irrespective of country location

We believe that these benefits significantly enhance our quality of service and speed of response.

EY Africa has a presence in 36 African countries and provides support in the remaining African continent. In addition, we can provide support from our London Africa desk and Paris African Center. Our network throughout the region helps demonstrate that we are responsive to the needs of our clients, stimulating trade and enhancing business relationships.





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