OIL AND GAS IN AFRICA

AFRICA’S RESERVES, POTENTIAL AND PROSPECTS

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CONTENTS

Introduction and Overview 4
Oil and Gas: A Regional Perspective 5
Challenges and Opportunities 6
Selected African Oil Producers 8
Selected African Gas Producers 14
East Africa – The New Energy Frontier 16
Conclusion 18
SOURCES OF INFORMATION 19
CONTACT DETAILS 19
INTRODUCTION AND OVERVIEW

Africa is home to some of the world’s fastest-growing economies, many of them buoyed by new oil and gas finds, including Mozambique, Tanzania, Kenya, Uganda and Ghana. Even though the international price of oil is presently projected to moderate somewhat in 2013 from last year, oil prices are expected to remain more than 75% higher than in 2009. As a result, Africa’s key oil producing countries are expected to continue to list amongst those countries expanding the fastest on the continent.

Africa boasts with a long list of oil producing countries. According to data from the US Energy Information Administration (EIA) from 2010, 16 of the 54 countries in Africa are exporters of oil, namely Nigeria, Angola, Libya, Algeria, Sudan, South Sudan, Equatorial Guinea, Congo (Brazzaville), Gabon, Chad, Egypt, Tunisia, Cameroon, Ivory Coast, Democratic Republic of Congo (DRC), and Mauritania.

Africa’s oil history stretches over a period of several decades, in some places it is even a century old. Presently, there are about 500 oil companies that participate in African hydrocarbon exploration. According to figures from the US EIA, Africa’s proven oil reserves have grown by nearly 120% in the past 30 years or so, from 57 billion barrels in 1980 to 124 billion barrels in 2012. In addition, it is estimated that at least another 100 billion barrels are offshore Africa, only waiting to be discovered. In turn, Africa’s proven reserves of natural gas have grown from 210 trillion cubic feet (tcf) in 1980 to 509 tcf in 2012, representing growth of over 140%. Furthermore, recent further discoveries of sizable natural gas reserves in Tanzania and Mozambique point to significant upward potential for these figures.

In 2010, Africa’s oil production represented 12.4% of the world’s total crude oil output, while Africa’s crude oil exports grabbed a higher share at nearly 20% of the world’s total exports of crude – as a result of limited refining capacity and still limited oil consumption on the continent – while Africa held 8.8% of the world’s proven reserves of oil in the year.

Africa’s prospects and potential for further oil and gas finds remain exceedingly positive. According to research by the Chatham House (published in November 2012), compared with some 15,000 wells drilled in West Africa, only 500 have been drilled in East Africa to date. While new hydrocarbon finds boost the interest in and potential of East Africa, prospects of pre-salt discoveries across the Gulf of Guinea are significant. In this regard, in 2011, Angola signed a number of ultra-deep water deals with oil majors in subsalt blocks in the Kwanza Basin, whose oil volumes are forecast to be of commercial quantities. If prospects are as favourable as projected, Angola could extend its life as a major oil exporter by an additional 30 years and the country should be able to increase its oil production to eclipse that of Nigeria.

Four of Africa’s oil producers are also members of the Organisation of the Petroleum Exporting Countries (OPEC), namely Algeria, Angola, Libya and Nigeria. Libya already joined OPEC in 1962, followed by Algeria in 1969, Nigeria in 1971, and with Angola Africa’s newest member of OPEC, joining the international club of oil producing countries in 2007. Gabon was also previously a member of OPEC, but officially departed from the producer organisation at the June 1996 OPEC meeting. Africa’s adherence to OPEC output quotas has varied over the years, with domestic supply problems and the international oil price at times more of a driving force to determine output levels, especially in Nigeria, than OPEC output restrictions.

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1 OPEC member countries are: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.
In terms of trade in oil, Africa has for years been seen by western and Asian markets as a means to diversify away from too deep a dependence on Middle Eastern oil. Robust demand from especially India and China over the past decade, fuelled by strong economic growth in these countries, has started to change not only Africa’s export profile, but also the continent’s economic landscape. Although Saudi Arabia is the principal supplier of oil to China, Angola occupies second place, with China receiving nearly 9% of its oil from Luanda, according to Trade Map figures. Other African countries that export to China include Congo (Brazzaville), Libya, Algeria, Equatorial Guinea, Nigeria, South Africa, Egypt, with the Asian powerhouse also an important trade partner of Sudan and South Sudan. Africa’s oil exports to China are expected to increase over the medium- to the long-term – with the International Energy Agency projecting that China will become the world’s largest net-importer of oil by 2020.

From the accompanying graphs, it is clear that both China and India’s prominence has grown as key destinations of Africa’s oil exports. When just considering the past few years, whereas in 2007, only 10% of Africa’s oil was shipped to China, and 5% to India, by 2011, these figures increased to 14% and 8% respectively. Oil contributes substantially to Africa’s total export receipts; in 2011, an estimated 58% of Africa’s total export receipts in value terms belonged to the category ‘mineral fuels, oils and distillation products’. In some individual countries, hydrocarbon exports account for over 95% of export earnings.

**OIL AND GAS: A REGIONAL PERSPECTIVE**

A stretch of West Africa’s coast spanning more than a dozen countries, the Gulf of Guinea is a growing source of oil to world markets. The Gulf of Guinea has for a long time now been a significant producer of hydrocarbons and continues to attract significant amounts of the foreign direct investment targeted at Africa’s hydrocarbons. The Gulf of Guinea runs from Guinea on Africa’s north-western tip to Angola in the south and includes oil producing Nigeria, Ghana, Ivory Coast, DRC, Congo (Brazzaville), Gabon, Cameroon, Equatorial Guinea and Angola. Gulf of Guinea nations mostly supply European and American markets, although Angola supplies much to the Chinese as well. Nigeria is the biggest oil exporter, at 2.5 million bpd in 2011, with fellow-OPEC member Angola exporting an estimated 1.84 million bpd in that year. Smaller producers include Equatorial Guinea (303,000 bpd), Congo (Brazzaville) (298,000 bpd), Gabon (244,000 bpd), Cameroon (62,000 bpd), and Ivory Coast (40,600 bpd), with all these numbers being estimated average daily oil output for 2011. Apart from some established West African oil producers keenly intent on ramping up oil output over the next number of years, such as Angola, new exporters are also entering the market. Ghana joined the ranks of West African oil producers in mid-December 2010, following discovery of a major offshore oil field in June of 2007. This helped the country to register one of the highest economic growth rates in the world in 2011 – when Ghana saw its first full year of oil production.
For a long time now North Africa has also been a substantial producer of hydrocarbons, with Libya host to the continent’s largest reserves of oil. Algeria is also a major producer of crude oil, and hosts the continent’s third largest reserves of oil. In turn, a rapid increase in oil consumption in Egypt – the largest oil consumer in Africa – has seen that country now listed as a net-oil importer. But that said, Egypt’s gas production has increased five-fold since the mid-1990s, with this commodity now forming an important part of the nation’s export receipts. Apart from the big-league players of Libya, Algeria and Egypt, there are also some smaller producing states in the north, including Tunisia, Morocco and Mauritania.

Elsewhere, East Africa has become the continent’s newest energy frontier – spurred by the discovery of oil onshore Uganda in 2006, and recent offshore discoveries of natural gas in Tanzania. The March 2012 discovery of oil in Kenya, in the remote onshore Turkana region, has perhaps added fuel to the fire, although commercial viability of this find yet remains to be determined. Overall, oil and gas production is expected to expand rapidly in the east of the continent over the medium- to long-term. However, the elusive find to date still remains an East African offshore oil discovery. In short, Uganda will become an oil producer over the medium-term, Tanzania – which already is a small gas producer – could become a much larger gas producer over the medium- to long-term, whilst Kenya is speedily developing some of its onshore and offshore potential. Kenya however will need to show commercial viability for some of its finds, before it will really gain traction. Other than these three countries, Madagascar is also seen to have potential, but no commercial discoveries have been made there to date.

Moving to Southern Africa, the Kudu gas field off the coast of Namibia is the country’s only known hydrocarbon resource and contains large reserves of good quality dry gas. Only 14 hydrocarbon wells had been drilled by mid-2011 of which eight are in the Kudu gas field. While seismic data and continued exploration activity supports the outlook for the establishment of a local oil industry, there is still no tangible proof that this commodity can be extracted profitably. That said, except for the Kudu gas development, Namibia is still in the early phase of exploration. South Africa has a small amount of oil and gas production with limited reserves. Over 265 wells have been drilled offshore, but large virgin acreage still exists offshore. Exploration in Mozambique is expected to increase over the medium-term, buoyed by substantial recent natural gas finds.

Overall, Africa’s oil reserves and production are expected to increase over the medium- to the long-term, but over the short-term, production of crude is most likely to remain concentrated in Nigeria, Algeria, Angola, Equatorial Guinea and other Gulf of Guinea nations, in addition to Egypt and Libya. Although Sudan and South Sudan also remain potential major players, these economies have suffered in the period following South Sudan’s secession in 2011. South Sudan’s policy decisions regarding oil production in the newly independent state have had immense effects on both countries’ economies. Following months of disagreements regarding the transit fee to be paid to Sudan for using its oil infrastructure, as well as having some of its oil confiscated, South Sudan decided to shut down oil production completely towards the end of January 2012. At present, much uncertainty exists regarding when oil production and exports will resume. Nevertheless, in terms of its reserves and unexplored territory, the region has world class potential onshore, and also opportunities in the Red Sea.

Challenges and Opportunities

Limited refining capacity

For all of Africa’s oil resources, refining capacity on the continent remains limited and as a result, countries like Angola and Nigeria export crude oil, only to import refined oil again later at an additional cost. Problems in the refining industry on the continent include corruption, poor maintenance, theft, and other operational problems. In some countries, conflicts have at times also interrupted the flow of crude into the refineries and forced them to shut down. Subsidies have also contributed to low capacity utilisation at refineries. In Nigeria, for example, current subsidy schemes lead producers to sell crude overseas rather than to local refineries and therefore add to increasing volumes of refined product imports, which present an enormous cost to the economy. On the other hand, Algeria is a net-exporter of petroleum products with its production of refined products exceeding domestic consumption thereof. According to OPEC, Algeria had a total refinery capacity of 652,500 bpd in 2011, though total output of petroleum products was significantly less, at 501,300 bpd (down from 631,500 bpd in 2010). Even so, this is well above the country’s total oil consumption of 344,500 bpd. That said, with Algeria’s crude oil production being much higher than its refinery capacity, the country has scope to expand refinery production.

Oil economy minimal linkages to other sectors

Another challenge is that in most African countries, the hydrocarbon sector has minimal links to other sectors of the economy, with the sector providing very little employment – in Angola for example, the oil sector employs less than 1% of the workforce. Furthermore, some of the countries in Africa with the highest income inequality are oil producing states, such as Gabon, Nigeria, Angola, and Equatorial Guinea. In this sense, in a country like Nigeria, where 70% of the population lives below the poverty line, many locals see fuel subsidies as the only benefit of living in an oil-rich nation. And, of course, fuel subsidies bring with it its own inefficiencies and losses to the economy. Efforts aimed at diversification of these economies have yielded mixed results – although in Nigeria, the non-oil sector has been expanding at a much faster pace than the oil sector in recent years, with this set to continue to be the case over the medium-term.
Averting boom, bust cycles by saving excess oil revenue

Africa has only registered mixed success in creating successful, workable frameworks for saving excess oil funds. In cases where Africa has succeeded though, it has helped select countries to aver previous boom and bust cycles. For example, Nigeria’s Excess Crude Account (ECA) was a pillar of International Monetary Fund (IMF)-backed fiscal reforms, launched in 2003. Although the ECA has helped Nigeria to smooth government finances and the budget, it also has had its numerous shortcomings, and has not proved to be a good mechanism of ring fencing savings, and provided no legal underpinning for the sharing of oil revenues among the different tiers of government. In fact, the system was rotten from the start and has long been crippled by patronage networks, theft, corruption and mismanagement that have seen tens of billions of dollars disappear. In this regard, Nigeria finally enacted the Sovereign Wealth Fund Act in May 2011 to invest windfall oil earnings in infrastructure development, to provide a stabilisation fund, and to ensure savings for future generations of Nigerians. However, it has proven more difficult than hoped for Nigeria to move the sovereign wealth fund into the operational phase of its existence, and at present, the ECA is still actively used. Elsewhere, in Angola, the inclusion of President Dos Santos’s son – José Filomeno de Sousa dos Santos on the board of the newly established $5bn Fundo Soberano de Angola (FSDEA or sovereign wealth fund) has raised eyebrows and some groans, but his inclusion on the board may give the Dos Santos Trust an element of comfort that would allow the FSDEA to make progress and grow its assets. 

Algeria has a sizable oil stabilisation fund, accumulated from years of oil and gas revenues. The fund was established in 2000 to insulate the economy from oil price shocks. According to the Sovereign Wealth Fund Institute (SWFI), the fund is worth in the region of $56.7bn. In recent years, though, the value of the fund has declined as the government has used it to finance a massive spending drive. The IMF has also warned that if public spending continues on the current trend, then the oil stabilisation fund’s value as a percentage of GDP would fall by 50% between 2010 and 2016, at which time it will provide little cover in case of a sustained drop in international oil prices. One of the main problems is that there is very little transparency over how public funds are managed, which tends to lead to the mismanagement and poor allocation of funds. In turn, the Libyan sovereign wealth fund, called the Libyan Investment Authority (LIA), is also among the least transparent in the world. Moreover, investigations since the deposition of Muammar Qadhafi have uncovered misconduct and misappropriation by the fund’s former management. The LIA was established in 2006 with the goal of managing the country’s oil revenues and investing these funds in financial assets. According to the SWFI, the LIA is worth $65bn. The government was, however, unable to use these funds during and immediately after the civil war in 2011 due to international sanctions. Since then, the government has regained access over most of the LIA’s assets and plans to use some of it to help restore the country’s damaged infrastructure. 

Before the civil war, Libya was an important source of foreign direct investment for other African countries. In fact, one branch of the LIA, called the Libya Africa Portfolio for Investments (LAP), specialises in investing on the African continent. In a bid to diversify its revenue base, the LAP invested in the energy, communications, and tourism sectors of various countries. According to the SWFI, the LAP has $5.2bn in capital, with significant holdings in the following companies:

- OiLibya;
- Afriqiyah Airways;
- Sahel-Saharan Investment and Trade Bank (BISC);
- LAP Green Network;
- Libyan Arab African Investment Trade Company; and
- Libyan African Portfolio.

Geology, geography and governance

On a final note for this section, in an article in November 2012, Reuters stated that oil in Africa tends to depend on the three ‘Big Gs’ of geology, geography and governance. Reuters then made the point that in East Africa, the geology has been favourable for oil, but mostly, the geography not. For example, landlocked Uganda’s onshore oil reserves are 1,300 km from the coast and so a costly pipeline is the only way to export the crude. In turn, while Kenya is not landlocked, its onshore discovery of oil – yet to be confirmed to be commercially viable – was in the remote Turkana region. On the other hand, on the West Coast of Africa, Ghana’s Jubilee field is conveniently off-shore, while its location places it in the heart of a mature oil region where nearby countries, like Nigeria, have been producing black gold for decades. The point is made that for East Africa, “everything about oil is new”. 

This may also have played a part in Ghana getting oil on-stream a spectacular three and a half years following its initial discovery at the Jubilee field, whereas the challenge to get oil on-stream in Uganda has proven to be substantially more daunting with much longer lead times. Tim O’Hanlon, Tullow’s vice president for Africa, told Reuters that “In no matter where you are in the world, where there’s no infrastructure and no history of the oil business, it will take at least half a dozen years to go from exploration phase to development concepts”. Furthermore, research and consultancy company Wood Mackenzie has noted that with tax stability key for any investor, Ghana’s stable fiscal regime for existing investors has underpinned the development of the oil sector. Uganda in turn saw tax disputes with explorer Heritage Oil and the Ugandan government turning to arbitration after the Britain-based firm disputed the tax bill from the sale of its assets there to Tullow for $1.45bn in 2010. In addition, Uganda has also requested that any development plan involves the construction of a refinery – which could prove a very costly undertaking at an estimated $2.5bn price tag.
SELECTED AFRICAN OIL PRODUCERS

Although Libya is endowed with the continent’s largest reserves of oil, Nigeria has the highest rate of production, with Angola seemingly intent on displacing Nigeria in the number one output spot, although it still has some way to go. In this section we explore the oil landscape of a number of Africa’s oil producers and exporters, namely Nigeria, Angola, Algeria, Gabon, Cameroon, and Ghana, in more detail.

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>Proven Reserves of Crude Oil (billion barrels) 2012</th>
<th>Production of Oil (‘000 bpd) 2011</th>
<th>Exports of Oil (‘000 bpd) 2010</th>
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<tr>
<td>AFRICA TOTAL</td>
<td>124.209</td>
<td>9,378</td>
<td>8,371</td>
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<tr>
<td>Libya</td>
<td>47.100</td>
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<tr>
<td>Nigeria</td>
<td>37.200</td>
<td>2,528</td>
<td>2,341</td>
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<tr>
<td>Algeria</td>
<td>12.200</td>
<td>1,884</td>
<td>1,097</td>
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<tr>
<td>Angola</td>
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<td>Sudan and South Sudan (combined)</td>
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<td>Egypt</td>
<td>4.400</td>
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<tr>
<td>Gabon</td>
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<td>Congo (Brazzaville)</td>
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<td>Chad</td>
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<tr>
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<tr>
<td>Mauritania</td>
<td>0.020</td>
<td>8</td>
<td>7</td>
</tr>
</tbody>
</table>

*Libya’s oil production is usually around 1.6 million bpd, but was severely impacted in 2011 by the civil war.
Sources: US Energy Information Administration (International Energy Statistics), Oil and Gas Journal
Please Note: This table refers to proven oil reserves which may be very different to reserve estimates.
Nigeria – Unleashing the oil giant’s enormous potential

Nigeria has substantial reserves of both oil and gas, even when compared on a global basis. As such, even though Nigeria’s economy has become increasingly diversified in recent years, with non-oil growth continuing to outpace oil growth by a comfortable measure, oil and gas combined still account for about 95% of export receipts, around 15% of GDP and over 80% of fiscal revenue. This leaves the economy very vulnerable to oil price or crude production volatility. Hence, developments in the international energy market and in the country’s own domestic crude supply situation will continue to have a major impact on Nigeria’s macroeconomic risk assessment in the short- to medium-term.

Nigeria has the second largest oil reserves in Africa after Libya and is the continent’s primary oil producer. Nigeria’s 37.2 billion barrels of oil reserves also places it among the top 10 countries in terms of reserves on a global basis. Nigeria’s oil industry is supported by two important advantages. Firstly, the country’s oil is of a high quality and generally sells at a premium to Brent, the North Sea benchmark crude. Nigeria’s light crude is popular with US and European refiners as it is easily processed into fuel products, also meaning that disruption to Nigerian crude supplies can have a quick impact on the international market. A second advantage for the Nigerian oil industry relates to the country’s geographic location. Nigeria is well located to supply oil markets in North America, a major source of global demand. Perhaps a third advantage which may be highlighted is that in Nigeria, production costs of oil are generally low. Although updated production costs could not be obtained, the International Energy Agency World Energy Outlook of 2008 indicated that Nigeria’s production costs in ultra-deep water fields can reach $30/bbl compared to onshore costs of around $15/bbl. In contrast, at that stage it cost around $40 to produce one barrel of oil in Angola.

The majority of Nigeria’s reserves are found along the country’s Niger River Delta and offshore in the Bight of Benin, the Gulf of Guinea and the Bight of Bonny. Current exploration activities are mostly focused in the deep and ultra-deep offshore areas with some activities planned in the Chad basin, located in the northeast of the country. The reality is that Nigeria’s onshore oil reserves are gradually declining as these oil fields age, while new development is concentrated at offshore oil fields. The most recent official statement that we have which corroborates this is a comment made by Diezani Alison-Madueke, Nigeria’s petroleum minister. In August 2011 she said that the country’s onshore oil reserves are declining at a rate of 10% - 12% p.a. as ageing fields pass peak production and investment in new projects slows. Although the Niger Delta remains home to most of the country’s oil production at around 60%, the future for expanding oil reserves is likely to be in deep offshore fields. Nigeria’s present oil production capacity is around 3.23 million bpd, but in reality, the country only produces around 2.5 million bpd.

Looking ahead, our baseline assumption is that Nigeria’s oil production will trend mostly sideways over the short- to medium-term. There obviously is enormous upward potential, but the uncertainty about the delayed passing of the Petroleum Industry Bill (PIB) has capped investment into the oil sector, while Nigeria also continues to fight some battles in terms of the trade in stolen oil. In terms of the PIB, the regulatory and fiscal terms that it will impose on the oil industry will to a large extent determine foreign investment into the oil sector. The PIB is a vast piece of legislation which represents a key reform for Nigeria as certainty about the oil sector is needed for new deep water investment – where potentially the most scope is for further oil exploration. The key point here is that until the PIB is passed, a number of upcoming projects will be delayed, which will cause oil production to plateau over the shorter-term. The reality is that the PIB will need to be passed before significant investment flows return to the oil sector. Oil executives have repeatedly said that the delay in passing the PIB has put on hold billions of dollars-worth of investment in Nigeria’s energy sector.

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2 Nigeria is the largest producer of sweet oil in OPEC. This sweet oil is similar in composition to petroleum extracted from the North Sea.
Following the amnesty agreement of the government of Nigeria with the Movement for the Emancipation of the Niger Delta (MEND) in mid-2009, Nigeria has now made most of its post-conflict catch-up in production. But now the challenge is to create the necessary incentives for developing new oil fields, while there also seems to have been a shift from blatant vandalism for political purposes to increased levels of theft of crude from pipelines.

Angola – Sub-Saharan Africa’s number 2 oil producer

The hydrocarbon sector remains Angola’s main engine of economic growth, accounting for more than 96% of exports, 80% of government revenue, and in excess of 60% of GDP. Accordingly, any volatility in oil production and/or global oil prices tends to have a direct influence on the performance of the economy. Fortunately, Angola’s hydrocarbon potential is indeed massive. While the US EIA in 2012 indicated Angola’s proven oil reserves to be 9.5 billion barrels, it is in fact conservatively estimated that remaining oil reserves are around 12 to 15 billion barrels, with the bulk located offshore and in the Cabinda area.

The recent coming on-stream of a number of new oil facilities, as well as the recommencement of production at existing oil fields, increased Angola’s oil output from 1.66 million bpd in 2011 to 1.8 million bpd in 2012. New oil facilities include Exxon’s 140,000 bpd Kizomba D Satellites field, Total’s new 220,000 bpd deepwater Pazflor field and BP’s 150,000 bpd PSVM field. Early in January 2013, an Angolan government budget bill showed that the country planned to increase oil production to 1.84 million bpd in 2013 and extend the output rebound of 2012 that has helped the economy return to strong growth following three disappointing years. The 2013 budget proposal is based on a 2013-17 National Development Plan that shows the rebound in oil production climbing to two million bpd in 2015 and peaking at 2.08 million bpd in 2016.

Sociedade Nacional de Combustiveis de Angola (Sonangol, the national oil company) has, since 1978, been the sole concession holder for all oil and gas exploration and output in Angola. Foreign companies involved in the energy sector, which currently includes BP, Chevron, Total, and Exxon Mobil, are obliged to arrange joint ventures and production sharing agreements (PSAs) with Sonangol. China’s Sinopec and CNOOC are among the national oil companies operating in the country and continue to be important players in terms of development aid, oil-backed loans and trade. Even though the state company has taken steps to increase transparency of its activities after being criticised in recent years for not publishing its financial accounts, concerns still remain as to the opaqueness of state finances; relating to oil revenues in particular.

Most of Angola’s oil production takes place offshore in the South Atlantic Ocean where tankers are loaded up and shipped straight to their destinations. Oil concessions are categorised into three types depending on the depth of the blocks:

- Shallow blocks - of up to 500 metres of water;
- Deep blocks - between 500 and 1,500 metres; and
- Ultra-deep blocks - ranging from 1,500 to 2,500 metres.

Over the past 10 – 15 years the last category has been the main focus of new oil exploration off the country’s coast. In terms of future oil production, Angola’s amendments to oil legislation, which in essence ends Sonangol’s oil products monopoly and now permits private companies to refine crude oil and distribute, store, trade and transport oil products, could prove to be a further incentive for oil companies to up oil production. In addition, the signing by Luanda of a number of ultra-deep water deals with oil majors in the Kwanza Basin, could be significant over the medium- to long-term. Over and above the new oil find in the Kwanza Basin, the go ahead for exploration of the subsalt blocks has the potential to change the dynamics of the oil sector, with a number of market participants of the opinion that the region remains one of the very best unexplored areas in the world. If the findings are as rewarding as expected, this stands to provide a significant boost to production in the medium- to long-term.

Libya – Largest oil reserves in Africa

Libya is exceedingly well endowed with hydrocarbon resources. Singlehandedly, Libya with its proven crude oil reserves of 47.1 billion barrels, accounts for nearly 38% of the continent’s proven oil reserves. Libya not only has substantial reserves on an African scale, but also on a global basis. The country has 12 oilfields with reserves of over one billion barrels each and two others with reserves of between 0.5 and one billion barrels.

In this regard, it is no surprise that the Libyan economy is one of the most hydrocarbon-dependent in the world. In fact, the oil and gas industry accounts for almost 70% of GDP, 90% of fiscal revenues, and approximately 97% of export earnings. After the civil war caused oil production to fall to zero in August 2011, the sector made a quick recovery. Indeed, figures from OPEC show that Libya produced 1.51 million bpd of crude oil by October 2012, which is only slightly below the pre-crisis level of 1.55 million - 1.6 million bpd. However, the US EIA warned recently that “the drive to ramp-up production as fast as possible has deferred routine and non-routine maintenance, which could cause production to stagnate or even fall slightly in the coming months.” In order to sustain production at high levels, Libya will need to attract foreign workers back to the country; however, this will require an improvement in the security situation. In addition, since political risk remains high, spates of unrest could lead to stoppages from time to time, which would reduce oil output.
Most recently, protests at the Zueitina port caused operations at the port to halt since the start of 2013. As a result, production at the oil fields that use the port has also stopped. Upstream exploration remained limited in 2012 despite Libya’s economic recovery as oil companies waited for an improvement in the security situation to allow foreign workers to return, as well as for more clarity regarding economic policy. By the end of November last year, only the National Oil Corporation (NOC) and Algerian state oil company Sonatrach were doing exploration.

After having to halt operations throughout most of 2011-12, BP stated at the start of November 2012 that it was committed to oil exploration in Libya and that it would drill 17 new exploration wells, located both onshore and offshore. No timeline was given for the drilling, but it may well start early in 2013. Similarly, Repsol noted recently that it is making final preparations to start drilling in Libya early in 2013. These two cases suggest that some companies are ready (or close to being ready) to invest in Libya again, which is very important because without investment oil production would gradually diminish.

Algeria – Third largest oil reserves in Africa

Algeria presents one of the largest oil and gas opportunities in Africa. According to the US EIA, Algeria had an estimated 12.2 billion barrels of proven oil reserves at the end of 2012 – the third biggest in Africa. That said, Algeria’s full hydrocarbon potential still has to be reliably established. The fact that Algeria’s stock of reserves has stagnated at close to its current level over the past few years, possibly reflects the fact that tax and investment laws are providing little incentive for oil companies to invest and explore Algeria. Unfavourable laws include a windfall tax when the oil price exceeds $30/bbl. According to the EIA, there are also frequent delays in Algerian projects.

As a result of the steady decline in oil production, Algeria’s hydrocarbon sector as a whole has contracted in real terms over the past few years. With some fields maturing, oil companies are using enhanced recovery techniques to maintain production levels. At current production levels, reserves would last another 19 years. Despite the current trend of declining oil production, there is substantial upward potential for oil output. In fact, some energy analysts view that Algeria’s oil output could be two million bpd by 2015. Over the first 11 months of last year, crude oil output averaged 1.21 million bpd, 3.8% down from the same period in 2011. According to the CEO of Sonatrach, Abdelhamid Zerguine, this is due to declining output at foreign oil companies’ maturing fields as well as a drop in demand from Europe. The long-run decline at these fields is, however, expected to be offset by new start-ups: according to Mr Zerguine in a recent statement, the 100,000 bpd El Merk oil field will come on stream “in the coming months”. Production at the field is set to consist of around 100,000 bpd of crude oil, 30,000 bpd of condensate, and 30,000 bpd of natural gas liquids. Algeria produces a high quality light crude oil with a very low sulphur and mineral content. As such, its oil has a relatively high price, with its so-called Sahara Blend trading at a higher price than Brent crude and the OPEC reference basket.

Algeria is extremely reliant on its hydrocarbon sector, as it accounts for almost 40% of GDP, 98% of exports and 70% of fiscal revenues. The sector is dominated by the national oil and gas company, Sonatrach. According to Forbes, it is the 12th largest oil and gas company in the world, producing the equivalent of 2.7 million bpd, most of which is in the form of natural gas. This makes Sonatrach larger (in terms of output) than the likes of Total and Qatar Petroleum on the global stage. The company has operations in a number of countries outside Algeria namely Mali, Niger, Libya, Egypt, Spain, Italy, Portugal, Britain, Peru, and the US. The company had a turnover of $56.1bn in 2010. In that year, it was also the fifth largest natural gas and fourth biggest liquefied natural gas (LNG) exporter in the world.

According to the company’s website, it made 16 discoveries on its own in 2009, and another seven discoveries in partnership with other companies operating in Algeria. In 2010, it made 27 discoveries alone and two in partnership. It also made two discoveries in Libya. In 2012, it announced that it plans to invest $80bn in the exploration and production of oil and gas over the 2012-16 period. Reportedly, $56bn will be invested in upstream activity, over $6bn in downstream and almost $6bn in transportation. According to Mr Zerguine, these investments will include the construction of new refineries. All foreign companies with a presence in Algeria must work in partnership with Sonatrach, with the latter always having majority ownership.
Gabon – A 14-year slide in oil production
Most of Gabon’s land area is covered by rainforest and the country’s offshore geology is highly complex. As a result, large discoveries have rarely been made. Several smaller fields are typical, being the reason that the country is only able to slowly increase its estimated net reserves. The Gabonese government believes that the implementation of new regulations and the launch of a deep offshore oil licencing round in 2013 will attract foreign investment. Reportedly, Shell, Total, and Perenco will drill exploration wells in 2013. The government hopes that these deep-water blocks will deliver significant reserves and end the slide in oil production seen over the past 14 years. However, we believe that the government’s interference in the sector and the outlook for higher taxes and an increase in the state’s share in projects will deter future investment. Furthermore, the Gabonisation law and the occurrence of strikes in the oil sector makes investing in Gabon’s energy sector even less rewarding. The law requires that at least 90% of all jobs in the hydrocarbon sector be held by Gabonese nationals, while all executive jobs are to be held by Gabonese citizens. Uncertainty about this law, for example over what timeframe it will be implemented and how strictly it will be enforced, have led to many international oil companies adopting a wait-and-see attitude, thereby suspending further large capital investments. The hydrocarbon sector remains crucially important to Gabon’s economy—the hydrocarbons account for between 80% and 90% of Gabon’s total export earnings.

Cameroon – Oil output set to rise temporarily before resuming downward trend
Cameroon is estimated to have attracted less than 2% of the Gulf of Guinea’s oil investments over the past decade. Almost all exploration efforts have been offshore, but only in more recent years have selected companies expanded its search onshore and in the north. Oil analysts view Cameroon’s oil future to be at a certain degree of risk, with its Rio del Rey basin relatively mature. To provide context, most of Cameroon’s oil is located offshore in the Rio del Rey basin, while the remainder is found in the Douala Basin. According to the US EIA, Cameroon had 200 million barrels of proven oil reserves in 2012, from a peak of 555 million barrels in 1986. Between 1989 and 2007, the country’s reserves remained stable at 400 million barrels, but since then have been on a declining trend. Furthermore, the country’s petroleum production has been declining gradually since 1986, mainly due to the depletion of mature oil fields. Data from the US EIA indicates that Cameroon’s total oil supply declined by 5.1% to 61,990 bpd between 2010 and 2011 after a 15.4% decline in 2010. Despite the decline in production, the country’s fiscal and export revenues earned from oil sales have been boosted during the last few years by high oil prices. Cameroon’s oil output is expected to increase temporarily over the next few years as new wells start with production (following successful drilling results during the past few years) before resuming the downward trend (unless significant new oil wells are discovered). Production already increased considerably in 2012, climbing by 34% during the first half of the year to an average of 82,162 bpd, according to data on oil output from the EIA. The government projects that crude oil output will reach up to 100,000 bpd by early 2013. Cameroon’s state-owned oil company, Société Nationale des Hydrocarbures (SNH) expects oil production to increase by 20% during 2012-14. Oil makes a contribution of some 6% to Cameroon’s GDP, 40% to exports, and accounts for around 40% of the Cameroonian government’s fiscal revenues.

Ghana – Excellent prospects to ramp-up oil production
Ghana discovered its first large-scale, commercially viable oil field in June 2007. The Kosmos Energy team discovered the Jubilee oil field following the drilling of the Mahogany-1 exploration well in Ghana’s deep waters. A string of discoveries in the Jubilee offshore oilfield from 2007 onwards means that Ghana is confident of total reserves there of around 1.5 billion barrels, with a potential upside of two billion barrels, and with more, probably, in adjacent sites. Presently though, the US EIA indicates Ghana’s proven reserves of oil to be 0.66 billion barrels. The Jubilee field is considered to be the largest find offshore West Africa in the last decade. The field produces light, sweet crude, much of which is used by refiners in Europe.

It took Ghana only three and a half years since discovery of oil in June 2007, until commercial production commenced in December of 2010. That said, there have now been some unexpected delays which have impeded the ramp-up of production at the Jubilee field. Tullow has long targeted 120,000 bpd of crude oil output at Jubilee and had once hoped to reach that by 2011. In January 2013, the company said it was now producing 110,000 bpd of crude. Ghana originally aimed for output of 250,000 bpd by 2013, a production level which would put the nation among the world’s top 50 producers. UK-listed operator Tullow holds a 36.05% stake in Jubilee. Other shareholders include state oil firm Ghana National Petroleum Corporation (GNPC) with 13.75%, private investment group Kosmos with 23.49%, Anadarko Petroleum Corp with 23.49%, and Sabre Oil and Gas with 2.81%.

Apart from Tullow’s main producing asset, the Jubilee field, the company is working on a number of other oil prospects in Ghana, such as the Tweneboa, Enyenra and Ntomme (TEN) fields, all of which could underpin Ghana’s oil production levels over the medium-term. By far the most investment into Ghana’s oil sector is offshore. Combined, GNPC expects oil production from the oil fields that have already reached exploratory and appraisal phase, to reach 600,000 bpd by 2018.
SELECTED AFRICAN GAS PRODUCERS

In 2012, there were 24 African countries with gas reserves, and exploration for gas reserves on the continent continues. Nigeria has the largest natural gas reserves on the continent; nevertheless, North Africa remains the continent’s leading region for natural gas production. Substantial finds of natural gas in Mozambique and Tanzania have also lifted the prospects for these countries to become major exporters of LNG over the medium- to long-term. Energy analysts however have the view that a single-minded focus on LNG may also see Tanzania and Mozambique compromise on developing the region through gas-fired power stations and plants converting gas to fuel. Furthermore, it is difficult to estimate what the potential future impact of LNG exports on the countries’ balance sheets will be, given the volatility in natural gas prices. Development of unconventional reserves, such as shale oil and gas, is also reducing demand from the US for energy from world markets. In this section we explore the gas landscape of a number of Africa’s current or prospective producers in more detail.

Nigeria – Largest natural gas reserves in Africa

Presently Nigeria still has limited infrastructure in place to take advantage of its massive gas reserves – the largest on the continent. Owing to the fact that security concerns and uncertainty over terms of access in Nigeria limit production growth in West Africa, North Africa remains the continent’s leading region for natural gas production. All of Nigeria’s current gas reserves were found while searching for oil, according to the petroleum ministry. The government wants to create incentives for energy companies to explore specifically for gas, and in this regard, that gas will start to ‘decouple’ from oil in terms of investment.

<table>
<thead>
<tr>
<th>World Natural Gas Reserves</th>
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<tbody>
<tr>
<td>Country</td>
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<tr>
<td>World</td>
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<tr>
<td>Top 20 countries</td>
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<tr>
<td>Russia</td>
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<tr>
<td>Iran</td>
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<tr>
<td>Qatar</td>
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<tr>
<td>Saudi Arabia</td>
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<td>United States</td>
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<tr>
<td>Turkmenistan</td>
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<tr>
<td>United Arab Emirates</td>
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<tr>
<td><strong>Nigeria</strong></td>
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<tr>
<td>Venezuela</td>
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<td><strong>Algeria</strong></td>
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<td>Iraq</td>
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<tr>
<td>Australia</td>
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<td>China</td>
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<td><strong>Egypt</strong></td>
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<td>Norway</td>
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<td>Uzbekistan</td>
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<tr>
<td>Kuwait</td>
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</table>

Sources: US Energy Information Administration (International Energy Statistics), Oil and Gas Journal
Data as of 1 January 2011

Please Note: This table refers to proven oil reserves which may be very different to reserve estimates or potential.

Africa Proven Reserves of Natural Gas (trillion cubic feet)

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AFRICA TOTAL</strong></td>
<td>509.406</td>
</tr>
<tr>
<td>Nigeria</td>
<td>180.458</td>
</tr>
<tr>
<td>Algeria</td>
<td>159.000</td>
</tr>
<tr>
<td>Egypt</td>
<td>77.200</td>
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<tr>
<td>Libya</td>
<td>52.795</td>
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<tr>
<td>Angola</td>
<td>10.947</td>
</tr>
<tr>
<td>Cameroon</td>
<td>4.770</td>
</tr>
<tr>
<td>Mozambique</td>
<td>4.500</td>
</tr>
<tr>
<td>Congo (Brazzaville)</td>
<td>3.200</td>
</tr>
<tr>
<td>Sudan and South Sudan</td>
<td>3.000</td>
</tr>
<tr>
<td>Tunisia</td>
<td>2.300</td>
</tr>
<tr>
<td>Namibia</td>
<td>2.200</td>
</tr>
<tr>
<td>Rwanda</td>
<td>2.000</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>1.300</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>1.000</td>
</tr>
<tr>
<td>Gabon</td>
<td>1.000</td>
</tr>
<tr>
<td>Mauritania</td>
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</tr>
<tr>
<td>Ethiopia</td>
<td>0.880</td>
</tr>
<tr>
<td>Ghana</td>
<td>0.800</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.500</td>
</tr>
<tr>
<td>Tanzania</td>
<td>0.230</td>
</tr>
</tbody>
</table>

Sources: US Energy Information Administration (International Energy Statistics), Oil and Gas Journal
Nigeria had an estimated 187 trillion cubic feet (tcf) of proven natural gas reserves as of 1 January 2011, which made Nigeria the eighth largest natural gas reserve holder in the world. At this level, Nigeria’s gas reserves account for 2.8% of the global total. Industry experts have said that Nigeria’s proven gas reserves could potentially be as high as 600 tcf if deliberate steps are taken to explore for gas as opposed to coincidental discovery during oil exploration. A significant portion of Nigeria’s marketed natural gas is processed into LNG. Nigeria’s natural gas reserves are projected to last over 100 years.

The majority of the country’s proven natural gas reserves are located in the Niger Delta and the sector is also impacted by the security and regulatory issues affecting the oil industry. Presently, natural gas that is associated with oil production is mostly flared, but the development of regional pipelines, the expansion of LNG infrastructure and policies to ban gas flaring are expected to accelerate growth in the sector, both for export and domestic use in electricity generation. Energy experts estimate that Nigeria has lost $2bn in potential revenue from gas flaring on an annual basis, although the Nigerian National Petroleum Corporation (NNPC) has put this number at $2.5bn in a 2011 estimate. In turn, the petroleum ministry has indicated that at least $3bn in revenue is lost annually due to flaring. As such there has been a strong drive to reduce flaring, and it would seem that Nigeria has at least made some progress in reducing gas flaring over the years. According to NNPC data, 45.64% of gas was flared in 2002, with this figure dropping to 25.79% in 2011.

In March 2011, President Goodluck Jonathan formally launched the federal government’s Gas Revolution Master Plan, an ambitious programme designed to mark the beginning of the end of gas flaring in the country. The overall strategy is to attract $25bn worth of investment into developing the country’s gas infrastructure and to create about 600,000 new jobs. Furthermore, the government aims to increase domestic gas supply to over 10 billion cubic feet per day by 2020 from the current level of one billion cubic feet per day. However actual investments since the launch of the programme have not been very forthcoming, with some companies postponing or cancelling projects.

A plan to build a trans-Saharan pipeline across the Mediterranean to Europe was put in place in 2009, when Nigeria signed an accord with northern neighbours Niger and Algeria. The Trans-Saharan Natural Gas Pipeline, if built, would stretch 4,500 km to bring natural gas from Nigeria, across Niger, and connecting in Algeria to export pipelines to Europe. However, the project still faces significant security issues and has not yet obtained the necessary financing. The annual capacity of the pipeline would be up to 1,060 billion cubic feet of natural gas.

Angola – Second largest natural gas reserves in SSA
Angola has the second largest proven natural gas reserves in sub-Saharan Africa (SSA) after Nigeria. According to the US EIA, Angola had almost 11 tcf in proven natural gas reserves in 2012, which is a significant increase from a level of only two tcf in 2007. In a milestone development, after many delays, in early October 2012 the country reportedly shipped its first LNG exports from the $10bn LNG plant near Soyo, to Asia (Japan). According to Luanda, the Asian and European markets will be the key focus for LNG exports and not to the US as originally planned, due to the glut of gas supply in the latter which has resulted in lower prices and therefore profit margins. At full production, the Soyo LNG plant will have a capacity of 5.2 million tonnes per annum. The Soyo unit is seen as the single largest investment in the country.

Development of Angola’s fledgling LNG sector is likely to play an increasingly important role in powering Angola’s economic growth going forward.

Algeria – Natural gas output could last another 60 years
According to the US EIA, Algeria had proven natural gas reserves of 159 tcf in 2012. At current production levels, this would provide output for another 57.7 years. More than half of these reserves are located in the Hassi R’Mel field. Algeria’s production of marketed gas placed it in 10th position on a global basis in 2011. Algeria is also the third largest supplier of natural gas to Europe. However, after peaking in 2005, gas production has decreased over the past few years, contributing to the contraction of the hydrocarbon sector. With relatively poor foreign investment in Algeria’s oil and gas sector in recent years, on-going projects in the southwest region of the country are important to boost production levels in the medium-term. Two major projects are the Southwest Gas Project and the Menzel Ledjmet East Project. Regarding the former, according to the EIA, the Southwest Gas Project is currently under way in the country and is set to be on-stream by mid-2016.

Investment in shale gas has significant potential in Algeria. According to the International Energy Agency (IEA), Algeria has 231 tcf of recoverable shale gas reserves, although the commercial viability of these reserves is yet to be determined. In October 2012, policymakers approved a revision of the tax system in the energy sector, with the aim of attracting more foreign investment, particularly in the unconventional energy industry, while the government also announced that it would provide financial incentives to companies wishing to invest in unconventional energy resources. Various foreign companies are already exploring for shale gas resources. According to a Bloomberg report, Algeria’s marketed natural gas production could almost double to 5.7 tcf p.a. over the next two decades. However, before commercial viability can

4 The Trans-Saharan pipeline was given the official go-ahead in 2009, having been declared economically and technically feasible, and 2015 was set as the official targeted start date.
5 Gross gas production is much higher than marketed gas production, but more than half the total is used for reinjection into wells to extract oil and gas. Around 2% of gross gas production is also lost in flaring.
be proven, hundreds of test wells will have to be drilled over the next few years. Sonatrach itself has extensive investment plans over the next five years to develop the sector. However, production is unlikely to start within the next decade.

**Egypt – Gas production increased fivefold since mid-1990s**

Egypt’s oil production has been in decline for almost two decades; however this has been offset by the development of the natural gas industry. In fact, natural gas production has increased fivefold since the mid-1990s. Up to around 2004, gas production just increased enough to cater for rising consumption levels. However, it surged in 2005-06, thereby contributing significantly to higher hydrocarbon exports and to real GDP growth. Natural gas has become the key driver of growth in Egypt’s energy sector, with several new wells being discovered in recent years. During 2000-09, natural gas production increased by an average of 14.5% p.a. There was however a decline in 2010-11 because of a decision by the government at the end of 2008 to enact a two-year moratorium on new gas export deals due to the fact that international gas prices were low at that stage. Another factor may have been the numerous terrorist attacks on Egyptian-Israeli gas pipelines, which would have caused production to decline as well. According to the EIA, BG Group accounts for around 40% of Egypt’s total gas production. BP accounts for another 22% of total gas production, but following recent discoveries in the Gulf of Suez and in the Mediterranean, it is expected to increase its output over the next few years. Eni is another major gas producer and operates in the Nile Delta and the Mediterranean. Egypt’s natural gas production is likely to expand in the medium-term, with the country potentially becoming an important supplier of gas to Europe.

**Mozambique – Massive potential in natural gas boosted by recent discoveries**

Mozambique is viewed to be one of the African countries that will be most able to boost its share of foreign direct investment inflows to the continent over the medium- to long-term. Apart from the large-scale expansion of coal production, natural gas exploration activities and plans to build LNG plants have helped to boost foreign investment. Most recently, on 5 December 2012, Italian oil and gas giant Eni announced new discoveries of natural gas in Mozambique. The six tcf of gas at the company’s Mamba field brings total discoveries at the complex to 75 tcf. Eni will drill two further wells to determine the full potential of the Mamba field’s discoveries. Mamba is Eni’s largest ever exploration discovery. Meanwhile, Anadarko has made natural gas discoveries of around 65 tcf in Mozambique according to our records, bringing the country’s total to 140 tcf. For comparison purposes, Nigeria (which holds the largest proven natural gas reserves in Africa) had 180.5 tcf of proven natural gas reserves at the end of 2012. Note however that Nigeria’s reserves are proven, while Mozambique’s number is just an estimate. Nevertheless, it indicates the country’s massive potential in the sector. Some notable gas projects – current or planned – are listed below:

- Eni expects to spend €3.1bn in Mozambique during 2012-15. Eni has also stated that it plans to invest €50bn to develop its gas finds in Mozambique, quite possibly with the help of other partners.
- Anadarko has stated that it plans to build a LNG plant in the country, with production expected to start in 2018. This process is expected to involve $14bn in investments.
- South Africa’s Sasol continues to invest in the expansion of its natural gas production in the country.

**EAST AFRICA – THE NEW ENERGY FRONTIER**

The discovery of enormous oil reserves in Uganda in 2006 and subsequent discoveries have sparked hopes among investors and large oil companies that the country could become a lucrative new player on the global oil stage. It is now believed that Uganda could be sitting on one of the biggest onshore oil reserves in SSA. If events do go according to plan, Uganda could transform itself into a mid-size oil producer in coming years, with the reality being that the East African country could be one of the top-50 oil producers in the world in time to come. Turning to Kenya, in March 2012 Tullow announced that it had discovered some oil in the Turkana region, although the commercial viability still needs to be determined. Elsewhere, Tanzania has been able to increase the size of its original estimates for natural gas reserves substantially in 2012. The hydrocarbon sector in Uganda, Kenya and Tanzania is discussed in some more detail below.

**Uganda – Could be endowed with one of largest onshore oil reserves in SSA**

Despite Uganda’s enormous discoveries, with the initial discovery of a large reserve of oil dating back to 2006, the country has been slow in getting its oil on stream. However, boding very positively for the development of the oil sector, Kampala recently upwards revised the country’s estimated oil reserves to 3.5 billion barrels of crude oil, from a previous estimate of 2.5 billion barrels. As a result, foreign interest in the oil sector is likely to remain strong for years to come. In the interim, however, significant investment by Tullow Oil, CNOOC and Total in oil exploration and infrastructure-related projects continues following the February 2012 approval by Kampala of the $2.9bn far down partnership deal. In essence, the partnership is the key to unlocking $10bn of investment in vital infrastructure by the three oil companies in...
coming years to allow Uganda to commence commercial oil production and ultimately export oil to world markets.

Tullow Oil announced in May 2012 that the three partners will jointly spend up to $750m in 2012 in exploration and further drilling in the country. By 2014, the three oil majors combined have indicated that they could potentially spend $14bn to develop the country’s oil fields. While still very much at an exploratory stage, on 1 November 2012 Kampala announced that it is considering building an oil refinery with an initial capacity of 20,000 bpd, which would be upgraded to 60,000 bpd after three years. The ultimate objective is for the refinery to process 180,000 bpd of crude.

Kenya – Onshore oil discovered, but commercial viability yet to be determined

In March 2012 Tullow announced that it had discovered some oil in the Turkana region in Kenya, although the commercial viability still needs to be determined. The Ngamia find is expected to support investment in Kenya over the short-term, and if the oil find does indeed prove to be commercially viable, investment could rise strongly in the medium- to long-term. In August 2012, Tullow commenced drilling another well, Twiga-1, in Northern Kenya. The Twiga-1 well (in Block 13T) is about 30 km west of where Tullow made its initial oil discovery at Ngamia-1. Subsequently, on 31 October 2012, Tullow announced that it had struck oil at Twiga. Before this official announcement, sources “with knowledge of Tullow Kenya’s operations” told the press that the Twiga well had yielded 30 metres of ‘net pay’6, 10 m more than was found at Ngamia at first. The estimate at Ngamia has since been raised to 100 m of net pay, and the source said that the operator expected the second well to have a similar profile.

In the meantime, Tullow and its Canadian partner Africa Oil Corp have started drilling a third well in Kenya. Drilling of the well, known as Paipai-1 and located in northern Kenya’s Marsabit County, started on 29 September 2012. Its planned total depth is 4,112 m and it could contain as many as 121 million barrels of crude oil, Africa Oil said. Tullow hopes that the well will encounter oil, rather than gas. “A discovery at Paipai would extend the producing plays of [South] Sudan into Kenya and open a potentially significant and new petroleum province within Kenya”, Keith Hill, Africa Oil’s chief executive, announced.

Tullow also was a venture partner in the offshore well, Mbawa-1, that encountered gas. On 10 September 2012, Tullow Oil and Australia’s Pancontinental Oil & Gas announced their consortium’s operator Apache had found gas in Mbawa-1. However, on 11 September 2012, Kenya’s energy minister said that the country’s first offshore gas discovery was encouraging, but not large enough for commercial production. Nevertheless, Apache will spend the next year interpreting the data from Mbawa to determine if the gas was dry or the result of an oil formation. It will then drill a second well in the L8 block at the end of 2013. Kenya has yet to determine whether it has commercially viable quantities of hydrocarbons, but the search, both on- and offshore continues.

Tanzania – Substantial natural gas discoveries may place country in new league

Presently, Tanzania’s shallow water natural gas reserves of around two tcf have already been commercialised for the domestic market. In addition, recent natural gas discoveries in Tanzanian deep sea have certainly increased hopes and potential prospects for the hydrocarbon industry in the country. On 18 October 2012 Tanzania raised its estimate of recoverable natural gas reserves to 33 tcf from 28.74 tcf, following recent big discoveries offshore. In fact, gas strikes off East Africa’s seaboard have led to predictions that the region could become the world’s third-largest exporter of natural gas over the long-term. Already in June 2012, Tanzania nearly tripled its estimate of recoverable natural gas resources to up to 28.74 tcf from 10 tcf following major discoveries by firms like Statoil ASA, Ophir Energy and BG Group. According to Tanzania Petroleum Development Corporation (TPDC), about 61 wells have been drilled in Tanzania both offshore and onshore during the past 60 years. According to the US EIA, Tanzania had 0.23 tcf of proven natural gas reserves in 2012.7 But upward revisions to this number are likely to be made in the coming years, on the back of the number of large discoveries made of late. In fact, it is estimated that Tanzania’s upside potential is as much as 60 tcf of natural gas. It is reasonable to expect that the next five to 10 years would see continuing exploration. The reality however is that to commercialise Tanzania’s offshore reserves of natural gas will take time; estimates are between seven years and a decade. According to the IMF, after commerciality has been declared, this would be followed by design and negotiation of investment proposals. If an LNG export project were to advance, the Fund projects that cumulative foreign direct investment into Tanzania could be in the $20bn - $30bn range. According to the IMF, the peak level of investment could be concentrated in the 2017-20 period, with “LNG production starting between 2020 and 2025 and extending over perhaps two decades”. The IMF projects that at a price of $10 per 1,000 cubic foot in the Far East export market, Tanzania’s export earnings from gas could significantly exceed $3bn annually (10% of 2012 GDP).

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6 The ‘net pay’ is the net thickness of an oil reservoir which is capable of producing hydrocarbons.

7 There are presently large differences between Tanzania’s proven, estimated and potential natural gas reserves.
CONCLUSION

In 2012, there were 21 countries in Africa with proven oil reserves, according to US EIA data, while there were 24 African countries with proven natural gas reserves. In 2011, 22 African countries produced crude oil, while 16 African countries were listed as net-exporters of the commodity. Energy analysts project that Africa should be able to increase its production of oil from 9.4 million bpd in 2011 to 12 million bpd in 2020. The Organisation for Economic Cooperation and Development estimates that $1.25trn will be invested over the 2001-30 period in African energy, with upstream exploration and investment remaining the focus for both the oil and gas sectors.

The continent’s energy giants are undoubtedly, and will remain, Nigeria, Angola, Libya, Algeria, and to a smaller extent Egypt. In this regard, the Gulf of Guinea and North Africa will remain the main hydrocarbon producing regions on the continent for years to come. However, that is not to say that the operating environment in these countries will be easy, or that there is no security risk, to the contrary. Furthermore, there are great expectations for East Africa. Only recently, Uganda’s estimated reserves of oil were increased to 3.5 billion barrels from a previous estimate of 2.5 billion barrels. In addition, gas strikes off East Africa’s seaboard have led to predictions that the region could become the world’s third-largest exporter of natural gas over the long-term. Much of Africa is still relatively unexplored or underexplored. Increasingly, China will become the destination for more of Africa’s oil, with the Asian powerhouse extending its influence on the continent via foreign direct investment, increasing trade ties, and resources for infrastructure deals.
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Organisation of the Petroleum Exporting Countries (OPEC)
Reuters
Sovereign Wealth Fund Institute
Trade Map
Tullow
UNCTAD World Investment Report
Wall Street
Wood Mackenzie
World Bank
CONTACT DETAILS

ANTHONY THUNSTROM
Chief Operating Officer Africa
M: +27 83 700 8862
E: anthony.thunstrom@kpmg.co.za

KATHERINE MILES
Senior Manager
Africa High Growth Markets
M: +27 82 710 7408
E: katherine.miles@kpmg.co.za

SHELLEY ALBERTS
Manager
Africa High Growth Markets
M: +27 82 710 9807
E: shelley.alberts@kpmg.co.za

WAYNE JANSEN
Africa Head of Mining
M: +27 (0) 83 357 2131
E: wayne.jansen@kpmg.co.za

DIMEJI SALUDEEN
Head of Mining
West Africa
T: +23 412 718 955
E: dimeji.salaudeen@ng.kpmg.com

JACQUES ERASMUS
Head of Mining
Southern Africa
M: +27 (0) 82 719 0305
E: jacques.erasmus@kpmg.co.za

ALEXIS MAJNONI
Head of Mining
Francophone Africa
T: +33 622 545 452
E: amajnoni@kpmg.fr

JOSE SILVA
Head of Mining
Angola
T: +35 121 011 0160
E: jlsilva@kpmg.com

BENSON NDUNGU
Head of Mining
East Africa
T: +25 641 434 0315
E: bndungu@kpmg.com