

# African hydrocarbon industry and African countries to be focused by EIL

**Submitted by**

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REFERENCE COPY



An Internship report submitted in partial fulfillment of requirements for  
Integrated BBA+MBA

University of Petroleum and Energy Studies, Energy acres, Bidholi, Dehradun

## Acknowledgement

This report is the manifestation of a learning process that began for me 2 months ago, when I joined Engineers India Limited as a Summer Trainee. But, apart from my efforts, the completion of this project depends largely on the encouragement and guidelines of many others. I would to express a deep sense of gratitude towards them.

First of all I would like to express my heartfelt thanks to **Mr. Vivek Midha (Senior Manager, Marketing)** for giving me an opportunity to work with his team at **Engineers India Limited, Delhi.**

I would like to make special mention of **Mr. Deepak Gupta**, this work would not have been possible without his inputs, support & encouragement and above all his precious time.

In all it was a great experience to work with all above mentioned people. Thank you all once again.

Arpit Jain  
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### **Executive summary**

The project title “African hydrocarbon industry and African countries to be focused by EIL” is about the overall analysis of African hydrocarbon industry. This study consists of three parts.

First part contains EIL company profile and introduction of African oil and gas sector on a broader sense. It tells about African oil and gas upstream, midstream as well as downstream business.

Second part consists of country profiles of African countries. Each country profile focus on basic demographics of the country, energy scenario, oil and gas industry directory, market overview: oil and gas, SWOT of the country, future projections and oil and gas industry news in the country. In this project I have tried to study each African country in which oil and gas businesses is going on or have future potential. In this regard seventeen countries study has been included in this project.

Third part tells about the countries to be focused by EIL which have upcoming potential in this sector in order to expand its overseas business.

TRG/VT/2013 (S)/119

July 12, 2013

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that **Mr. Arpit Jain**, a student of MBA (Oil & Gas) from University of Petroleum & Energy Studies, Dehradun, completed his Practical Training in **Marketing Division** of our organization from May 20, 2013 to July 12, 2013. He has undertaken his training assignment on **“African Hydrocarbon Industry & African Countries to be focused by EIL.”**

During the course of training, **Mr. Arpit Jain** has been regular and punctual. He has taken keen interest in his assignment and his performance on evaluation has been found to be **“Excellent.”**

*Shiv Kumar Nagpal*  
12/7/13  
(Shiv Kumar Nagpal)  
Officer (HR)

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## Company Profile

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### *About Engineers India Limited*

Engineers India Limited (EIL) was set up in 1965 to provide engineering and related technical services for petroleum refineries and other industrial projects. EIL is working under the administrative control of Ministry of Petroleum and Natural Gas (MoP & NG), Government of India. In addition to Petroleum Refineries, with which EIL started initially, over the years it has diversified and excelled in various other fields. EIL today has emerged as Asia's leading design, engineering and turnkey contracting company providing a complete range of project services needed to conceptualize, plan, design, engineer and construct projects to meet the specific requirements of its clients in the following fields:

- Petroleum Refining
- Petrochemicals
- Pipelines
- Offshore Oil & Gas
- Onshore Oil & Gas
- Terminals & Storages
- Mining & Metallurgy
- Infrastructure

EIL is capable of providing services from concept to commissioning in all the sectors listed above and its association with clients extend beyond the commissioning of their plants through monitoring the operation of each plant and accumulating feedback on its performance. EIL is providing its services in the following modes:

**a) Project Implementation Services (EPCM)** such as Conceptual Studies, Feasibility Studies, Detailed Project Reports, FEED Package, Basic Design Engineering Package (BDEP) Project Management, Planning & Scheduling, Cost Engineering, Process Design, Detailed Engineering, Procurement Services, Construction Management & Supervision, Commissioning and plant start-up assistance etc.

**b) Project Management Consultancy (PMC) Services.**

**c) Specialist Services** such as Heat & Mass Transfer Equipment Design, Engineering & Technology Development and Design, Environmental Engineering, Information Technology Services, Specialist Materials and Maintenance Services, Energy Conservation Services, Plant Operations & Safety including HAZOP Studies, Safety Integrity Levels (SIL) studies and Risk Analysis, Yield and Energy and Optimisation Studies.

**d) Engineering, Procurement & Construction (EPC) / Lumpsum Turnkey (LSTK) Contracts.**

#### e) Open Book converted LSTK Projects.

EIL has been involved in setting up of almost all the large projects that have come up in India in the Oil & Gas Sector in the last four decades and has also successfully executed several assignments in the middle-east and south-east Asia. EIL has to its credit more than 400 major projects successfully completed and operating smoothly at the rated capacity, creating an array of satisfied clients. In the course of setting up various projects, EIL has worked with a large number of process licensors and engineering/construction/contracting companies worldwide and is well versed with the latest engineering codes and practices followed internationally.

EIL is a strong technology based and technology oriented company and has developed extensive data bank, computerized design tools, flexible yet integrated project control systems, besides having an extra edge in the following traits:

Technical skills for process design, optimization and integration, HAZOP Analysis.

- Knowledge & appreciation of third party processes.
- Extensive experience in detailed engineering.
- Worldwide procurement capabilities (purchase, inspection, expediting, transportation).
- Expertise in Contract Management
- Expertise in Project Management Consultancy Services
- Expertise in construction management & commissioning assistance.

#### Engineers India Limited Evolution and Key Milestone

Year	Milestone
1965	Established as a JV between Gol and Bechtel
1967	Wholly owned Gol Company MRL refinery (now CPCL- a group company of IOCL)
1969	Expansion to Petrochem with IPCL (now Reliance Industries Ltd)
1973	Expansion in Hydrocarbon Value Chain -Offshore -Pipelines -Onshore oil and gas -Terminals
1975-78	First Overseas Project Entered Non-Ferrous Metallurgical Sector
1989	R&D Centre in Gurgaon
1997	Listed on the BSE and NSE stock exchanges Accorded the Mini Ratna status
2001	Diversified into infrastructure

2004	Expanded into strategic storages for Gol
2007	Pioneers in hydrocarbon industry in india to enter into OBE contract
2010	Share split 2:1 Bonus Share 1000% special interim dividend Successful FPO of 3.36Cr Shares if Rs. 5 each.
2011	Re-Entry into Fertilizer Sector
2012	Diversifying into Oil & Gas Exploration (NELP-IX)

***Engineers India Limited Mission Statement***

To be a world-class globally competitive EPC and total solutions Consultancy Organization.

***Engineers India Limited Mission Statement***

- Achieve 'Customer Delight' through innovative, cost effective and value added consulting and EPC services.
- To maximize creation of wealth, value and satisfaction for stakeholders with high standards of business ethics and aligned with national policies.

***Engineers India Limited Core Values***

- Benchmark to learn from superior role models.
- Nurture the essence of customer relationship and bonding.
- Foster innovation with emphasis on value addition.
- Integrity and trust as fundamental to functioning.
- Thrive upon constant knowledge updation as a learning organization.
- Passion in pursuit of excellence.
- Quality as a way of life.
- Collaboration in synergy through cross- functional team efforts.
- Sense of ownership in what we do.

***Engineers India Limited Risk Policy***

EIL is committed to effective management of risks across the organization by aligning its risk management structure for timely identification, assessment, mitigating, monitoring and reporting of risks.

Risk management at EIL is the responsibility of every employee both individually as well as collectively.

## **Research design and methodology**

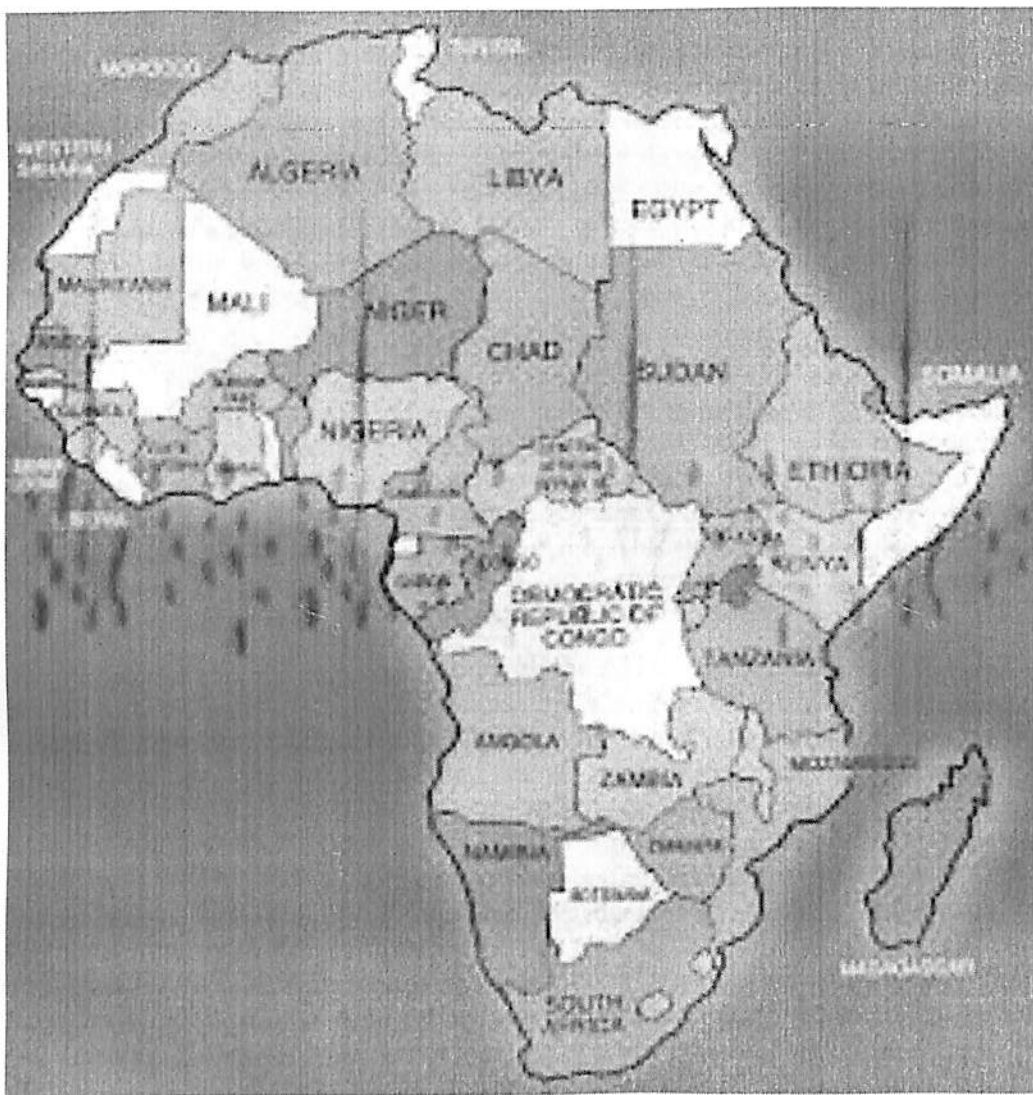
### **Research design:**

It is a descriptive research in which African hydrocarbon sector is described. In this research secondary data has been used, no primary data has been collected. **Descriptive research**, also known as statistical research, describes data and characteristics about the population or phenomenon being studied.

### **Data sources:**

The main data source was BMI reports on countries and websites like CIA, Indexmundi, Petroleum Africa, Africa-oil-gas, Infoplease.com etc.

## 1-Continent: Africa



### About Africa:

**Africa** is the world's second-largest and second-most-populous continent. At about 30.2 million km<sup>2</sup> (11.7 million sq mi) including adjacent islands, it covers six percent of the Earth's total surface area and 20.4 percent of the total land area.<sup>[2]</sup> With 1.0 billion people (as of 2009, see table), it accounts for about 15% of the world's human population. The continent is surrounded by the Mediterranean Sea to the north, both the Suez Canal and the Red Sea along the Sinai Peninsula to the northeast, the Indian Ocean to the southeast, and the Atlantic Ocean to the west. The continent includes Madagascar and various archipelagos. It has 54 fully recognized

sovereign states ("countries"), 9 territories and two *de facto* independent states with limited or no recognition.<sup>[3]</sup>

Africa, particularly central Eastern Africa, is widely accepted as the origin of humans and the Hominidae clade (great apes), as evidenced by the discovery of the earliest hominids and their ancestors, as well as later ones that have been dated to around seven million years ago – including *Sahelanthropus tchadensis*, *Australopithecus africanus*, *A. afarensis*, *Homo erectus*, *H. habilis* and *H. ergaster* – with the earliest *Homo sapiens* (modern human) found in Ethiopia being dated to circa 200,000 years ago.<sup>[4]</sup> Africa straddles the equator and encompasses numerous climate areas; it is the only continent to stretch from the northern temperate to southern temperate zones.

### **Politics:**

The African Union (AU) is a 54 member federation consisting of all of Africa's states except Morocco. The union was formed, with Addis Ababa, Ethiopia, as its headquarters, on 26 June 2001. The union was officially established on 9 July 2002<sup>[64]</sup> as a successor to the Organisation of African Unity (OAU). In July 2004, the African Union's Pan-African Parliament (PAP) was relocated to Midrand, in South Africa, but the African Commission on Human and Peoples' Rights remained in Addis Ababa. There is a policy in effect to decentralize the African Federation's institutions so that they are shared by all the states.

The African Union, not to be confused with the AU Commission, is formed by the Constitutive Act of the African Union, which aims to transform the African Economic Community, a federated commonwealth, into a state under established international conventions. The African Union has a parliamentary government, known as the African Union Government, consisting of legislative, judicial and executive organs. It is led by the African Union President and Head of State, who is also the President of the Pan-African Parliament. A person becomes AU President by being elected to the PAP, and subsequently gaining majority support in the PAP. The powers and authority of the President of the African Parliament derive from the Constitutive Act and the Protocol of the Pan-African Parliament, as well as the inheritance of presidential authority stipulated by African treaties and by international treaties, including those subordinating the Secretary General of the OAU Secretariat (AU Commission) to the PAP. The government of the AU consists of all-union (federal), regional, state, and municipal authorities, as well as hundreds of institutions, that together manage the day-to-day affairs of the institution.

Political associations such as the African Union offer hope for greater co-operation and peace between the continent's many countries. Extensive human rights abuses still occur in several parts of Africa, often under the oversight of the state. Most of such violations occur for political reasons, often as a side effect of civil war. Countries where major human rights violations have been reported in recent times include the Democratic Republic of the Congo, Sierra Leone, Liberia, Sudan, Zimbabwe, and Côte d'Ivoire.

### **Economy:**

Although it has abundant natural resources, Africa remains the world's poorest and most underdeveloped continent, the result of a variety of causes that may include the spread of deadly diseases (notably HIV/AIDS and malaria), corrupt governments that have often committed



serious human rights violations, failed central planning, high levels of illiteracy, lack of access to foreign capital, and frequent tribal and military conflict (ranging from guerrilla warfare to genocide).<sup>[65]</sup> According to the United Nations' Human Development Report in 2003, the bottom 25 ranked nations (151st to 175th) were all African.<sup>[66]</sup>

Poverty, illiteracy, malnutrition and inadequate water supply and sanitation, as well as poor health, affect a large proportion of the people who reside in the African continent. In August 2008, the World Bank<sup>[67]</sup> announced revised global poverty estimates based on a new international poverty line of \$1.25 per day (versus the previous measure of \$1.00). 80.5% of the Sub-Saharan Africa population was living on less than \$2.50 (PPP) a day in 2005, compared with 85.7% for India.<sup>[68]</sup>

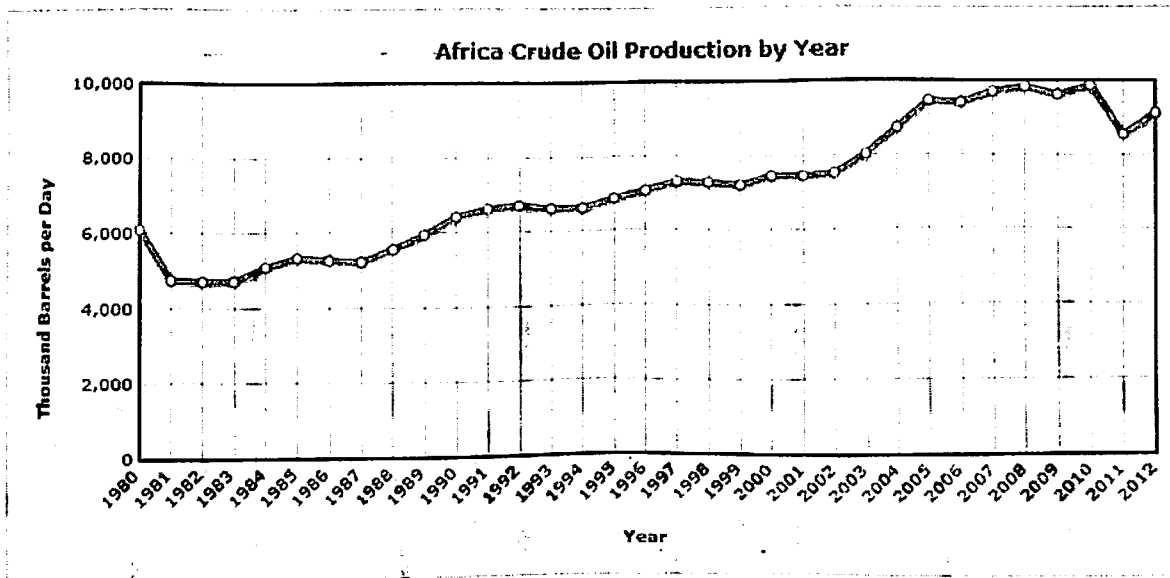
The new figures confirm that sub-Saharan Africa has been the least successful region of the world in reducing poverty (\$1.25 per day); some 50% of the population living in poverty in 1981 (200 million people), a figure that rose to 58% in 1996 before dropping to 50% in 2005 (380 million people). The average poor person in sub-Saharan Africa is estimated to live on only 70 cents per day, and was poorer in 2003 than he or she was in 1973<sup>[69]</sup> indicating increasing poverty in some areas. Some of it is attributed to unsuccessful economic liberalization programs spearheaded by foreign companies and governments, but other studies and reports have cited bad domestic government policies more than external factors.<sup>[70][71][72]</sup>

From 1995 to 2005, Africa's rate of economic growth increased, averaging 5% in 2005. Some countries experienced still higher growth rates, notably Angola, Sudan and Equatorial Guinea, all three of which had recently begun extracting their petroleum reserves or had expanded their oil extraction capacity. The continent is believed to hold 90% of the world's cobalt, 90% of its platinum, 50% of its gold, 98% of its chromium, 70% of its tantalite,<sup>[73]</sup> 64% of its manganese and one-third of its uranium.<sup>[74]</sup> The Democratic Republic of the Congo (DRC) has 70% of the world's coltan, and most mobile phones in the world are made with elements refined from this mineral. The DRC also has more than 30% of the world's diamond reserves.<sup>[75]</sup> Guinea is the world's largest exporter of bauxite.<sup>[76]</sup> As the growth in Africa has been driven mainly by services and not manufacturing or agriculture, it has been growth without jobs and without reduction in poverty levels. In fact, the food security crisis of 2008 which took place on the heels of the global financial crisis has pushed back 100 million people into food insecurity.<sup>[77]</sup>

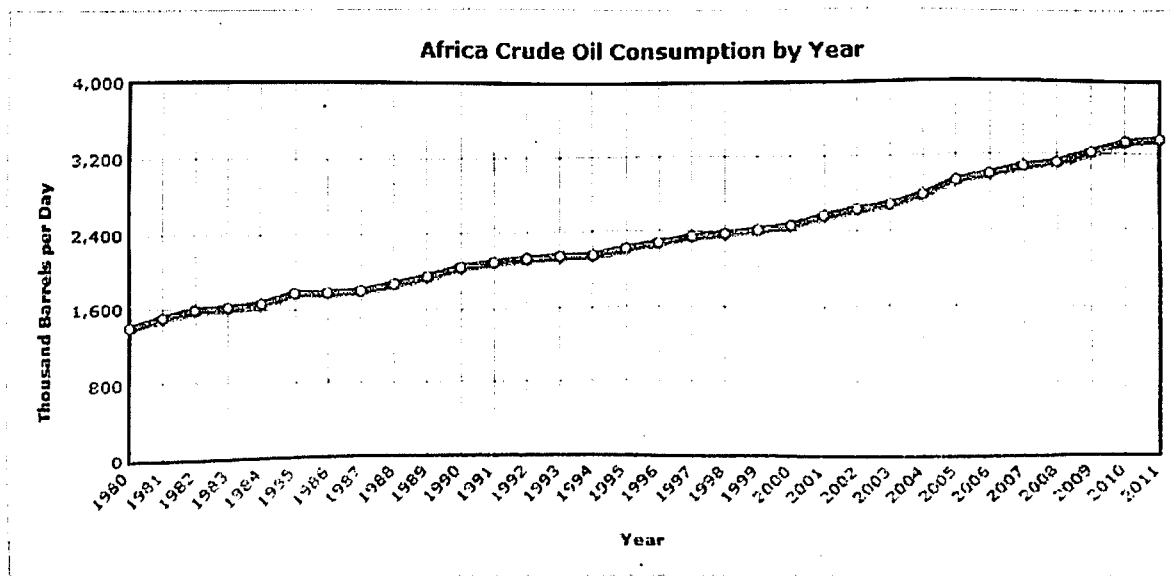
In recent years, the People's Republic of China has built increasingly stronger ties with African nations. In 2007, Chinese companies invested a total of US\$1 billion in Africa.<sup>[78]</sup>

A Harvard University study led by professor Calestous Juma showed that Africa could feed itself by making the transition from importer to self-sufficiency. "African agriculture is at the crossroads," says Dr. Juma. Juma also states, "We have come to the end of a century of policies that favored Africa's export of raw materials and importation of food. Africa is starting to focus on agricultural innovation as its new engine for regional trade and prosperity."

1.1 Crude oil production Africa:



1.2 Crude oil consumption Africa:



### **1.3 Highest crude oil producing countries in Africa 2011:**

#### **1. Nigeria**

**Barrels per day: 2,211,000**

Nigeria produces 2.2 million gallons of oil per day, placing them 12th among producers. But they are the 4th biggest exporter, exporting 2.1 million barrels each day. Much controversy has surrounded oil production in Nigeria. Most recently Royal Dutch Shell is on the defensive following a \$100 million fine imposed by a Nigerian court for a 1970 oil spill. Also, past reports show that militants have attacked pipelines and kidnapped oil employees, cutting into Nigeria's oil production. Last year, a military attack in Nigeria's Oil Delta killed up to 150 people.

#### **#2. Algeria**

**Barrels per day: 2,125,000**

Algeria produces 2.1 million barrels of oil daily. In 2010, Algeria's president fired the CEO and top managers of the state-owned oil firm Sonatrach following a corruption scandal.

#### **#3. Angola**

**Barrels per day: 1,948,000**

Angola produces 1.9 million barrels of oil daily, and export 1.8 million barrels, placing them at #7 on the world's list of exporters.

#### **#4. Libya**

**Barrels per day: 1,790,000**

Libya produces 1.7 million barrels of oil per day, while exporting 1.2 million barrels daily. As violence in Libya currently escalates, the price of oil has skyrocketed

#### **#5. Egypt**

**Barrels per day: 680,500**

#### **#6. Sudan**

**Barrels per day: 486,700**

#### **#7. Equatorial Guinea**

**Barrels per day: 346,000**

**#8. Republic of Congo**

**Barrels per day: 274,400**

**#9. Gabon**

**Barrels per day: 241,700**

**#10. South Africa**

**Barrels per day: 191,000**

**#11. Chad**

**Barrels per day: 115,000**

**#12. Tunisia**

**Barrels per day: 91,380**

**#13. Cameroon**

**Barrels per day: 77,310**

**#14. Cote d'Ivoire**

**Barrels per day: 58,950**

**#15. Democratic Republic of Congo**

**Barrels per day: 16,360**

**#16. Ghana**

**Barrels per day: 7,081**

**#17. Morocco**

**Barrels per day: 4,053**

#### 1.4 Refining capacity of Africa:

According to the 2012 BP Statistical Energy Survey, Africa had a 2011 refinery capacity of 3317 thousand barrels a day, 3.56% of the world total. Refinery throughput was 2219 thousand barrels a day, 2.93% of the world total.

Oil refineries convert crude oil into fuel products, lubricating oils, bitumen and chemical feedstocks.

Prior to 1954 there were no refineries in Africa. All refined products were supplied to Africa from European and American refineries. For many years, Shell and Mobil managed The WARP programme for all the marketers operating in West Africa. Under this programme, each month Shell arranged a ship from Curacao refinery, and Mobil arranged a ship from the UK. All marketers would request the quantities of each product they needed, and the ship would make a "milk run" along the coast. There was a similar arrangement in East Africa.

In the 50 years between 1954 and 2004 48 refineries were built in Africa. In 1954 the first African refineries were built in Algiers (CFP/Total) and Durban (Socony/Mobil). These were followed by the building of Luanda refinery (Petrofina) in 1958, and refineries in Kenya (Shell/BP), Ghana (ENI/Agip), and Senegal (consortium), in 1963. In the 1960's refineries were also built in Cote d'Ivoire, Gabon, Tanzania, Nigeria (Port Harcourt I), and Capetown. In the 1970's, following nationalisation of the oil industry in many countries, several state controlled refineries were built, such as Arzew in Algeria, Warri in Nigeria, CORAF in Congo, and SoNaRa in Cameroon. A final burst of refinery building took place in the 1980's, including refineries at Warri and Port Harcourt in Nigeria. Whilst there have been a number of modernisation projects since then, the only new refineries built in the past 10 years have been Khartoum in 2001, and MIDOR in Egypt in 2002.

Even whilst refineries were being built, others were already being closed. In 1966 the Zimbabwe refinery closed due to sanctions imposed during the UDI period. Between 1980 and 2003 a further 10 uneconomic refineries closed permanently.

All the refineries are basically of the topping/reforming type, except for the 4 refineries in South Africa, 2 in Egypt, 3 in Nigeria, 1 in Cote d'Ivoire, and 1 in Ghana, There are also 3 Synfuel plants (coal and gas feedstock) in South Africa. The total active distillation capacity for the continent is around 3 million b/d (15 million mt/yr), an average of 79,000 b/d per refinery.

The largest refinery in Africa is the Skikda refinery in Algeria (300mbd), the second largest the Ras Lanuf plant in Libya (220mbd). In Sub Saharan Africa the largest are the Port Harcourt refinery I and II in Nigeria (210mbd), and the Shell/BP Sapref refinery in Durban (165mbd).

Excluding some specialty plants (remote locations, bitumen) the smallest operating refinery is the 14mbd Solimar refinery in Madagascar, which operates only occasionally. There are several small 20mbd refineries including Sogara Gabon, Indeni Zambia, SAR Senegal and CORAF Congo.

The major refining centres in Africa are in South Africa, Nigeria, Egypt and Algeria.

**South Africa** has 4 refineries and 3 synfuels plants.

- Caltex has a 5.5 million mt/yr (110,000 b/d) refinery in Cape Town.
- Shell and BP have joint ownership of the 8.2 million mt per annum (165,000 b/d) Sapref refinery in Durban.
- Engen has the 6 million mt/yr (125,000 b/d) Enref refinery in Durban.
- Sasol and Total have joint ownership of the 4.2 million mt/yr (85,000 b/d) Natref refinery in Sasolburg.

All the South African refineries have undergone major expansions and upgrading since 1990.

**Nigeria** has three refineries, all owned by the Nigerian National Petroleum Company, NNPC. The Nigerian government has announced its intention to sell 51% of each of the refineries in 2004.

- Kaduna refinery in northern Nigeria was built in 1980 with a capacity of 5.5 million mt/yr (110,000 b/d). A Lube Baseoil plant was added in 1982, and an LAB plant in 1987.
- Warri refinery in the south central region was built in 1978 with a capacity of 6.2 million mt/yr (125,000 b/d). A Carbon Black plant and a Polypropylene plant were added in 1986.
- Port Harcourt refinery in the southeast is made up of two refineries, built in 1965 and 1989. In 1993 they were merged into one, with a total capacity of 10.500 million mt/yr (210,000 b/d). The Eleme Petrochemical plant, which was built adjacent to the Port Harcourt refinery in 1995, has an Olefin production capacity of 483,000 mt/yr, a Polypropylene capacity of 80,000 mt/yr and a Polyethylene production capacity of 250,000 mt/yr.

The Nigerian oil industry has been impacted seriously by operational problems during recent years, and production has been below 50% of capacity.

**Egypt** has 9 refineries mostly concentrated in the northeast (Cairo, Alexandria, Suez). Egyptian General Petroleum Corp (EGPC) operates all but one of the refineries. The exception is the MIDOR Refinery in Alexandria.

- El Mex refinery in Alexandria is operated by the Alexandria Petroleum Company. It has a capacity of 100,000 b/d, and 22,500 b/d of vacuum distillation capacity. In addition it has a Lube Baseoil manufacturing plant and a Bitumen unit.
- Cairo Petroleum Refining Company in Mostorod, near Cairo. This refinery has a capacity of 145,000b/d.

- The El-Nasr Petroleum Company near Suez has a capacity of 99,300 b/d. It has a 35,000 b/d Hydrocracker and a Bitumen unit.
- The Amiriyah Petroleum Refining Company in Alexandria has a capacity of 78,000 b/d, and a 15,000 b/d vacuum distillation unit. It has a 9,000 b/d Alkylation unit, and a 2,000 b/d lube baseoil manufacturing unit.
- The Suez Petroleum Processing Company near Suez has a capacity of 66,400 b/d, and a 9,500 b/d vacuum distillation unit. It has a 16,400 b/d Delayed Coker, and a 1,000 b/d Lube Baseoil unit.
- The Asyut Petroleum Refining Company near the center of Egypt has a capacity of 47,000 b/d. This simple refinery has a small Naphtha Reformer, and is designed to supply product to the central and southern regions.
- The Tanta refinery near Port Said is operated by the Cairo Petroleum Refining Company. It has a capacity of 35,000 b/d. Other than a small Hydrotreating unit it has no upgrading capacity.
- The El-Nasr Petroleum Company operates the small Wadi Feran refinery on the Red Sea in the Gulf of Suez. It has capacity of 7,000 b/d, and was designed to service operations related to the Suez Canal.
- The Middle East Oil Refinery (MIDOR) was completed in 2002 in the Amiriyah Free Zone, Alexandria. It has a capacity of 100,000 b/d, and has a 35,000 b/d Hydrocracker, a 22,800 b/d Coker, and a 10,700 b/d Isomerisation unit. This is the only privately owned refinery in Egypt. It was originally a joint Egyptian/Israeli venture, but the Israeli shareholders sold out to the Egyptian National Bank in 2001.

**Algeria** is another major refining centre with 4 refineries.

- Algiers refinery, built in 1964, has a capacity of 60,000 b/d. It was built by CFP/Total to supply the main market. It has no cracking capacity, and no special units.
- Arzew refinery, built in 1973, has a capacity of 60,000 b/d. It was built by Sonatrach as an export refinery. It has no cracking facilities, but has Lube Baseoil (1984 built), and Bitumen units.
- Skikda refinery, built in 1980 (expanded in 1993), has a capacity of 300,000 b/d. It was built by Sonatrach as an export refinery and petrochemical complex. It has no cracking facilities, but has an Aromatics unit (BTX) and a Bitumen plant.
- Hassi Messaoud, a small refinery in southern Algeria, built in 1960, and expanded in 1979, has a capacity of 30,000 b/d.

The 6,000 b/d refinery in In Amenas was shutdown in 1986.

Many African refineries have been forced to close a result of low worldwide refining margins, small local markets, high operating cost (due to small size), and poor yields. Following the World Bank/IMF insistence on market liberalisation in the early 1980's, many of the remaining refineries have faced significant challenges.

**Country wise detailed analysis of oil and gas sector of Africa:**

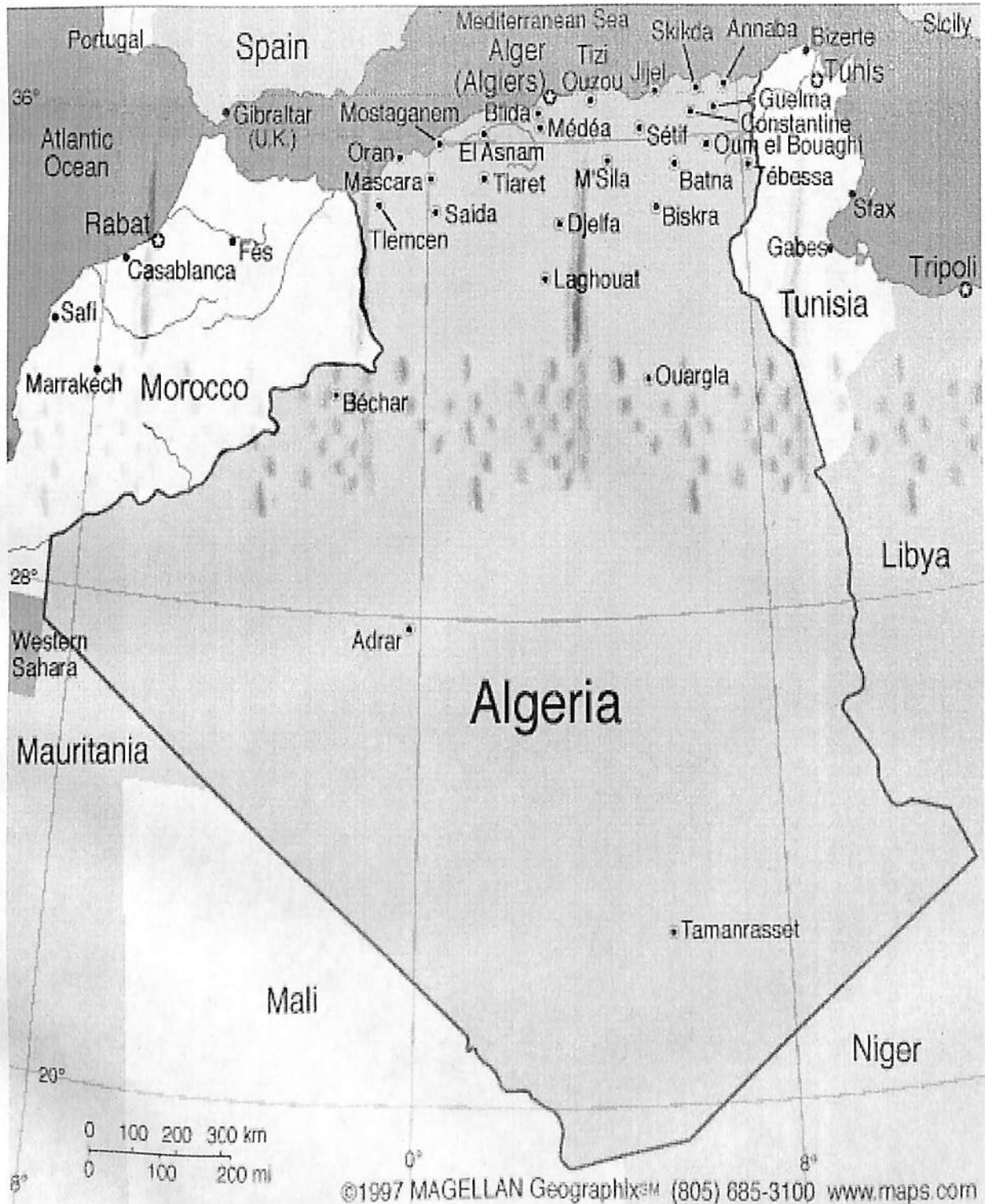
**Structure:**

1. About the country
2. Country's crude oil production
3. Country's crude oil consumption
4. Energy scenario
5. Oil and gas industry directory
6. Market overview: oil and gas
7. S.W.O.T.
8. Trends prevailing in oil and gas market of the country
9. Future projections
10. Oil and gas Industry news



2. Country:

Algeria



## 2.1 About<sup>1</sup>:

### Geography

Nearly four times the size of Texas and the largest country on the continent, Algeria is bordered on the west by Morocco and Western Sahara and on the east by Tunisia and Libya. The Mediterranean Sea is to the north, and to the south are Mauritania, Mali, and Niger. The Saharan region, which is 85% of the country, is almost completely uninhabited. The highest point is Mount Tahat in the Sahara, which rises 9,850 ft (3,000 m).

### Government

Parliamentary republic.

### History

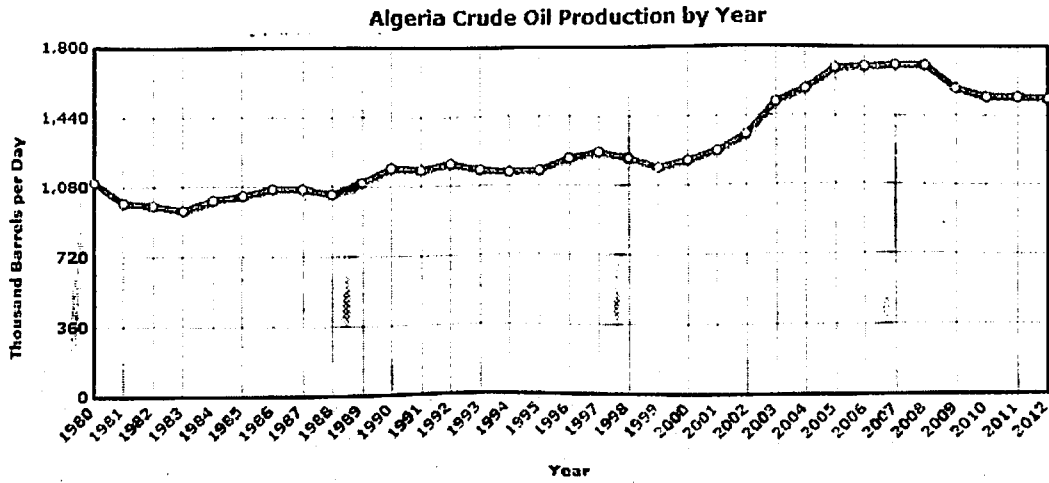
Excavations in Algeria have indicated that *Homo erectus* resided there between 500,000 and 700,000 years ago. Phoenician traders settled on the Mediterranean coast in the 1st millennium B.C. As ancient Numidia, Algeria became a Roman colony, part of what was called Mauretania Caesariensis, at the close of the Punic Wars (145 B.C.). Conquered by the Vandals about A.D. 440, it fell from a high state of civilization to virtual barbarism, from which it partly recovered after an invasion by Arabs about 650. Christian during its Roman period, the indigenous Berbers were then converted to Islam. Falling under the control of the Ottoman Empire by 1536, Algiers served for three centuries as the headquarters of the Barbary pirates. Ostensibly to rid the region of the pirates, the French occupied Algeria in 1830 and made it a part of France in 1848.

Algerian independence movements led to the uprisings of 1954–1955, which developed into full-scale war. In 1962, French president Charles de Gaulle began the peace negotiations, and on July 5, 1962, Algeria was proclaimed independent. In Oct. 1963, Ahmed Ben Bella was elected president, and the country became Socialist. He began to nationalize foreign holdings and aroused opposition. He was overthrown in a military coup on June 19, 1965, by Col. Houari Boumédiène, who suspended the constitution and sought to restore economic stability. After his death, Boumédiène was succeeded by Col. Chadli Bendjedid in 1978. Berbers rioted in 1980 when Arabic was made the country's only official language. Algeria entered a major recession after world oil prices plummeted in the 1980s.

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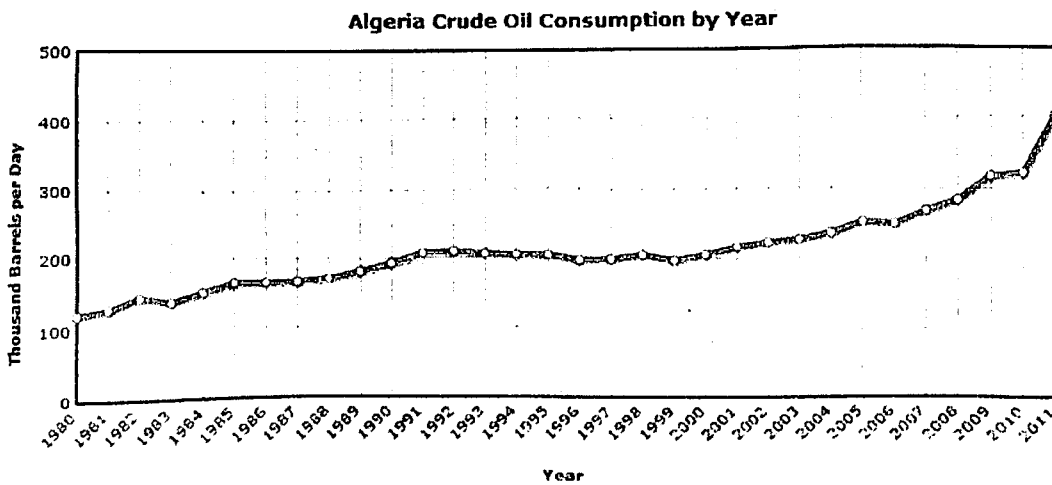
<sup>1</sup> Source: [www.infoplease.com](http://www.infoplease.com)

2.2 Algeria crude oil production<sup>2</sup>:



Source: United States Energy Information Administration

2.3 Algeria crude oil consumption<sup>3</sup>:



Source: United States Energy Information Administration

<sup>2</sup> Source: EIA

<sup>3</sup> Source : EIA

## 2.4 Energy scenario of Algeria<sup>4</sup>:

Electricity	production	consumption	exports	imports
	40.22 billion kWh (2009 est.)	31.39 billion kWh (2009 est.)	405 million kWh (2009 est.)	369 million kWh (2009 est.)
<b>World ranking</b>	<b>59</b>	<b>61</b>	<b>63</b>	
<b>Crude oil</b>	1.885 million bbl/day (2011 est.)	N.A.	697,500 bbl/day (2009 est.)	8,152 bbl/day (2009 est.)
<b>World ranking</b>	<b>16</b>	<b>N.A.</b>	<b>20</b>	<b>79</b>
<b>Refined petroleum products</b>	447,100 bbl/day (2008 est.)	316,400 bbl/day (2011 est.)	446,500 bbl/day (2008 est.)	11,700 bbl/day (2008 est.)
<b>World ranking</b>	<b>34</b>	<b>41</b>	<b>18</b>	<b>130</b>
<b>Natural gas</b>	84.61 billion cu m (2010 est.)	28.82 billion cu m (2010 est.)	55.79 billion cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>11</b>	<b>30</b>	<b>7</b>	<b>151</b>

<sup>4</sup> Source: CIA world fact book

## 2.5 Algeria Oil and Gas Industry Directory<sup>5</sup>:

**EPCI CONTRACTORS:** SAIPEM ALGERIA, BENTINI SPA (GEPSCO / BENCO), COMERINT, ENAC SPA, ENSP GROUP, ENTREPROSE ALGERIE, INERGA , JGC ALGERIA, METALENG SRL, PETRO SERVICES, PSN ALGERIA SERVICES SARL, SAIPEM CONTRACTING ALGERIA SPA, SNC-LAVALIN MAGHREB EURL ALGERIA , SOMIK SPA, SOMIZ SPA, SPIECAPAG ALGERIA, STROYSTRANGAZ SPA, WOOD GROUP SOMIAS SPA ALGERIA.

**FABRICATION SUBCONTRACTORS:** BOCCARD ALGERIE, BONATTI SPA, CLYDE UNION PUMPS ALGERIE, ENTREPRISE NATIONALE DE TRAVAUX AUX PUITES (ENTP) ALGERIA, FLOWSERVE ALGERIA, HIMA ALGERIA, IOTA ALGERIE SARL, KSB ALGERIE EURL, PHOCEENNE ALGER, POVAL SPA, REFIT ALGERIA EURL , ROTEQ SERVICE, SAFET BDL, SARPI.

**MECHANICAL ENGINEERING, EQUIPMENT SUPPLIES, WORKSHOPS, PROCUREMENT, LOCAL COMPANIES:** ATLAS COPCO ALGERIE SPA, AVA ALGERIE, ENSP GROUP, KOUBA FERRONNERIE, MEI SPA, TEKFLOW ALGERIA.

**BASE LOGISTICS, LIFE CAMP MANAGEMENT:** REDMED GROUP ALGERIA

**DIVING, UNDER WATER ENGINEERING:** H2O PRO-SERVICES, TECNOSUB INTERNACIONAL ALGERIA

**AVIATION & HELICOPTER SERVICES:** TASSILI AIRLINES

**GOVERNMENT ASSOCIATES:** AGENCE NATIONALE POUR LA VALORISATION DES RESSOURCES HYDROCARBURES (ALNAFT), AUTORITE DE REGULATION DES HYDROCARBURES (ARH), COMMISSION DE REGULATION DE L'ELECTRICITE ET DU GAZ (CREG), MINISTERE DE L'ENERGIE ET DES MINES (MEM) ALGERIA, SONATRACH, SONELGAS SPA.

**ELECTRICAL ENGINEERING, POWER GENERATION, INSTRUMENTATION:** ABB AUTOMATION ALGERIA, ABB POWER TECHNOLOGIES SPA ALGERIA, ABB PROCESS SOLUTIONS & SERVICES SPA ALGERIA, AEC SPA, AL-ELEC SPA, AMIMER ENERGIE SPA, CEGELEC ALGERIE, ENELPOWER ALGERIA, ENERGICAL, EVOLUTEC ALGERIA, INPROTEC ALGERIE SARL, MITRONIC SARL ALGERIA, NUOVO CASTORO ALGERIE, NUOVO PIGNONE SPA, REMELEC SARL, S.P.F.M.E.E. EURL.

<sup>5</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

**CATERING SERVICES:** ALMAFRIQUE SARL, CIEPTAL (CIS CATERING) ALGERIE, ENTREPRISE NATIONALE DE TRAVAUX AUX PUIITS (ENTP) ALGERIA, FOOD & FOOL CATERING FFC, MULTICATERING ALGERIA, REDMED GROUP ALGERIA, SODEXO ALGERIA.

**INSPECTION SERVICES:** BUREAU VERITAS ALGERIE, ENGTP.

**CONSTRUCTION AND CIVIL ENGINEERING:** BATENCO OUEST, COSIDER GROUP, CR METAL, DRAGADOS INDUSTRIAL ALGERIE SPA, GCB SPA, ICM EST, INERGA.

**PAINTING, SCAFFOLDING, THERMAL INSULATION, HVAC:** AZUR PAINT PRODUCTS ALGERIA, ENAP, LASSARAT ALGERIE SA.

**REFINING & PETROCHEMICALS:** ENIP SPA, AZOCHIM SARL.

**GAS LIQUIFICATION, MARKETING & DISTRIBUTION:** AIR LIQUIDE ALGERIE, CHIALI GROUP, COGIZ, KAHRIF SPA, KHANAGHAZ SPA, LINDE GAS ALGERIE SPA.

**TUBULARS & PIPE INSPECTION, PIGGING, COATING:** ALFAPIPE, ANABIB GROUP SPA, ARCELORMITTAL PIPES & TUBES, AZUR PAINT, BJSP ALGERIA, ENAC SPA, WELDTEST.

**AGENTS, REPRESENTATIVES, CONSULTANS, LOCAL COMPANIES:** DISTRIM SPA, PALL ALGERIE, UNAOIL SAM ALGERIA.

**LOGISTICS, TRANSPORTATION, SHIPPING, CLEARING AND FORWARDING:** AGILITY LOGISTICS SARL, AGS FRASERS ALGERIA, CIEPTAL (CIS CATERING) ALGERIE, DHL INTERNATIONAL (ALGERIE) SARL, ENTREPRISE PORTUAIRE DE BEJAIA, HYPROC SHIPPING COMPANY, MEDISTAR ALGERIA, ENTREPRISE NATIONALE DE TRAVAUX AUX PUIITS (ENTP) ALGERIA, SDV ALGERIA, TRANSMEX SPA, UNION TRANSIT SARL.

**ENVIROMENTAL, WASTE MANAGEMENT, REMEDIATION SERVICES:** COGIS IMPIANTI SPA, DISTRIM SPA, ECOLOGY MEDITERANEAN ALGERIA, OSPREC SPA.

**EQUIPMENT & TOOLS SUPPLIES, WORKSHOPS, OCTG STOCKISTS, MULTINATIONALS:** AIRAGON INDUSTRY, CAMERON ALGERIA, FORAID ALGERIE, GENERAL ELECTRIC THERMODYN ALGERIA, HIMA ALGERIA, LOGICONSULT, ROVATTI, EPRA, PETROVALVES, SOSAPAL SPA, SPIE OIL & GAS SERVICES ALGERIE, TECHNOACIER SARL, TRACTOR PARTS SERVICES SARL (TPS).

**HSE, QA/QC, QMS SERVICES:** CIEPTAL (CIS CATERING) ALGERIE, GEOS ALGERIE.

**RISK ASSESSMENT, SECURITY SERVICES: CONTROL RISKS ALGERIA, G4S ALGERIA, GEOS ALGERIE.**

**TELECOM, IT SERVICES: WMCSAT ALGERIA.**

**PROJECT MANAGEMENT, TECHNICAL ASSISTANCE: ECM ALGERIE, EVOLUTEC ALGERIA, FORAID ALGERIE, IOTA ALGERIE SARL, INVENSYS ALGERIA, MPH IMS SPA, PHOCEENNE ALGER, SPIE OIL & GAS SERVICES ALGERIE.**

**MANPOWER SUPPLY, RECRUITMENT, HR AGENCIES: AGS FRASERS ALGERIA, ECM ALGERIE, GENERAL OIL SERVICES.**

## **2.6 Market overview: oil and gas**

### **LNG:**

Algeria was the world's first producer of liquefied natural gas (LNG) and was the seventh largest exporter of LNG in 2010. Europe's leading LNG importer, signed a deal with Sonatrach in December 2007 to extend existing LNG supply contracts from 2013 to 2019. Sonatrach has awarded construction contracts for an LNG plant at Arzew, which will have a capacity of 4.7mn tonnes per annum (tpa) with a planned 2013 start-up.

### **REFINING:**

Algeria's refining sector is made up of three large coastal refineries with terminal access to the Mediterranean market, and two smaller inland plants linked to local oilfields at Adrar and Hassi Messaoud. **The country has a total capacity of 456,000 barrels per day (b/d)**, well over half of which is provided by the 300,000b/d Skikda plant on the north east coast close to the Tunisian border. Of the two other coastal refineries, one is located in the capital Algiers (54,243b/d) and another at Arzew (60,000b/d) in Oran Province.

**BMI forecasts see capacity hitting 834,000b/d in 2018<sup>6</sup>.**

**Proposed refinery project:** The Tiaret refinery project has been under consideration since 2006, but there has been little progress. The FEED contract was supposed to be awarded on April 3 2011, but the country indefinitely postponed the award at the end of March 2011. This was the fourth delay to the awards, with previous deadlines having been January, September and November 2010.

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<sup>6</sup> Source: business monitor international

## Refineries In Algeria

Refinery	Capacity (b/d)	Owner (Contractor)	Completed	Details
Skikda	300,000	Sonatrach/Naftec	1980	Processes Saharan Blend
Arzew	60,000	Sonatrach/Naftèc	1972	Built by Itochu
Algiers	54,243	Sonatrach/Naftec	1964	
Hassi-Messaoud	30,000	Sonatrach/Naftec	1962	
Soralchin (Adrar)	12,000	CNPC/Sonatrach	2007	
<b>Total Capacity</b>	<b>456,243</b>			
<b>Planned additional capacity</b>				
Arzew Expansion	30,000		Late 2011	
Skikda Expansion	32,000	(Samsung)	Mid-2012	
Algiers Expansion	20,000	(Technip)	Mid-2014	
Tiaret	300,000	Sonatrach	2014	Greenfield refinery
<b>Total added capacity</b>	<b>382,000</b>			

Source: BMI

**Petrochemicals:** Algeria is trying to compete with other energy-rich countries in the Middle East and North Africa (MENA), with the aim of playing an important part in the global petrochemicals industry. With new facilities due on stream in 2014, it is expected to become a significant supplier to Western Europe, but plant openings risk coinciding with the continued slump in the euro zone petrochemicals market. The Algerian chemicals and petrochemicals industry is mainly based in three centers: Skikda, Arzew and Annaba. These sites are industrial and refining centers and include the Arzew refinery and the Skikda refinery.

A new ethylene cracker is being built and is due to come online in 2014. Algeria has a lot of potential feedstock, and the government has ambitious plans once the proposed Arzew cracker comes online, with capacity to include 350,000tpa HDPE, 450,000tpa LLDPE and 550,000tpa mono ethylene glycol (MEG), which it hopes to export.

## Algeria Cracker Capacity, 2010-2017 ('000 tpa)

	2010	2011	2012	2013f	2014f	2015f	2016f	2017f
Arzew	na	na	na	na	na	1,100	1,100	1,100
ENIP (Sonatrach), Skikda	130	130	130	130	130	130	130	130

Source: BMI



2.7 SWOT:

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-A leading country in the development of new technologies for gas exploitation, Algeria was the first country to produce liquefied natural gas (LNG), and an ambitious CO2 sequestration and re-injection project in Illizi was launched in 2001.</li> <li>-Strong position state-owned Sonatrach is the world's 11th largest oil company and the fourth largest gas producer and exporter.</li> <li>- The country has strong institutions and technocrats in the petroleum industry.</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-Most of the country's hydrocarbons production lies in mega-fields: Hassi Messaoud, which accounts for 52% of the country's oil reserves, and HassiR'Mel, which accounts for more than 60% of the country's gas reserves. As output from these fields has been erratic, it remains unclear whether production at these fields is declining.</li> <li>-Sonatrach has failed to build on its technological lead to expand internationally and bolster its image abroad.</li> <li>-The export market is largely geared towards the European market and petroleum revenues will, therefore, be affected by global head winds.</li> </ul>
<p><b>S.W.O.T.</b></p>	
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-The mooted reform of Algeria's hydrocarbons law is expected to improve the business environment - in particular by creating large incentives for exploration and production from offshore and unconventional acreages. It is anticipated that the reform taxes will be calculated based on the profit from a project instead of turnover. <b>This is expected to spur foreign investment and revive the country's moribund upstream segment.</b></li> <li>-Algeria's territory remains relatively unexplored. Studies by the United States Geological Survey (USGS) suggest that known basins such as the Erg Oriental-Berkine, Erg Occidental-Ahnet and Illizi basins still have large undiscovered resources.</li> <li>-There is also potential for exploration in the north of the country and offshore in Mediterranean waters, although given the high urban density and environmental concerns in this area, these resources might be harder to tap into.</li> <li>-Algeria has large technically recoverable shale gas resources, which, according to EIA estimates, hold more than 6.5trn cubic meters (tcm) of gas. This puts the country in third place in Africa, behind South Africa (13.7tcm) and Libya (8.2tcm).</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-The country has proven immune to the 'Arab spring' but there is still a risk that the situation could become much more volatile in coming years.</li> <li>-The attack at BP's In Amenas Plant revealed serious security concerns for the country's hydrocarbon market.</li> </ul>

## 2.8 Key trends in Algeria oil and gas sector:

-There were three main developments in Algeria's hydrocarbons sector over the past quarter. Firstly, the In Amenas plant and Ain Chikh pipeline attack. Secondly, the adoption of the 2013 Hydrocarbon law, revamping the production tax stem, state ownership and exploration incentives. Finally, the start-up of gas production at Eni-operated Menzel Ledjmet Est.

-The Algerian Parliament in January 2013 approved a new national hydrocarbons law that reforms some of the more unwelcome policies that were established in 2005. BMI believe that while it creates strong exploration incentives, the new production tax regime remains unclear and burdensome, and could deter some companies from entering the market. Additionally, increased state ownership, especially in downstream and midstream, is creating further uncertainty for investors.

-Terrorist attacks, in particular at BP's In Amenas gas plant, are creating security concerns for investors, further fuelled by the armed conflict in neighboring Mali. Most likely, these events will push state hydrocarbons regulator ALNAFT to postpone the long-expected offshore licensing round in order to wait for improved investor sentiment. BMI forecast that oil production will rise from estimated 1.845mn barrels per day (b/d) in 2012 to 1.901mn b/d in 2016 as ambitious new projects, mostly located in the Berkinebas in, come on stream. Production will steadily decline afterward to reach around 1860mn b/d in 2020.

-Consumption of crude is forecast to rise steadily between 2012 and 2022. This is partly in line with the expected GDP growth rate. We anticipate that **crude consumption will rise from an estimated 417,100b/d in 2012 to 569,700b/d by 2022.**

**-BMI forecast that gas production will increase from an estimated 84.4bcm in 2012 to 107bcm by 2022 as ambitious new projects, mostly located in the Ahnet, Berkine and Illizi basins, come on-stream.**

-Production will be further boosted by increased output at major fields such as Hassi R'Mel and by enhanced recovery rates at the In Salah Gas Project.

-Gas demand is set to rise steadily on the back of solid economic growth. BMI forecasts average annual growth of 5.36% to 2021, with consumption forecast to rise from an estimated 30.3bcm in 2012 to 52.3bcm in 2022.

## 2.9 Risks associated in operating in Algeria:

- 1- Limited democratic system.
- 2- Growing terrorist activities.

## 2.10 Future projections:

-Irish-independent Petroceltic announced in October 2011 that fracture simulation of the AT-8 well on the Ain Tsila discovery, in the Illizi Bas in, enhanced the pre-facture flow rates to 1mn cubic metres of gas per day (Mcm/d) and 1,100b/d of condensate. The Ain Tsila natural gas field contains a sizeable opportunity for Algeria, as it is estimated to hold approximately 59.5bcm of sellable gas, 67mn bbl of gas condensate, and 108mn bbl of LNG. In August 2012, Petroceltic formally declared the field commercially viable. The project is now expected to start in 2014 with first gas to come in 2017.

### Algeria Refining - Production And Consumption, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	456.3	486.3	516.3	516.3	534.4	534.4
Crude Oil Refining Capacity, % change y-o-y	0.0	6.6	6.2	0.0	3.5	0.0
Crude Oil Refining Capacity, Utilisation, %	88.9	89.4	89.9	89.9	90.4	90.4
Refined Petroleum Products Production, 000b/d	405.8	435.0	464.4	464.4	483.3	483.3
Refined Petroleum Products Production, % change y-o-y	0.0	7.2	6.8	0.0	4.1	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	428.8	459.0	489.4	490.4	510.3	511.3
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	7.0	6.6	0.2	4.1	0.2
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	402.0	417.1	433.8	450.7	467.6	483.5
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	28.8	3.8	4.0	3.9	3.8	3.4

e/f = estimate/forecast. Source: EIA, BMI

-The most important development in the years ahead for the Algerian sector remains the opening of the Tiaret refinery, which BMI believe will reach an output capacity of 300,000b/d by 2018.

## 2.11 Industry news:

-Algeria's refining capacity will double over the next five years if the current expansion drive remains on track, according to Algeria's oil minister Youcef Yousfi, quoted by Petroleum Africa. Algeria plans to construct six new refineries in a bid to increase its refining capacity to 60mn tonnes per year, compared with the current capacity of 30mn tonnes. Although Yousfi failed to disclose any other details, he revealed that the construction of the new refineries will commence at end-2013.

-Berkine consortium, a partnership between Algeria's state-owned Sonatrach and US independent Anadarko Petroleum, has started production at the El Merk complex, in Algeria. The El Merk complex, which is located 350km south east of Hassi Messaoud, has recoverable reserves of 1.2bn barrels of oil and condensate. According to news agency APS, production has started at 12,000 barrels per day (b/d) of crude oil, with output expected to reach 127,000b/d of crude oil and condensates by the end of 2013. The complex is also expected to produce 30,000b/d of liquefied petroleum gas (LPG).





### 3.1 About<sup>7</sup>:

#### Geography:

Angola, more than three times the size of California, extends for more than 1,000 mi (1,609 km) along the South Atlantic in southwest Africa. The Democratic Republic of the Congo and the Republic of Congo are to the north and east, Zambia is to the east, and Namibia is to the south.

A plateau averaging 6,000 ft (1,829 m) above sea level rises abruptly from the coastal lowlands. Nearly all the land is desert or savanna, with hardwood forests in the northeast.

#### Government:

Angola underwent a transition from a one-party socialist state to a nominally multiparty democracy in 1992.

#### History:

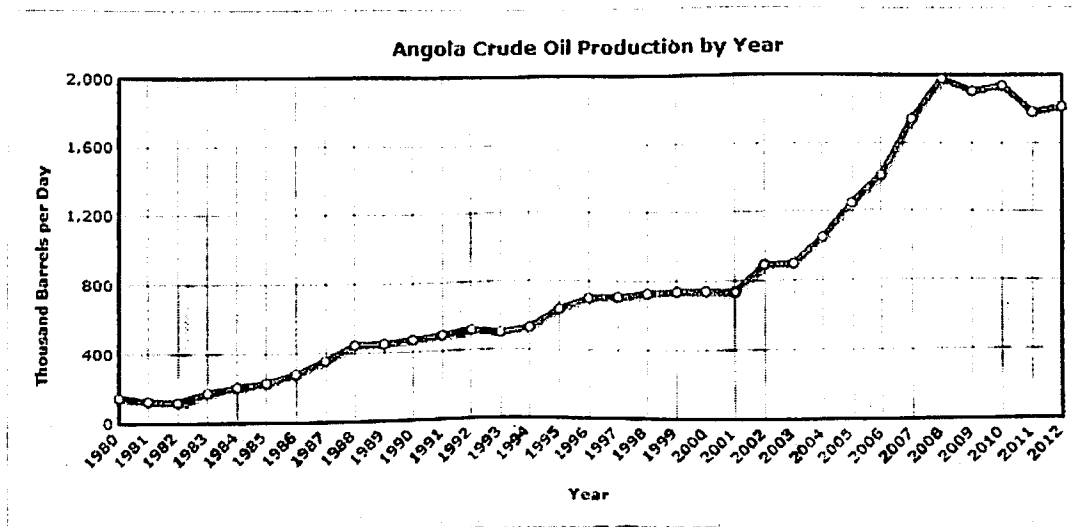
The original inhabitants of Angola are thought to have been Khoisan speakers. After 1000, large numbers of Bantu speakers migrated to the region and became the dominant group. Angola derives its name from the Bantu kingdom of Ndongo, whose name for its king is *ngola*.

Explored by the Portuguese navigator Diego Cão in 1482, Angola became a link in trade with India and Southeast Asia. Later it was a major source of slaves for Portugal's New World colony of Brazil. Development of the interior began after the Berlin Conference in 1885 fixed the colony's borders, and British and Portuguese investment fostered mining, railways, and agriculture.

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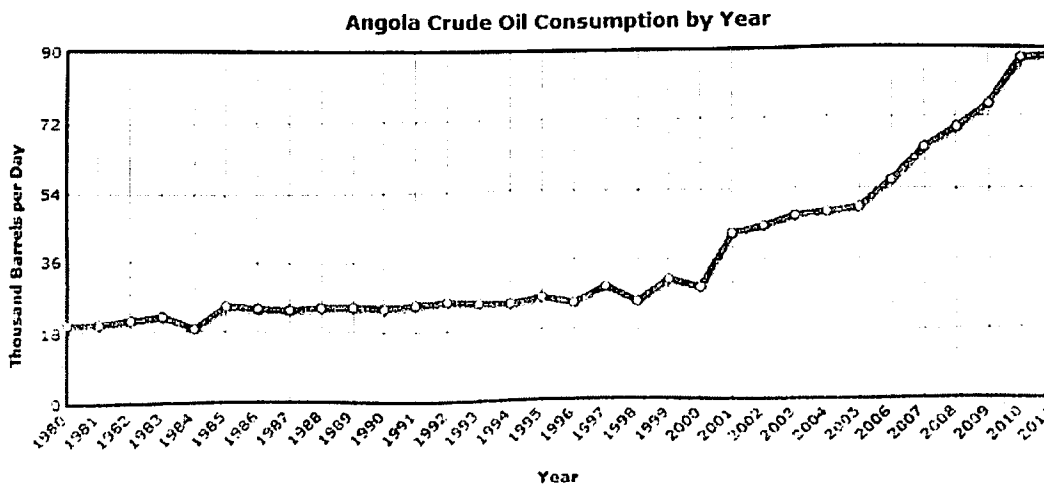
<sup>7</sup> Source: [www.infoplease.com](http://www.infoplease.com)

3.2 Angola crude oil production<sup>8</sup>:



Source: United States Energy Information Administration

3.3 Angola crude oil consumption<sup>9</sup>:



Source: United States Energy Information Administration

<sup>8</sup> Source: EIA

<sup>9</sup> Source : EIA

3.4 Energy scenario Angola<sup>10</sup>:

Electricity	production	consumption	exports	imports
	4.08 billion kWh (2009 est.)	3.659 billion kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>123</b>	<b>125</b>	<b>156</b>	<b>155</b>
<b>Crude oil</b>	1.84 million bbl/day (2012 est.)	N.A.	1.757 million bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>17</b>	<b>N.A.</b>	<b>9</b>	<b>153</b>
<b>Refined petroleum products</b>	37,310 bbl/day (2008 est.)	79,430 bbl/day (2011 est.)	31,050 bbl/day (2008 est.)	41,480 bbl/day (2008 est.)
<b>World ranking</b>	<b>89</b>	<b>87</b>	<b>67</b>	<b>75</b>
<b>Natural gas</b>	734 million cu m (2010 est.)	733 million cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>69</b>	<b>96</b>	<b>56</b>	<b>154</b>

<sup>10</sup> Source: CIA world fact book



### 3.5 Angola oil and gas industry directory<sup>11</sup>:

**Exploration & production, multinationals and local companies:** AFREN ANGOLA, AGIP ANGOLA LTD, AJOCO EXPLORATION CO. LTD., AJOCO'91 EXPLORATION CO. LTD., ALROSA ANGOLA, ANGOLA JAPAN OIL CO. LTD., BP ANGOLA, CABINDA GULF OIL COMPANY LTD. (CABGOC), CNR (RANGER OIL LTD) ANGOLA, DAEWOO ANGOLA, ESSO EXPLORATION ANGOLA, FALCON OIL HOLDING SA, HYDRO OIL & ENERGY (NORSK HYDRO) ANGOLA, LACULA OIL COMPANY LTD., MAERSK OIL ANGOLA, OCEAN ANGOLA / DEVON, PETROBRAS ANGOLA, PETROGAL ANGOLA, SHELL EXPLORATION & PRODUCTION ANGOLA B.V., SOCO INTERNATIONAL ANGOLA, SOMOIL, SOCIEDADE PETROLIFERA ANGOLANA S.A.R.L., SONANGOL P & P, STATOIL ANGOLA, TOTAL E & P ANGOLA, VAALCO ANGOLA (KWANZA), VITOL ANGOLA.

**EPCI contractors:** ACERGY ANGOLA, ANGOFLEX ANGOLA, KVAERNER OIL & GAS ANGOLA, KWANDA LDA (SAIPEM) ANGOLA, PETROMAR, UEM (SAIPEM) ANGOLA, SEVENSEAS ANGOLA (SUBSEA 7), SAIPEM S.P.A. ANGOLA, SONAMET INDUSTRIAL S.A.R.L. (ACERGY EX-STOLT OFFSHORE) ANGOLA, TECHNIP ENGENHARIA ANGOLA.

**Fabrication subcontractors:** BOCCARD ANGOLA, FORAID / SONAID (AMEC SPIE) ANGOLA, FRIEDLANDER ANGOLA, PORTUMO ANGOLA (PONTICELLI FRERES), STAPEM OFFSHORE ANGOLA, TECHNIC SERVICES ANGOLA

**Mechanical engineering, equipment supplies, workshops, procurement, local companies:** ANGOFLEX ANGOLA, CAMERON ANGOLA, CATERPILLAR ANGOLA, FMC / FKI ANGOLA, FRANK'S ANGOLA, VETCO GRAY LTDA ANGOLA, WEATHERFORD SUCURSAL DE ANGOLA.

**Base logistics, life camp management:** INTELS ANGOLA LDA (SOIL RECOVERY) , SONILS (SONANGOL INTEGRATED LOGISTIC SERVICES)

**Aviation and helicopter services:** EUROSTRAL ANGOLA, FIS FRANCE INTERNATIONAL SERVICE ANGOLA, LSG, LOGISTICA, SERVICOS E GESTAO, LDA (HELI-UNION ANGOLA), SONAIR (SERVICO AEREO, S.A.R.L. ANGOLA).

**Government associates:** CAPITANIA (PORT AUTHORITY), ISQ (INSTITUTO DE SOLDADURA E QUALIDADE), MINISTRY OF FISHERY ANGOLA, MINISTRY OF HOME AFFAIRS (POLICE) ANGOLA, MINISTRY OF INDUSTRY ANGOLA, MINISTRY OF PETROLEUM ANGOLA, MINISTRY OF PUBLIC ADMINISTRATION, EMPLOYEMENT & SOCIAL SECURITY ANGOLA, MINISTRY OF TRANSPORTS,

<sup>11</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

POSTS & TELECOMMUNICATIONS ANGOLA, MINISTRY OF URBANISM & ENVIRONMENT, PORT IMMIGRATION (SME) ANGOLA, PORTO DE LUANDA.

**Supply vessels, crew boats, thugs, barges, houseboats operators:** ANGOBULK ANGOLA, J.F. AGUIAR ANGOLA, SARIES OFFSHORE SERVICES (SOSER ANGOLA), SONASHIP ANGOLA, SONASURF (SURF, BOURBON) ANGOLA, SONATIDE MARINE (TIDEX / TIDEWATER) ANGOLA.

**Electrical engineering, power generation, instrumentation:** ABB LTDA ANGOLA, CEGELEC ANGOLA, SPIE OIL & GAS SERVICES SUCURSAL ANGOLA, TECNOSPIE SUCURSAL ANGOLA.

**Certification services:** BUREAU VERITAS (BIVAC INTERNATIONAL) ANGOLA, DNV ANGOLA.

**Painting, scaffolding, thermal insulation, HVAC:** LASSARAT ANGOLA COMERCIAL, LDA, PREZIOSO ANGOLA

**Refining & petrochemicals:** FINA PETROLEOS DE ANGOLA

**Agents, representatives, consultants, local companies:** PARIFEX FOBORO ANGOLA, WAPO ANGOLA

**Logistics, transportation, shipping, clearing and forwarding:** AGS ANGOLA, ALONSUUS LTDA, BOLLORE AFRICA LOGISTICS, DHL INTERNATIONAL ANGOLA, EXELLOGISTICS (ANGOLA), GETMA ANGOLA, LDA, GULF AGENCY COMPANY ANGOLA, HULL BLYTH LTD ANGOLA, KUEHNE NAGEL ANGOLA, MAERSK ANGOLA, LDA, OREY ANGOLA, PANALPINA TRANSPORTES MUNDIAIS NAVEGACAO E TRANSITOS, S.A.R.L. ANGOLA, SDV AMI (ANGOLA) LDA.

**Equipment and tools supplies, workshops, octg stockists, multinationals:** ANGOFLEX ANGOLA, CAMERON ANGOLA, CATERPILLAR ANGOLA, FMC / FKI ANGOLA, FRANK'S ANGOLA, S&N PUMP AFRICA, LDA, SONAID ANGOLA, VETCO GRAY LTDA ANGOLA, WEATHERFORD SUCURSAL DE ANGOLA.

**Naval yards, shipyards:** LOBINAVE ANGOLA

**Telecommunications, IT services:** ALCATEL LUCENT ANGOLA, ANGOLA OFFSHORE SERVICES, H. OIL GROUP HOMT ANGOLA, SONANGOL MERCURY ANGOLA

**Project management, technical assistance:** H. OIL GROUP HOMT ANGOLA, SONEPRAL ANGOLA, SPIE OIL & GAS SERVICES SUCURSAL ANGOLA, TECNOSPIE SUCURSAL ANGOLA, TECOR ANGOLA.

### 3.6 Market overview oil and gas:

**Refining:** Angola currently has only one refinery, which was built in 1958. The plant, located in Luanda, is 91.6% owned by **Sonangol**, with remaining stakes owned by Portugal's **GALP** (0.44%), through **Petrogal**, and private investors (7.96%). Prior to Sonangol's US\$600mn acquisition of Total's stake in the refinery in 2007, the French major owned a 64.1% share in **Fina Petr6leos de Angola** – the owner of the plant - and Sonangol owned another 34%, with the remaining stakes in the hands of private investors. Following the acquisition of Total's entire stake in the plant, the ownership of a larger share of the facility was opened up to smaller investors.

#### Refineries In Angola

Refinery	Capacity (b/d)	Owner	Completed	Details
Luanda	65,000(initially 39,000)	Sonangol	1958	
<b>Planned capacity expansion</b>				
SonaRef	200,000	Sonangol	2014-15	To process heavy crudes

**Source: Company data**

Angola's oil ministry, Botelho de Vas concelos, also revealed plans for a third refinery via a statement to the ANGOP press agency. Vicente gave some additional detail on the project by saying that it would be entirely private, and that the state would promote an investment in the town of Soyo, in the northern province of Zaire, for a 200,000b/d facility. Given the difficulties the authorities have had so far in attracting investment for SonaRef, BMI see little chance of this third project being finalized in the foreseeable future.

Consumption of refined products in Angola remains relatively low due to low levels of economic development across large segments of the population, but it is increasing steadily. In 2011, total consumption of oil products was approximately 88,000 BBL/d, up substantially from 75,300 BBL/d in 2009. Transportation fuel prices are among the lowest in the world due to state subsidies that have been in place for years; subsidies which equaled 7.8 percent of GDP in 2011 (the equivalent of 90 percent of the government's public investment spending).

#### LNG:

Central to Angola's plan of reducing flaring and monetizing its significant natural gas reserves is the LNG facility at Soyo, which was completed in 2012. The Angola LNG project is a joint venture between Sonangol (22.8 percent), Chevron (36.4 percent), Total (13.6 percent), BP (13.6 percent), and Eni (13.6 percent), and is slated to process 1 billion cubic feet (Bcf) per day of natural gas for domestic and international markets. The facility has a capacity of 5.2 million tons per year of LNG, and will also provide up to 125,000 cubic feet per day of natural gas for

domestic consumption. Plans call for the gas to be sourced from Blocks 0, 1, 2, 14, 15, 17 and 18.

According to Angola LNG—the Sonangol subsidiary in charge of the project in Soyo—the project represents the largest single investment in Angola in history. Operations were set to begin in the first quarter of 2012, but numerous delays pushed the scheduled start date back to the beginning of 2013. <sup>12</sup> Angola LNG has seven LNG carriers at its disposal, each with a capacity of 160,000 cubic meters, though due to the delays at the facility in Soyo several of the vessels have been contracted out to other companies. Initial plans called for the LNG cargoes to be shipped to a re-gasification facility in Pascagoula, Mississippi operated by Gulf LNG; however, the market conditions in the United States are no longer favorable due to the gas-glut caused by the boom in unconventional gas. Instead, Angola LNG is targeting consumers in Europe and Asia, and is rumored to want to send its first shipment to fellow Lusophone country Brazil.

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<sup>12</sup> Source: EIA

3.7 SWOT:

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-Angola's hydrocarbons industry is set to enjoy strong growth in the coming years .</li> <li>-New LNG export platforms will allow the country to become a leading exporter of gas in the region.</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-OPEC quotas constrain the country's output.</li> <li>-Projects , in the upstream and downstream, suffer significant and continuous delays which are a real drag on the industry.</li> </ul>
<p><b>S.W.O.T.</b></p>	
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-The reduction of flaring and the development of liquefied natural gas (LNG) infrastructure offer <b>potential for booming growth in the gas market.</b></li> <li>-Exploration in subsalt basins, which share similar characteristics to subsalt acreage in Brazil, could boost oil reserves and production.</li> <li>-The creation of the National Oil Agency, which has taken from Sonangol the responsibility of shaping regulation and awarding concessions , should bring more transparency and efficiency to the sector.</li> <li>-A new onshore licensing round in the Kwanza bas in will be launched in the coming months .</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-Although it seems that the political transition and the restructuring of the oil sector are taking place in an orderly manner, there remains a substantial amount of uncertainty.</li> <li>-There is <b>widespread and high-level corruption</b>, as illustrated by the investigation of Cobalt's activities in the country by the US Securities and Exchange Commission (SEC) and the Department of Justice (DoJ). More importantly Manuel Vicente, the rumored successor to President Jos é Eduardo Dos Santos in the coming five years , is accused of having received bribes , creating further uncertainty with regard to the political transition.</li> </ul>

### 3.8 Key trends in Angola oil and gas market:

-BP finally succeeded in starting production from the PSVM field, which we expect to reach 150,000 barrels per day (b/d) of peak production by 2014. Chevron's Mafumeira Sul project received a final investment decision and is set to start production from 2016/17.

-Finally, the Angola LNG project faced new delays in early 2013 with further postponement of the start-up date. While no deadline has been announced, BMI expect the project to start operations by Q413.

-BMI expect oil production to increase from approximately 1.83mn b/d in 2012 to 2.49mn b/d in 2018, followed by a decrease to 2.35mn b/d in 2022. This is the result of projects that have recently come on-stream, such as Pazflor (220,000b/d) or PSVM (150,000 b/d), or that are scheduled to come on-stream in the coming years.

-Consumption of crude is likely to rise quickly from 2011 to 2021. This very high rate of growth is boosted by the country's double-digit GDP growth, as the economy experiences a catching up phenomenon following nearly three decades of civil war. BMI therefore anticipate that consumption will rise from an estimated 97,500b/d in 2012 to hit 179,500b/d by 2022.

-BMI forecast that gas production will increase from 0.73bn cubic metres (bcm) in 2012 to more than 8bcm after 2020, as the authorities and companies reduce the practice of flaring and start to monetize/associated gas resources from massive fields such as Pazflor (1.5bcm) and PSVM (2.5bcm).

-Gas demand is set to rise steadily for the rest of the decade. Relatively low demand growth when compared to growth in gas production and oil consumption can be explained by the fact that gas plays virtually no role in the country's electricity generation and that there are no plans to expand its share in the energy mix. As a result, BMI see gas consumption rising from 0.8bcm in 2012 to 0.9bcm by 2022.

-Non-subsalt Angolan oil reserves are likely to reach a peak in the coming decade, although they are set to increase at first thanks to exploration potential; not only in the well-known Lower Congo and Kwanza as in, but also in the southern Namibe basin. Exploration and recent discoveries in recently allocated subsalt acreages create a serious upside risk to our forecast. However, with still limited information on the commercial viability and speed at which these resources can be monetized, BMI have decided not to include them in this forecast until more information is made available. These will most likely come as more information on Cobalt's Cameia-1 discovery become available.

-The 65,000b/d Luanda refinery is still struggling and has low utilization rates. The 200,000b/d SonaRef project is stalling but BMI still expect it to come onstream in the next 10 years, albeit with some delays. The 200,000b/d Soyo plant is still in its early stages and we deem it unlikely to be completed before 2021.

**3.9 Risk associated in operating in Angola:**

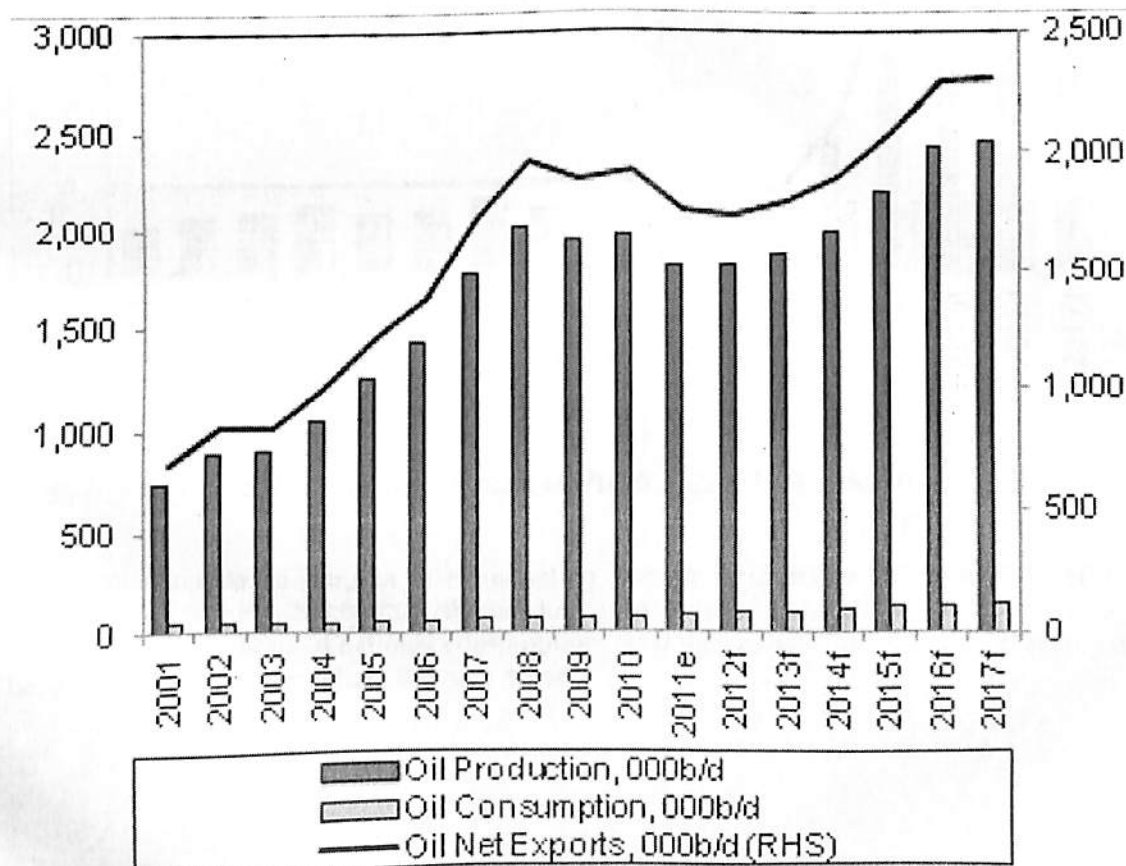
- 1- Social unrest
- 2- Internal conflict and regional tensions

**3.10 Future projections:**

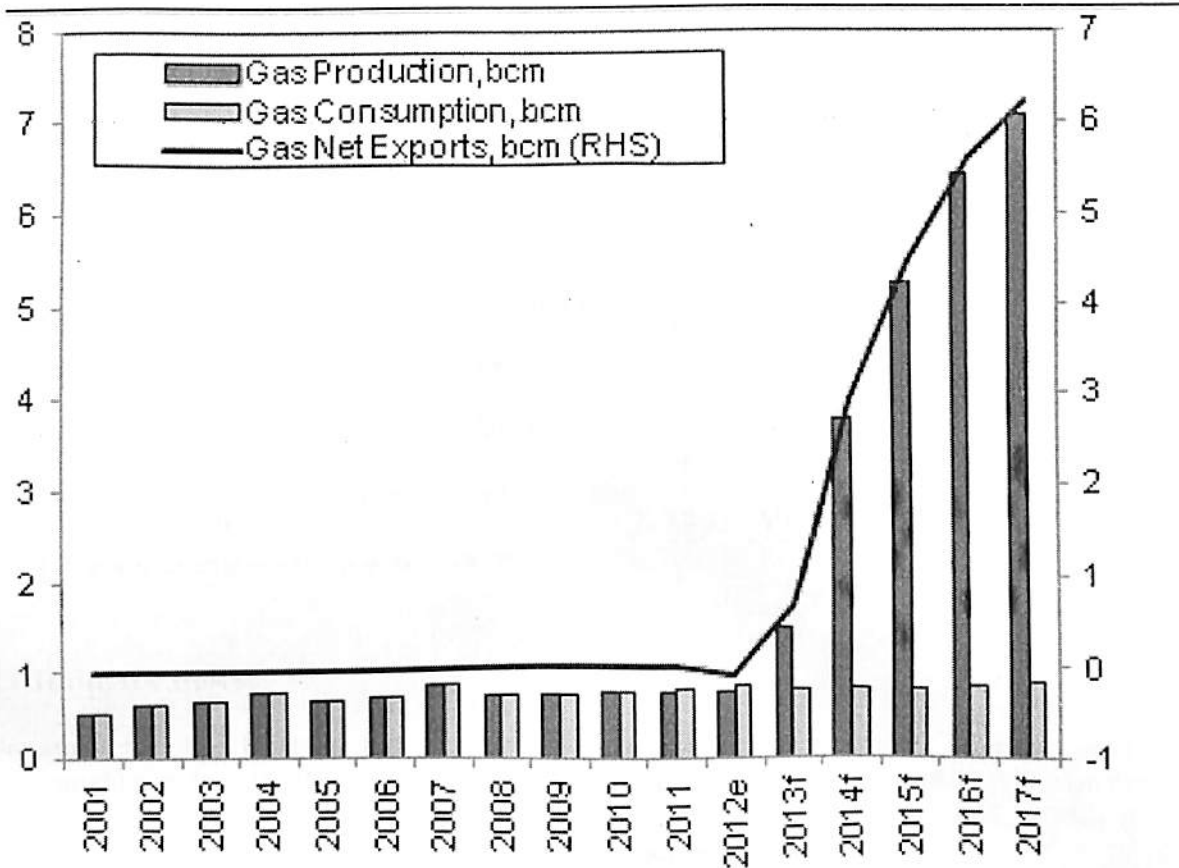
-Angola's proven oil reserves estimates to rise in the medium-to long term. A new discovery by **Maersk Oil** and concessionaire **Sonangol** on September 24 2012 at the Caporolo-1 exploration well in Block 16 confirms this view on the long-term potential of the country. It has delivered several billion-barrel discoveries to international oil companies (IOCs ) and there is believed to be further potential in the ultra-deep reservoirs.

**Angola Oil Production, Consumption & Exports**

2001-2017



*e/f = estimate/forecast. Source: historical, EIA; estimates/forecasts, BMI*



e/f = estimate/forecast. Source: historical, EIA; estimates/forecasts, BMI

-Refining capacity in Angola is expected to rise in 2015 when the SonaRef refinery is completed. Reaching 265,000b/d, the production of refined products will be enough to cover more than BMI forecast of national consumption. BMI thus expect the refineries to keep working below full capacity throughout the next decade.



**Refining And Oil Products Trade****Angola Refining - Production And Consumption, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	65.0	65.0	65.0	65.0	65.0	65.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	61.5	69.2	69.2	69.2	69.2	69.2
Refined Petroleum Products Production, 000b/d	40.0	45.0	45.0	45.0	45.0	45.0
Refined Petroleum Products Production, % change y-o-y	0.0	12.5	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	40.0	45.0	45.0	45.0	45.0	45.0
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	12.5	0.0	0.0	0.0	0.0
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	88.0	97.5	107.4	115.3	123.6	133.3
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	18.9	10.8	10.1	7.4	7.2	7.8

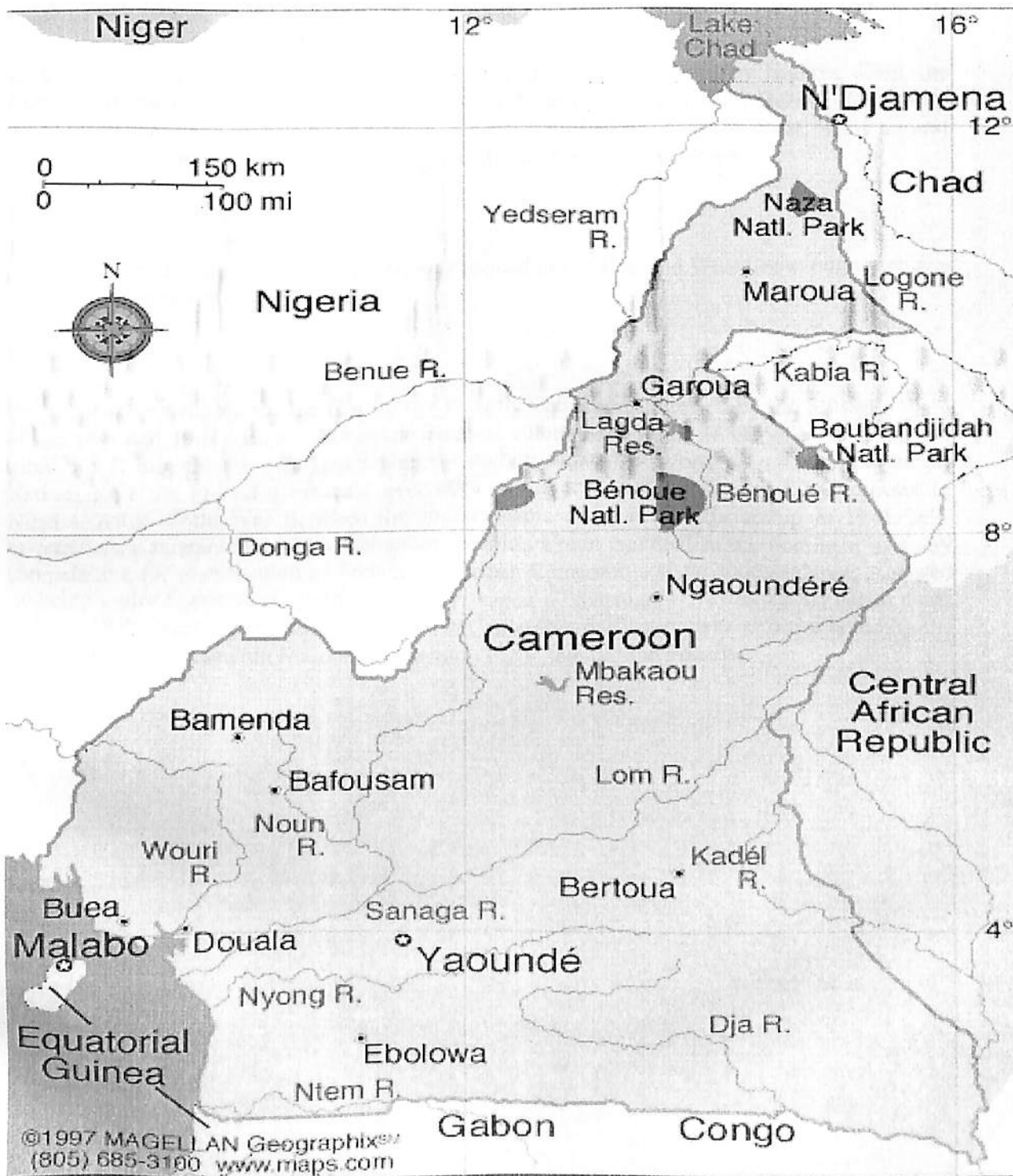
e/f = estimate/forecast. Source: EIA, BMI

**3.11 Industry news:**

1-Sonangol has finally started the construction of the Lobito refinery. After numerous delays, production is now scheduled to start from 2017. Additional refining capacity will ease the country's growing dependence on fuel imports. However, we forecast sustained growth in demand will outpace domestic refined product output again by 2019.

4. Country:

Cameroon



## 4.1 About<sup>13</sup>:

### Geography

Cameroon is a Central African nation on the Gulf of Guinea, bordered by Nigeria, Chad, the Central African Republic, the Republic of Congo, Equatorial Guinea, and Gabon. It is nearly twice the size of Oregon. Mount Cameroon (13,350 ft.; 4,069 m), near the coast, is the highest elevation in the country. The main rivers are the Benue, Nyong, and Sanaga.

### Government

After a 1972 plebiscite, a unitary republic was formed out of East and West Cameroon to replace the former federal republic.

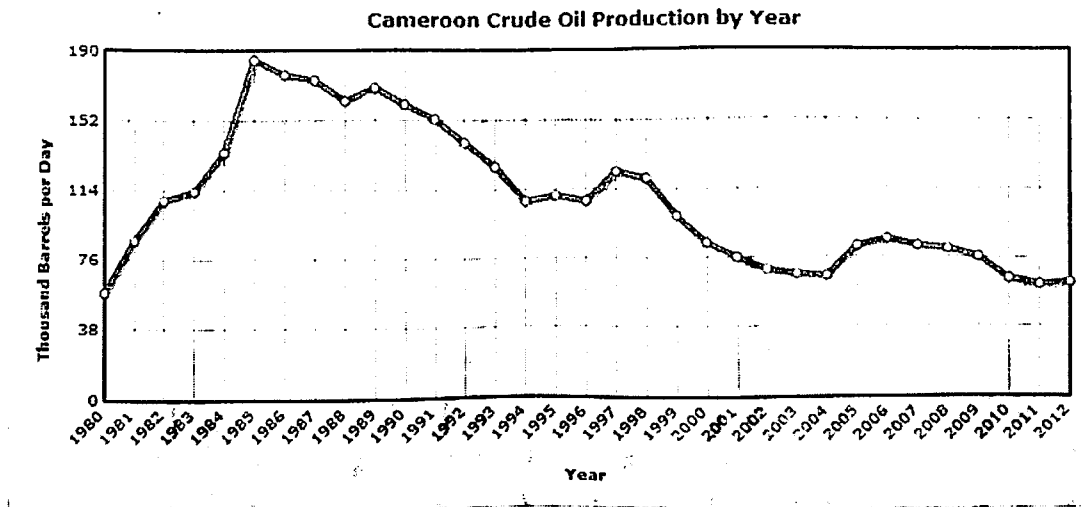
### History

Bantu speakers were among the first groups to settle Cameroon, followed by the Muslim Fulani in the 18th and 19th centuries. The land escaped colonial rule until 1884, when treaties with tribal chiefs brought the area under German domination. After World War I, the League of Nations gave the French a mandate over 80% of the area, and the British 20% adjacent to Nigeria. After World War II, when the country came under a UN trusteeship in 1946, self-government was granted, and the Cameroon People's Union emerged as the dominant party by campaigning for reunification of French and British Cameroon and for independence. Accused of being under Communist control, the party waged a campaign of revolutionary terror from 1955 to 1958, when it was crushed. In British Cameroon, unification was also promoted by the leading party, the Kamerun National Democratic Party, led by John Foncha.

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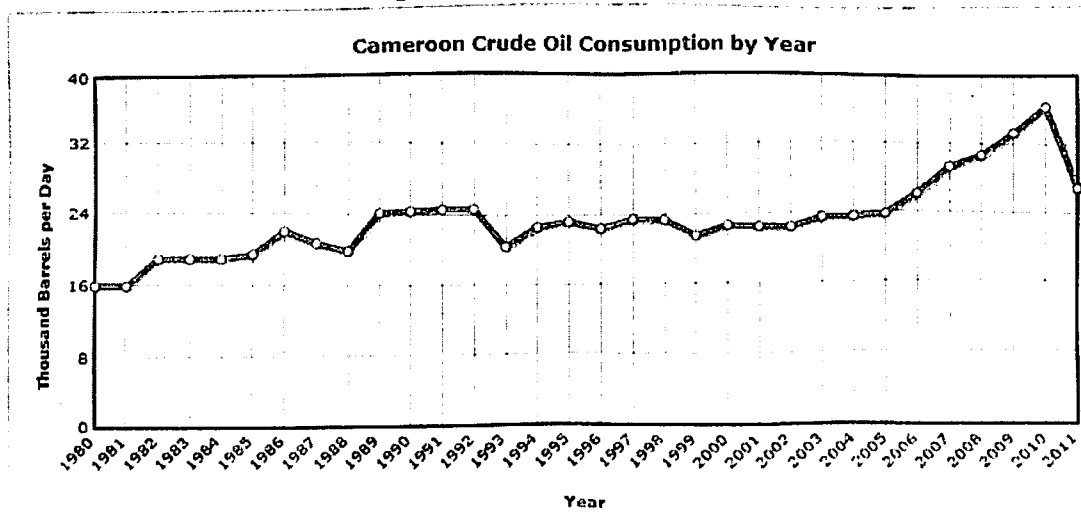
<sup>13</sup> Source: [www.infoplease.com](http://www.infoplease.com)

4.2 Cameroon crude oil production<sup>14</sup>:



Source: United States Energy Information Administration

4.3 Cameroon crude oil consumption<sup>15</sup>:



Source: United States Energy Information Administration

<sup>14</sup> Source: EIA

<sup>15</sup> Source: EIA

4.4 Energy scenario of Cameroon<sup>16</sup>:

Electricity	production	consumption	exports	imports
	5.589 billion KWh (2009 est.)	5.049 billion KWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>115</b>	<b>113</b>	<b>179</b>	<b>171</b>
<b>Crude oil</b>	61,580 bbl/day (2011 est.)	N.A.	64,740 bbl/day (2009 est.)	32,490 bbl/day (2009 est.)
<b>World ranking</b>	<b>57</b>	<b>N.A.</b>	<b>44</b>	<b>64</b>
<b>Refined petroleum products</b>	42,520 bbl/day (2008 est.)	29,410 bbl/day (2011 est.)	17,470 bbl/day (2008 est.)	5,715 bbl/day (2008 est.)
<b>World ranking</b>	<b>87</b>	<b>116</b>	<b>77</b>	<b>151</b>
<b>Natural gas</b>	20 million cu m (2010 est.)	20 million cu m (2009 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>89</b>	<b>113</b>	<b>80</b>	<b>117</b>

<sup>16</sup> Source: CIA world fact book

#### **4.5 Cameroon oil and gas industry directory:<sup>17</sup>**

**Exploration & production, multinationals and local companies:** BOWLEVEN CAMEROON, BP CAMEROON, EXXON MOBIL CAMEROON, KOSMOS ENERGY CAMEROON, ORANTO PETROLEUM CAMEROON, PECTEN CAMEROUN COMPANY, PERENCO CAMEROON, SNH (SOCIETE NATIONAL DES HYDROCARBURES) CAMEROON, STERLING ENERGY CAMEROON, TOTAL E & P CAMEROON, VICTORIA OIL AND GAS CAMEROON.

**EPCI contractors:** PRODUCTION SERVICES NETWORK (PSN) CAMEROON, SNC, LAVALIN INC. CAMEROON

**FPSO & buoys builders, operators:** SMIT TERMINALS CAMEROON

**Government associations:** MINISTRY OF MINES AND ENERGY CAMEROON

**Engineering, design, FEED:** ECM CAMEROUN

**Supply vessels, crew boats, thugs, barges, houseboats operators:** TIDEWATER CAMEROON

**Electrical engineering, power generation, instrumentation:** ABB SUB-SAHARA AFRICA LTD. CAMEROON, ASEA BROWN BOVERI CAMEROON, AES SONEL CAMEROON, CEGELEC CAMEROON, SCHNEIDER ELECTRIC CAMEROON, SONEL CAMEROON

**Catering services:** SODEXO CAMEROON

**Inspection and certification services:** BUREAU VERITAS CAMEROON, SGS CAMEROUN S.A.

**Refining & petrochemicals:** SONARA (SOCIETE NATIONALE DE RAFFINAGE) CAMEROON

**Gas liquefaction, marketing & distribution:** AFRIGAZ, AZA LTD. CAMEROON, SOCIETE CAMEROUNAISE DES GAZ LIQUEFIES DE PETROLE

**Agents, representatives, consultants, local companies:** TEFON OILFIELD SERVICES CAMEROON

**Logistics, transportation, shipping, clearing and forwarding:** DHL INTERNATIONAL CAMEROON SARL, GETMA CAMEROON, SDV, SAGA CAMEROON, BOLLORE AFRICA LOGISTICS CAMEROON, SUPERMARITIME CAMEROON S.A.

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<sup>17</sup> Source: [www.Africa-oil-gas.com](http://www.Africa-oil-gas.com)

**Risk assessment, security services:** G4S SECURITY SERVICES SA (WACKENHUT CAMEROON S.A.)

**Project management, technical assistance:** ECM CAMEROUN

#### 4.6 Market overview: oil and gas

**Refining:** SONARA entered service in 1981 and is located in the city of Limbe, some 100km from Douala. The facility has already undergone two upgrades, one in 1996 and one in 2001. About half of the facility's products are sold on the domestic market with the rest distributed to other Central African nations, France, the US and parts of West Africa.

In December 2009 SONARA inked a US\$98.25mn loan deal in order to upgrade its production capacity. **SONARA hopes to boost the Limbe refinery's capacity from 45,000 barrels per day (b/d) to 70,300b/d**, and also to upgrade the facility so that it will be able to process the heavy crude oil that is produced in Cameroon, not just light grades that it imports.

**The government has entered into a memorandum of understanding (MoU) with US-based international Refinery Consultants (IRC) to build a new oil refinery in the country.** The IRC will conduct extensive studies for building the high-capacity Cameroon Atlantic Refinery Project in Kribi. Initially, the refinery will produce at least 200,000b/d and could be expanded to 350,000b/d in the next few years. IRC and Refinery Technology will mutually finance the project on a build, own, operate and transfer (BOOT) basis in collaboration with their financial partners.

#### Refineries In Cameroon

##### Refinery Capacity (b/d) Owner Completed Details

Refinery	Capacity (b/d)	Owner	Completed	Details
Limbe	45,000	SONARA	1981	na

**na = not available. Source: Company data**

**Oil pipelines:** Cameroon is involved in one of West Africa's most controversial energy schemes, joining forces with neighboring Chad in the US\$4.2bn Chad-Cameroon Oil Development and Pipeline Project. The development by US-based **ExxonMobil** of oil fields in Chad's Doba required the construction of a costly 1,078km export pipeline. The World Bank backed the project and extracted guarantees and commitment from Chad. Oil flow began ahead of schedule in 2003 and project revenues initially beat expectations. By 2005, however, the Chadian government was renegeing on commitments, and in September 2008 the World Bank collected loan balances and withdrew.

**LNG terminals:** If Cameroon can realize its theoretical gas reserves potential in excess of 500bcm, it could support an LNG export scheme. **Suez Global LNG** signed a MoU in 2008 to look into developing LNG projects. SNH and GDF Suez began by jointly evaluating the alternatives for LNG export schemes.

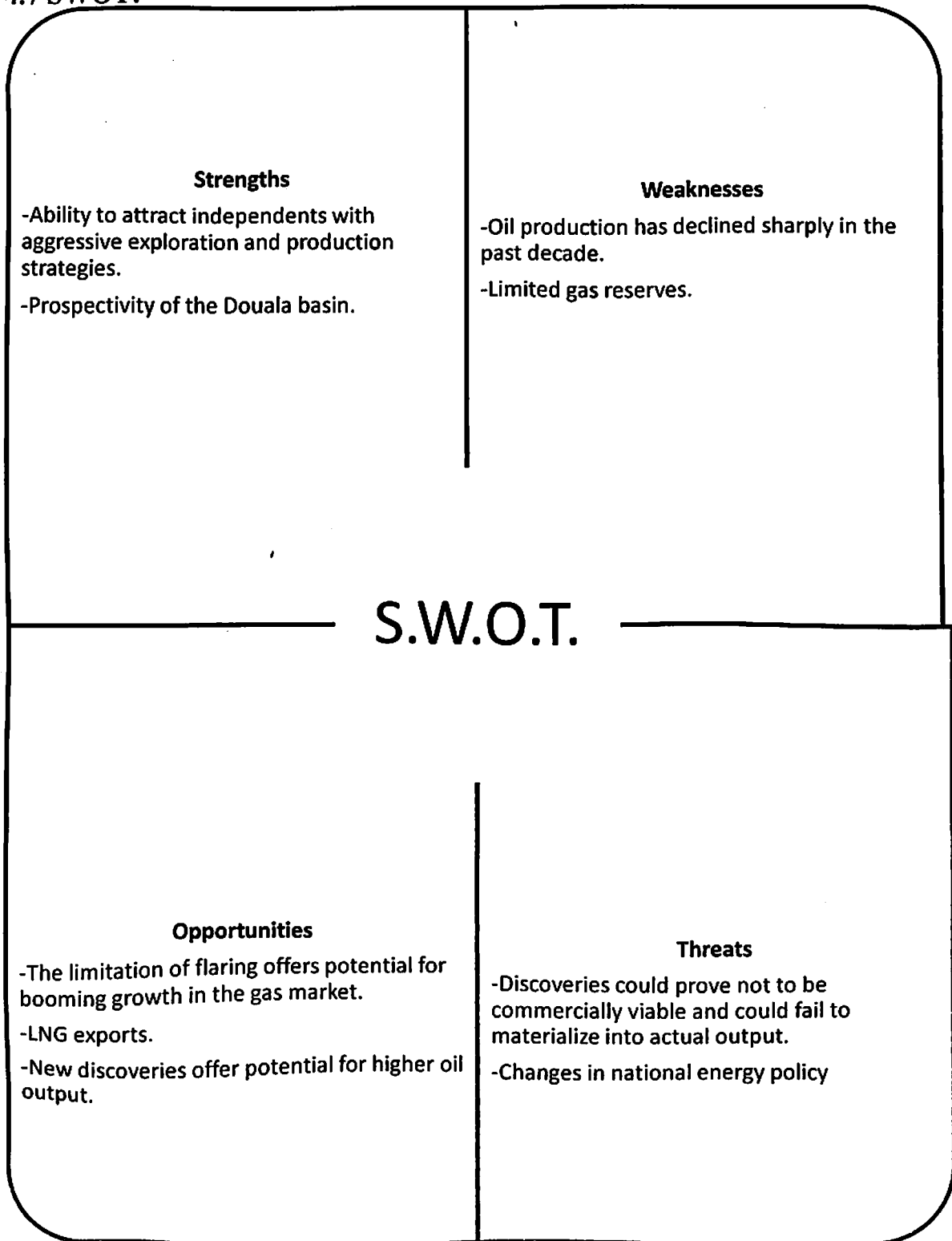
Preliminary studies concluded that the optimal method to export LNG from Cameroon is an onshore production plant located in the area of Kribi fed by a national gas -aggregation network Connecting known gas resources. A pre-front end engineering and design (pre-FEED) contract for the project was awarded to Foster Wheeler on June 29 2010. The preliminary engineering Studies for the project will include the design of gas gathering pipelines and an onshore LNG plant with a production capacity of up to 3.5mn tonnes per annum (TPA), or 4.8bcm of gas per annum, to be located in the area of Kribi on the southern coast. GDF Suez and SNH will jointly manage the study.

Following the award of a feasibility study contract, the director of GDF Suez's global LNG business, Philippe Olivier, met Cameroonian president Paul Biya on October 12 2010 in the hope of advancing the project further. Olivier allegedly said the company was keen to invest US\$5bn in the project.

GDF Suez is continuing to drive the Cameroon LNG (CLNG) project forwards, with a provisional front end engineering and design (FEED) study launch dates slated for the second half of 2013, a final investment decision for 2014/15 and first cargo delivery date of the end of 2018, according to Raphael Tilot, head of Cameroon LNG project.



4.7 SWOT:



#### 4.8 Key trends in Cameroon oil and gas sector:

-BMI expects growth in oil production to be somewhat irregular over the next decade with output of an estimated 61,700 barrels per day (b/d) in 2012, peaking at 98,800b/d in 2020 before falling back. This uncertain growth outlook is based on a small number of modest new projects capable of offsetting only temporarily the underlying decline of older fields.

-The Cameroon government has assumed that domestic oil production will average nearly 79,000b/d in 2013. UK-based energy firm **Bowleven** announced in October 2012 that oil production at its Etinde project in Cameroon is likely to begin in 2015 rather than 2013, as was previously stated.

-Meanwhile, consumption of crude is likely to steadily increase from 2012 to 2022. BMI therefore anticipate that **consumption will rise from an estimated 37,500b/d in 2012, to hit above 60,000b/d by 2021.**

-BMI forecasts that gas production will increase from 0.24bn cubic meters (bcm) in 2012 to 3.3bcm by 2022, as the country reduces the practice of flaring and start monetizing associated gas resources. Gas production is to be boosted further by new projects, such as the Victoria Oil and Gas Logbaba scheme. Gas output growth provides export prospects, notably in the form of LNG as suggested by the proposed 4.83bcm liquefied natural gas (LNG) terminal in Kribi.

-Bowleven has applied formally to the government for permission to start extracting gas. The company has moved forward with a final investment decision in March 2013, with the first gas from the MLHP-7 block on the Etinde permit expected to be produced in 2016.

-Gas demand is set to rise steeply on the back of numerous infrastructure projects that will boost domestic consumption. The most notable of these projects is the 150 megawatt (MW) Kribi power plant. As a result, we see gas consumption rising from 0.2bcm in 2012 to 0.8bcm by 2020.

-In the downstream sector, the government has ambitious plans to **expand capacity at Société Nationale de Raffinage (SONARA), the country's only refinery located in Cape Limboh, from 42,200b/d to 70,300b/d;** and to upgrade the facility so that it will be able to process the heavy crude oil that is produced in Cameroon, and not simply imported light grades.

-The government has entered into a memorandum of understanding (MoU) with US-based **International Refinery Consultants (IRC)** to build a new oil refinery in the country. The IRC will conduct extensive studies for building the high-capacity Cameroon Atlantic Refinery Project in Kribi. Initially, the refinery will produce at least 200,000b/d of oil and could be expanded to 350,000b/d in the next few years.<sup>18</sup>

#### 4.9 Risks associated in operating in Cameroon:<sup>19</sup>

- 1- Legislative elections in 2013 planned, social instability can occur.
- 2- After dark security problems due to bandits.

<sup>18</sup> Source: BMI

<sup>19</sup> Travel.state.gov

#### 4.10 Future projections:

##### Cameroon Proven Oil & Gas Reserves And Total Petroleum Data, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	0.2	0.2	0.2	0.2	0.2	0.2
Proven Oil Reserves bbl mn	200.0	200.0	190.0	186.8	183.5	178.7
Proven Oil Reserves % change y-o-y	0.0	0.0	-5.0	-1.7	-1.7	-2.6
Reserves to production ratio (RPR), years	8.8	8.9	8.1	6.8	5.9	5.3
Natural Gas Proven Reserves, tcm	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas Proven Reserves, bcm	135.1	135.1	140.4	140.4	140.4	140.4
Natural Gas Proven Reserves, % change y-o-y	0.0	0.0	3.9	0.0	0.0	0.0
Natural Gas Reserve to Production Ratio, years	901.0	553.8	286.9	204.8	164.5	50.9

##### Cameroon Oil Production, Consumption And Net Exports, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	62.0	61.7	64.1	74.8	84.6	92.9
Total Oil Production, mn bbl/year	22.6	22.5	23.4	27.3	30.9	33.9
Total Oil Production, % change y-o-y	-5.1	-0.5	3.9	16.7	13.1	9.8
Total Oil Production, US\$bn	0.9	0.9	0.9	1.0	1.1	1.2
Total Oil Production, US\$bn, % change y-o-y	31.9	1.3	-1.0	12.9	6.6	7.6
Total Oil Production, US\$bn at US\$50/bbl	1.1	1.1	1.2	1.4	1.5	1.7
Total Oil Production, US\$bn at US\$100/bbl	2.3	2.3	2.3	2.7	3.1	3.4
Total Oil Production, US\$bn at US\$150/bbl	3.4	3.4	3.5	4.1	4.6	5.1
Total Oil Consumption, 000b/d	35.0	37.5	39.9	42.4	44.9	47.3
Total Oil Consumption, % change y-o-y	-4.1	7.1	6.6	6.1	6.0	5.4
Total Net Oil Exports (crude and products), 000b/d	27.0	24.3	24.2	32.4	39.7	45.6
Total Net Oil Exports (crude and products), % change y-o-y	-6.2	-10.3	-0.3	34.1	22.3	14.8
Total Net Oil Exports (crude and products), US\$bn	1.1	1.0	0.9	1.2	1.4	1.6
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	30.3	-8.6	-4.9	29.7	15.3	12.4
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	0.5	0.4	0.4	0.6	0.7	0.8
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	1.0	0.9	0.9	1.2	1.4	1.7
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	1.5	1.3	1.3	1.8	2.2	2.5

<sup>20</sup> Source: BMI

**Cameroon Refining - Production And Consumption, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	45.0	45.0	45.0	45.0	70.0	70.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	55.6	0.0
Crude Oil Refining Capacity, Utilisation, %	92.9	92.9	92.9	92.9	89.8	89.8
Refined Petroleum Products Production, 000b/d	41.8	41.8	41.8	41.8	62.8	62.8
Refined Petroleum Products Production, % change y-o-y	-9.9	0.0	0.0	0.0	50.3	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	64.8	65.8	66.8	67.8	89.8	90.8
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	-6.6	1.5	1.5	1.5	32.5	1.1
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	35.0	37.5	39.9	42.4	44.9	47.3
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-4.1	7.1	6.6	6.1	6.0	5.4

e/f = estimate/forecast. Source: EIA, BMI

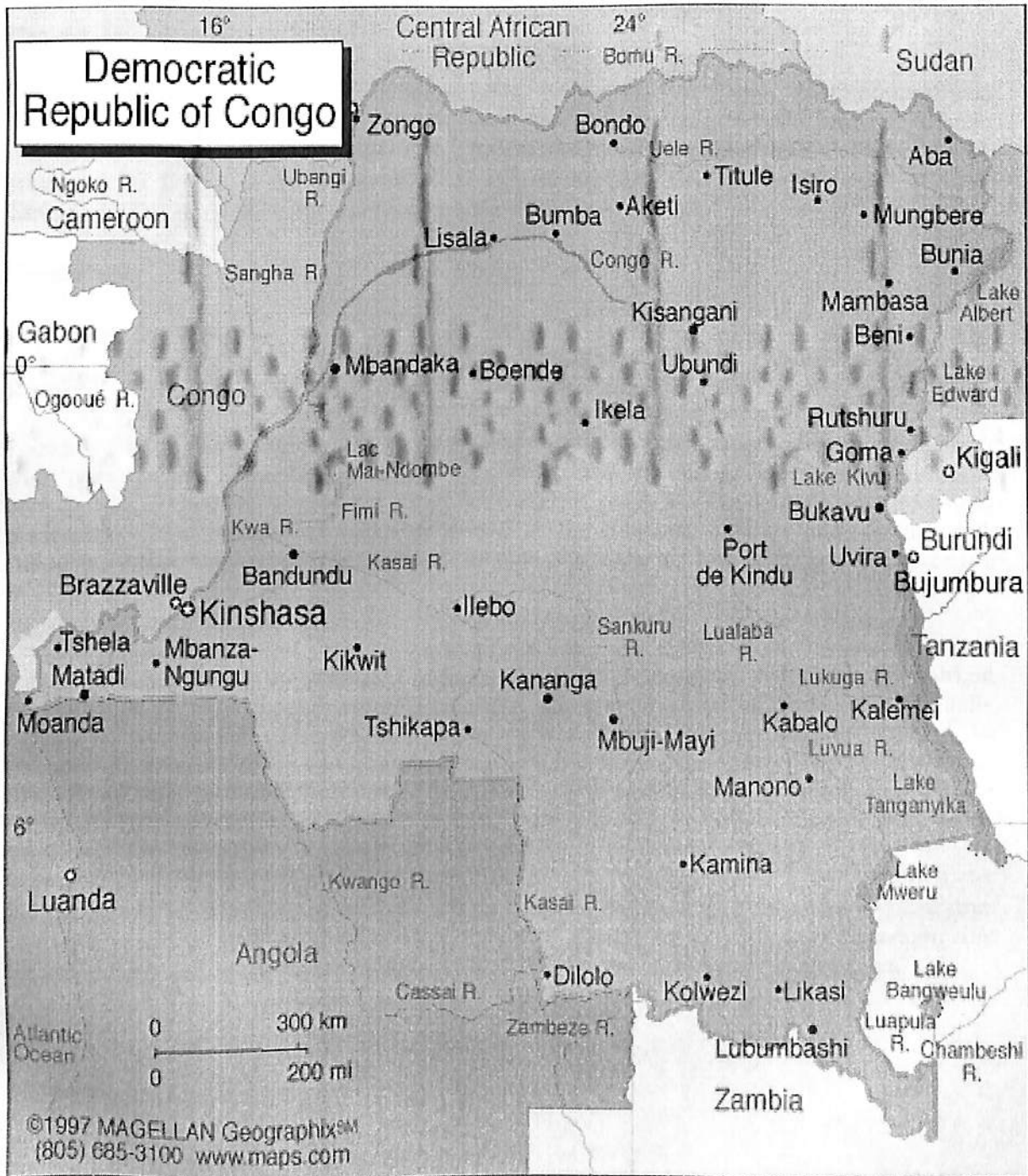
#### 4.11 Industry news:

-Dana Petroleum has been awarded a production sharing contract (PSC) for the Bakassi West block in the Rio del Rey Basin. The company will conduct a seismic acquisition programme in 2013 and 2014, and is expected to drill a first well by 2015. This will create further upside risk for the long-term reserve outlook.

-UK-listed engineering company Plexus Holdings has secured a contract to supply specialized wellhead equipment to Switzerland's Glencore for use in gas exploration drilling off Cameroon. Under the terms of the US\$1.13mn contract, Plexus will supply POS-GRIP wellhead equipment for one well, with an option for Glencore to increase this to three. The contract will enable Plexus to strengthen its business footprint in West Africa, primarily in Cameroon.

5. Country:

Republic of Congo



## 5.1 About<sup>21</sup>:

### Geography

The Congo, in west-central Africa, is bordered by the Republic of Congo, the Central African Republic, the Sudan, Uganda, Rwanda, Burundi, Tanzania, Zambia, Angola, and the Atlantic Ocean. It is one-quarter the size of the U.S. The principal rivers are the Ubangi and Bomu in the north and the Congo in the west, which flows into the Atlantic. The entire length of Lake Tanganyika lies along the eastern border with Tanzania and Burundi.

### Government

Transitional government.

### History

Formerly the Belgian Congo, this territory was inhabited by ancient Negrito peoples (Pygmies), who were pushed into the mountains by Bantu and Nilotic invaders. The American correspondent Henry M. Stanley navigated the Congo River in 1877 and opened the interior to exploration. Commissioned by King Leopold II of the Belgians, Stanley made treaties with native chiefs that enabled the king to obtain personal title to the territory at the Berlin Conference of 1885.

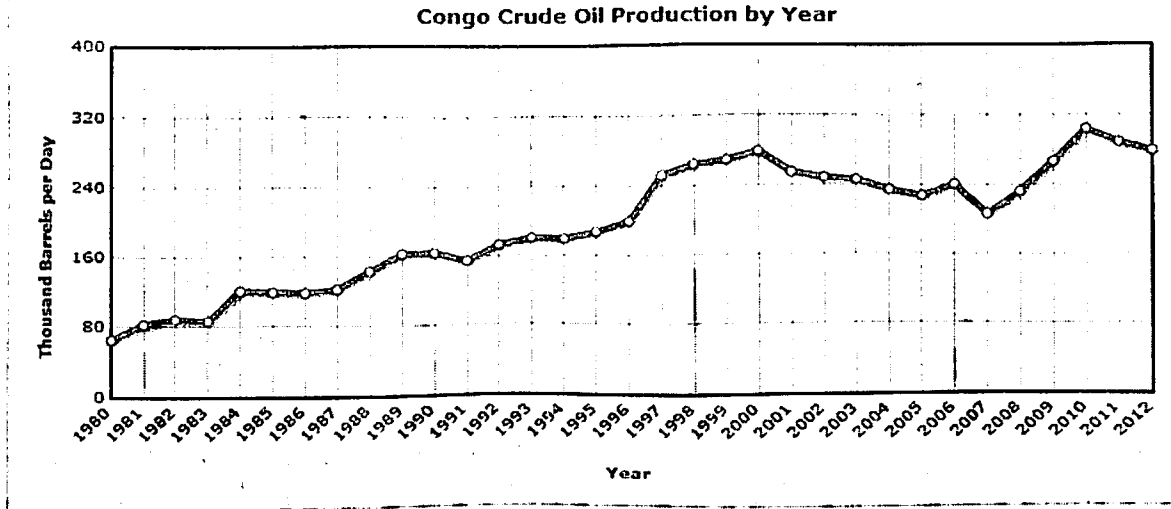
Leopold accumulated a vast personal fortune from ivory and rubber through Congolese slave labor; 10 million people are estimated to have died from forced labor, starvation, and outright extermination during Leopold's colonial rule. His brutal exploitation of the Congo eventually became an international cause célèbre, prompting Belgium to take over administration of the Congo, which remained a colony until agitation for independence forced Brussels to grant freedom on June 30, 1960. In elections that month, two prominent nationalists won: Patrice Lumumba of the leftist Mouvement National Congolais became prime minister and Joseph Kasavubu of the ABAKO Party became head of state.

But within weeks of independence, the Katanga Province, led by Moise Tshombe, seceded from the new republic, and another mining province, South Kasai, followed. Belgium sent paratroopers to quell the civil war, and the United Nations flew in a peacekeeping force.

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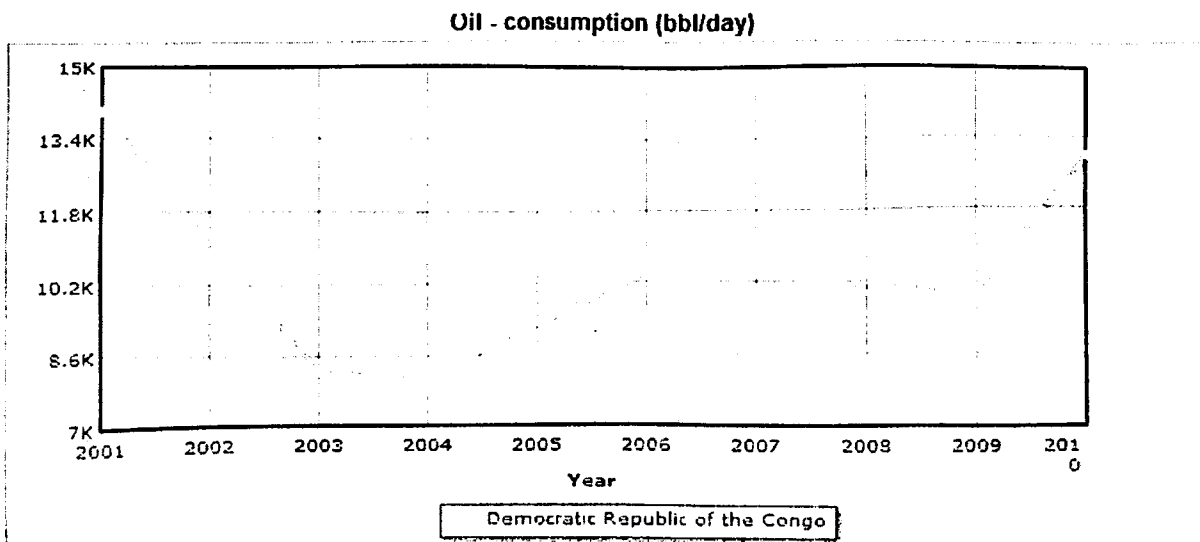
<sup>21</sup> Source: [www.infoplease.com](http://www.infoplease.com)

5.2 Congo crude oil production<sup>22</sup>:



Source: United States Energy Information Administration

5.3 Congo crude oil consumption<sup>23</sup>:



<sup>22</sup> Source: EIA

<sup>23</sup> Source: EIA

5.4 Energy scenario of Congo:<sup>24</sup>

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	7.75 billion kWh (2009 est.)	6.588 billion kWh (2009 est.)	887 million kWh (2009 est.)	105 million kWh (2009 est.)
<b>World ranking</b>	<b>100</b>	<b>101</b>	<b>56</b>	<b>94</b>
<b>Crude oil</b>	20,160 bbl/day (2011 est.)	N.A.	11,000 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>72</b>	<b>N.A.</b>	<b>58</b>	<b>170</b>
<b>Refined petroleum products</b>	0 bbl/day (2008 est.)	10,240 bbl/day (2011 est.)	0 bbl/day (2008 est.)	11,500 bbl/day (2008 est.)
<b>World ranking</b>	<b>133</b>	<b>154</b>	<b>164</b>	<b>131</b>
<b>Natural gas</b>	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>113</b>	<b>129</b>	<b>77</b>	<b>175</b>

<sup>24</sup> Source: CIA world fact book



### **5.5 Republic of Congo oil and gas directory:<sup>25</sup>**

**Exploration & production, multinationals and local companies:** ENI CONGO HOLDING BV, ENI CONGO S.A., LUNDIN PETROLEUM CONGO, MAUREL ET PROM CONGO, OPHIR ENERGY CONGO, PA RESOURCES CONGO, PERENCO CONGO, PREMIER OIL CONGO, SOCIETE NATIONALE DES PETROLES CONGOLAIS S.A., SOCO INTERNATIONAL CONGO, TOTAL E & P CONGO, VITOL CONGO.

**EPCI contractors:** BOSCONGO, SAIPEM CONGO

**Fabrication subcontractors:** DIETSMANN SERVICES CONGO S.A.

**Base logistics, life camp management:** INTELS CONGO S.A.

**Diving, underwater engineering:** STAPEM OFFSHORE CONGO

**Engineering, Design, FEED:** ECM CONGO

**Supply vessels, crew boats, thugs, barges, houseboats operators:** SEABULK OFFSHORE CONGO, TIDEWATER CONGO

**Electrical engineering, power generation, instrumentation:** ABB CONGO

**Catering services:** SODEXO CONGO

**Inspection and certification services:** BUREAU VERITAS CONGO, COTECNA INSPECTION CONGO S.A.R.L.

**Gas liquification, marketing & distribution:** AIR LIQUIDE SCGI CONGO

**Tubulars & pipe inspection, pigging, coating:** AMOSCO CONGO

**Logistics, transportation, shipping, clearing and forwarding:** BOLLORE AFRICA LOGISTICS CONGO, DHL INTERNATIONAL CONGO SARL, GETMA CONGO, SDV SAGA CONGO

**Equipment & tool supplies, workshops, OCTG stockists, multinationals:** FORAID CONGO, SMITH BITS CONGO, VETCO GRAY CONGO

**Manpower and personnel services:** IPEDEX CONGO, ECM CONGO

**Project management, technical assistance:** ECM CONGO, FORAID CONGO

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<sup>25</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

## 5.6 Market overview: oil and gas

The oil sector accounts for almost two-thirds of the country's GDP, and oil exports account for around 90% of total export revenues. Energy consumption is dominated by oil (78%), with the remainder coming from hydro-electricity.

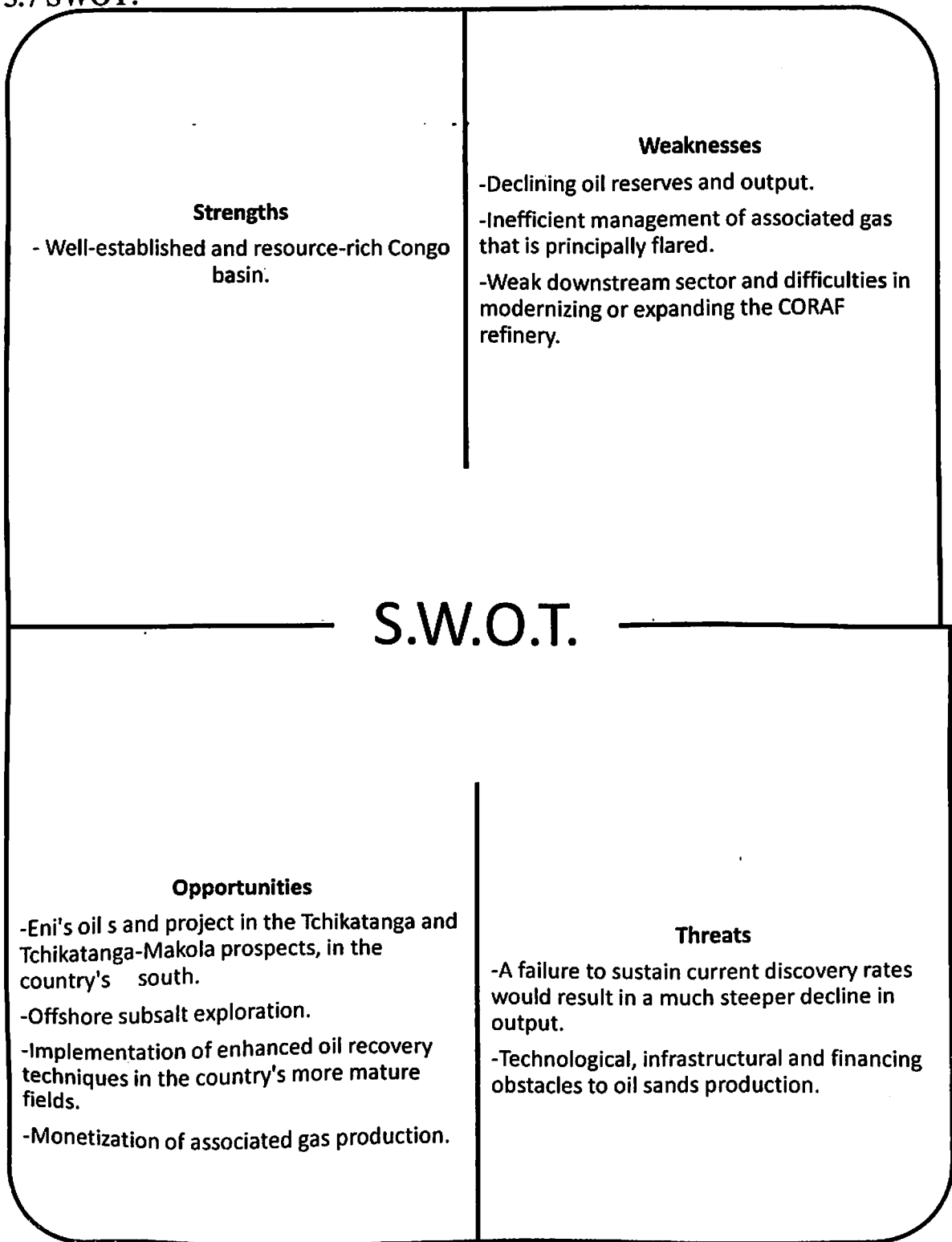
**Total is the leading oil producer, accounting for nearly 40% of the country's production,** While Eni accounts for approximately a third. The vast majority of Congolese oil and condensates exports is shipped to China (41% in 2011) and the US (17% in 2011).

The theoretical crude distillation capacity of the country's sole refinery, **Congolaise de Raffinage (CORAF)**, is 21,000b/d, it often operates at less than half capacity, with prolonged periods of inactivity. The government has tried to privatize CORAF, with the hope of increasing utilization at the refinery. However, private investors have shown little interest. The government has since been working to expand and modernise CORAF in an effort to make it more attractive to investors, although no progress has been reported on a US\$868mn deal signed in February 2008 with Saudi Arabia's **Rawabi Holding Company** to quintuple the facility's capacity.

**In January 2012, Reuters reported that Congo is planning the construction of an oil port, second refinery and major pipeline as part of an expansion of its oil sector.** The announcement was made by Hydrocarbons Minister Andre Raphael Loemba as part of a New Year's address to ministry employees. The planned pipeline will stretch from Pointe-Noire on the coast to the capital Brazzaville and up to Ouessou in the north west of the country. The new refinery is also expected to be located in Pointe Noire. However, the address contained no details either of the timing or cost of the aforementioned projects.

National oil company **Société Nationale des Pétroles du Congo (SNPC)** regulates all oil production and exploration activities in the country. SNPC develops production sharing agreements (PSAs) with each international oil company (IOC) that operates in the country to ensure a constant minimum flow of revenues to the government.

5.7 SWOT:



### 5.8 Key trends in Congo's oil and gas sector:

-BMI expects oil production to decline steadily due to most of the production coming from mature fields and the lack of new projects coming on-stream. We see liquids production falling from an estimated 292,000 barrels per day (b/d) in 2012 to 277,000b/d in 2017 before hitting 264,000b/d in 2022. This relatively gradual decrease is explained by a small number of new projects coming onstream, offset by a steady decline rate in mature field output.

-Consumption of crude is likely to rise at an average of 4.8% from 2012 to 2022. BMI therefore anticipates that consumption will rise from an estimated 14,000b/d in 2012 to 22,000b/d by 2022.

-BMI forecasts that gas production will increase from an estimated 1.4bn cubic metres (bcm) in 2012 to 4.8bcm by 2022. Domestic gas use will be boosted by the implementation of enhanced oil recovery techniques that include the reinjection of gas in mature fields to improve natural lift.

-Gas demand is set to rise at an average annual growth rate of 13.3%. This is explained by the country's strong expected macroeconomic expansion.

-Congo's crude reserves are likely to start declining from their 1.60bn barrels (bbl) peak of the 2007-2011 period. Unless substantial discoveries are made, new deepwater basins opened or oil sands resources proven to be commercially viable, current discovery rates would see reserves falling to 1.36bn bbl in 2017 and then to 1.28bn bbl by 2022. With regards to gas, given the lack of investment in the sector, reserves are likely to continue to remain stuck at their 1997 level of 90.61bcm.

-In the downstream sector, the authorities have struggled to modernize CORAF, the country's sole refinery. Despite an US\$868mn investment deal signed with Saudi Arabia's **Rawabi Holding Company** in February 2008 to increase capacity at the plant to 100,000b/d, there has been no sign of upgrade at the plant. BMI have not factored any expansion in our forecasts and BMI see capacity stagnating at 21,000b/d with an average utilisation rate of 66.9% throughout the decade.

### 5.9 Risks associated in operating in Congo:

- 1- Highly critical crime and political violence post declared by US government.
- 2- Aviation safety is not as per international standard.

### 5.10 Future projections:

BMI estimates put the Republic of Congo's (RoC) reserves at around 1.50bn barrels (bbl) in 2012.

Our forecasts, based on historical data from the EIA, see only a gradual decline to around 1.3bn bbl during the period to 2022.

Gas reserves are expected to remain stable at around 90.6bn cubic metres (bcm) throughout the decade, as a small rise in output is overs had owed by a low discovery rate, in line with historical gas exploration in the country.

We see the main upside potential to our oil reserves forecast coming from Eni's discovery of a large oil sands deposit in May 2009, which may become Africa's first large unconventional oil sands development.

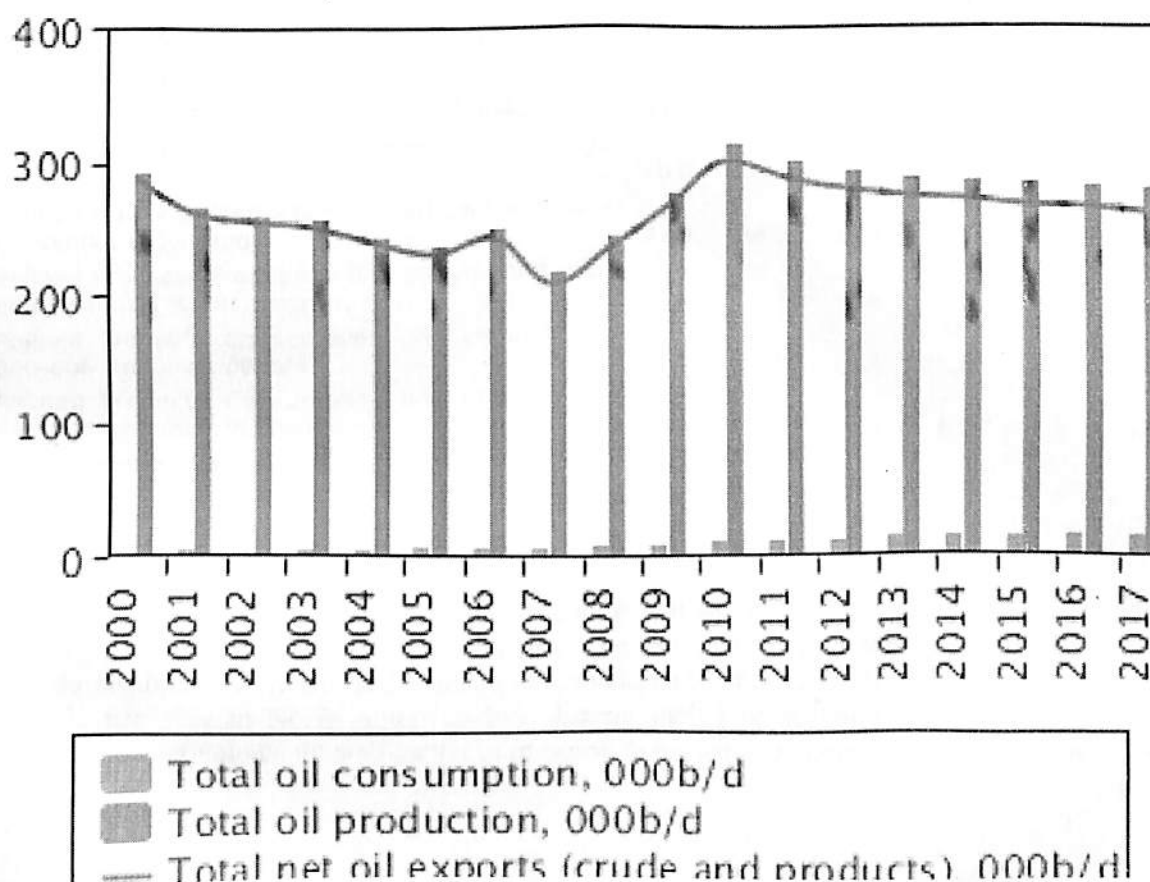
#### Congo (Brazzaville) Proven Oil & Gas Reserves And Total Petroleum Data, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	1.6	1.5	1.5	1.5	1.5	1.5
Proven Oil Reserves bbl mn	1,600.0	1,510.0	1,510.0	1,510.0	1,510.0	1,510.0
Proven Oil Reserves % change y-o-y	0.0	-5.6	0.0	0.0	0.0	0.0
Reserves to production ratio (RPR), years	14.7	14.2	14.3	14.5	14.6	14.8
Natural Gas Proven Reserves, tcm	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas Proven Reserves, bcm	90.6	90.6	90.6	90.6	90.6	90.6
Natural Gas Proven Reserves, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Reserve to Production Ratio, years	78.8	65.7	52.5	39.4	39.4	32.8

## Oil Supply And Demand

### Republic of Congo Oil Production, Consumption & Exports

2000-2017



### Refining and Oil Products Trade

Congo's only refinery is located in the south west of the country, in the coastal city of Pointe Noire, and is operated by the **Congolaise de Raffinage (CORAF)**. Although the theoretical crude distillation capacity of the CORAF plant is 21,000b/d, it often operates at less than half capacity, with prolonged periods of inactivity.

The government has tried to privatize CORAF, with the hope of increasing utilization rates at the refinery, but private investors have shown little interest in the facility. The government has since been working to expand and modernize the plant in an effort to make it more attractive to investors. It signed an US\$868mn investment deal with Saudi Arabia's **Rawabi Holding Company** in February 2008 to increase capacity at the plant to 100,000b/d by 2010, a deadline that has not been met. In the absence of any further announcements, this now appears unlikely to happen at all and we have yet to factor this expansion into our forecasts, as previous attempts to upgrade and enlarge the facility have failed.

**Congo (Brazzaville) Refining - Production and Consumption, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	21.0	21.0	21.0	21.0	21.0	21.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	66.9	66.9	66.9	66.9	66.9	66.9
Refined Petroleum Products Production, 000b/d	14.0	14.0	14.0	14.0	14.0	14.0
Refined Petroleum Products Production, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	37.0	38.0	39.0	40.0	41.0	42.0
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	2.7	2.6	2.6	2.5	2.4
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	13.0	13.9	14.7	15.6	16.4	17.2
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-4.5	7.0	6.0	6.0	5.0	5.0

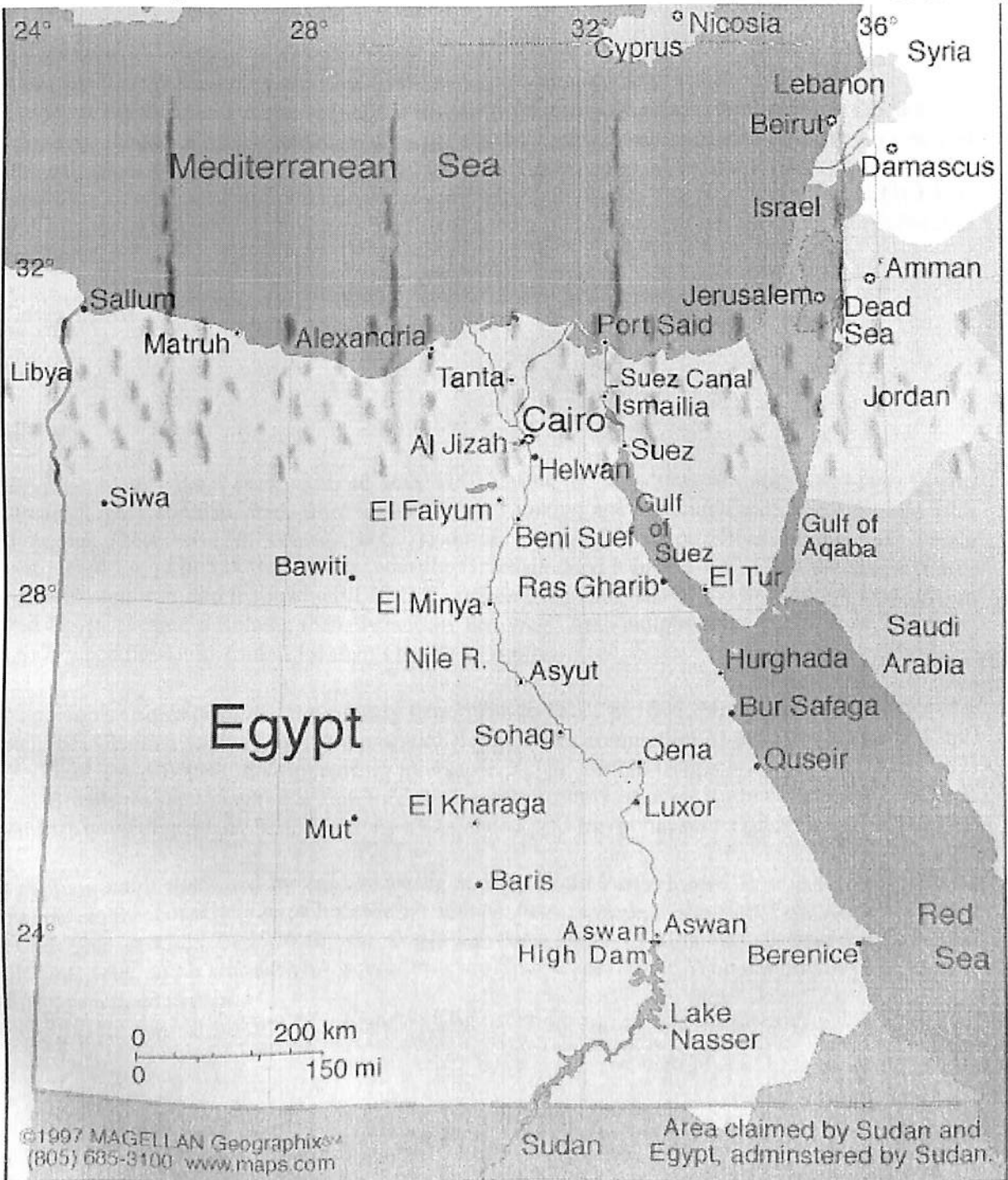
e/f = estimate/forecast. Source: EIA, BMI

### 5.11 Industry news:

Qatar Petroleum's (QPI) latest international venture will see it take a stake in Total's 140,000 barrel of oil equivalent per day Congo project. The move into Africa comes shortly after QPI recently acquired unconventional acreage in Canada and announced joint-venture with Exxon focusing not only in North American but also on global opportunities. We expect QPI to continue its international diversification in response to growing challenges to its lead in the LNG market.

### 6. Country:

### Egypt





## 6.1 About<sup>26</sup>:

### Geography

Egypt, at the northeast corner of Africa on the Mediterranean Sea, is bordered on the west by Libya, on the south by the Sudan, and on the east by the Red Sea and Israel. It is nearly one and one-half times the size of Texas. Egypt is divided into two unequal, extremely arid regions by the landscape's dominant feature, the northward-flowing Nile River. The Nile starts 100 mi (161 km) south of the Mediterranean and fans out to a sea front of 155 mi between the cities of Alexandria and Port Said.

### Government

Republic.

### History

Egyptian history dates back to about 4000 B.C. , when the kingdoms of upper and lower Egypt, already highly sophisticated, were united. Egypt's golden age coincided with the 18th and 19th dynasties (16th to 13th century B.C. ), during which the empire was established. Persia conquered Egypt in 525 B.C. , Alexander the Great subdued it in 332 B.C. , and then the dynasty of the Ptolemies ruled the land until 30 B.C. , when Cleopatra, last of the line, committed suicide and Egypt became a Roman, then Byzantine, province. Arab caliphs ruled Egypt from 641 until 1517, when the Turks took it for their Ottoman Empire.

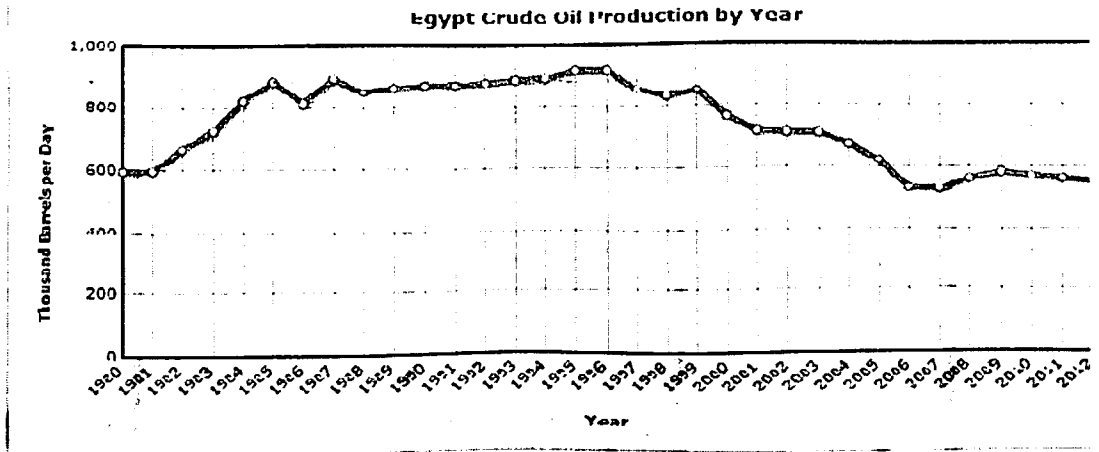
Napoléon's armies occupied the country from 1798 to 1801. In 1805, Mohammed Ali, leader of a band of Albanian soldiers, became pasha of Egypt. After completion of the Suez Canal in 1869, the French and British took increasing interest in Egypt. British troops occupied Egypt in 1882, and British resident agents became its actual administrators, though it remained under nominal Turkish sovereignty. In 1914, this fiction was ended, and Egypt became a protectorate of Britain.

Egyptian nationalism, led by Zaghlul Pasha and the Wafd Party, forced Britain to relinquish its claims on the country. Egypt became an independent sovereign state on Feb. 28, 1922, with Fu'ad I as its king. In 1936, by an Anglo-Egyptian treaty of alliance, all British troops and officials were to be withdrawn, except from the Suez Canal Zone. When World War II started, Egypt remained neutral.

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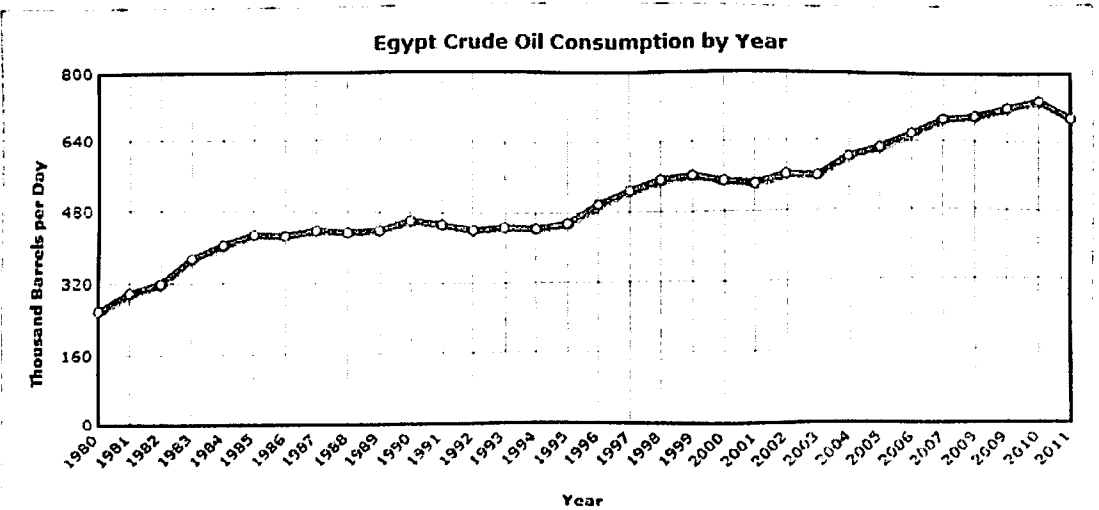
<sup>26</sup> Source: [www.infoplease.com](http://www.infoplease.com)

6.2 Egypt crude oil production<sup>27</sup>:



Source: United States Energy Information Administration

6.3 Egypt crude oil consumption<sup>28</sup>:



Source: United States Energy Information Administration

<sup>27</sup> Source: EIA

<sup>28</sup> Source: EIA

6.4 Energy scenario of Egypt:<sup>29</sup>

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	136.6 billion kWh (2010 est.)	115.8 billion kWh (2009 est.)	1.118 billion kWh (2009 est.)	183 million kWh (2009 est.)
<b>World ranking</b>	<b>28</b>	<b>28</b>	<b>54</b>	<b>89</b>
<b>Crude oil</b>	711,500 bbl/day (2011 est.)	N.A.	86,720 bbl/day (2009 est.)	48,590 bbl/day (2009 est.)
<b>World ranking</b>	<b>28</b>	<b>N.A.</b>	<b>40</b>	<b>57</b>
<b>Refined petroleum products</b>	628,100 bbl/day (2008 est.)	816,300 bbl/day (2011 est.)	91,680 bbl/day (2008 est.)	114,600 bbl/day (2008 est.)
<b>World ranking</b>	<b>30</b>	<b>24</b>	<b>44</b>	<b>45</b>
<b>Natural gas</b>	61.33 billion cu m (2010 est.)	46.16 billion cu m (2010 est.)	15.17 billion cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>16</b>	<b>19</b>	<b>19</b>	<b>187</b>

<sup>29</sup> Source: CIA world fact book

## **6.5 Egypt oil and gas industry directory:<sup>30</sup>**

**Exploration & production, multinationals and local companies:** AGIBA PETROLEUM COMPANY EGYPT, APACHE EGYPT COMPANIES, BG EGYPT, BP EXPLORATION AND PRODUCTION EGYPT, CALIK ENERJI EGYPT, DANA PETROLEUM EGYPT, GULF OF SUEZ PETROLEUM COMPANY (GUPCO) EGYPT, IEOC PRODUCTION EGYPT, KHALDA PETROLEUM COMPANY EGYPT, OFFSHORE SHUKHEIR OIL COMPANY (OSOCO) EGYPT, OMV EGYPT, PERENCO EGYPT, PETROSA EGYPT, PETZED INVESTMENT & PROJECT MANAGEMENT, LTD EGYPT, PREMIER OIL EGYPT, PTT EXPLORATION AND PRODUCTION EGYPT, SHELL EGYPT.

**EPCI contractors:** BECHTEL EGYPT, PRODUCTION SERVICES NETWORK (PSN) EGYPT, SAIPEM EGYPT, SNC, LAVALIN EGYPT LLC.

**Fabrication subcontractors:** SAFET EGYPT, SECO EGYPT.

**Diving, underwater engineering:** RED SEA DIVING & HYDROGRAPHIC SURVEY (SEAPRO EGYPT), COMMERCIAL DIVING COMPANY (CDC EGYPT), EL SAFWA GROUP FOR MARINE WORKS EGYPT.

**Government, associations:** EGYPTIAN GENERAL PETROLEUM CORPORATION

**Inspection, certification and testing services:** WATSON GRAY EGYPT

**Refining & petrochemicals:** ALEXANDRIA PETROLEUM COMPANY EGYPT, EGYPTIAN PETROCHEMICALS COMPANY, POLIMERI EUROPA LIAISON OFFICE FOR EGYPT.

**Agents, representatives, consultants, local companies:** CROWN ENGINEERING EGYPT, DREXEL OILFIELD EQUIPMENT EGYPT, TAM OILFIELD SERVICES EGYPT, TURBO EGYPT.

**Logistics, transportation, shipping, clearing and forwarding:** DHL EGYPT W.L.L.

**Equipment & tools supplies , workshops, OCTG stockists , multinationals:** AMANSA EGYPT, CAMERON IRON WORKS EGYPT, ITECO OILFIELD SUPPLY EGYPT, MANTRAC EGYPT, OFFSHORE ZONE (SAE) EGYPT, OIL ENGINEERING & CONSULTANCY EGYPT.

**Risk assessment, security services:** G4S SECURITY SERVICES (EGYPT) LLC

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<sup>30</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

## 6.6 Market overview: oil and gas

**Refining:** Egypt has eight refineries with a total capacity of 775,835 barrels per day (b/d), according to company data. The OGI estimates capacity to be somewhat lower, at 726,250b/d. Even at this lower figure, Egypt has the largest refining sector in Africa, ahead of the nearest competitors Nigeria, South Africa and Algeria. The country's two major refining centres are Alexandria and Suez, which in 2009 accounted for 36% and 27% of the country's total crude distillation capacity respectively.

<b>Refineries in Egypt</b>				
<b>Refinery</b>	<b>Location</b>	<b>Capacity (b/d)</b>	<b>Owner (Subsidiary)</b>	<b>Completed</b>
Mostorod	Cairo	160,720	EGPC (Cairo Petroleum Refining)	na
Al-Nasr	Suez	140,630	EGPC (Nasr Petroleum)	1913
Al-Mex	Alexandria	100,450	EGPC (Alexandria Petroleum)	1957
Midor	Alexandria	100,450	EGPC	2000
Asyut	Asyut	90,405	EGPC (Asyut Oil Refining)	1972
Ameriya	Alexandria	75,000	EGPC	1972
Al-Suez	Suez	68,000	EGPC (Suez Oil Processing)	1921
Gharbia	Tanta	40,180	EGPC (Cairo Petroleum)	na
<b>Total capacity</b>	<b>775,835</b>			
<b>Proposed capacity expansion</b>				
Suez	Suez	500,000	Egypt-Saudi-Kuwaiti JV	Delayed from 2009
Ain Sukhna	Red Sea	130,000	na	na
na	na	300,000	CNCEC/ Rongsheng	na
na	na	300,000	Essar	Delayed from 2010
<b>Additional capacity</b>	<b>1,230,000</b>			

na = not available. Source: BMI

**LNG terminals:** Egypt currently has two LNG projects operating three trains. The first is in Damietta on the eastern side of the Nile Delta and is operated by the Spanish electric utility **Union Fenosa**. The second is a project located at Idku in the western Delta, with **BG** and Malaysia's **Petronas** as the project's major investors.

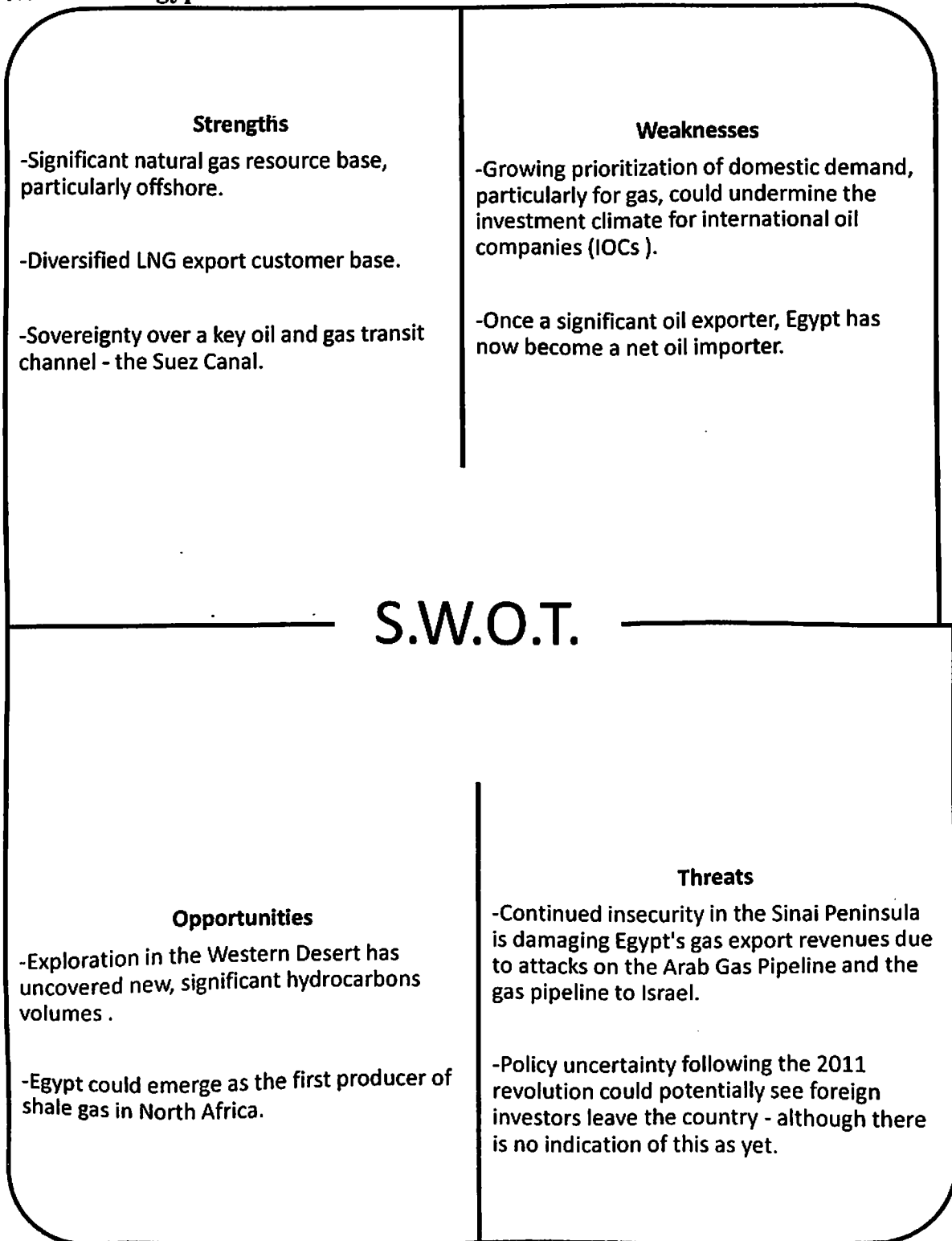
## LNG Terminals In Egypt

Terminal	Trains	Capacity (mn tpa)	Completed/Scheduled	Ownership
Damietta Train 1	1	5	2005	Union Fenosa (40%), Eni (50%), Egas (10%), EGPC (10%)
Egyptian LNG Train 1	1	3.6	2005	BG (35.5%), Petronas (35.5%), Egas (12%), GDF Suez (5%), EGPC (12%)
Egyptian LNG Train 2	1	3.6	2005	BG (38%), Petronas (38%), Egas (12%), EGPC (12%)
<b>Total capacity</b>	<b>3</b>	<b>12.2</b>		
<b>Planned additional capacity</b>				
Egyptian LNG Train 3	1	3.6	2017	BG, Petronas, EGPC, Egas, RWE (stakes tbd)
Damietta LNG Train 2	1	5	2016	BP, Eni, EGPC, Egas (stakes tbd)

Source: BMI

**Petrochemicals:** In the Middle East and Africa Petrochemicals Risk/Reward Ratings (RRRs), Egypt remains in ninth place with 44.7 points, unchanged since the previous quarter. Egypt lies 4.0 points behind Turkey and 4.1 points ahead of Algeria. However, the situation could deteriorate if the political turbulence increases and petrochemicals facilities are again closed in response. Nevertheless, growth in capacity should remain on course, making Egypt more self-sufficient in petrochemicals and turning it into a net exporter in some segments.

6.7 SWOT Egypt:



### 6.8 Key trends in Egypt's oil and gas sector:

-BMI expects Egyptian oil production to decline from 713,700 barrels per day (b/d) in 2012 to 648,300b/d in 2021. At the same time, consumption is expected to rise significantly, from 709,200b/d to 945,700 b/d over the same period, quadrupling Egypt's oil import bill.

-Although gas production is expected to grow from 61.1 cubic metres (bcm) to 82.1bcm in the 2012-2021 period, consumption will rise at an ever more rapid pace, from 52.0bcm to 76.9bcm. - Net gas exports, especially through LNG, will fall over the forecast period as Egypt's consumption increases sharply.

-Although disturbances have reduced exports to Jordan to 16% of the contractual agreement, we expect trade links to persist.

-**Egyptian General Petroleum Corporation (EGPC)** and Egypt's other state companies will continue to push their own licensing rounds , hoping that political challenges will not ensnare investment in upstream hydrocarbons projects . Results of the EGAS 2012 licensing round are expected to come throughout H113.

### 6.9 Risks associated in operating in Egypt:

- 1- Political tensions rising between Egypt's Islamist parties and educated middle class. This may lead to operation risk.<sup>31</sup>
- 2- Corruption risk.<sup>32</sup>

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<sup>31</sup> Source: Weathering the storm: Navigating through Egypt's changing business environment

<sup>32</sup> Source: thebriberyact.com



## 6.10 Future projections:

### Oil and gas reserves:

#### Egypt Proven Oil And Gas Reserves And Total Petroleum Data, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	4.4	4.4	4.3	4.1	3.9	3.8
Proven Oil Reserves bbl mn	4,400.0	4,400.0	4,300.0	4,100.0	3,900.0	3,750.0
Proven Oil Reserves % change y-o-y	18.9	0.0	-2.3	-4.7	-4.9	-3.8
Reserves to production ratio (RPR), years	16.6	16.9	16.5	15.7	14.9	14.6
Natural Gas Proven Reserves, tcm	2.2	2.2	2.2	2.2	2.2	2.2
Natural Gas Proven Reserves, bcm	2,184.8	2,184.8	2,200.0	2,190.0	2,170.0	2,150.0
Natural Gas Proven Reserves, % change y-o-y	0.0	0.7	-0.5	-0.9	-0.9	-1.4
Natural Gas Reserve to Production Ratio, years	35.7	35.8	34.6	33.1	31.6	30.4

### Total production, consumption and net exports:

#### Egypt Oil Production, Consumption And Net Exports, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	727.1	713.7	713.2	714.7	714.7	702.3
Total Oil Production, mn bbl/year	265.4	260.5	260.3	260.9	260.9	256.3
Total Oil Production, % change y-o-y	1.7	-1.8	-0.1	0.2	0.0	-1.7
Total Oil Production, US\$bn	10.4	10.4	9.9	9.6	9.1	8.7
Total Oil Production, US\$bn, % change y-o-y	41.3	0.0	-4.7	-3.1	-5.7	-3.8
Total Oil Production, US\$bn at US\$50/bbl	13.3	13.0	13.0	13.0	13.0	12.8
Total Oil Production, US\$bn at US\$100/bbl	26.5	26.1	26.0	26.1	26.1	25.6
Total Oil Production, US\$bn at US\$150/bbl	39.8	39.1	39.0	39.1	39.1	38.5
Total Oil Consumption, 000b/d	697.0	709.2	730.5	752.4	782.5	811.8
Total Oil Consumption, % change y-o-y	-5.5	1.8	3.0	3.0	4.0	3.8
Total Net Oil Exports (crude and products), 000b/d	30.1	4.5	-17.2	-37.7	-67.8	-109.5
Total Net Oil Exports (crude and products), % change y-o-y	-	231.7	-85.0	-482.5	118.5	79.9
Total Net Oil Exports (crude and products), US\$bn	1.2	0.2	-0.7	-1.4	-2.4	-3.7
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	-	283.0	-84.7	-464.7	111.4	69.6
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	0.5	0.1	-0.3	-0.7	-1.2	-2.0
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	1.1	0.2	-0.6	-1.4	-2.5	-4.0
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	1.6	0.2	-0.9	-2.1	-3.7	-6.0

**Refining:**

**Egypt Refining - Production And Consumption, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	726.3	726.3	775.8	775.8	775.8	858.2
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	6.8	0.0	0.0	10.6
Crude Oil Refining Capacity, Utilisation, %	83.0	83.0	83.0	83.0	83.0	83.0
Refined Petroleum Products Production, 000b/d	602.6	602.6	643.7	643.7	643.7	712.1
Refined Petroleum Products Production, % change y-o-y	0.0	0.0	6.8	0.0	0.0	10.6
Refined Products Production (inc ethanol and non-conventional), 000b/d	625.6	626.6	668.7	669.7	670.7	740.1
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	0.2	6.7	0.1	0.1	10.3
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	697.0	709.2	730.5	752.4	782.5	811.8
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-5.5	1.8	3.0	3.0	4.0	3.8

e/f = estimate/forecast. Source: EIA, BMI

**6.11 Industry news:**

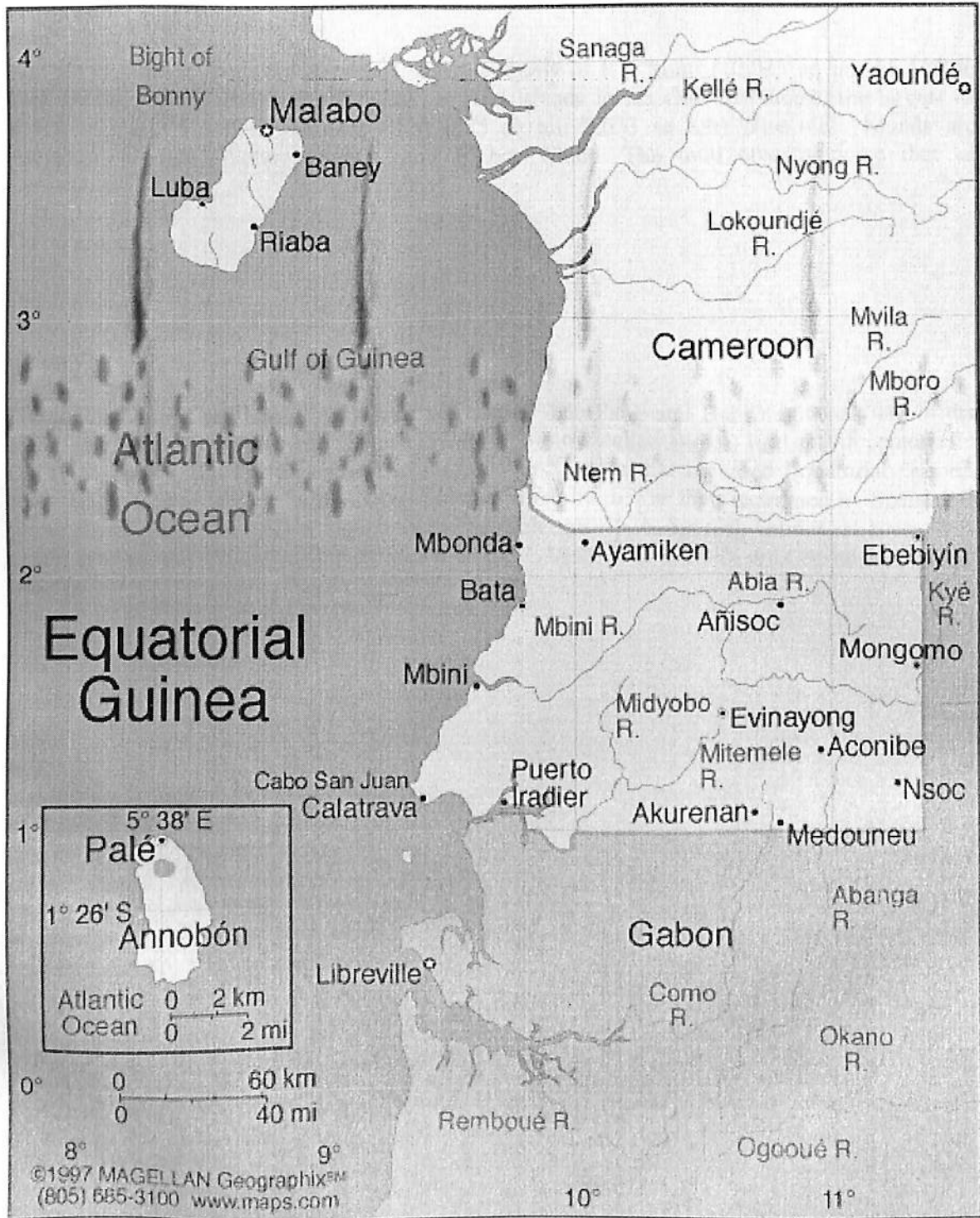
-Petrochemical start-ups in 2013 will focus on the polyvinyl chloride (PVC) and polyethylene terephthalate (PET) segments. **In mid-2013, India's Sanmar Group plans to open a captive ethylene plant to serve its vinyl chloride monomer (VCM)-PVC chain, which produces 400,000tpa VCM and 200,000tpa PVC and is set to double in size in the future. Meanwhile, Egypt is set for a massive boost in its self-sufficiency in semi-finished PET products with the opening of a 430,000tpa PET chip facility in Q313.**

-Egypt is reportedly negotiating gas supplies from Algeria and Qatar. While the country is set to remain a net exporter for the coming years, it will be facing an increasing import requirement in order to meet both export obligations and growing consumption, incentivized by the government. We believe that even though increasing imports will prove very costly for the country and its energy intensive industries, it remains the less economically harmful solution when compared to a potentially large hike in gas prices, or stringent quotas.

- **Egypt will spend US\$18bn in investment in its downstream segment through to 2017 so as to boost the country's fuel supply**, according to Oil Minister Osama Kamal in an interview with Al Tahrir. This forms part of the 'measures in the next couple of years' to boost production by about 100,000 barrels per day (b/d) from 502,055b/d to 602,466b/d. It will involve both upgrading of existing facilities and new build projects.

7. Country:

Equatorial Guinea



## 7.1 About<sup>33</sup>:

### Geography

Equatorial Guinea, formerly Spanish Guinea, consists of Río Muni (10,045 sq mi; 26,117 sq km), on the western coast of Africa, and several islands in the Gulf of Guinea, the largest of which is Bioko (formerly Fernando Po) (785 sq mi; 2,033 sq km). The other islands are Annobón, Corisco, Elobey Grande, and Elobey Chico. The total area is twice that of Connecticut.

### Government

Dictatorship.

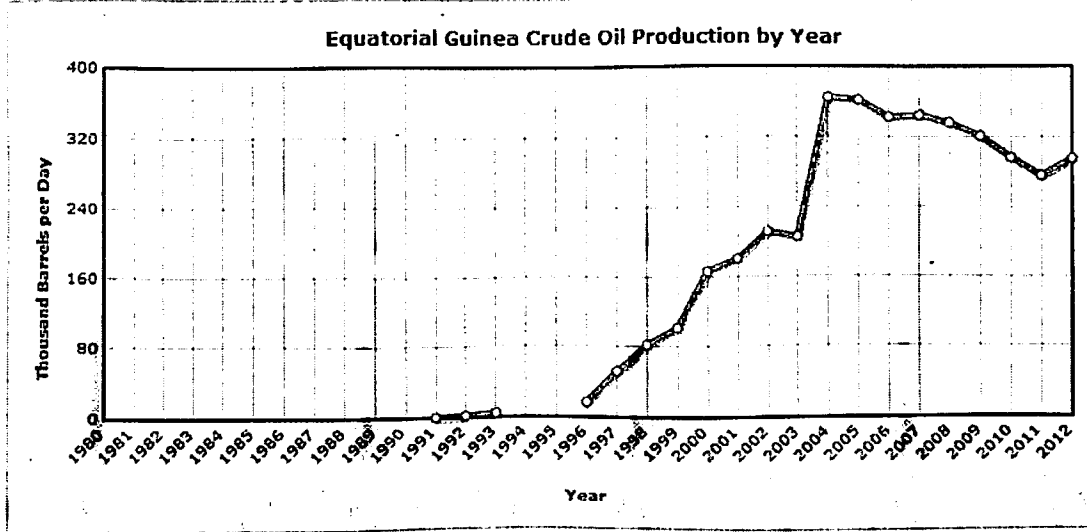
### History

The mainland was originally inhabited by Pygmies. The Fang and Bubi migrated there in the 17th century and to the main island of Fernando Po (now called Bioko) in the 19th century. In the 18th century, the Portuguese ceded land to the Spanish that included Equatorial Guinea. From 1827 to 1844, Britain administered Fernando Po, but it was then reclaimed by Spain. Río Muni, the mainland, was not occupied by the Spanish until 1926. Spanish Guinea, as it was then called, gained independence from Spain on Oct. 12, 1968. It is Africa's only Spanish-speaking country.

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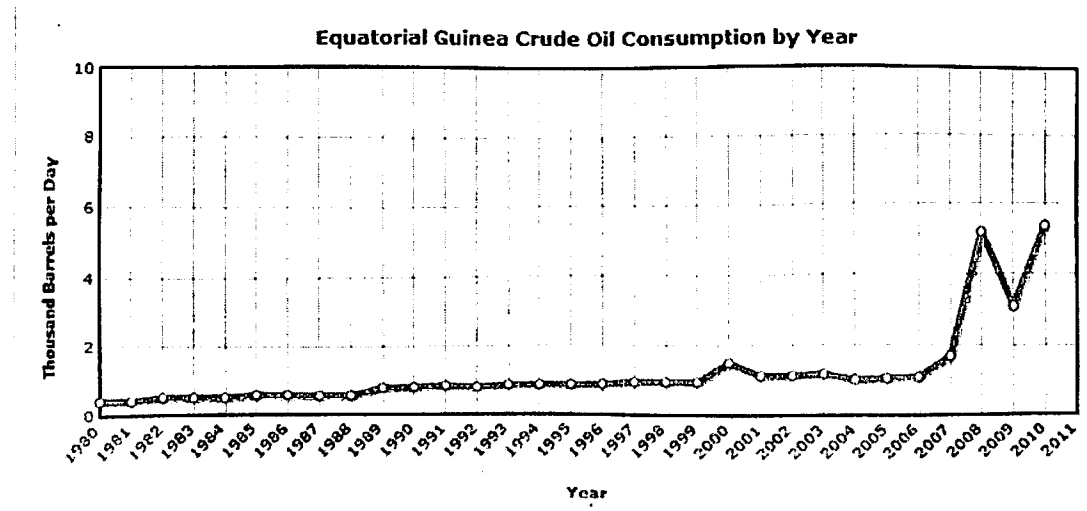
<sup>33</sup> Source: infoplease.com

**7.2 Equatorial Guinea crude oil production<sup>34</sup>:**



Source: United States Energy Information Administration

**7.3 Equatorial Guinea crude oil consumption<sup>35</sup>:**



Source: United States Energy Information Administration

<sup>34</sup> Source: EIA

<sup>35</sup> Source: EIA

7.4 Energy scenario of Equatorial Guinea<sup>36</sup>:

Electricity	production	consumption	exports	imports
	97 million kWh (2009 est.)	90.21 million kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>196</b>	<b>197</b>	<b>190</b>	<b>182</b>
<b>Crude oil</b>	302,500 bbl/day (2011 est.)	N.A.	299,400 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>35</b>	<b>N.A.</b>	<b>25</b>	<b>179</b>
<b>Refined petroleum products</b>	0 bbl/day (2009 est.)	1,588 bbl/day (2011 est.)	25,670 bbl/day (2008 est.)	4,561 bbl/day (2008 est.)
<b>World ranking</b>	<b>142</b>	<b>195</b>	<b>71</b>	<b>161</b>
<b>Natural gas</b>	6.74 billion cu m (2010 est.)	1.58 billion cu m (2010 est.)	5.16 billion cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>49</b>	<b>82</b>	<b>31</b>	<b>188</b>

<sup>36</sup> Source: CIA world fact book

### **7.5 Equatorial Guinea oil and gas industry directory<sup>37</sup>:**

**Exploration & production, multinationals and local companies:** ENERGY OVERSEAS EQUATORIAL GUINEA, EXXON MOBIL EQUATORIAL GUINEA, GALP ENERGIA EQUATORIAL GUINEA, OPHIR ENERGY EQUATORIAL GUINEA, OPHIR ENERGY SAO TOME AND PRINCIPE, PETRONAS EQUATORIAL GUINEA, PETROSA EQUATORIAL GUINEA, REPSOL EQUATORIAL GUINEA, ROC OIL (EQUATORIAL GUINEA) COMPANY LTD., SASOL PETROLEUM EQUATORIAL GUINEA, VANCO EQUATORIAL GUINEA

**EPCI contractors:** WOOD GROUP EQUATORIAL GUINEA.

**Diving, underwater engineering:** OCEANEERING EQUATORIAL GUINEA, SEAWELD ENGINEERING EQUATORIAL GUINEA.

**FPSO & buoys builders, operators:** SMIT TERMINALS SONAGAS S.A. EQUATORIAL GUINEA.

**Supply vessels, crew boats, thugs, barges, houseboats operators:** TIDEWATER EQUATORIAL GUINEA.

**Inspection services:** BUREAU VERITAS EQUATORIAL GUINEA.

**Tubulars & pipe inspection, pigging, coating:** BJ SERVICES EQUATORIAL GUINEA.

**Logistics, transportation, shipping, clearing and forwarding:** DHL EXPRESS SAO TOME AND PRINCIPE, DHL INTERNATIONAL EQUATORIAL GUINEA, SDV AFRITRAMP EQUATORIAL GUINEA, BOLLORE AFRICA LOGISTICS EQUATORIAL GUINEA, SUPERMARITIME SAO TOME LDA.

**Equipment & tools supplies, workshops, OCTG stockists, multinationals:** CAMERON EQUATORIAL GUINEA, TECHNIQUES INTERNATIONAL CORP. (EQUATORIAL GUINEA) LTD., FMC SUBSEA SCES EQUATORIAL GUINEA.

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<sup>37</sup> Source: [www.Africa-oil-gas.com](http://www.Africa-oil-gas.com)

## 7.6 Market overview: Oil and Gas

### Upstream:

Oil and gas production in Equatorial Guinea has grown rapidly since the discovery of large offshore oil reserves in 1995. **The country is now Sub-Saharan Africa (SSA)'s fourth largest oil exporter after Nigeria, Angola and South Sudan** (at the time of writing a formal agreement for the resumption of South Sudanese production had been completed).

The Ministry of Mines, Industry and Energy is the regulatory body for the petroleum industry, controlling the issuance of all new exploration and production (E&P) licenses and ensuring that resource extraction is in accordance with the terms of the Hydrocarbons Law of Equatorial Guinea (November 2006).

With low domestic consumption, Equatorial Guinea exports the majority of its oil and gas production. In 2010 the **majority of the country oil was exported to the United States, Canada, and Western Europe. Asia, however, takes the lion's share of the country's gas output, with Korea, Japan and Taiwan accounting for the 54% of the country's LNG export in 2010**, although reports indicated that 2011 saw an increase in LNG shipments to Japan following the aftermath of the March earthquake.

**Refining:** While Western IOC's are responsible for the majority of investment in the country's oil and gas sector, minister of mines, industry and energy Gabriel M. Obiang Lima reported that **only China's Sinopec would be offered an ownership stake in the construction of a new refinery**. The development indicated a warming energy relationship between China and Equatorial Guinea.

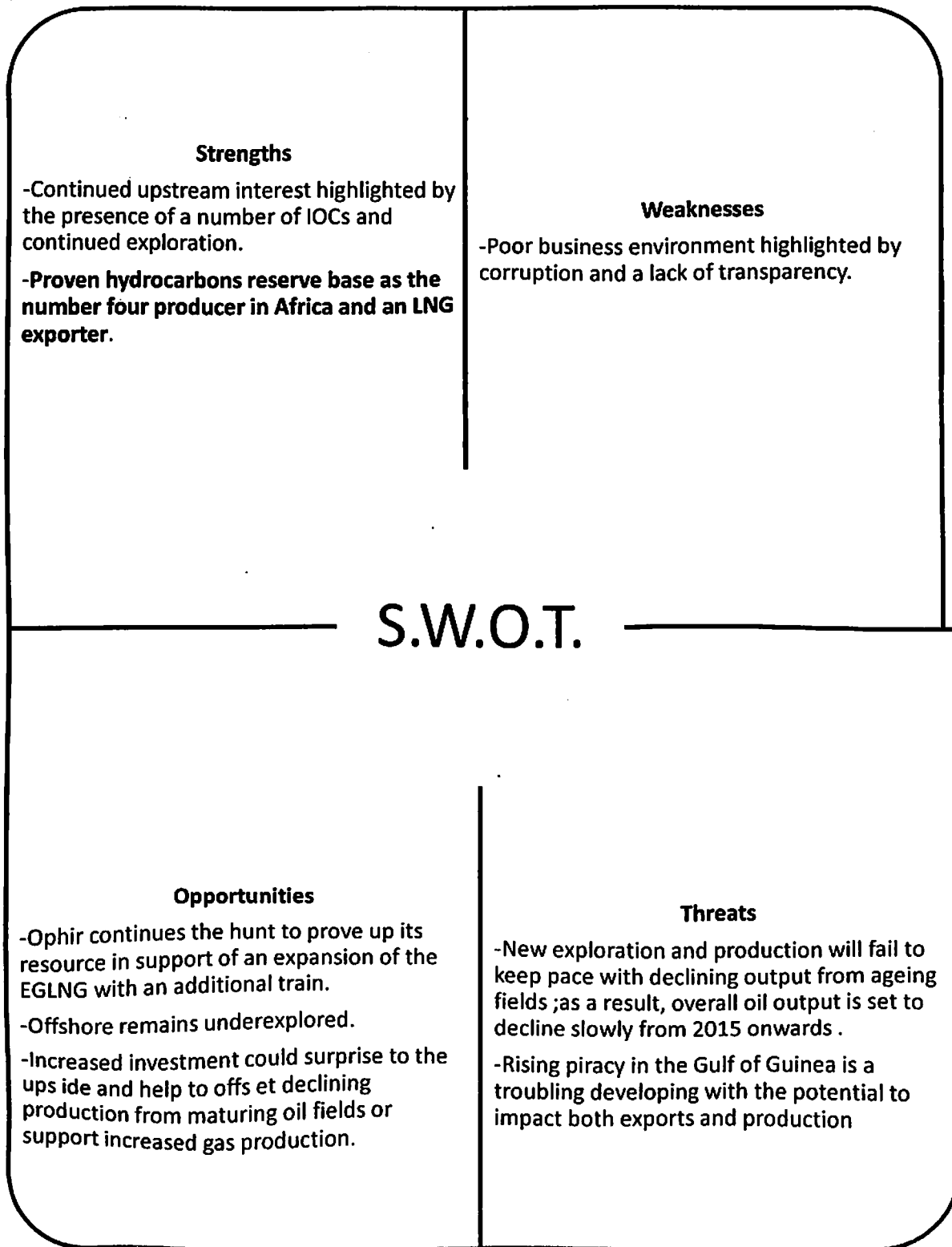


## Equatorial Guinea - BMI Upstream Projects Database

Name	Field Name	Companies	Status	Est. Peak Oil/Liquids Output, (b/d)	Est. Peak Gas Output, (bcm)	Type of Project	Onshore/ Offshore
Ceiba Complex	Ceiba	Hess (85%), Energy Africa (15%)	Producing	36,000	na	Oil	Offshore
Okume Complex	Okume	Hess (85%), Energy Africa (15%)	Producing	72,000	na	Oil	Offshore
Zafiro	Zafiro (Block B)	ExxonMobil (71.25%), GEPetrol (28.75%)	Producing	75,000	na	na	Offshore
Aseng	Aseng	Noble Energy (38%), Atlas Petroleum International Ltd (27.55%), Glencore EG Ltd (23.75%), PA Resources (5.7%), GEPetrol (5%)	Development	50,000	1	Oil and gas	Offshore
Alen	Alen	Noble Energy (44.65%), GEPetrol (28.75%), Glencore EG Ltd (24.93%), Atlas Petroleum (1.38%) and PA Resources (0.29%)	Development	41,666	na	na	Offshore

na = not available. Source: BMI

7.7 SWOT:



### 7.8 Key trends in oil and gas industry:

- BMI expects oil production to reach 317,000 barrels per day (b/d) in 2013, before peaking at 320,500b/d in 2015.
- BMI expects gas production to reach 7.1bcm in 2013 and fall to 6bcm by 2022.
- Continued interest in West Africa's highly prospective deep-water should see interest in exploration of the country's offshore sustained into 2013, with the potentially commercial discoveries such as those at Block R likely to whet the appetite of those with an existing presence or interest in the region.
- However, the country's business environment, with a strong reputation for corruption, may be an obstacle to new investment.
- Oil and gas demand is set to rise steadily over our forecast period, with demand for the latter set to increase at a faster rate as the economy continues to expand and domestic infrastructure improves. **BMI forecasts consumption of 1.8bcm in 2013, rising to 2.7bcm by 2022.**

### 7.9 Risks associated in operating in Equatorial Guinea:

- 1- Lack of transparency and persistent allegations of elite corruption.
- 2- Low regime stability<sup>38</sup>

### 7.10 Future projections:

#### Oil and gas reserves:

**Equatorial Guinea Proven Oil & Gas Reserves And Total Petroleum Data - Historical Data And Forecasts, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	1.1	1.0	0.9	0.8	0.6	0.6
Proven Oil Reserves bbl mn	1,100.0	985.7	869.9	754.0	637.1	620.0
Proven Oil Reserves % change y-o-y	0.0	-10.4	-11.7	-13.3	-15.5	-2.7
Reserves to production ratio (RPR), years	10.0	8.5	7.5	6.5	5.4	5.5
Natural Gas Proven Reserves, tcm	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Proven Reserves, bcm	36.8	36.1	35.3	34.6	33.9	33.3
Natural Gas Proven Reserves, % change y-o-y	-0.5	-2.0	-2.0	-2.0	-2.0	-2.0
Natural Gas Reserve to Production Ratio, years	5.4	5.2	5.0	4.8	4.6	4.7

39

<sup>38</sup> Source: www.maplecroft.com

<sup>39</sup> Source: BMI

**Refining:**

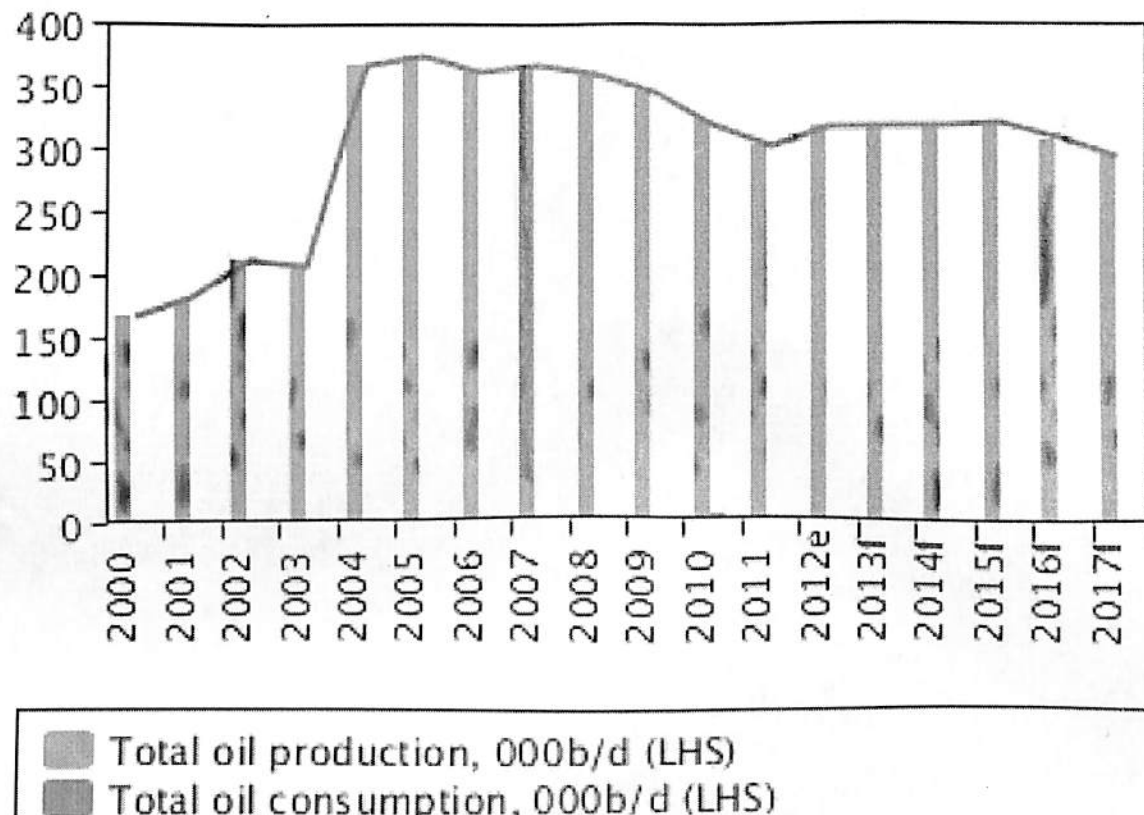
**Equatorial Guinea Refining - Production And Consumption - Historical Data & Forecasts, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Petroleum Products Production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	23.0	24.0	25.0	26.0	27.0	28.0
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	4.3	4.2	4.0	3.8	3.7
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	1.0	1.1	1.1	1.2	1.3	1.3
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-81.1	7.0	6.0	5.0	5.0	5.0

e=estimate, f=forecast. Source: EIA, BMI

### Oil and gas production and consumption: Equatorial Guinea Oil Production, Consumption

2000-2017

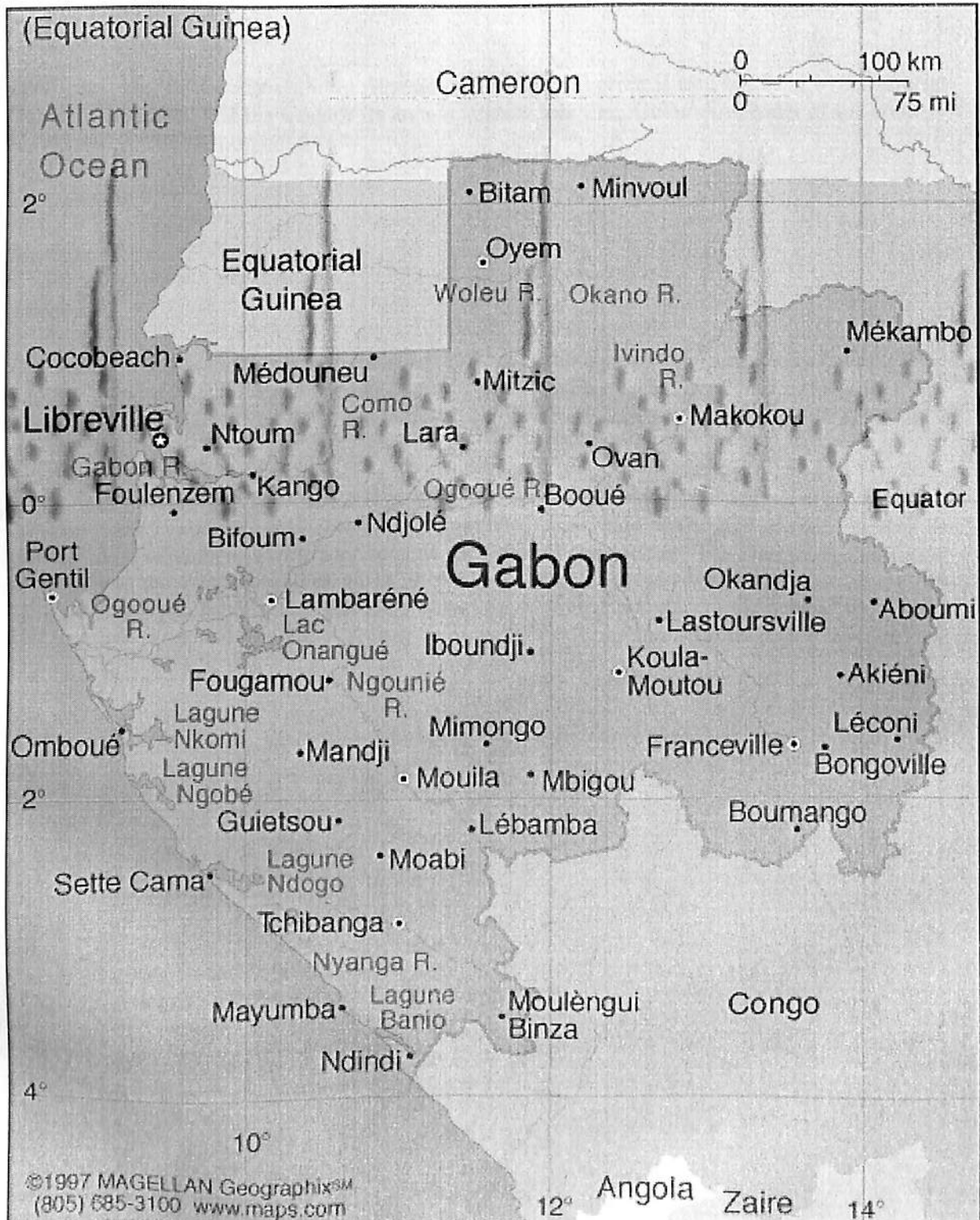


#### 7.11 Industry news:

In July 2012, Gabriel M. Obiang Lima, the country's minister of mines, industry and energy, reported the country **had approached China's Sinopec regarding the construction of the 20,000b/d refinery**. Lima said that although a number of multinational firms had been approached regarding the project, Sinopec would be the only firm offered an ownership stake. A final decision on the refinery, according to Lima, would be made in 2012. Although this date has now passed, there is no sign of an impending FID or a start date for construction.

8. Country:

Gabon



## **8.1 About<sup>40</sup>:**

### **Geography**

This West African country with the Atlantic as its western border is also bounded by Equatorial Guinea, Cameroon, and the Congo. Its area is slightly less than Colorado's. Most of the country is covered by a dense tropical forest.

### **Government**

Republic.

### **History**

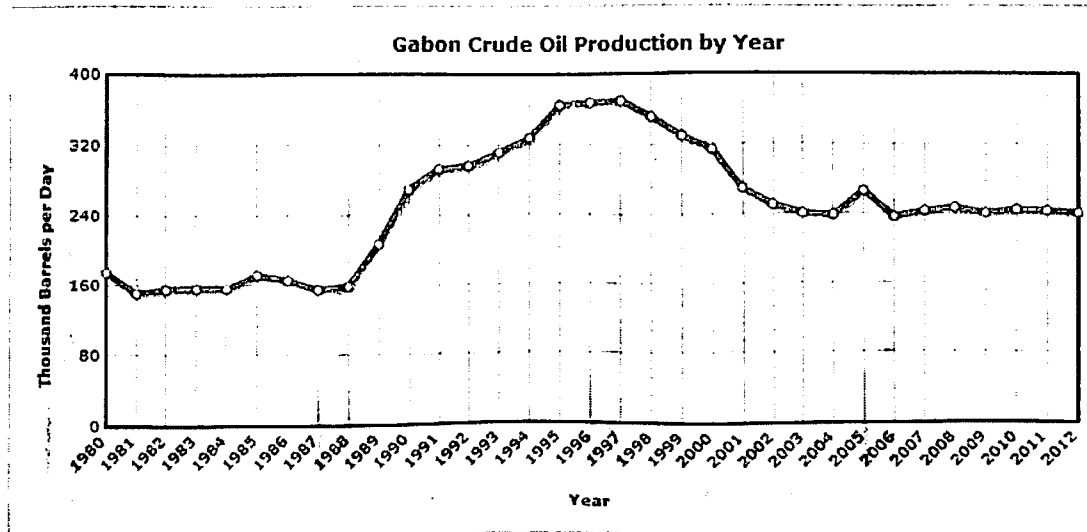
The earliest humans in Gabon were believed to be the Babinga, or Pygmies, dating back to 7000 B.C. , who were later followed by Bantu groups from southern and eastern Africa. Now there are many tribal groups in the country, the largest being the Fang peoples, who constitute 25% of the population.

Gabon was first explored by the Portuguese navigator Diego Cam in the 15th century. In 1472, the Portuguese explorers encountered the mouth of the Como River and named it "Rio de Gabao," river of Gabon, which later became the name of the country. The Dutch began arriving in 1593, and the French in 1630. In 1839, the French founded their first settlement on the left bank of the Gabon estuary and gradually occupied the hinterland during the second half of the 19th century. The land became a French territory in 1888, an autonomous republic within the French Union after World War II, and an independent republic on Aug. 17, 1960

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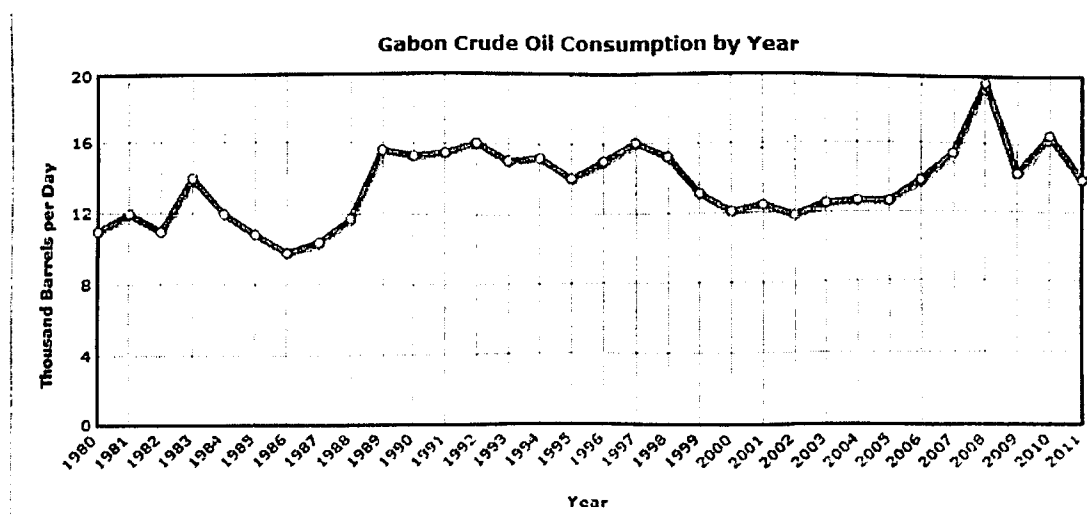
<sup>40</sup> Source: [www.infoplease.com](http://www.infoplease.com)

### 8.2 Crude oil production Gabon<sup>41</sup>:



Source: United States Energy Information Administration

### 8.3 Gabon crude oil consumption<sup>42</sup>:



Source: United States Energy Information Administration

<sup>41</sup> Source: EIA

<sup>42</sup> Source: EIA



8.4 Energy scenario of Gabon<sup>43</sup>:

Electricity	production	consumption	exports	imports
	1.604 billion kWh (2009 est.)	1.301 billion kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>140</b>	<b>147</b>	<b>199</b>	<b>191</b>
<b>Crude oil</b>	244,700 bbl/day (2011 est.)	N.A.	226,800 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>37</b>	<b>N.A.</b>	<b>30</b>	<b>188</b>
<b>Refined petroleum products</b>	20,700 bbl/day (2008 est.)	15,800 bbl/day (2011 est.)	8,985 bbl/day (2008 est.)	5,890 bbl/day (2008 est.)
<b>World ranking</b>	<b>97</b>	<b>142</b>	<b>88</b>	<b>150</b>
<b>Natural gas</b>	80 million cu m (2010 est.)	80 million cu m (2010 est.)	0 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>81</b>	<b>107</b>	<b>103</b>	<b>197</b>

<sup>43</sup> Source: CIA world fact book

## 8.5 Gabon oil and gas industry directory<sup>44</sup>:

**Exploration & production, multinationals:** ANADARKO GABON, BOWLEVEN GABON, CNR INTERNATIONAL (GABON) LTD, ENERGY AFRICA GABON, ENI GABON S.A., GULF OF GUINEA PETROLEUM CORPORATION INC. GABON, GGPC GABON, HESS GABON, MARATHON OIL GABON, MAUREL ET PROM GABON, MPDC GABON CO. LTD, OPHIR ENERGY GABON, PANAFRICAN INC. GABON, PERENCO GABON, PIONEER RESOURCES GABON, ROCKOVER OIL AND GAS GABON, SASOL PETROLEUM WEST AFRICA GABON, SHELL GABON, SINO GABON OIL AND GAS LTD, SINOPEC INTERNATIONAL PETROLEUM SERVICES CORPORATION GABON, STERLING ENERGY GABON, TRANSWORLD EXPLORATION GABON, TOTAL GABON, TULLOW OIL GABON, VAALCO GABON ETAME, VANCO GABON

**EPCI contractors:** ACERGY GABON

**Fabrication and maintenance subcontractors:** DIETSMANN TECHNOLOGIES GABON, FORAID GABON, ISCO GABON, OIL AND GAS ENGINEERING GABON, SOGAMAR S.A. GABON, TESIGA GABON

**Base logistics, life camp management:** INTELS GABON S.A.R.L.

**FPSO & buoys builders, operators:** SMIT TERMINALS GABON, TINWORTH LTD GABON

**Aviation & helicopter services:** HELI, UNION GABON

**Dredging services:** BOSKALIS INTERNATIONAL GABON

**Government , associations:** HYDROCARBONS REFINERY DISTRIBUTION PARTICIPATIONS AND MARKETING INTEGRATED PETROLEUM SERVICES GABON, GABON MINISTRY OF OIL EXPLORATION AND PRODUCTION.

**Supply vessels, crew boats, thugs, barges, houseboats operators:** CKOR GABON, JAVA BOAT CORPORATION GABON, SURF GABON, TIDEWATER MARINE INTERNATIONAL GABON, SMIT TERMINALS GABON.

**Electrical engineering, power generation, instrumentation:** CAO, CONTROLE ET AUTOMATISME DE L OUEST GABON.

**Catering services:** SODEXO GABON

**Inspection and certification services:** BUREAU VERITAS GABON

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<sup>44</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

**Refining & petrochemicals:** SO.GA.RA SOCIETE GABONAISE DE RAFFINAGE

**Tubulars & pipe inspection, pigging, coating:** AMOSCO GABON LTD

**Logistics, transportation, shipping, clearing and forwarding:** GETMA GABON, SHIPPING LOGISTIC INC. GABON, STCG GABON

**Environmental, waste management, remediation services:** CKS ENVIRONMENTAL GABON

**Equipment & tool supplies, workshops, OCTG stockists, multinationals:** CAMERON GABON, CUDD PRESSURE CONTROL GABON, EQUIPEMENT AND CONTRÔLES GABON, GSMP GABON, SMITH BITS GABON

**Naval yards, shipyards:** CHANTIER NAVAL DES BAUX GABON

**Manpower services:** IPEDEX GABON

**Project management, technical assistance:** ECM GABON, FORAID GABON

## **8.6 Market overview: oil and gas**

Gabon's oil reserves base has been steadily declining since 2008 as a slowdown in new exploration has slowed reserve replacement. **Total, the largest producer in Gabon, reported a 7% decrease in 2011 total production from Gabon on the back of naturally declining output from mature fields.** Output from the country's largest field, Rabi, peaked in 1997 at 217,000 barrels per day (b/d) before declining to 23,000b/d by 2010.

The two major oil companies operating in Gabon are Royal Dutch Shell and Total, along with Sinopec-owned Addax Petroleum and Perenco.

**Oil production for 2011 was 244,000b/d, making Gabon the sixth biggest producer in Sub-Saharan Africa.**

**The SOGARA refinery at Port-Gentil is Gabon's only crude processing facility.** Opened in 1967, Sogara is owned jointly by the Gabonese government (25%) and a number of IOCs led by Total (44%) and Shell (17%). According to the Oil & Gas Journal (OGJ), the refinery has 24,000b/d of crude distillation capacity. The majority of Gabon's production is therefore exported. Upside potential comes from a July 2012 Memorandum of Understanding (MoU) for the construction of a new 50,000b/d refinery to replace the ageing SOGARA plant.

Gabon's oil ministry remains responsible for all regulation in the oil and gas industry; however, a newly created national oil company (NOC) holds interest in oil licenses on behalf of the state.

Despite the creation of the **Gabon Oil Company** in June 2011, the state does hold ownership of all oil and gas resources allowing foreign companies to take large equity stakes in exploration and development through production-sharing contracts (PSCs).

The tax system within Gabon encourages foreign investment as certain aspects of oil exploration are exempt from VAT. In addition to providing investment incentives, Gabon has also been striving for greater transparency within the oil industry. In 2004, it created an online oil databank where users can obtain energy information dating back 30 years .

#### Upstream Projects Database

Field Name	Field Name	Companies	Status	Est. Oil/Liquids Output, (b/d)	Peak Gas Output (bcm)	Est. Peak Gas Output (bcm)	Type of Project	Onshore/ Offshore
		Vaalco Energy (28.07%), PanAfrican Energy Gabon (31.36%), Sasol Petroleum West Africa (27.75%), Sojitz Etame (2.98%), PetroEnergy Resources (2.34%), Energy Africa Gabon (7.5%)	Producing	21,350	na		Oil	Offshore
Olowi	Olowi	Canadian Natural Resources	Producing	25,000	na		Oil,	Offshore
Rabi	Rabi	Total, Shell	Producing	217,000	na		Oil, Gas-Re-injection	Onshore

na = not available/applicable. Source: BMI

**8.7 SWOT Gabon:**

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-Relatively stable political environment.</li> <li>-Strong presence of international oil companies (IOCs ) and proven production.</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-The critical weakness for Gabon remains the twin problems of falling production and declining reserves.</li> <li>-Lack of gas extraction and processing infrastructure continues to limit use of resources .</li> <li>-Relations between oil sector labour unions and government could undermine the latter's ability to overhaul the country's regulatory framework and introduce more attractive terms, with the most recent strike evidence of enduring tensions.</li> </ul>
<p><b>S.W.O.T.</b></p>	
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-Proposals such as the Gas Master Plan framework may lead to greater utilization of the country's gas resources, as well as increased exploration for non-associated gas deposits .</li> <li>-Construction of a new refinery at Port-Gentil would eliminate the need for the country to import refined products with an existing facility scheduled to shut in 2015, but also provides a scope for refined production exports .</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-Efforts to advance more attractive terms ahead of the offshore licensing round could be undermined by reports that the government is using audits to demand claw-back and increase equity stakes in face of falling revenues. If confirmed, these developments pose downside risk to the country's business environment and could dampen interest in offshore blocks .</li> <li>-Although the most recent strike in March 2013 reportedly had minimal impact on production, continued oil sector labour disputes could easily reignite and impact production as they did in 2011.</li> <li>-Declining oil production has already contributed negatively to BMI growth forecasts, and without extensive upstream investment or significant new discoveries this trend is set to continue.</li> </ul>

### 8.8 Key trends in oil and gas sector:

-BMI expects oil production to fall from 246,000b/d in 2012, to 235,000b/d in 2017, as increased production elsewhere fails to offset the declines from maturing fields .

-With tensions between oil sector works and the government still high following mass strikes which saw nearly all production offline for several days in 2010 and more limited disruptions following a recent week-long strike in March, the government's efforts to revamp its regulatory framework could be undermined by labour unions .

-However, reports in late March that the government was in advanced talks with oil companies such as **Shell** and **Total** for some of the 42 blocks open for bidding suggest interest - at least among larger international oil companies (IOCs ) - remains , despite above-ground developments

-Yet, rising stakes for the state could limit the attractiveness of Gabon's acreage to smaller independents .

**-With Gabon's existing refinery scheduled to be shut down in 2016, at the same time as the new facility is to come online, the country would not only avoid the need to import expensive refined fuels , but would also gain the capacity to become a fuel exporter.**

-BMI estimates that gas production will continue to rise in line with consumption over the next decade, mainly as a result of reductions in flaring rather than new fields being brought online. - The government's nascent Gas Master Plan is likely to see increased use of gas as a feedstock for power and according to the government will expand upstream activity to harness non-associated gas resources . The government continues to pledge a reduction in flaring; however, continued investment in infrastructure to harness and transport gas remains necessary.

### 8.9 Key risks in operating in Gabon:

- 1- Ongoing political strife presents above ground risks to operations.
- 2- Labor union disputes due to foreign countries employees on executive positions.

### 8.10 Future projections:

#### Oil and gas reserves:

**Gabon Proven Oil And Gas Reserves And Total Petroleum Data 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	2.0	2.0	2.0	2.0	2.0	2.0
Proven Oil Reserves bbl mn	2,000.0	2,000.0	2,000.0	2,000.0	2,000.0	1,950.0
Proven Oil Reserves % change y-o-y	0.0	0.0	0.0	0.0	0.0	-2.5
Reserves to production ratio (RPR), years	22.4	22.2	22.5	22.8	23.0	22.6
Natural Gas Proven Reserves, tcm	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Proven Reserves, bcm	28.2	27.0	25.8	24.4	22.9	21.4
Natural Gas Proven Reserves, % change y-o-y	-0.3	-4.2	-4.7	-5.3	-6.0	-6.8
Natural Gas Reserve to Production Ratio, years	168.1	150.2	117.1	87.1	74.0	59.4

**Oil production and consumptions:****Gabon Oil Production, Consumption and Net Exports Data 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	244.1	246.9	243.1	240.1	238.0	236.4
Total Oil Production, mn bbl/year	89.1	90.1	88.7	87.6	86.9	86.3
Total Oil Production, % change y-o-y	-0.6	1.1	-1.5	-1.2	-0.9	-0.7
Total Oil Production, US\$bn	3.5	3.6	3.4	3.2	3.0	2.9
Total Oil Production, US\$bn, % change y-o-y	38.1	3.0	-6.1	-4.5	-6.6	-2.7
Total Oil Production, US\$bn at US\$50/bbl	4.5	4.5	4.4	4.4	4.3	4.3
Total Oil Production, US\$bn at US\$100/bbl	8.9	9.0	8.9	8.8	8.7	8.6
Total Oil Production, US\$bn at US\$150/bbl	13.4	13.5	13.3	13.1	13.0	12.9
Total Oil Consumption, 000b/d	14.0	14.4	14.5	14.6	14.7	14.9
Total Oil Consumption, % change y-o-y	-28.3	2.5	0.8	0.8	1.1	1.4
<b>Total Net Oil Exports (crude and products), 000b/d</b>	<b>230.1</b>	<b>232.5</b>	<b>228.6</b>	<b>225.5</b>	<b>223.2</b>	<b>221.4</b>
Total Net Oil Exports (crude and products), % change y-o-y	1.8	1.1	-1.7	-1.4	-1.0	-0.8
Total Net Oil Exports (crude and products), US\$bn	9.0	9.3	8.7	8.3	7.8	7.5
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	4.2	4.2	4.2	4.1	4.1	4.0
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	8.4	8.5	8.3	8.2	8.1	8.1
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	12.6	12.7	12.5	12.3	12.2	12.1

e/f = estimate/forecast. Source: EIA, BMI

**Refining:****Gabon Refining - Production And Consumption Data, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	24.0	24.0	24.0	24.0	24.0	24.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	85.0	85.0	85.0	85.0	85.0	85.0
Refined Petroleum Products Production, 000b/d	20.4	20.4	20.4	20.4	20.4	20.4
Refined Petroleum Products Production, % change y-o-y	9.7	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	44.4	45.4	46.4	47.4	48.4	49.4
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	6.7	2.3	2.2	2.2	2.1	2.1
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	14.0	14.4	14.5	14.6	14.7	14.9
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-28.3	2.5	0.8	0.8	1.1	1.4

e/f = estimate/forecast. Source: EIA, BMI

**8.11 Industry news:**

In late November 2012, Etienne Ngoubou, Gabon's oil and energy minister, announced that the country is planning to launch the 10th offshore round in June 2013. The proposal is conditional on the government being able to pass new regulation aiming at attracting foreign investors.

However, falling revenues have led the government to tighten fiscal terms, and launch audits of existing operations in the country. Audits have reportedly led to demands for large claw backs and increased equity stakes for the government.



9. Country:

Ghana



## 9.1 About<sup>45</sup>:

### Geography

A West African country bordering on the Gulf of Guinea, Ghana is bounded by Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Atlantic Ocean to the south. It compares in size to Oregon, and its largest river is the Volta.

### Government

Constitutional democracy.

### History

Several major civilizations flourished in the general region of what is now Ghana. The ancient empire of Ghana (located 500 mi northwest of the contemporary state) reigned until the 13th century. The Akan peoples established the next major civilization, beginning in the 13th century, and then the Ashanti empire flourished in the 18th and 19th centuries.

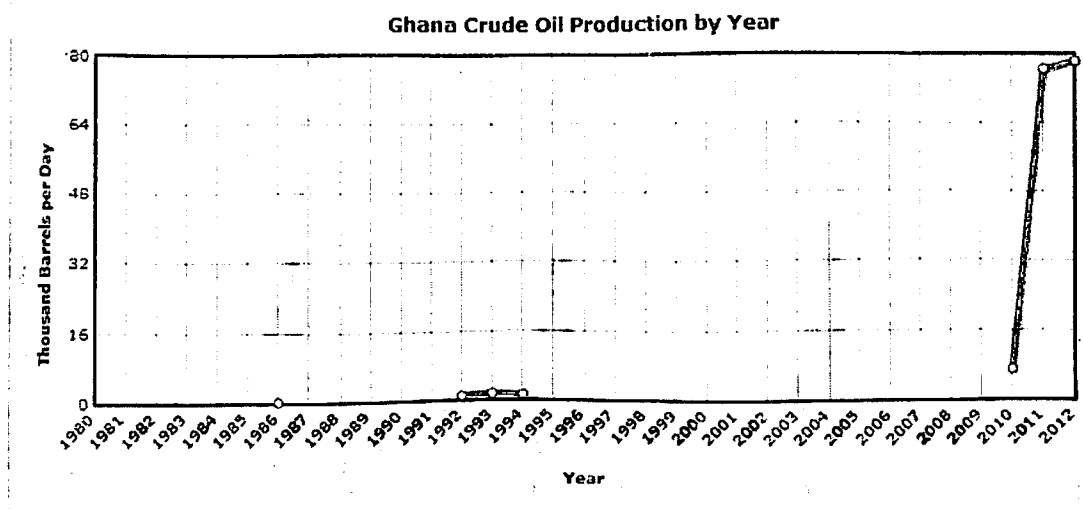
Called the Gold Coast, the area was first seen by Portuguese traders in 1470. They were followed by the English (1553), the Dutch (1595), and the Swedes (1640). British rule over the Gold Coast began in 1820, but it was not until after quelling the severe resistance of the Ashanti in 1901 that it was firmly established. British Togoland, formerly a colony of Germany, was incorporated into Ghana by referendum in 1956. Created as an independent country on March 6, 1957, Ghana, as the result of a plebiscite, became a republic on July 1, 1960.

Premier Kwame Nkrumah attempted to take leadership of the Pan-African Movement, holding the All-African People's Congress in his capital, Accra, in 1958 and organizing the Union of African States with Guinea and Mali in 1961. But he oriented his country toward the Soviet Union and China and built an autocratic rule over all aspects of Ghanaian life. In Feb. 1966, while Nkrumah was visiting Beijing and Hanoi, he was deposed by a military coup led by Gen. Emmanuel K. Kotoka.

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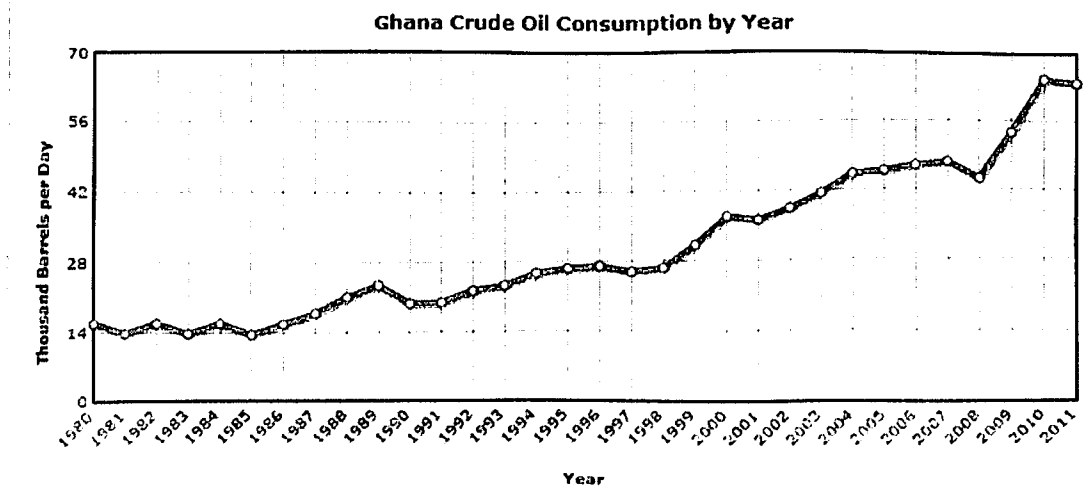
<sup>45</sup> Source: [www.infoplease.com](http://www.infoplease.com)

9.2 Ghana crude oil production<sup>46</sup>:



Source: United States Energy Information Administration

9.3 Ghana crude oil consumption<sup>47</sup>:



Source: United States Energy Information Administration

<sup>46</sup> Source: EIA

<sup>47</sup> Source: EIA

9.4 Energy scenario of Ghana<sup>48</sup>:

Electricity	production	consumption	exports	imports
	8.764 billion kWh (2009 est.)	6.122 billion kWh (2009 est.)	752 million kWh (2009 est.)	198 million kWh (2009 est.)
<b>World ranking</b>	<b>98</b>	<b>105</b>	<b>57</b>	<b>88</b>
<b>Crude oil</b>	72,580 bbl/day (2011 est.)	N.A.	14,000 bbl/day (2011 est.)	43,000 bbl/day (2009 est.)
<b>World ranking</b>	<b>54</b>	<b>N.A.</b>	<b>55</b>	<b>59</b>
<b>Refined petroleum products</b>	27,260 bbl/day (2008 est.)	61,590 bbl/day (2011 est.)	7,275 bbl/day (2008 est.)	24,390 bbl/day (2008 est.)
<b>sWorld ranking</b>	<b>93</b>	<b>93</b>	<b>92</b>	<b>96</b>
<b>Natural gas</b>	0 cu m (2010 est.)	120 million cu m (2010 est.)	0 cu m (2010 est.)	120 million cu m (2010 est.)
<b>World ranking</b>	<b>134</b>	<b>104</b>	<b>105</b>	<b>73</b>

<sup>48</sup> Source: CIA world fact book

### **9.5 Ghana oil and gas industry directory<sup>49</sup>:**

**Exploration & production, multinationals and local companies:** AFEX OIL (GHANA) LTD, AFREN ENERGY GHANA LTD., ATI PETROLEUM GHANA, BRITISH BORNEO OIL AND GAS LTD. GHANA, CHALLENGER MINERALS (GHANA) LTD, ENI GHANA, EXXONMOBIL GHANA LTD., GASOP OIL (GHANA) LTD., GHANA NATIONAL PETROLEUM CORPORATION GNPC, KOSMOS ENERGY GHANA, LUKOIL OVERSEAS GHANA LTD., MIDWAY RESOURCES, SALTPOND OFFSHORE PRODUCING COMPANY LTD. SOPCL, TAP OIL (GHANA) LTD, TULLOW GHANA LTD, VANCO GHANA LTD., VITOL UPSTREAM GHANA, YOUNG ENERGY PRIZE GHANA.

**EPCI contractors:** GLOBAL OFFSHORE INTERNATIONAL LLC

**Diving, underwater engineering:** AFRICAN COASTAL MARINE SERVICES LTD

**FPSO & buoys builders, operators:** SMIT TERMINALS GHANA

**Dredging services:** BOSKALIS INTERNATIONAL GHANA, VAN OORD DREDGING AND MARINE CONTRACTORS BV GHANA.

**Government, associations:** ENERGY COMMISSION, ENERGY FOUNDATION EF, GHANA FREEZONES BOARD, GHANA INVESTMENT PROMOTION CENTRE GIPC, GHANA GOVERNMENT, GHANA NATIONAL PETROLEUM CORPORATION GNPC, MINISTRY OF ENERGY, NATIONAL PETROLEUM AUTHORITY.

**Engineering, design, FEED:** ADITECH ENGINEERING LTD., AYDON GHANA LTD., IES INTERNATIONAL ENERGY SERVICES LTD., RELIABLE LOGISTICS & SERVICES LTD.

**Supply vessels, crew boats, tugs, barges, houseboats operators:** TIDEWATER MARINE INTERNATIONAL GHANA, WORKSHIPS AFRICA GHANA

**Electrical engineering, power generation, instrumentation:** ABB GHANA, SCHNEIDER ELECTRIC GHANA.

**Catering services:** UNIVERSAL SODEXO GHANA

**Inspection and certification services:** BUREAU VERITAS GHANA, GATEWAY SERVICES LTD. GHANA, INSPECTORATE GHANA LTD.

**Gas liquification, marketing & distribution:** WEST AFRICAN GAS PIPELINE COMPANY LTD. (WAGPO).

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<sup>49</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

**Agents, representatives, consultants, local companies:** AYDON GHANA LTD, G&J OIL AND GAS DEVELOPMENT COMPANY (GHANA) LTD., INDUSTRIAL AND ALLIED SERVICES LTD. IAS, RELIABLE LOGISTICS & SERVICES LTD.

**Logistics, transportation, shipping, clearing and forwarding:** BOLLORE AFRICA LOGISTICS GHANA, DHL GHANA LTD., GETMA GHANA, GHANA PORTS AND HARBOURS AUTHORITY GPHA, ICM GHANA LOGISTIC SERVICES LTD., INTERNATIONAL TALLY SERVICES & CO. LTD., I.T.S GROUP, MARICONSULT LTD., MENERGY INTERNATIONAL (GHANA) LTD, RELIABLE LOGISTICS & SERVICES LTD., SDV (GHANA) LTD, SUPERMARITIME GHANA LTD, TAKORADI PORT, TEMA PORT

**Environmental, waste management, remediation services:** IES INTERNATIONAL ENERGY SERVICES LTD.

**Equipment & tools supplies, workshops, OCTG stockists, multinationals:** ALPHA POWER MACHINES LTD., HOLMAN BROS (GHANA) LTD., MANTRAC GHANA, MULTI-TECH SERVICES LTD., TECHNIQUES INTERNATIONAL COMPANY LTD.

**Naval yards, shipyards:** P.S.C. TEMA SHIPYARD LTD.

**Risk assessment, security services:** G4S SECURITY SERVICES (GHANA) LTD

### 9.6 Market overview: oil and gas:

**Refining:** The Tema Oil Refinery, located on the Gulf of Guinea coast about 40km south of Accra, is a simple hydro skimming plant with a 45,000 barrels per day (b/d) crude distillation unit and a 14,000b/d residual fluid catalytic cracking unit to process residual fuel oil into diesel, petrol and liquefied petroleum gas (LPG). Total capacity is about 2mn tonnes per annum (tpa) but, on average, the plant has processed less than 1.5mn tpa. The plant has been operating well below economically viable utilization levels.

		Downstream Projects			
Name		Capacity, b/d	Capacity, tpa	Completion of construction	Main Owner
New (Proposed)	Alpha	200,000	9,955,202	2015	New Alpha Refinery Ghana
	Tema	45,000	2,239,920	1963	Tema Oil Refinery Co

Source: BMI

**New Alpha Refinery (Ghana), a South African company, is believed to be committed to the construction of a US\$6bn, 200,000b/d refining complex in Accra, having signed a memorandum of understanding (MoU) in 2010.** Original plans for 2015 start-up seem unrealistic and in the absence of a final investment decision (FID) on the project we have yet to include the proposal in our forecast. This may influence the decision over the Tema upgrade. The Alpha project has the potential for an upgrade to 400,000b/d, but we have not included this in our capacity projections.

### **Oil Terminals/Ports**

There are dedicated oil berths at the Tema and Takoradi ports. As part of a plan to develop Ghana's oil and gas sector, the Ghana Ports and Harbours Authority (GHPA) announced in May 2010 that it had earmarked US\$500mn to expand the Takoradi Port, which has acted as the onshore base for Jubilee operations. The port will be dredged to accommodate larger ships and the existing manganese terminal will be converted into an oil service terminal. The first phase of the expansion plan, which involves the extension of existing main breakwaters and provision of bulk mineral ore handling facilities, was expected to begin by the end of 2012 and be complete by the middle of 2014. The remaining phases will then continue under a public-private partnership arrangement.

### **Gas Pipelines**

The West Africa Gas Pipeline (WAGP) runs from Nigeria through Benin, Togo and into Ghana. The 678km pipeline feeds power stations in Tema and Takoradi. Ghana hopes to expand its domestic gas pipeline network to utilize associated gas flows from Jubilee and other projects to boost domestic industry. Following an earlier disruption in 2010, the WAGP remained offline at the time of writing following damage sustained on August 28 2012. Although the pipeline was repaired, a fatal explosion in October delayed its restart further, with the resumption pushed back to Q113 despite previous optimism flows would resume before the end of 2012.

9.7 SWOT:

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-Proven oil and gas potential, with commercial production since 2010 and rising exports over the course of our forecast period.</li> <li>-<b>Attractive business environment with openness to international investment.</b></li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-Lack of robust international oil company presence - smaller independents have more limited capital investment capabilities.</li> <li>-<b>Absence of downstream infrastructure</b> capable of processing domestic crude leaves country reliant on refined product imports.</li> </ul>
<p><b>S.W.O.T.</b></p>	
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-Offshore exploration continues to yield promising discoveries while underexplored offshore acreage offers massive reserves potential, with strong interest in the region's deep-water and subsalt potential.</li> <li>-Associated and non-associated gas developments pose upside risks to BMI gas forecasts, and could eliminate the need for imports with the country already considering some minimal exports within the region.</li> <li>-<b>Investment in new refining capacity essential to reducing the cost of imported processed fuels.</b></li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-Reliance on the West African Gas Pipeline, which is again offline, has left the country reliant on expensive oil imports to meet domestic energy demand.</li> <li>-Gas demand could rise faster than forecast, raising the prospect of a greater import burden than the minimal volumes we currently forecast will be necessary by 2022.</li> </ul>



## 9.8 Key trends in Ghana oil and gas sector:

-After troubled start-up, output from the **Tullow Oil** -operated Jubilee field is on track to reach the target production rate of 120,000barrels per day (b/d) in 2013. With the firm reporting output at the time of writing around 110,000b/d, this should help stabilize Ghana's output over the coming years.

-Ghana's reserves are likely to continue to grow at a rapid rate as the appraisal of the Greater Tweneboa, Southeastern Jubilee and West Cape Three Points prospects continues. The Oil & Gas Journal (OGJ) annual reserves and production survey attributes 660mn barrels (bbl) of proven oil reserves to the country. **BMI** estimates that resource base will grow to 735mn bbl by 2017.

**-Limited refinery capacity will leave the country dependent upon imports of refined products to meet demand; however, there is a chance capacity could rise to as much as 245,000b/d over the long term if new facilities come online toward 2018.**

-**BMI** expect net oil exports to grow from approximately at an average rate of nearly 3% from 2012 to reach 112,000b/d by 2022, generating significant revenues for the local economy.

-With a strong pace in exploration activity expected to continue into 2013, the upside potential for gas reserves and production remains strong. **BMI** forecast domestic production will begin in 2013 from 0.5bn cubic metres (bcm), and rise to 3.8bcm by 2022.

-Ghana's ability to process gas will grow, with a US\$3bn loan from the China Development Bank supporting new midstream gas infrastructure capacity and facilitating a gradual increase in gas production over the coming years , as domestic demand from power generation gathers pace. However, concerns with regards to delays to a key project (Chinese companies capturing associated gas from the Jubilee field) and allegations of inflated costs could negatively impact the development of future gas projects .

-Although domestically produced gas is currently reserved for the local market, interest on the part of international oil companies remains in the development of a potential LNG export project.

## 9.9 Risks associated in operating in Ghana:

- 1- Political tensions due to recent presidential elections.
- 2- Security issues

## 9.10 Future projections:

### Oil and gas reserves:

#### Ghana Proven Oil & Gas Reserves And Total Petroleum Data, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	0.7	0.7	0.7	0.7	0.7	0.7
Proven Oil Reserves bbl mn	660.0	660.0	682.1	685.9	724.9	729.5
Proven Oil Reserves % change y-o-y	0.0	0.0	3.3	0.6	5.7	0.6
Reserves to production ratio (RPR), years	23.1	20.9	14.4	14.5	14.8	12.8
Natural Gas Proven Reserves, tcm	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Proven Reserves, bcm	25.0	25.0	30.0	32.0	35.0	35.0
Natural Gas Proven Reserves, % change y-o-y	13.6	0.0	20.0	6.7	9.4	0.0
Natural Gas Reserve to Production Ratio, years	0.0	0.0	58.8	31.1	22.6	15.7

### Oil supply and demand:

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, '000b/d	78.2	86.4	129.4	129.4	134.4	156.1
Total Oil Production, mn bbl/year	28.5	31.5	47.2	47.2	49.1	57.0
Total Oil Production, % change y-o-y	780.7	10.5	49.8	0.0	3.9	16.1
Total Oil Production, US\$bn	1.1	1.3	1.8	1.7	1.7	1.9
Total Oil Production, US\$bn, % change y-o-y	1,123.7	12.5	42.8	-3.3	-2.1	13.8
Total Oil Production, US\$bn at US\$50/bbl	1.4	1.6	2.4	2.4	2.5	2.8
Total Oil Production, US\$bn at US\$100/bbl	2.9	3.2	4.7	4.7	4.9	5.7
Total Oil Production, US\$bn at US\$150/bbl	4.3	4.7	7.1	7.1	7.4	8.5
Total Oil Consumption, '000b/d	64.0	70.4	77.4	83.2	87.4	91.8
Total Oil Consumption, % change y-o-y	-1.1	10.0	10.0	7.5	5.0	5.0
Total Net Oil Exports (crude and products), '000b/d	14.2	16.0	52.0	46.1	47.0	64.3
Total Net Oil Exports (crude and products), % change y-o-y	-125.4	12.5	224.9	-11.2	1.8	36.9
Total Net Oil Exports (crude and products), US\$bn	0.6	0.6	2.0	1.7	1.6	2.2
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	-135.4	14.6	209.8	-14.1	-4.0	34.1
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	0.3	0.3	0.9	0.8	0.9	1.2
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	0.5	0.6	1.9	1.7	1.7	2.3
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	0.8	0.9	2.8	2.5	2.6	3.5

**Refining:****Ghana Refining - Production And Consumption, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, '000b/d	45.0	45.0	45.0	45.0	45.0	45.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	61.0	61.0	61.0	61.0	61.0	61.0
Refined Petroleum Products Production, '000b/d	27.5	27.5	27.5	27.5	27.5	27.5
Refined Petroleum Products Production, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), '000b/d	50.5	51.5	52.5	53.5	54.5	55.5
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	2.0	1.9	1.9	1.9	1.8
Refined Products Consumption (inc ethanol and non-conventional), '000b/d	64.0	70.4	77.4	83.2	87.4	91.8
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-1.1	10.0	10.0	7.5	5.0	5.0

e/f = BMI estimate/forecast. Source: EIA, BMI

**9.11 Industry news:**

New Alpha Refinery (Ghana), a South African company, is believed to be committed to the construction of a US\$6bn, 200,000b/d refining complex in Accra. Original plans for 2015 s tart-up seem unrealistic. This may influence the decision over the Tema upgrade, given the Alpha project has the potential for an upgrade to 400,000b/d.

10 Country:

Libya



©1997 MAGELLAN Geographix<sup>SM</sup>  
(805) 685-3100 www.maps.com

## 10.1 About<sup>50</sup>:

### Geography

Libya stretches along the northeast coast of Africa between Tunisia and Algeria on the west and Egypt on the east; to the south are the Sudan, Chad, and Niger. It is one-sixth larger than Alaska. Much of the country lies within the Sahara. Along the Mediterranean coast and farther inland is arable plateau land.

### Government

Military dictatorship.

### History

The first inhabitants of Libya were Berber tribes. In the 7th century B.C. , Phoenicians colonized the eastern section of Libya, called Cyrenaica, and Greeks colonized the western portion, called Tripolitania. Tripolitania was for a time under Carthaginian control. It became part of the Roman Empire from 46 B.C. to A.D. 436, after which it was sacked by the Vandals. Cyrenaica belonged to the Roman Empire from the 1st century B.C. until its decline, after which it was invaded by Arab forces in 642. Beginning in the 16th century, both Tripolitania and Cyrenaica nominally became part of the Ottoman Empire.

Tripolitania was one of the outposts for the Barbary pirates who raided Mediterranean merchant ships or required them to pay tribute. In 1801, the pasha of Tripoli raised the price of tribute, which led to the Tripolitan war with the United States. When the peace treaty was signed on June 4, 1805, U.S. ships no longer had to pay tribute to Tripoli.

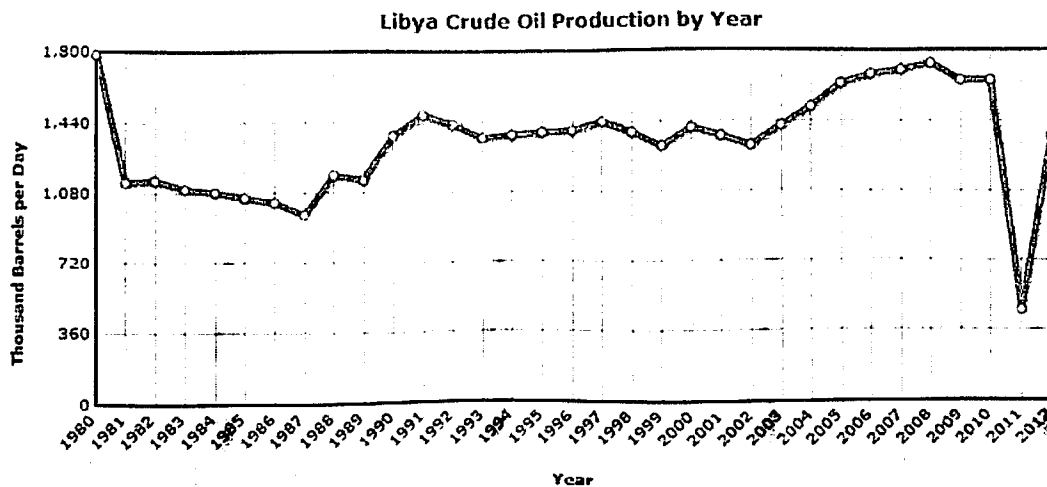
Following the outbreak of hostilities between Italy and Turkey in 1911, Italian troops occupied Tripoli. Libyans continued to fight the Italians until 1914, by which time Italy controlled most of the land. Italy formally united Tripolitania and Cyrenaica in 1934 as the colony of Libya.

Libya was the scene of much desert fighting during World War II. After the fall of Tripoli on Jan. 23, 1943, it came under Allied administration. In 1949, the UN voted that Libya should become independent, and in 1951 it became the United Kingdom of Libya. Oil was discovered in the impoverished country in 1958 and eventually transformed its economy.

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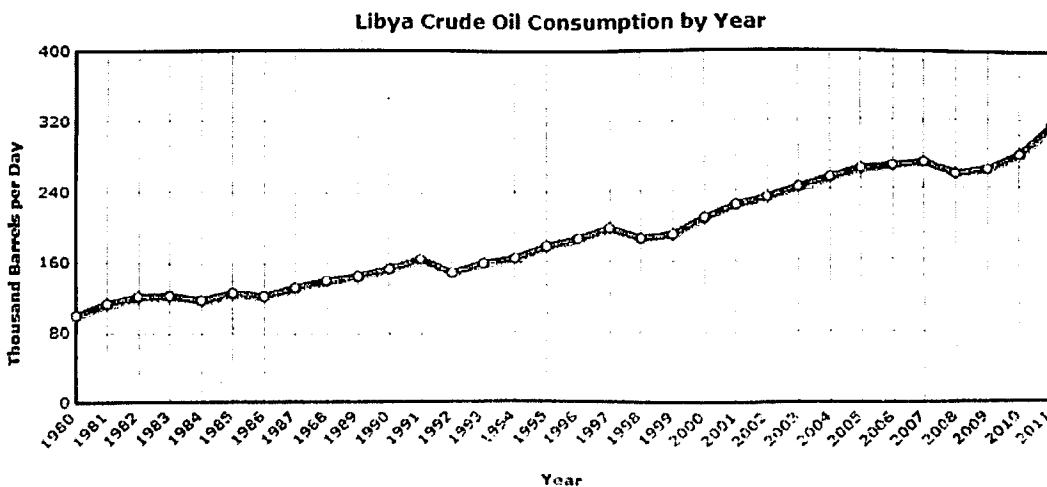
<sup>50</sup> Source: [www.infoplease.com](http://www.infoplease.com)

10.2 Libya crude oil production<sup>51</sup>:



Source: United States Energy Information Administration

10.3 Libya crude oil consumption<sup>52</sup>:



Source: United States Energy Information Administration

<sup>51</sup> Source: EIA

<sup>52</sup> Source: EIA

10.4 Energy scenario of Libya<sup>53</sup>:

Electricity	production	consumption	exports	imports
	28.6 billion kWh (2009 est.)	24.29 billion kWh (2009 est.)	124 million kWh (2009 est.)	73 million kWh (2009 est.)
<b>World ranking</b>	<b>65</b>	<b>68</b>	<b>69</b>	<b>98</b>
<b>Crude oil</b>	502,400 bbl/day (2011 est.)	N.A.	1.039 million bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>31</b>	<b>N.A.</b>	<b>15</b>	<b>59</b>
<b>Refined petroleum products</b>	309,000 bbl/day (2008 est.)	314,000 bbl/day (2011 est.)	84,490 bbl/day (2008 est.)	575.3 bbl/day (2008 est.)
<b>World ranking</b>	<b>44</b>	<b>44</b>	<b>45</b>	<b>201</b>
<b>Natural gas</b>	16.81 billion cu m (2010 est.)	6.844 billion cu m (2010 est.)	9.97 billion cu m (2010 est.)	0 cu m (2011 est.)
<b>World ranking</b>	<b>36</b>	<b>55</b>	<b>22</b>	<b>91</b>

<sup>53</sup> Source: CIA world fact book

### **10.5 Libya oil and gas industry directory<sup>54</sup>:**

**Exploration & Production, Multinationals:** BG LIBYA, COMPAGNIE DES PETROLES TOTAL LIBYE (CPTL), ENI NORTH AFRICA LIBYA, MARATHON OIL CORPORATION LIBYA, MITSUBISHI CORPORATION EXPLORATION LIBYA, MOECO LIBYA CO. LTD., OCCIDENTAL PETROLEUM LIBYA (OXY), NAFTOGAZ OF UKRAINE LIBYA, OMV OF LIBYA LTD., OMV EXPLORATION & PRODUCTION LTD., OMV OIL EXPLORATION GMBH, OMV OIL PRODUCTION GMBH, OMV OIL AND GAS EXPLORATION GMBH, REPSOL EXPLORACION MURZUQ, S.A. LIBYA, SHELL EXPLORATION AND PRODUCTION LIBYA GMBH, SUNCOR ENERGY LIBYA, TOTAL E&P LIBYE, VITOL LIBYA, WINTERSHALL LIBYA.

**EPCI Contractors:** BECHTEL LIBYA, PONTICELLI LIBYA, PRODUCTION SERVICES NETWORK (PSN) LIBYA, SAIPEM LIBYA, SNAMPROGETTI LIBYA, SNC, LAVALIN EUROPE B.V. LIBYA.

**Fabrication Subcontractors:** DIETSMANN LIBYA, PONTICELLI LIBYA, SAFET LIBYAN REPRESENTATIVE OFFICE LIBYA.

**Diving, Underwater Engineering:** TECNOSUB INTERNACIONAL LIBYA

**Geophysicals, Seismics, Data Processing, Geology, Geosciences:** BEICIP FRANLAB LIBYA, BGP LIBYA, CGG VERITAS AGESCO LIBYA, PGS EXPLORATION (UK) LTD. LIBYAN BRANCH, SAHARA PETROLEUM SERVICES CO. LIBYA (SAPESCO)

**Engineering, Design, FEED:** BECHTEL LIBYA

**Survey:** FUGRO ROVTECH LTD. LIBYA

**Trading, Lifting, Bunkering of Crude Oil and Petroleum Products, Tanker, Vessels Brokers:** VITOL LIBYA

**Tubulars & Pipe Inspection, Pigging, Coating:** BJ TUBULAR SERVICES LIBYA

**Agents, Representatives, Consultants, Local companies:** COMPASS ENGINEERING LIBYA, SOC LIBYA, TNDE OILFIELD CO., UNAOIL LIBYA

**Equipment & tools Supplies , Workshops, OCTG Stockists, Multinationals:** ITECO OILFIELD SUPPLY LIBYA, SPIE LIBYA JSCO

**Training Services:** M & O LIBYA

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<sup>54</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)



Project Management, Technical Assistance: SPIE LIBYA JSCO

### 10.6 Market overview: oil and gas

#### Key players Libya oil and gas sector:

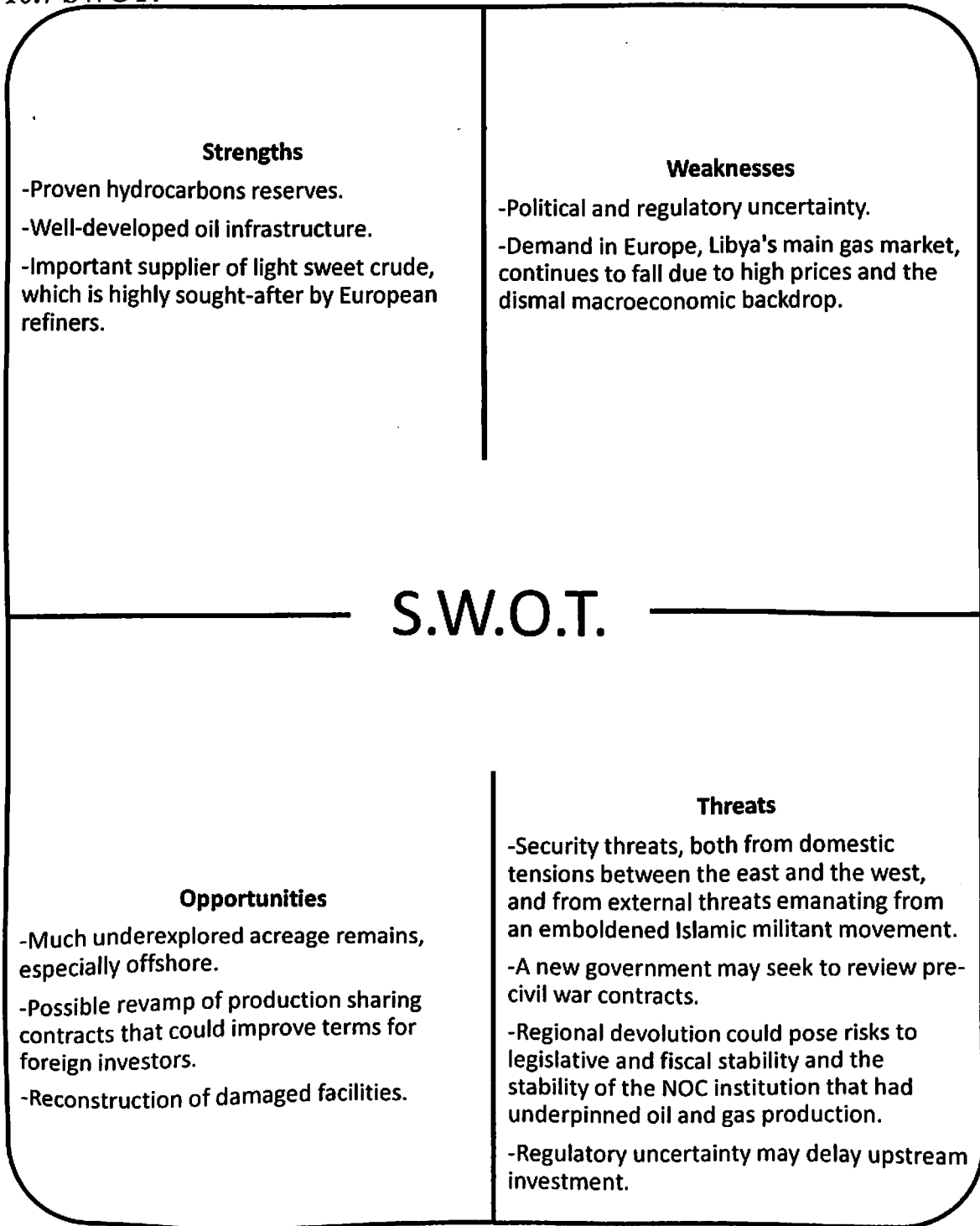
Company	2010 Sales (US\$mn)	% share of total sales	No. of employees	Year established	2010 Total assets (US\$mn)	Ownership
NOC	na	na	na	1970	na	100% state
Eni Libya	na	na	na	1959	na	100% Eni
Total Libya	na	na	na	1959	na	100% Total
OMV Libya	na	na	na	1985	na	100% OMV
Conoco Libya	na	na	na	2005	na	100% ConocoPhillips
Repsol Libya	na	na	na	na	na	100% Repsol

na = not available.

#### Key Upstream Players

Company	Oil production (000b/d)	Market share (%)	Gas production (bcm)	Market share (%)
NOC	840e	50.8	8.0e	40e
Eni Libya	116	6.5	9.0	56
Repsol Libya	40	2.5	na	na
Total Libya	55	3.6	na	na
OMV Libya	29	2.0	na	na
ConocoPhillips	47	3.0	na	na
Marathon	46	3.0	0.04	na
Hess	22	1.3	na	na
Occidental	7	0.5	na	na

10.7 SWOT:



### **10.8 Key trends in Libyan oil and gas sector:**

**-BMI estimate total liquids production of 1.62mn barrels per day (b/d) in 2012, rising to 1.78mn b/d in 2017 and 1.87mn b/d by 2022.**

-There are both upside and downside risks to these forecasts. An improvement to Libya's political situation could see a gush of investment particularly into greenfield projects, particularly with high oil prices supporting such decisions

-International investment is also a big unknown. Foreign suitors are likely to be attracted by Libya's vast oil and gas reserves, which stood at an estimated at 47.1bn barrels (bbl) and 1.5trn cubic metres (tcm) respectively in 2012.

- However, clear political risks, the introduction of new production sharing contracts (PSC), and a revised hydrocarbons law are all likely to affect the country's business environment.

-Before the civil war, there was some 378,000b/d of refining capacity in Libya. However, BMI expect refineries to operate below their utilization rate owing to interruptions to their operations by demonstrators against the new regime. Since the civil war, Libya's oil and gas assets - including refineries - have served as focal points around which protests have been based.

-Oil and gas consumption is set to return to pre-war levels gradually because damage to infrastructure is likely to lead to lower domestic demand from power generation. However, over the longer term, reconstruction efforts are likely to drive economic growth and oil demand higher.

### **10.9 Risks associated in operating in Libya:**

- 1- Political tensions existing in the country.
- 2- Islamic militant movements.

### 10.10 Future projections:

#### Libya Oil Production, Consumption and Net Exports: Historical Data & Forecasts, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	501.6	1,620.5	1,739.0	1,747.7	1,756.4	1,765.2
Total Oil Production, mn bbl/year	183.1	591.5	634.7	637.9	641.1	644.3
Total Oil Production, % change y-o-y	-72.0	223.1	7.3	0.5	0.5	0.5
Total Oil Production, US\$bn	7.2	23.6	24.2	23.5	22.3	21.9
Total Oil Production, US\$bn, % change y-o-y	-61.1	229.0	2.3	-2.8	-5.3	-1.6
Total Oil Production, US\$bn at US\$50/bbl	9.2	29.6	31.7	31.9	32.1	32.2
Total Oil Production, US\$bn at US\$100/bbl	18.3	59.1	63.5	63.8	64.1	64.4
Total Oil Production, US\$bn at US\$150/bbl	27.5	88.7	95.2	95.7	96.2	96.6
Total Oil Consumption, 000b/d	224.2	264.6	293.7	314.3	336.3	353.1
Total Oil Consumption, % change y-o-y	-20.0	18.0	11.0	7.0	7.0	5.0
Total Net Oil Exports (crude and products), 000b/d	277.3	1,355.9	1,445.3	1,433.4	1,420.2	1,412.1
Total Net Oil Exports (crude and products), % change y-o-y	-81.6	388.9	6.6	-0.8	-0.9	-0.6
Total Net Oil Exports (crude and products), US\$bn	10.9	54.2	55.1	52.8	49.3	48.1
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	-74.5	397.9	1.6	-4.1	-6.6	-2.6
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	5.1	24.7	26.4	26.2	25.9	25.8
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	10.1	49.5	52.8	52.3	51.8	51.5
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	15.2	74.2	79.1	78.5	77.8	77.3

### Refining:

#### Libya Refining - Production and Consumption: Historical Data & Forecasts, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	378.0	378.0	378.0	378.0	378.0	378.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	22.6	53.6	80.0	85.0	85.0	85.0
Refined Petroleum Products Production, 000b/d	85.4	202.5	302.4	321.3	321.3	321.3
Refined Petroleum Products Production, % change y-o-y	-78.0	137.0	49.3	6.3	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	108.4	226.5	327.4	347.3	348.3	349.3
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	-73.6	108.9	44.5	6.1	0.3	0.3

e/f=estimate/forecast. Source: EIA, BMI

**Additional refinery capacity of 200,000b/d was planned to come onstream in 2019 at the proposed Zwara facility; however, it remains to be seen whether Tamoil, a division of NOC, will follow through with the plans after it was most likely put on the backburner as a result of the 2011 civil war. UK banking group HSBC Holdings acted as a financial advisor to the Zwara Refining Company (ZORCO) before the civil war. It was attempting to attract an IOC partner for the planned refinery, according to a Middle East Economic Digest (MEED) report from July 16 2010.**

#### **10.11 Industry news:**

**-Repsol: The Spanish outfit announced that it will restart exploratory drilling in early 2013.**

**-BP: The UK major confirmed plans to drill 17 new exploration wells both onshore and offshore in 2013. Five of these are offshore wells in the Sirte Basin, while the rest are in the Ghadames Basin.**

**-Eni: The Italian firm plans to spend US\$8bn in the country over a decade.**

**-Royal Dutch Shell: The Anglo-Dutch major is still dithering on re-entry into Libya at the time of writing. After a decision to stop exploration in Libya in May 2012, the Anglo-Dutch players said in November 2012 that it is still 'very interested in other upstream activities' and has 'ongoing dialogue with Libyan officials.'**

11 Country:

South Africa



## 11.1 About<sup>55</sup>:

### Geography

South Africa, on the continent's southern tip, is bordered by the Atlantic Ocean on the west and by the Indian Ocean on the south and east. Its neighbors are Namibia in the northwest, Zimbabwe and Botswana in the north, and Mozambique and Swaziland in the northeast. The kingdom of Lesotho forms an enclave within the southeast part of South Africa, which occupies an area nearly three times that of California.

The southernmost point of Africa is Cape Agulhas, located in the Western Cape Province about 100 mi (161 km) southeast of the Cape of Good Hope.

### Government

Republic.

### History

The San people were the first settlers; the Khoikhoi and Bantu-speaking tribes followed. The Dutch East India Company landed the first European settlers on the Cape of Good Hope in 1652, launching a colony that by the end of the 18th century numbered only about 15,000. Known as Boers or Afrikaners, and speaking a Dutch dialect known as Afrikaans, the settlers as early as 1795 tried to establish an independent republic.

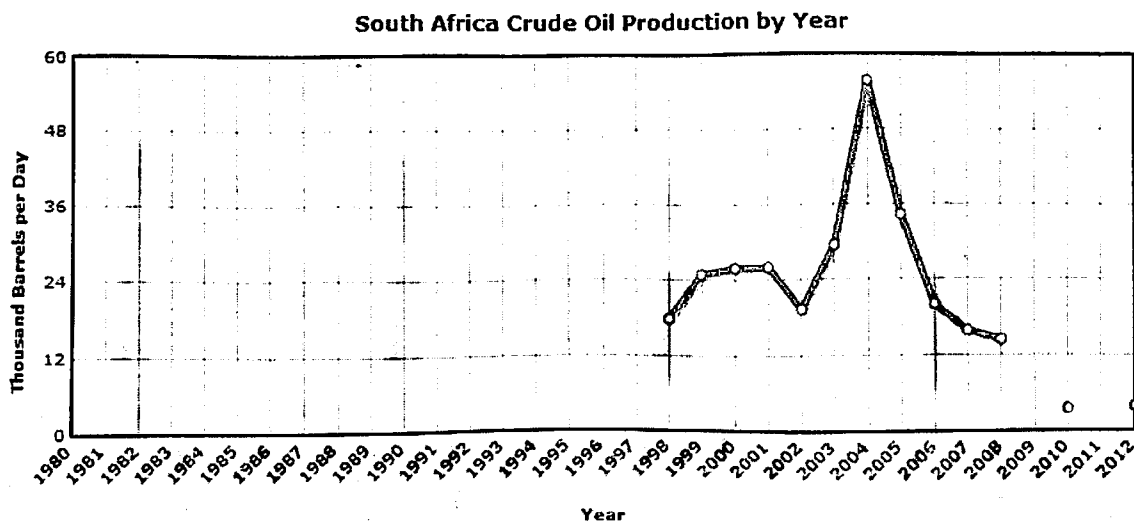
After occupying the Cape Colony in that year, Britain took permanent possession in 1815 at the end of the Napoleonic Wars, bringing in 5,000 settlers. Anglicization of government and the freeing of slaves in 1833 drove about 12,000 Afrikaners to make the "great trek" north and east into African tribal territory, where they established the republics of the Transvaal and the Orange Free State.

The discovery of diamonds in 1867 and gold nine years later brought an influx of "outlanders" into the republics and spurred Cape Colony prime minister Cecil Rhodes to plot annexation. Rhodes's scheme of sparking an "outlander" rebellion, to which an armed party under Leander Starr Jameson would ride to the rescue, misfired in 1895, forcing Rhodes to resign. What British expansionists called the "inevitable" war with the Boers broke out on Oct. 11, 1899. The defeat of the Boers in 1902 led in 1910 to the Union of South Africa, composed of four provinces, the two former republics, and the old Cape and Natal colonies. Louis Botha, a Boer, became the first prime minister. Organized political activity among Africans started with the establishment of the African National Congress in 1912.

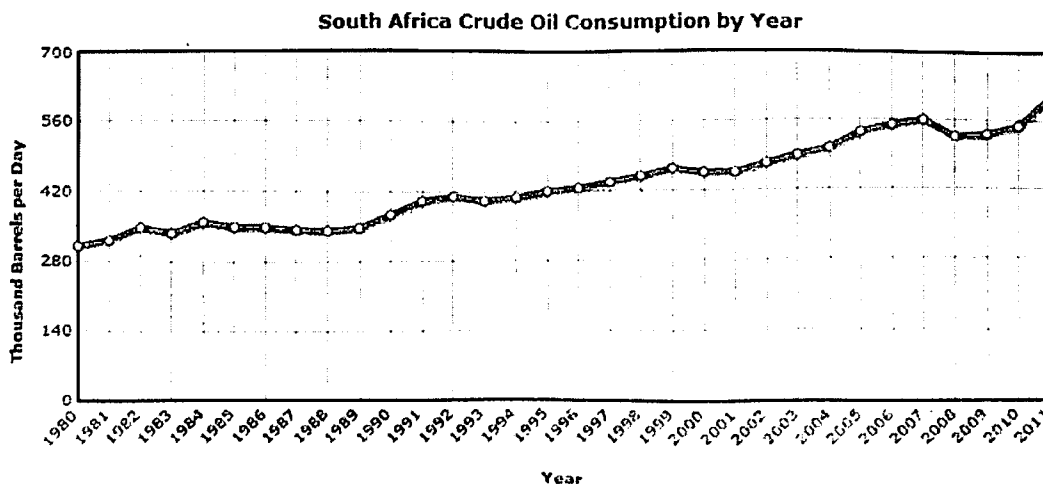
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<sup>55</sup> Source: [www.infoplease.com](http://www.infoplease.com)

### 11.2 Crude oil production South Africa<sup>56</sup>:



### 11.3 Crude oil consumption South Africa<sup>57</sup>:



Source: United States Energy Information Administration

<sup>56</sup> Source: EIA

<sup>57</sup> Source: EIA



**11.4 Energy scenario of South Africa<sup>58</sup>:**

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	257.9 billion kWh (2012 est.)	234.2 billion kWh (2012 est.)	15.04 billion kWh (2012 est.)	10.06 billion kWh (2012 est.)
<b>World ranking</b>	<b>16</b>	<b>17</b>	<b>12</b>	<b>23</b>
<b>Crude oil</b>	169,000 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	402,300 bbl/day (2009 est.)
<b>World ranking</b>	<b>41</b>	<b>N.A.</b>	<b>179</b>	<b>22</b>
<b>Refined petroleum products</b>	516,100 bbl/day (2008 est.)	590,900 bbl/day (2011 est.)	49,430 bbl/day (2008 est.)	60,290 bbl/day (2008 est.)
<b>World ranking</b>	<b>32</b>	<b>30</b>	<b>60</b>	<b>63</b>
<b>Natural gas</b>	970 million cu m (2010 est.)	4.01 billion cu m (2010 est.)	0 cu m (2010 est.)	3.04 billion cu m (2010 est.)
<b>World ranking</b>	<b>65</b>	<b>67</b>	<b>175</b>	<b>43</b>

<sup>58</sup> Source: CIA world fact book

### 11.5 Libya oil and gas industry directory<sup>59</sup>:

**Exploration & Production, Multinationals:** ANSCHUTZ (SOUTH AFRICA) (PTY) LTD., BHP BILLITON PETROLEUM SOUTH AFRICA, BP SOUTH AFRICA, CNR INTERNATIONAL (SOUTH AFRICA) (PTY) LTD, ENGEN SOUTH AFRICA, FOREST EXPLORATION INTERNATIONAL (SOUTH AFRICA) (PTY) LTD., GLOBAL OFFSHORE OIL EXPLORATION (SOUTH AFRICA) (PTY) LTD., NEW AFRICAN GLOBAL ENERGY SOUTH AFRICA, OPHIR ENERGY SOUTH AFRICA, PETROSA SOUTH AFRICA - PETROLEUM, OIL AND GAS CORPORATION OF SOUTH AFRICA (PTY) LTD, PIONEER NATURAL RESOURCES SOUTH AFRICA, Q VENTURE DEVELOPMENT (SOUTH AFRICA) LTD, SASOL PETROLEUM INTERNATIONAL (PTY) LTD. SOUTH AFRICA, TULLOW SOUTH AFRICA (PTY) LTD.

**EPCI Contractors:** AKER SOLUTIONS SOUTH AFRICA, SNC-LAVALIN MURRAY & ROBERTS (PTY) LTD. PBMR SOUTH AFRICA, SNC, LAVALIN SOUTH AFRICA (PTY) LTD.

**Mechanical Engineering, Equipment Supplies, Workshops, Procurement, Local Companies:** GUERRINI MARINE CONSTRUCTION SOUTH AFRICA

**Diving, Underwater Engineering:** ALLIED DIVING SOUTH AFRICA, BREAKWATER DIVING SERVICES SOUTH AFRICA, CAPE DIVING (PTY) LTD SOUTH AFRICA, COMMERCIAL DIVING SERVICES SOUTH AFRICA, DIVE SOLUTIONS SOUTH AFRICA, DORMAC DIVING SOUTH AFRICA, GUERRINI MARINE CONSTRUCTION SOUTH AFRICA, PRODIVE SOLUTIONS SOUTH AFRICA, PROJECT DIVERS INTERNATIONAL SOUTH AFRICA, SEA BOURNE DIVING CONTRACTORS SOUTH AFRICA, SMIT AMANDLA MARINE (PTY) LTD SOUTH AFRICA, SUBTECH DIVING SOUTH AFRICA, UNDERWATER PROJECTS SOUTH AFRICA, UNDERWATER SERVICES SOUTH AFRICA.

**Offshore Services, Marine Works, Heavy Lift:** SMIT AMANDLA MARINE (PTY) LTD SOUTH AFRICA, SMIT SALVAGE SOUTH AFRICA, SMIT TERMINALS SOUTH AFRICA, SMIT TRANSPORT SOUTH AFRICA.

**Government, Associations:** OFFSHORE PETROLEUM ASSOCIATION OF SOUTH AFRICA OPASA, PETROLEUM AGENCY SOUTH AFRICA

**Catering Services:** SODEXO SOUTHERN AFRICA (PTY) LTD.

**Inspection Services:** INSPECTORATE GAZELLE TESTING SERVICES SOUTH AFRICA, INSPECTORATE CHEMTAUR (PTY) SOUTH AFRICA LTD.

<sup>59</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

**Refining & Petrochemicals:** CHEVRON SOUTH AFRICA (PTY) LTD, SHELL AND BP SOUTH AFRICAN PETROLEUM REFINERIES (PTY) LTD

**Agents, Representatives, Consultants, Market Research:** WOOD MACKENZIE SOUTH AFRICA

**Logistics, Transportation, Shipping Agents, Clearing and forwarding:** DHL INTERNATIONAL (PTY) LTD. SOUTH AFRICA, SDV TRANSAMI SAEL SOUTH AFRICA, BOLLORE AFRICA LOGISTICS SOUTH AFRICA, SUPERMARITIME SOUTH AFRICA (PTY) LTD., TRISTAN EXPORT (PTY) SOUTH AFRICA, WORLD SHIPPING AGENCIES SOUTH AFRICA.

**Equipment & tools Supplies , Workshops, OCTG Stockists, Multinationals:** COMPAIR SOUTH AFRICA (PTY.) LTD., MC BRI MARKETING ENTERPRISES SOUTH AFRICA, N & Z INSTRUMENTATION AND CONTROL SOUTH AFRICA, TRISTAN EXPORT (PTY) SOUTH AFRICA.

**Naval Yards, Shipyards:** DORMAC DIVING SOUTH AFRICA

**Risk Assessment, Security Services:** G4S SECURITY SERVICES (SOUTH AFRICA)

### **11.6 Market overview: oil and gas**

**PetroSA** is the operator of all of the country's government-owned oil and gas holdings. The company produces oil from the Oribi, Oryx and Sable fields . Gas and condensate is produced at the offshore EM, EBF and FA fields , which supply a 45,000b/d synfuel complex. IOC involvement is modest in the upstream oil and gas segment, but significant in refining and fuels distribution. Key downstream oil players include **Engen** and Sasol, plus **Shell, BP, Caltex** and **Total**.

## Key Players In South African Oil And Gas Sectors

Company	2011 sales, ZARbn	% of total sales	No. of employees	Year est.	2011 Total assets, ZARbn	Ownership
Sasol	169.4	100	33,928	1950	na	9% state
PetroSA	14.4	100	1,225	2002	na	100% state
Shell SA	na	na	1,700	1902	na	75% RD Shell
Caltex	na	na	1,100	1911	na	75% Chevron
BPSA	na	1.0	1,300	1920	na	75% BP
Total SA	na	na	900	1954	na	75% Total

na = not available/applicable. Source: BMI, Company data

## Key Upstream Player

Company	Oil production (000b/d)	Market share (%)	Gas production (bcm)	Market share (%)
PetroSA	20	66.7	3	100

Source: BMI, Company data

## Key Downstream Players

Company	Refining capacity (000b/d)	Market share (%)	No. of retail outlets	Market share (%)
Sasol	67	12	411	9
Shell SA	90	16	800e	18
BPSA	90	16	600e	16
Total SA	38	7	530e	13
Engen	135	26	1,200e	27
Caltex	110	21	850e	17

e = estimate. Source: BMI, Company data

### 11.8 Key trends in South Africa oil and gas sector:

-In September 2012, South Africa's Cabinet has announced the end of a temporary ban on fracking, which had been in place since April 2011. Bundu Oil & Gas, Chesapeake Energy, Chevron, Falcon Oil & Gas, Sasol, Shell and Statoil are among the players actively pursuing the development of shale gas in South Africa. The government's decision will move the process forward, with public consultations the next step in an ongoing process to develop the country's unconventional gas reserves. Environmental groups have responded to the government's decision by confirming they will file a lawsuit to prevent any actual production of shale gas, but Shell has said that following the government's latest decision **first gas from shale would be possible by 2015.**

**-Consumption of crude is forecasted to rise steadily over our 10-year forecast period**

- Sasol has plans to expand Secunda by another 30,000b/d and has proposed to build the 80,000b/d Mafutha plant. As a result, BMI expect synfuels production to grow from an estimated 160,000b/d in 2011 to 258,000b/d in 2022.

- Although there is the potential to source gas from the Orange basin and the onshore shale formations in the Karoo basins, BMI believe it is too early to adopt an overly optimistic stance. As regards the Orange basin, we believe that the development of gas production could grow much faster and BMI estimate South Africa to have produced 3.5bn cubic metres (bcm) of gas in 2012. BMI forecasts that this will increase significantly over their forecast period, reaching 7.1bcm by 2022.

-Bolstered by strong macroeconomic growth, infrastructure projects and GTL, domestic gas consumption is set to increase substantially, from an estimated 5.7bcm in 2012 to 9.7bcm by 2022.

-In terms of infrastructure, many ambitious projects have been proposed, particularly in the downstream sector. The 400,000b/d Mthombo refining complex in Coega epitomises the country's willingness to remain a leader in the sector. South Africa is also hoping to increase its synthetic oil output through Sasol's proposed expansion of the Secunda CTL facility and the possible construction of the 80,000b/d Mafutha CTL.

### 11.9 Risks associated in operating in South Africa:

- 1- Ongoing reduced margins of downstream sector due to local conditions posing threat to downstream players and prospect players.

### 11.10 Future projections:

- some measure of comfort for domestic petrochemicals producers and converters, also undermine demand activity in the wider economy and therefore have a knock-on effects for petrochemicals output. At the same time, rand weakness will erode margins by pushing up the cost of feeds tock.

-Sasol's Ethylene Purification Unit (EPU5) project - which will increase ethylene availability for its PE plants - is expected to be operational in H213, while the C3 stabilization project will achieve 'beneficial operation' in mid- 2014. Sasol said EPU5 will raise ethylene production by around 48,000tpa by 2015 and will supply PE production facilities, thereby reducing South African plastics converters' reliance on imports. There are no further plans for significant expansion or new plants over the next five years, according to BMI research.

South Africa Oil Production, Consumption and Net Exports	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, '000b/d	183.1	183.3	195.1	208.1	221.3	270.5
Total Oil Production, mn bbl/year	66.8	66.9	71.2	76.0	80.8	98.7
Total Oil Production, % change y-o-y	0.3	0.1	6.4	6.7	6.3	22.2
Total Oil Production, US\$bn	2.6	2.7	2.7	2.8	2.8	3.4
Total Oil Production, US\$bn, % change y-o-y	39.3	2.0	1.4	3.2	0.2	19.7
Total Oil Production, US\$bn at US\$50/bbl	3.3	3.3	3.6	3.8	4.0	4.9
Total Oil Production, US\$bn at US\$100/bbl	6.7	6.7	7.1	7.6	8.1	9.9
Total Oil Production, US\$bn at US\$150/bbl	10.0	10.0	10.7	11.4	12.1	14.8
Total Oil Consumption, '000b/d	610.0	618.0	629.9	645.6	661.8	678.4
Total Oil Consumption, % change y-o-y	10.3	1.3	1.9	2.5	2.5	2.5
Total Net Oil Exports (crude and products), 000b/d	426.9	-434.7	-434.8	-437.5	-440.5	-407.8
Total Net Oil Exports (crude and products), % change y-o-y	15.3	1.8	0.0	0.6	0.7	-7.4
Total Net Oil Exports (crude and products), US\$bn	-16.8	-17.4	-16.6	-16.1	-15.3	-13.9
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	60.1	3.7	-4.6	-2.7	-5.1	-9.3
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	-7.8	-7.9	-7.9	-8.0	-8.0	-7.4
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	-15.6	-15.9	-15.9	-16.0	-16.1	-14.9
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	-23.4	-23.8	-23.8	-24.0	-24.1	-22.3

**South Africa Refining - Production and Consumption, 2011-2016**

South Africa Refining - Production and Consumption	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, '000b/d	515.0	515.0	515.0	515.0	505.0	695.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	-1.9	37.6
Crude Oil Refining Capacity, Utilisation, %	123.0	123.0	123.0	123.0	123.0	98.4
Refined Petroleum Products Production, '000b/d	633.5	633.5	633.5	633.5	621.2	683.9
Refined Petroleum Products Production, % change y-o-y	0.0	0.0	0.0	0.0	-1.9	10.1
Refined Products Production (inc ethanol and non-conventional), '000b/d	656.5	657.5	658.5	659.5	648.2	711.9
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	0.2	0.2	0.2	-1.7	9.8
Refined Products Consumption (inc ethanol and non-conventional), '000b/d	610.0	618.0	629.9	645.6	661.8	678.4
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	10.3	1.3	1.9	2.5	2.5	2.5

e=estimate, f=forecast. Source: EIA, BMI

**South Africa Refining - Production and Consumption, 2017-2022**

Table: South Africa Refining - Production and Consumption	2017f	2018f	2019f	2020f	2021f	2022f
Crude Oil Refining Capacity, '000b/d	875.0	855.0	825.0	807.0	807.0	807.0
Crude Oil Refining Capacity, % change y-o-y	25.9	-2.3	-3.5	-2.2	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	96.4	98.4	100.4	102.5	104.5	106.7
Refined Petroleum Products Production, '000b/d	843.8	841.3	828.4	826.8	843.7	860.9
Refined Petroleum Products Production, % change y-o-y	23.4	-0.3	-1.5	-0.2	2.0	2.0
Refined Products Production (inc ethanol and non-conventional), '000b/d	872.8	871.3	859.4	858.8	876.7	894.9
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	22.6	-0.2	-1.4	-0.1	2.1	2.1
Refined Products Consumption (inc ethanol and non-conventional), '000b/d	695.4	713.7	732.0	750.1	769.0	788.5

South Africa has the second largest crude refining industry in Africa (after Egypt), with a capacity of 515,000b/d in 2011, in addition to a total liquids production capacity from coal and gas of 205,000b/d. Major refiners Sasol and Engen attempted to merge their downstream oil businesses, but the deal was blocked after protests from other market participants. There are state-backed plans to build a 400,000b/d refining complex, known as Project Mthombo. The facility would be located in the Coega Industrial Development Zone near Port Elizabeth, on South Africa's south coast. This could undermine further the restricted profitability of existing refineries, which operators are reluctant to upgrade and expand due to low returns on investment.

**11.11 Industry news:**

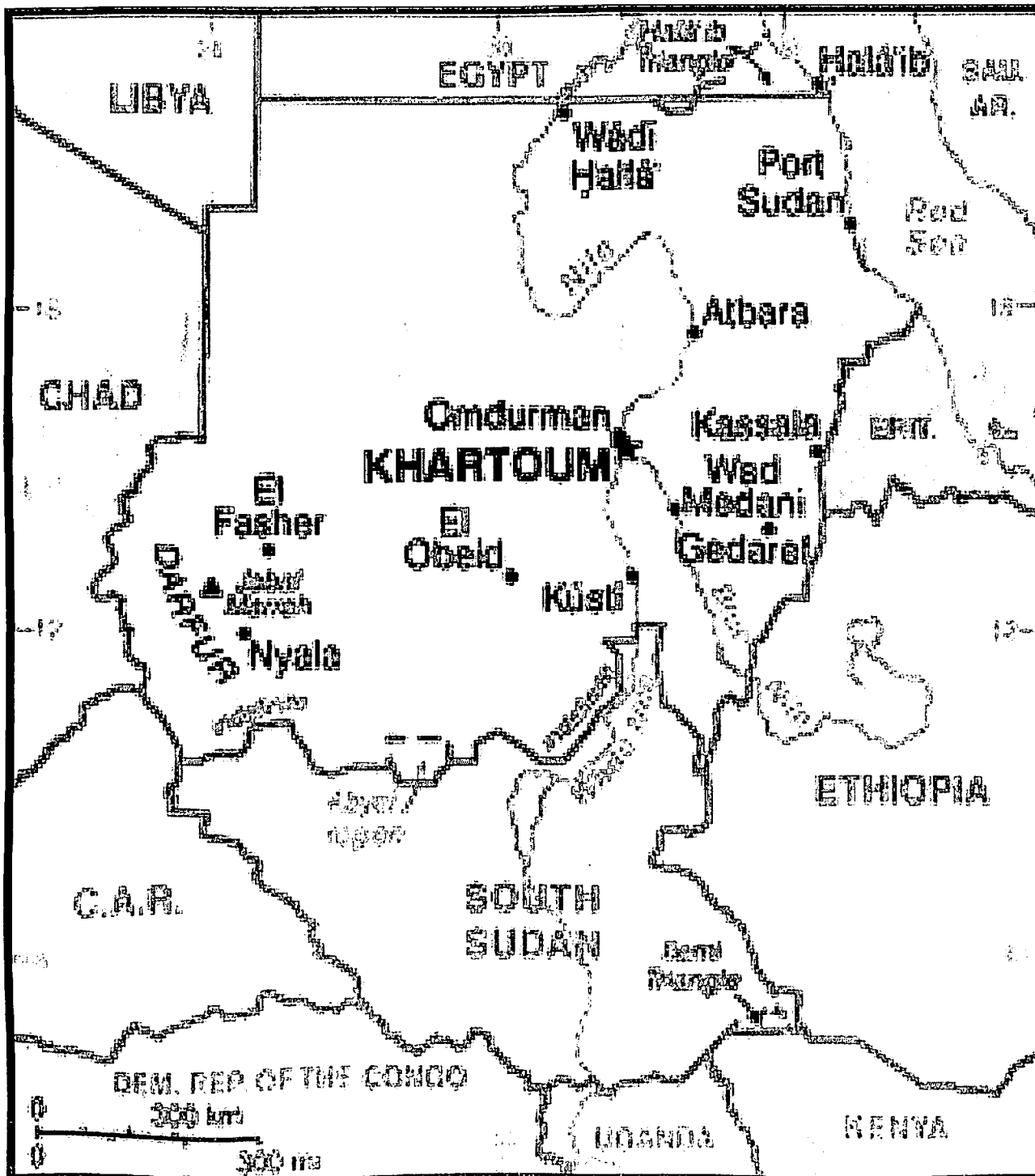
1-Chief executive Nozizwe Nokwe-Macamo endorsed PetroSA's plans to develop a liquefied natural gas (LNG) import terminal in South Africa at an industry event in Johannesburg in April. In December 2012, WorleyParsons was contracted to conduct a feasibility study for the construction of a floating LNG (FLNG) terminal at Mossel Bay. Following the study, a final investment decision (FID) on the US\$400mn project could be made as early as H213. The FLNG terminal would be used to feed the Mossel Bay gas -to-liquids (GTL) plant, with existing reserves previously seen as insufficient to sustain the 45,000 barrel per day (b/d) facility.

2- BMI expect South Africa will continue to require imports to the fuel rising domestic demand.



12 Country:

Sudan



## 12.1 About<sup>60</sup>:

### Geography

Sudan, in northeast Africa, measures about one-fourth the size of the United States. Its neighbors are Chad and the Central African Republic on the west, Egypt and Libya on the north, Ethiopia and Eritrea on the east, and South Sudan, Kenya, Uganda, and Democratic Republic of the Congo on the south. The Red Sea washes about 500 mi of the eastern coast. It is traversed from north to south by the Nile, all of whose great tributaries are partly or entirely within its borders.

### Government

Military government.

### History

What is now northern Sudan was in ancient times the kingdom of Nubia, which came under Egyptian rule after 2600 B.C. An Egyptian and Nubian civilization called Kush flourished until A.D. 350. Missionaries converted the region to Christianity in the 6th century, but an influx of Muslim Arabs, who had already conquered Egypt, eventually controlled the area and replaced Christianity with Islam. During the 1500s a people called the Funj conquered much of Sudan, and several other black African groups settled in the south, including the Dinka, Shilluk, Nuer, and Azande. Egyptians again conquered Sudan in 1874, and after Britain occupied Egypt in 1882, it took over Sudan in 1898, ruling the country in conjunction with Egypt. It was known as the Anglo-Egyptian Sudan between 1898 and 1955.

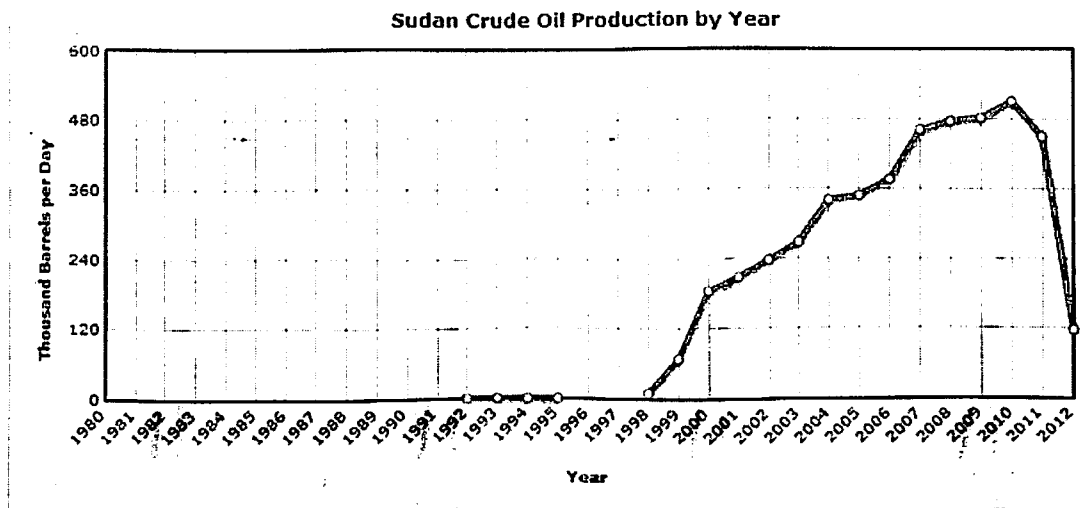
The 20th century saw the growth of Sudanese nationalism, and in 1953 Egypt and Britain granted Sudan self-government. Independence was proclaimed on Jan. 1, 1956. Since independence, Sudan has been ruled by a series of unstable parliamentary governments and military regimes. Under Maj. Gen. Gaafar Mohamed Nimeiri, Sudan instituted fundamentalist Islamic law in 1983. This exacerbated the rift between the Arab north, the seat of the government, and the black African animists and Christians in the south. Differences in language, religion, ethnicity, and political power erupted in an unending civil war between government forces, strongly influenced by the National Islamic Front (NIF) and the southern rebels, whose most influential faction is the Sudan People's Liberation Army (SPLA). Human rights violations, religious persecution, and allegations that Sudan had been a safe haven for terrorists isolated the country from most of the international community. In 1995, the UN imposed sanctions against it.

On Aug. 20, 1998, the United States launched cruise missiles that destroyed a pharmaceutical manufacturing facility in Khartoum which allegedly manufactured chemical weapons. The U.S. contended that the Sudanese factory was financed by Islamic militant Osama bin Laden.

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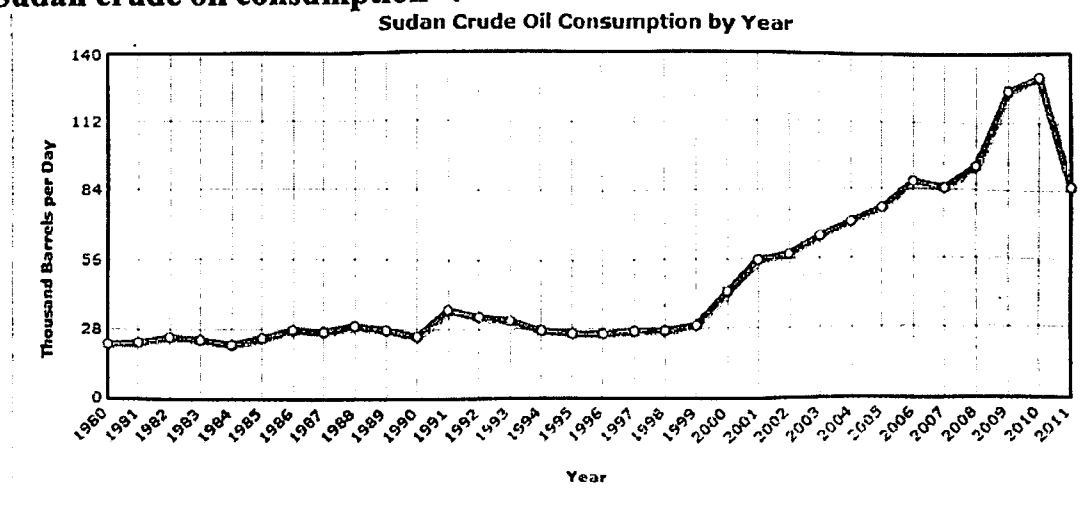
<sup>60</sup> Source: [www.infoplease.com](http://www.infoplease.com)

12.2 Sudan crude oil production<sup>61</sup>:



Source: United States Energy Information Administration

12.3 Sudan crude oil consumption<sup>62</sup>:



Source: United States Energy Information Administration

<sup>61</sup> Source: EIA

<sup>62</sup> Source: EIA

**12.4 Energy scenario of Sudan<sup>63</sup>:**

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	6.509 billion kWh (2009 est.)	4.611 billion kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>108</b>	<b>118</b>	<b>133</b>	<b>136</b>
<b>Crude oil</b>	120,000 bbl/day (2012 est.)	N.A.	370,700 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>48</b>	<b>N.A.</b>	<b>23</b>	<b>124</b>
<b>Refined petroleum products</b>	85,890 bbl/day (2008 est.)	95,450 bbl/day (2011 est.)	14,950 bbl/day (2008 est.)	24,820 bbl/day (2008 est.)
<b>World ranking</b>	<b>78</b>	<b>81</b>	<b>82</b>	<b>94</b>
<b>Natural gas</b>	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>193</b>	<b>196</b>	<b>183</b>	<b>132</b>

<sup>63</sup> Source: CIA world fact book

## 12.5 Market overview: oil and gas

**Oil refineries:** Sudan's three refineries - Al Abeed, Port Sudan and El Gily - have a combined refining capacity of 140,000 barrels per day (b/d), according to company and government data. **South Sudan was expected to build a new 50,000b/d US\$1.8bn refinery in Akon in Warrap State** but there has been little indication of how the project would be funded or when it might come onstream.

<b>Downstream Projects</b>					
<b>Country</b>	<b>Location</b>	<b>Name</b>	<b>Capacity, b/d</b>	<b>Capacity, tpa</b>	<b>Status</b>
Sudan	Red Sea	Port Sudan	21,700	1,244,400	Active
Sudan	Khartoum	El Gily	100,000	4,977,601	Active
Sudan	South Darfur	Abu Jabarah	2,000	99,552	Closed
Sudan	Khartoum	Al Shajarah	10,000	497,760	Closed
Sudan	North Kurdufan	Al Abeed	10,000	746,640	Closed
South Sudan	Melut	Tangrial	10,000	746,640	Planned
South Sudan	Tharjath		10,000	746,640	Proposed
South Sudan	Central Equatoria	Gemeza	100,000	4,977,601	Proposed
South Sudan	Warap State	Akon	50,000	2,488,800	Proposed
South Sudan	Tharjath		100,000	4,977,601	Proposed

**Source: BMI**

12.6 SWOT:

<p style="text-align: center;"><b>Strengths</b></p> <ul style="list-style-type: none"> <li>-Proven oil production and export capacity.</li> <li>-Long- term partners hips with Asian national oil companies (NOCs) and interest from international oil companies (IOCs) in South Sudan.</li> <li>-Well-developed midstream oil infrastructure (Sudan).</li> <li>-Strong refining capacity versus regional peers .</li> </ul>	<p style="text-align: center;"><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>-Weak gas infrastructure.</li> <li>-Continued international sanctions in the case of Sudan.</li> <li>-Border region remains disputed and volatile, and has again reignited to the detriment of the oil sector.</li> <li>-Majority of oil production concentrated in the border area.</li> <li>-Interdependence of Khartoum for oil exports from fields controlled by South Sudan, and dependence of Juba on export pipelines controlled by Khartoum leaves both states vulnerable.</li> </ul>
<p><b>S.W.O.T.</b></p>	
<p style="text-align: center;"><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>-Parts of South Sudan and the offshore Red Sea remain underexplored and could hold sizable hydrocarbon resources.</li> <li>-Restart of production from South and diplomatic agreements could unlock new investments in both Khartoum and Juba's upstream.</li> <li>-South Sudan's continued push for an independent pipeline presents significant midstream opportunities and upside to the reliability of its exports.</li> <li>-Some interest from NOCs and smaller independents in Sudan's upstream, and larger IOCs in South Sudan suggests upside from restart of exploration, although Juba is likely to see the largest benefit.</li> </ul>	<p style="text-align: center;"><b>Threats</b></p> <ul style="list-style-type: none"> <li>-Unsettled jurisdiction along the border and continued tensions among state and non-state actors could disrupt production or exports.</li> <li>-Damaged fields and infrastructure, in addition to the impact of production stoppages on reservoirs could delay both near- and long-term volumes from the south.</li> <li>-Without new exploration, the long-term outlook for South Sudan's oil production is bearish; BMI expect combined output from Juba and Khartoum's fields to increase at average annual rate of just 1% from 2017.</li> <li>-BMI see more downside than upside risk stemming from maturing production from fields in both Sudan and South Sudan.</li> </ul>

## 12.7 Key trends in Sudan's oil and gas sector:

-BMI views that border and security issues could again interrupt the flow of South Sudan's oil to market has played out.

-BMI estimate Sudan and South Sudan will produce 203,000 barrels per day (b/d) in 2013, rising to 402,000b/d in 2014.

-Although Khartoum is targeting ambitious increases in production from fields under its control, we continue to expect output to fall short of stated targets to increase production to 300,000b/d by 2017. Despite the announcement of recent upstream investment pledges totalling US\$1bn and the successful issuance of new licences, upstream activity and production from fields approaching maturity makes such a figure unattainable at present.

- Plans for a pipeline linkage with Kenya remain under consideration and pose long-term upside risk to the country's oil sector. Indeed, recent statements that South Sudan would consider using trucks to bypass the lack of pipelines fail to account for both the country's yawning infrastructure deficit, and the fact that such an option would be unlikely to support the export of significant volumes.

## 12.8 Risks associated in operating in Sudan:

- 1- Ongoing tensions between government and non-government actors.
- 2- Political unrest in the country.

## 12.9 Future projections:

### Oil and gas reserve:

#### Sudan And South Sudan Proven Oil & Gas Reserves And Total Petroleum Data

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	5.0	4.9	4.7	4.6	4.5	4.3
Proven Oil Reserves bbl mn	4,950.0	4,850.0	4,696.3	4,576.5	4,476.9	4,282.6
Proven Oil Reserves % change y-o-y	-1.0	-2.0	-3.2	-2.5	-2.2	-4.3
Reserves to production ratio (RPR), years	29.8	109.9	67.7	30.6	27.8	26.1
Natural Gas Proven Reserves, tcm	0.1	0.1	0.1	0.1	0.1	0.1
Natural Gas Proven Reserves, bcm	85.0	85.0	85.0	85.0	85.0	85.0
Natural Gas Proven Reserves, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Reserve to Production Ratio, years	0.0	0.0	0.0	0.0	0.0	0.0

## Sudan oil and gas production, consumption and exports:

### Sudan And South Sudan Oil Production, Consumption And Net Exports

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	454.5	120.9	190.0	410.0	441.0	449.0
Total Oil Production, mn bbl/year	165.9	44.1	69.4	149.7	161.0	163.9
Total Oil Production, % change y-o-y	-12.1	-73.4	57.1	115.8	7.6	1.8
Total Oil Production, US\$bn	17.8	4.8	7.5	15.6	16.3	16.2
Total Oil Production, US\$bn, % change y-o-y	22.2	-72.9	55.0	107.8	4.5	-0.2
Total Oil Production, US\$bn at US\$50/bbl	8.3	2.2	3.5	7.5	8.0	8.2
Total Oil Production, US\$bn at US\$100/bbl	16.6	4.4	6.9	15.0	16.1	16.4
Total Oil Production, US\$bn at US\$150/bbl	24.9	6.6	10.4	22.4	24.1	24.6
Total Oil Consumption, 000b/d	86.0	75.3	82.8	84.4	86.5	89.1
Total Oil Consumption, % change y-o-y	-34.2	-12.5	10.0	2.0	2.5	3.0
Total Net Oil Exports (crude and products), 000b/d	368.5	45.7	107.2	325.6	354.4	359.9
Total Net Oil Exports (crude and products), % change y-o-y	-4.6	-87.6	134.8	203.6	8.9	1.5
Total Net Oil Exports (crude and products), US\$bn	14.5	1.8	4.2	12.4	13.1	13.0
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	32.6	-87.4	131.6	192.4	5.7	-0.5
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	6.7	0.8	2.0	5.9	6.5	6.6
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	13.5	1.7	3.9	11.9	12.9	13.1
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	20.2	2.5	5.9	17.8	19.4	19.7

## Refining forecast:

### Sudan And South Sudan Refining - Production And Consumption

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	121.7	121.7	121.7	131.7	131.7	131.7
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	8.2	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	77.0	70.0	70.0	72.0	75.0	75.0
Refined Petroleum Products Production, 000b/d	93.7	85.2	85.2	94.8	98.8	98.8
Refined Petroleum Products Production, % change y-o-y	-2.5	-9.1	0.0	11.3	4.2	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	116.7	109.2	110.2	120.8	125.8	126.8
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	-2.0	-6.4	0.9	9.7	4.1	0.8
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	86.0	75.3	82.8	84.4	86.5	89.1
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-34.2	-12.5	10.0	2.0	2.5	3.0

e/f = estimate/forecast. Source: EIA, BMI



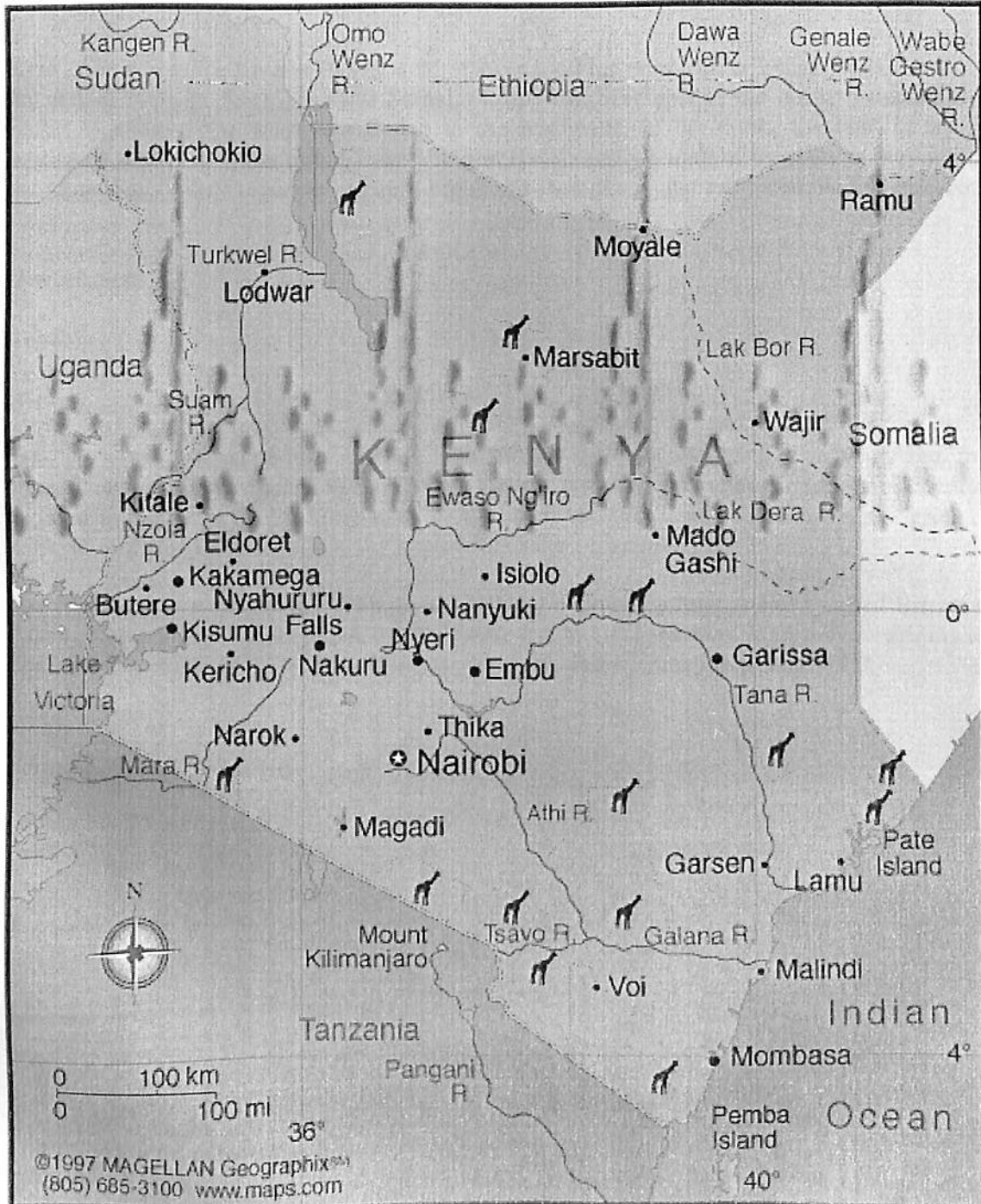
**12.10 Industry news:**

**1-State- owned Turkish Petroleum Corporation (TPAO)** has signed an agreement to jointly undertake oil exploration activities in the western Black Sea with super major **Royal Dutch Shell**. The terms of the agreement stipulate that each company will hold a 50% interest in the venture, with Shell promising investment ranging between US\$150mn and US\$200mn

**2-SOCAR is speeding along plans to build the 214,000b/d Star Refinery in Turkey.** This is a project that will not only help SOCAR secure export markets for Azeri crude in face of rising market obstacles posed by Russian obstruction, but also help boost Turkey's refining capacity so as to reduce the latter's dependence on imports of refined oil products. The Star Refinery has been accounted for in our 10-year forecast of Turkey's refining capacity.

13 Country:

Kenya



## 13.1 About<sup>64</sup>:

### Geography

Kenya lies across the equator in east-central Africa, on the coast of the Indian Ocean. It is twice the size of Nevada. Kenya borders Somalia to the east, Ethiopia to the north, Tanzania to the south, Uganda to the west, and Sudan to the northwest. In the north, the land is arid; the southwest corner is in the fertile Lake Victoria Basin; and a length of the eastern depression of the Great Rift Valley separates western highlands from those that rise from the lowland coastal strip.

### Government

Republic.

### History

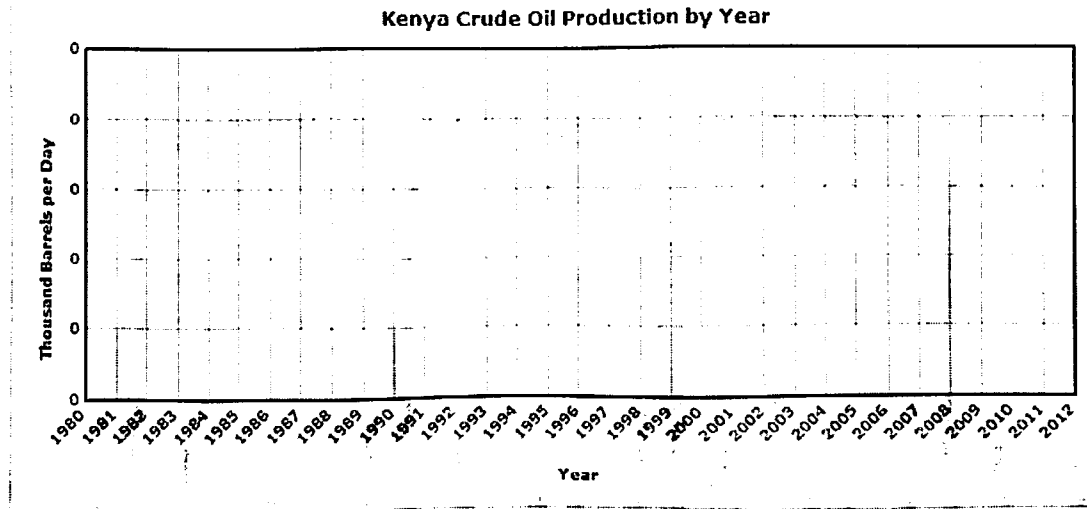
Paleontologists believe people may first have inhabited Kenya about 2 million years ago. In the 700s, Arab seafarers established settlements along the coast, and the Portuguese took control of the area in the early 1500s. More than 40 ethnic groups reside in Kenya. Its largest group, the Kikuyu, migrated to the region at the beginning of the 18th century.

The land became a British protectorate in 1890 and a Crown colony in 1920, called British East Africa. Nationalist stirrings began in the 1940s, and in 1952 the Mau Mau movement, made up of Kikuyu militants, rebelled against the government. The fighting lasted until 1956.

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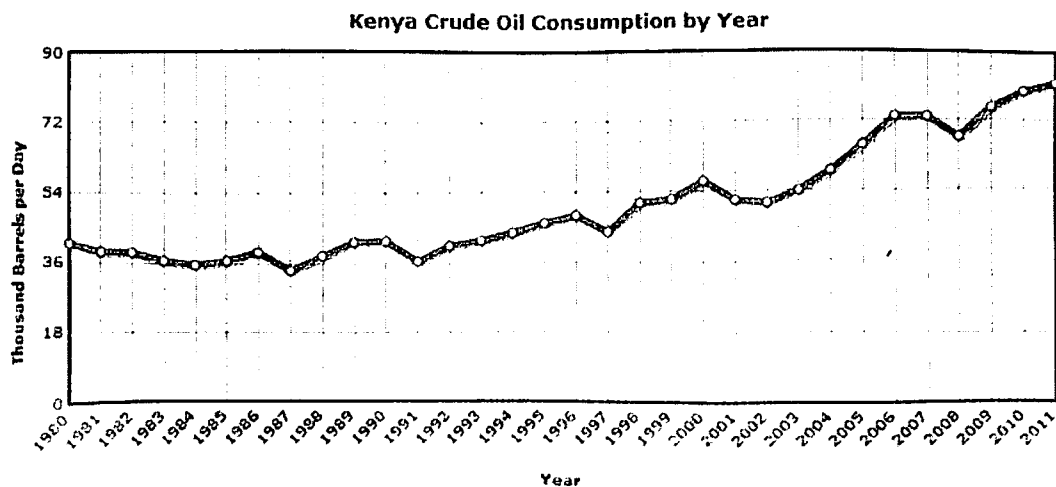
<sup>64</sup> Source: [www.infoplease.com](http://www.infoplease.com)

13.2 Kenya crude oil production by year<sup>65</sup>:



Source: United States Energy Information Administration

13.3 Kenya crude oil consumption per year<sup>66</sup>:



Source: United States Energy information Administration

<sup>65</sup> Source: EIA

<sup>66</sup> Source: EIA

13.4 Energy scenario Kenya<sup>67</sup>:

Electricity	production	consumption	exports	imports
	6.573 billion kWh (2009 est.)	6.573 billion kWh (2009 est.)	27 million kWh (2009 est.)	38 million kWh (2009 est.)
<b>World ranking</b>	<b>106</b>	<b>111</b>	<b>81</b>	<b>101</b>
<b>Crude oil</b>	0 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	32,560 bbl/day (2009 est.)
<b>World ranking</b>	<b>150</b>	<b>N.A.</b>	<b>134</b>	<b>63</b>
<b>Refined petroleum products</b>	30,960 bbl/day (2008 est.)	79,410 bbl/day (2011 est.)	1,065 bbl/day (2008 est.)	34,990 bbl/day (2008 est.)
<b>World ranking</b>	<b>92</b>	<b>88</b>	<b>108</b>	<b>81</b>
<b>Natural gas</b>	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>147</b>	<b>158</b>	<b>125</b>	<b>212</b>

<sup>67</sup> Source: CIA world fact book

**13.5 Kenya oil and gas industry<sup>68</sup>:**

<u>Alpha Logistics</u>	Company in Mombasa, Coast, Kenya
<u>Avana Petroleum Kenya</u>	Company in Kenya
<u>Bahari Resources</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Centric Energy (Kenya) Limited</u>	Organisation in Kenya
<u>Kenya Oil Company Ltd {Kenol}</u>	Listed Company in Nairobi, Nairobi Municipality, Kenya
<u>Kenya Oil Ltd</u>	Listed Company in Nairobi, Nairobi Municipality, Kenya
<u>Total Kenya Ltd</u>	Listed Company in Nairobi, Nairobi Municipality, Kenya
<u>Venture Risk Management</u>	Company in Westlands, Kenya
<u>Agip (Kenya) Ltd</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Chevron Kenya [Caltex Kenya]</u>	Company in Kenya
<u>Engen Kenya Ltd</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>ExxonMobil Kenya [Mobil Oil Kenya]</u>	Company in Kenya
<u>Jovenna (East Africa) Ltd</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Kenya Petroleum Refineries Ltd {KPRL}</u>	Company in Kenya
<u>Ministry of Energy</u>	Government in Kenya
<u>Mobil Oil Kenya</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>National Oil Corporation of Kenya {NOCK}</u>	Parastatal in Nairobi, Nairobi Municipality, Kenya
<u>Palmac Oil Refiners Ltd</u>	Company in Kenya
<u>Petroleum Institute of East Africa {PIEA}</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Primefuels Group</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Shell BP Kenya Ltd</u>	Company in Nairobi, Nairobi Municipality, Kenya
<u>Shell Chemical Company of East Africa Ltd</u>	Company in Kenya
<u>Trifoil Petroleum (K) Ltd</u>	

<sup>68</sup> Source: www.mbendi.com

## 13.6 Market overview: oil and gas

The East African republic of Kenya has no known oil or gas reserves, despite several decades of intermittent exploration. Although Australia continues the search off Kenya's shore, Kenya currently imports all crude petroleum requirements. The Kenyan government is encouraging foreign interest in oil exploration and there is a modest upstream oil industry. It is endowed with other energy sources including wood fuel, coal, solar and wind power, much of which is untapped. The country's commercial energy needs are supplied by electricity, coal, fuel wood and oil-derived products.

Petroleum is Kenya's major source of commercial energy and has, over the years, accounted for about 80% of the country's commercial energy requirements. Demand for oil in Kenya is quite small due to the country's underdeveloped economy, which is heavily dependent on labour intensive and rain-fed agriculture systems. The domestic demand for various petroleum fuels on average stands at 2.5 million tons per year, all of it imported from the Gulf region, either as crude oil for processing at the Kenya Petroleum Refineries Limited or as refined petroleum products.

Since liberalization, many new companies have been licensed by the government to engage in petroleum trading, especially import and export, wholesale and retail of petroleum products. However, despite this initiative, only about ten new entrants are actively trading with a market presence of less than 10% of the market share due to tariff and non-tariff barriers to entry.

**The Kenya Petroleum Refineries Limited, Kenya Pipeline Company Limited, National Oil Corporation of Kenya and Kenya Railways Corporation represent the government's presence in the petroleum industry.** The Kenya Petroleum Refineries Limited is owned on a 50:50 equity holding between the government and three shippers, namely, Shell, British Petroleum and Caltex. The Kenya Pipeline Company Limited, Kenya Railways Corporation and private transporters are involved in transportation of petroleum products from Mombasa to other parts of the country and neighbouring countries.

National Oil Corporation of Kenya Limited was incorporated in 1981 and the company's main objective then was to coordinate oil exploration (upstream) activities. In 1988 the company was mandated on behalf of the government to supply 30% of the country's crude oil requirements that would in turn be sold to oil marketing companies for refining and onward sale to consumers.

### Upstream

In July 2000, the Petroleum Institute of East Africa was launched with the aim of promoting all areas of the oil sector in East Africa. In 1997, the East African Community (EAC) (dissolved in 1977 due to political differences) was revived to create a partnership between Kenya, Uganda

and Tanzania. The aims of the EAC are, inter alia, to promote investment codes by protecting property and rights, and properly regulating the private sector.

To date, there has been no evidence of exploitable petroleum reserves in Kenya although limited exploration has taken place over the last forty years. Only 30 wells have been drilled however. The Kenyan government has spent in the region of US\$ 1.6 million on oil exploration and is increasing its attempts to attract investors to the oil exploration industry.

The National Oil Company of Kenya (NOCK) has made 17 blocks available for petroleum rights negotiations. The blocks are in the East African Rift System, the Anza Graben, the Mandera Basin, and the Lamu Embayment. The blocks are mainly onshore with the exception of the Southern Lamu Embayment which offers both onshore and offshore blocks.

Kenya has no production as no commercial oil discoveries have been made.

#### **Downstream - Oil Refining**

KPRL refinery in Mombassa is a topping and reforming refinery with a design capacity of 4 million mt/yr (80,000 bpd). It has a reformer and a catalytic hydrotreater, but otherwise has no upgrading units. Complex I was commissioned in 1963, Complex II in 1974. Since 1974 the Refinery configuration has remained essentially unchanged.

KPRL is owned by the Kenyan Government (50%), Caltex (15.77%), BP (17.11%), and Shell (17.11%). The refinery supplies refined products to the Kenyan market, Uganda and Northern Tanzania.

KPRL is the only refinery in Sub Saharan Africa that has always operated on a processing fee basis. Neither the crude oil nor the products are owned by KPRL. Until the end of 1994 the refinery was protected by an agreement, the "White Oil Rule", between the Government of Kenya and the shareholders whereby all marketers in Kenya ("Users") were obliged to process sufficient crude to meet the White Oil (LPG, Gasoline, Kerosene, Gas Oil) demand of the Kenyan market. Under the White Oil Rule KPRL Fuel Oil production was always greater than Kenyan demand, resulting in the users exporting the surplus Fuel Oil. This was economically unattractive, and over the years cost the Kenyan economy millions of dollars.

Following deregulation of the oil sector in 1994, the White Oil Rule was replaced by an agreement, (the "1995 Agreement"), between KPRL and its Users whereby the Users undertook to process sufficient crude oil to meet the Kenyan demand for fuel oil and LPG. This reduced the refinery intake of crude oil to a base load level of 1.6m tonnes per annum, which was sufficient to meet the inland fuel oil demand. Under the 1995 Agreement the processing fee was reduced to recover fixed and variable costs, and a small contribution to capital expenditure for continued operation. Some measure of protection has been afforded to the refinery by the imposition of an import tariff on gasoline and residual fuel oils.

Since 1994 the refinery has been running at around 40% of capacity (1.6 million mt/yr) that produces about 28,000 mt/yr LPG. The LPG production is viewed as strategically important. Due



to the lack of bulk handling facilities in Mombassa port there are severe limits on the amount that can be imported, and this has been a reason for rejecting proposals to close the refinery.

The refinery suffers from utility supply failures, and is limited to small 50,000mt crude cargoes because of discharge limitations.

The refinery has been under constant threat of closure since 1994 due to the shareholders unwillingness to invest, and the marketers' processing losses. The pressure to convert to unleaded mogas, and to lower the very high sulphur level in the diesel (around 7000ppm), has increased the threat of closure. Since the change of government in 2003 new studies have been commissioned, and the results are awaited.

### 13.7 Industry news:

1-Tullow's share price saw big gains following reports that recent discoveries in Kenya may indeed be commercial. The news was welcome for both Tullow and for Kenya's efforts to become a producer of oil. BMI maintain our view that Kenya could well outperform other frontier plays should exploration confirm the country is capable of significant commercial production. While BMI continue to watch regulatory developments with caution, we believe the latest news will only reinforce the excitement surrounding Kenya's prospects with a possible licensing round to come before end Q113.

2- FAR Energy completed 3D Seismic Surveys over its Kenyan and Senegalese offshore licenses in February. It unveiled promising results and estimated there are potentially 7bn barrels of oil in place. We believe that this development supports growing interest in East African oil exploration. In the future, we could see this trend strengthen and possibly extend to southern countries such as Tanzania and Mozambique, which thus far have been praised mostly for their gas potential. FAR Energy showcased promising results from its 3D seismic surveys offshore Kenya and Senegal. The company announced that potential oil in place over the two licenses could reach 7bn barrels (bbl).

3- **A recent IMF report reiterates local confidence that oil production in Kenya can begin before the end of the decade.** While recent exploration offers support to this case, the outlook for oil remains uncertain as with key questions about resources and regulations yet to be determine.

### 14. Country:

### Nigeria



## 14.1 About<sup>69</sup>:

### Geography

Nigeria, one-third larger than Texas and the most populous country in Africa, is situated on the Gulf of Guinea in West Africa. Its neighbors are Benin, Niger, Cameroon, and Chad. The lower course of the Niger River flows south through the western part of the country into the Gulf of Guinea. Swamps and mangrove forests border the southern coast; inland are hardwood forests.

### Government

Multiparty government transitioning from military to civilian rule.

### History

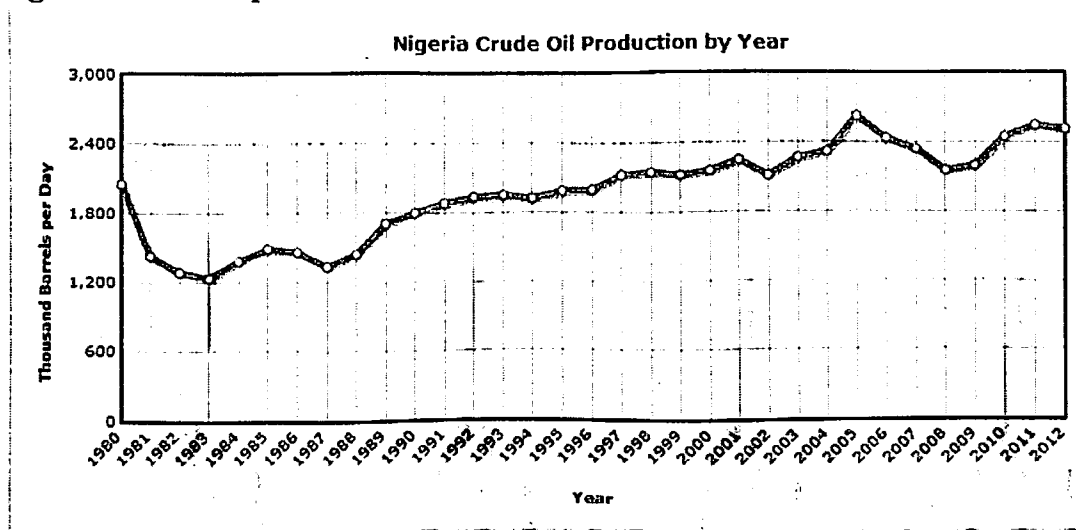
The first inhabitants of what is now Nigeria were thought to have been the Nok people (500 BC –c. AD 200). The Kanuri, Hausa, and Fulani peoples subsequently migrated there. Islam was introduced in the 13th century, and the empire of Kanem controlled the area from the end of the 11th century to the 14th.

The Fulani empire ruled the region from the beginning of the 19th century until the British annexed Lagos in 1851 and seized control of the rest of the region by 1886. It formally became the Colony and Protectorate of Nigeria in 1914. During World War I, native troops of the West African frontier force joined with French forces to defeat the German garrison in Cameroon.

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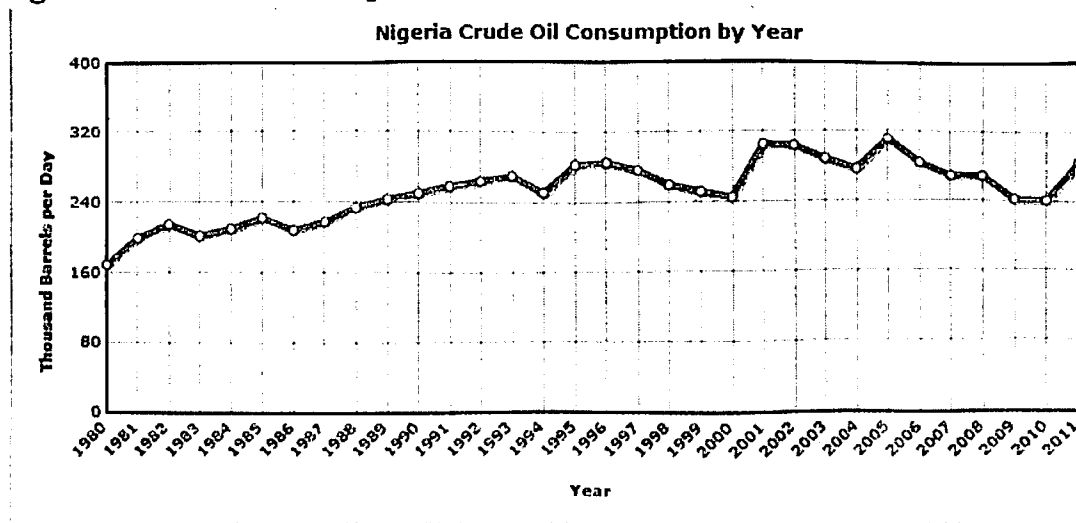
<sup>69</sup> Source: [www.infoplease.com](http://www.infoplease.com)

**14.2 Nigeria crude oil production<sup>70</sup>:**



Source: United States Energy Information Administration

**14.3 Nigeria crude oil consumption<sup>71</sup>:**



Source: United States Energy Information Administration

<sup>70</sup> Source: EIA

<sup>71</sup> Source: EIA

**14.4 Nigeria energy scenario<sup>72</sup>:**

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	18.82 billion kWh (2009 est.)	17.66 billion kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2010 est.)
<b>World ranking</b>	<b>75</b>	<b>71</b>	<b>112</b>	<b>115</b>
<b>Crude oil</b>	2.525 million bbl/day (2011 est.)	N.A.	2.051 million bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>13</b>	<b>N.A.</b>	<b>6</b>	<b>108</b>
<b>Refined petroleum products</b>	102,100 bbl/day (2008 est.)	271,600 bbl/day (2011 est.)	15,470 bbl/day (2008 est.)	133,400 bbl/day (2008 est.)
<b>World ranking</b>	<b>76</b>	<b>47</b>	<b>79</b>	<b>42</b>
<b>Natural gas</b>	29 billion cu m (2010 est.)	4.97 billion cu m (2010 est.)	24.02 billion cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>30</b>	<b>61</b>	<b>15</b>	<b>107</b>

<sup>72</sup> Source: CIA world fact book

#### 14.5 Nigeria oil and gas directory<sup>73</sup>:

**Exploration & Production, Multinationals:** ADDAX PETROLEUM EXPLORATION, AGIP ENERGY & NATURAL RESOURCES, BRASS EXPLORATION, CHEVRON CNL, CHEVRON PETROLEUM, CONOCO ENERGY, CONOCO PETROLEUM, ELF PETROLEUM NIGERIA (EPNL), ESSO EXPLORATION & PRODUCTION EEPNL, HARDY OIL, MOBIL PRODUCING, NEXEN PETROLEUM, NIGERIAN AGIP EXPLORATION (NAE), NIGERIAN AGIP OIL (NAOC), PETROLEO BRASILEIRO BRASPETRO, PHILLIPS OIL COMPANY, SHELL NIGERIA EXPLORATION & PRODUCTION (SNEPCO), SHELL PETROLEUM DEVELOPMENT COMPANY OF NIGERIA SPDC, STAR DEEP WATER PETROLEUM, STATOIL, SYNTROLEUM, TEXACO NIGERIA OUTER SHELF, TEXACO OVERSEAS (NIGERIA) PETROLEUM (TOPCON), TOTAL UPSTREAM.

**Exploration & Production, Local Companies :** AFREN ENERGY RESOURCES, ALFRED JAMES PETROLEUM, ALLIED ENERGY RESOURCES, AMALGAMATED OIL, AMNI INTERNATIONAL PETROLEUM DEVELOPMENT, ATLAS ORANTO PETROLEUM OIL, CAMAC, CONOIL PRODUCING, DUBRI OIL, EQUATOR EXPLORATION, EXPRESS PETROLEUM & GAS, FAMFA OIL, MIDLANTIC INTERNATIONAL, MILLENIUM OIL & GAS COMPANY (MOGCL), MONI PULO, NEW NIGERIA DEVELOPMENT (NNDC), NIGER DELTA PETROLEUM RESOURCES NIGERIAN PETROLEUM DEVELOPMENT (NPDC), NOREAST PETROLEUM, OILWORLD, OPTIMUM PETROLEUM DEV., ORIENTAL ENERGY RESOURCES, PAN OCEAN OIL CORP., SAHARA ENERGY FIELDS, SOLGAS PETROLEUM, SOUTH ATLANTIC PETROLEUM (SAPETRO), SUMMIT OIL, SUNLINK PETROLEUM, YINKA FOLAWIYO PETROLEUM

**EPCI Contractors:** ABB LUMMUS GLOBAL, ADAMAC INDUSTRIES, AMEC NATURAL RESOURCES, B+B OIL & GAS (BILFINGER + BERGER), BROWN & ROOT ENERGY, CHIYODA, CHROME OIL SERVICES, COMERINT, DAEWOO, DELATTRE BEZONS (DBN), EIFFEL, FOSTER WHEELER, FUNG TAI ENGINEERING, GLOBAL PIPELINES PLUS / GLOBAL OFFSHORE INTERNATIONAL GLOBESTAR ENGINEERING (ACERGY), GRINAKE-LTA CONSTRUCTION, HORIZON OFFSHORE, HYUNDAI (HYUNDAI HEAVY INDUSTRIES, HHI), IPCO, JGC, J. RAY CDERMOTT, LEIRVIK MODULE TECHNOLOGY, NIGERDOCK, PLS NACAP, PONTICELLI, SAIBOS SERVICES, SAIPEM, SDEM ERECTORS, SEA TRUCKS, OFFCON, SNC LAVALIN, SUBSEA, TECHNIP, TRANSCOASTA, T.S.K.J.

<sup>73</sup> Source: [www.africa-oil-gas.com](http://www.africa-oil-gas.com)

**Fabrication Subcontractors:** ADNAN MANSOOR, ALCON, AMBER RESOURCES, ASCOT FABRICATORS & CONSTRUCTORS, DENCA SERVICES, DELCON ENGINEERING, ENERWORKS OFFSHORE, FLABOD, FREZONE PLANT FABRICATION, GALBA, GANI INTERNATIONAL, GIBRALTAR CONSTRUCTION, HORCHI CONSTRUCTION, INERFIELD GLOBAL, LAD FLUID CONTROLS, MAZIN ENGINEERING, NEW OILFIELD AND ALLIED SERVICES, NIBOC ENGINEERING, NIDRO OIL & GAS, OILSERV, OZIMOX, PIVOT, GIS, PROFAB, PROJECT MASTERS PMNL, RENCO, SNIG, SUFFOLK ENGINEERING AND CONSTRUCTION, WK CONSTRUCTION.

**Mechanical Engineering, Equipment Supplies, Workshops, Procurement, Local Companies:** 3T WORLDWIDE QRI, ACM OF NIGERIA, AFTRAC, AIKON ENGINEERING, ALI-REZI, ANATRADE, ANCHOR-MARIC, ANDI MADU INTERNATIONAL, ARCO PETROCHEMICAL ENGINEERING, ARKLEEN OIL & GAS, BAYWOOD CONTINENTAL, BEKOOL & ASSOCIATES, BOZMAG INVESTMENT, BUSSDOR & CO., CHIOMA PRODUCTIONS, DAMAGIX, DEBYL, DE COON SERVICES, DE-LIGHT, DUPRE' INTERNATIONAL, DYNAMICS INFRASTRUCTURE, EARTHRO PETROLEUM, EL-MICHELLE, EMKOL OIL, ENERGY EQUIPMENT AND SERVICES (EES), EXECUTIVE SERVICES, FAIRSHORES, FIDDIL, FUTURE CONCERNS, GENPACO, GLOBAL ENERGY, GREPHIL INTERNATIONAL, HALDEN, INTERGLOBAL SERVICES, INTRALOG, JANDL OIL & GAS, JKPEEZ IMPEX / FACTORY ASSOCIATES AND EXPORTERS, KATCHEY COMPANY, LYNDON, MATRIX PETRO-CHEM, NEGRIS, NIGERIAN FOUNDRIES NFL, NIGERIAN ROPES, NORTHERN CABLE PROCESSING & MANUFACTURING NOCACO, OCEANEE INTEGRATED SERVICES OIS, PAN AFRICAN INTERNATIONAL, PETROCOM SERVICES, PROFLUID OIL FIELD, PROTECTIVE COATING NIGERIA DISTRIBUTORS, REBOLD INTERNATIONAL, ROTARY ENGINEERING, SLOT ENGINEERING, SPECIAL PIPING MATERIALS, SPECIALTY DRILLING FLUIDS SDFL, STANTECH, STARCHEM, TRIPLE ACE ENERGY SERVICES, UBINIINDUSTRIA, VIGEO, WESCO ENGINEERING, WIN INVESTMENT, WISS ENGINEERING.

**Base Logistics, Life Camp Management:** BRAWAL SHIPPING, INTELS (INTEL SERVICES), LADOL, LAGOS DEEP OFFSHORE LOGISTICS BASE, NEPTUNE MARITIME, PRODECO (PROPERTY DEVELOPMENT COMPANY), SNAKE ISLAND INTEGRATED FREE ZONE.

**Diving, Underwater Engineering:** ABERPORT MARINE SERVICES, HYDRODIVE, REACH ENGINEERING & DIVING SERVICES, SEAWELD ENGINEERING, SOLUS SCHALL (OCEANEERING), STOLT COMEX SEAWAY, UNDERWATER ENGINEERING COMPANY

**FPSO & Buoys Builders, operators:** BERGESEN WORLDWIDE (BW OFFSHORE), BLUEWATER OFFSHORE PRODUCTION SYSTEMS, FRED. OLSEN PRODUCTION FOPWAL, NIGERDOCK, SBM SERVICES.

**Aviation & Helicopter Services :** AERO CONTRACTORS CO. OF NIGERIA, BRISTOW HELICOPTERS, CAVERTON HELICOPTERS, PAN AFRICAN AIRLINES.

**Dredging Services:** B & Q DREDGING, DREDGING INTERNATIONAL SERVICE, NIGERIAN WESTMINSTER DREDGING & MARINE, PELFACO, VAN OORD NIGERIA (formerly BALLAST HAM NIGERIA).

**Government, Associations:** DEPARTMENT OF PETROLEUM RESOURCES DPR, NATIONAL PETROLEUM INVESTMENT MANAGEMENT SERVICES NAPIMS, NIGERIAN ASSOCIATION OF PETROLEUM EXPLORATIONISTS NAPE, NIGERIAN NATIONAL PETROLEUM CORPORATION NNPC, PETAN (PETROLEUM TECHNOLOGY ASSOCIATION OF NIGERIA).

**Engineering, Design, FEED:** ANKOR POINTE INTEGRATED, ARIOSH, BAKLANG GROUP, BROADVIEW ENGINEERING, CAKASA, CHESTERMEAD ASSOCIATES, CRESTVILLE ENGINEERING TECHNICAL CET, DELTA AFRIK ENGINEERING (DELTATEK / WORLEY PARSONS), DORMAN LONG ENGINEERING, DOVER ENGINEERING, ENERECO, EPIC ATLANTIC, EUROFLOW DESIGNS, FIELD OFFSHORE DESIGN ENGINEERING (FODE) / GENESIS - ILF ENGINEERS, INOG OIL & GAS SERVICES, LINKSO, LONADEK, MILLFIELD PROJECTS, MORPOL INDUSTRIAL CORP., MOSUNMOLU, MOTTMACDONALD ENGINEERING, NATIONAL ENGINEERING & TECHNICAL NETCO, NESTOIL, NETCO DIETSMANN, NEXANT, OZONO ENGINEERING, PARAGON, INTRALOG ENGINEERING, PENSPEN, PETROFAC, POINT ENGINEERING, PROSOL, SUNATECH INTERNATIONAL .

**Supply vessels, crew boats, thugs, barges, houseboats operators:** BOURBON INTEROIL, CHEVY MARINE, DIESEL POWER, DOLPHIN OFFSHORE, EDDA SUPPLY SHIPS, EDISON CHOUEST OFFSHORE, EXECON HOLDINGS, JAPPAUL OIL & MARITIME, JASON OILFIELD VENTURES, LAMNALCO, MAERSK SUPPLY SERVICES, NIGER, BENUE TRANSPORT NBTC, SEABULK OFFSHORE, OPERATORS, SEA TRUCKS, SHORELINE LIFTBOATS, SMIT -TIDEX, UNITOP INTERNATIONAL, WALVIS, WEST AFRICAN VENTURES, WEST AFRICA OFFSHORE SEACOR CKOR, WOODLAND, WORKSHIPS AFRICA.

**Electrical Engineering, Power Generation, Instrumentation:** ABB LIMITED, ABB ELECTRICAL SYSTEMS, AABOG INTERNATIONAL, ABB POWER LINES, AES NIGERIA BARGE, AGGREKO PROJECTS LTD., ALSTOM, CLEMESSY, CUMMINS WEST AFRICA / LEVENTIS POWER SYSTEMS, ETCO, F.S. AUTOMATION / FESTO, GTMH INEO, JMG, JUBAILI BROS ENGINEERING, KEMTECH ENGINEERING, MAKON



ENGINEERING & TECHNICAL, MANNCHYKE ELECTRO-TECHNICAL (LEWA) – MIKANO, OIL & INDUSTRIAL SERVICES, PARADIGM SERVICES, PPC (formerly PHILIPS PROJECT CENTRE), PROSERVE TECHNOLOGY, SCHNEIDER ELECTRIC, SIEMENS, SUDELETTRA, TRINDEL, WECO ENGINEERING & CONTRACTING, WELTEK, YALE CONTROLS.

**Catering Services:** COURDEAU, NIGERIAN CATERERS & SUPERMARKETS, UNIVERSAL SODEXHO, WEST AFRICA CATERING, WHASSAN EUREST.

**Inspection Services :** BUREAU VERITAS, COTECNA DESTINATION INSPECTION, DNV, MARINE TECHNICAL SERVICES INTERNATIONAL TSI, MOODY INTERNATIONAL, SAYBOLT, SGS INSPECTION SERVICES.

**Construction, Civil Engineering:** AKENNETH PILING FOUNDATIONS, BOUYGUES, C & C CONSTRUCTION (CHAGOURY GROUP), CAPPÀ & D'ALBERTO, DUMEZ DUKIN, EARTH MOVING INTERNATIONAL, FOUGEROLLE NIGERIA, G. CAPPÀ, HAMMAKOPP CONSORTIUM, JAGAL NIGERIA, JAM SERVICES COMPANY, JULIUS BERGER NIGERIA PLC., P.W. RESOURCES (formerly M.F. KENT), SALINI, SPIE BATIGNOLLES, TECHINT CIMIMONTUBI, TREVI FOUNDATIONS, ZAKHEM CONSTRUCTION.

**Painting, Scaffolding, Thermal Insulation, HVAC :** AMBER RESOURCES, C.S.A. SOUTHEY, H.I.S. ENGINEERING, I.P.E.S. (PREZIOSO), PROFIELD (LASSARAT), WILLICH NIGERIA.

**Refining & Petrochemicals :** ELEME PETROCHEMICAL (EPCL), KADUNA REFINERY & PETROCHEMICALS (KRPC), PORT HARCOURT REFINING (PHRC), WARRI REFINING & PETROCHEMICALS (WRPC).

**Gas Liquefaction, Marketing & Distribution:** AIR LIQUIDE, BOC GASES, BRASS LNG, NIGERIA LIQUEFIED NATURAL GAS (NLNG), NIGERIAN GAS (NGC), SHELL NIGERIA GAS.

**Trading, Lifting, Bunkering of Crude Oil and Petroleum Products, Tanker, Vessels Brokers:** ADDAX, AFRICAN OIL & GAS CARRIERS, BONNY GAS TRANSPORT (BGT), CAVERTON MARINE, FAIRWAY OFFSHORE, J.C.B., MARCA INTERNATIONAL, MECCO & MARINE HOLDING, MORLAP SHIPPING, OIL & MARITIME SERVICES, SAHARA ENERGY, SEA PETROLEUM & GAS SPG, TACOMA TRADING COMPANY.

**Tubulars & Pipe Inspection, Pigging, Coating:** AMOSCO, BELL OIL & GAS, B.G. TECHNICAL, BJ SERVICES, BREDERO SHAW GLOBAL, DRILLOG PETRO-DYNAMICS, HYDRIL AFRICA / TDPS, INSPECTION AND TESTS, JUVA-OIL SERVICES, LATEEJAY (OIL & GAS), PIPELINE PIGGING PRODUCTS & ACCESSORIES, PRESSURE CONTROL SYSTEMS, REMM OIL SERVICES, SOCOTHERM, TYPHA CENIA.

**Agents, Representatives, Consultants, Local companies:** ABNL, ANCHOR OIL & GAS SERVICES, ARIES, BIZFACTORS, CONTRACO, CRYSTALVIEW PETROLEUM CONSULTING, DEEP OFFSHORE SYSTEMS (WEST AFRICA), DEVIN ASSOCIATES, DEXTRON, ENADS, FALCON PETROLEUM, INTERNATIONAL ENERGY SERVICES (IES), JOSCAN, LINK RESOURCES, MULTINATIONAL CRAIG ENERGY SERVICES (MCES), MULTINATIONAL TECHNOLOGIES, NEXUS ALLIANCE, OIL & GAS SUPPORT SYSTEMS, OSUNO PETROLEUM CONSULTANCY, OWEL-LINKSO GROUP, PRIME ENERGY RESOURCES, Q.E.D. INTERNATIONAL, SEALAND OILFIELD SERVICES, WEAM AND COMPANY.

**Logistics, Transportation, Shipping, Clearing and forwarding:** AIR SEA FREIGHTERS, BASLE LINE, BRAWAL SHIPPING, BULKSHIP, BURNSVILLE INTEGRATED SERVICES, COMPAGNIE GENERALE DE LOGISTIQUE CGL, EXEL, GULF AGENCY AND SHIPPING GAC, GULFLINK, IDEKE SHIPPING, INTERNATIONAL MAINTENANCE & LOGISTIC SERVICES IMALOG, JOE-EBOJE INTERNATIONAL AGENCIES, MBONNY TECHNICAL SERVICES, MURPHY SHIPPING & COMMERCIAL SERVICES, OAN (OVERSEAS AGENCY NIGERIA), PANALPINA WORLD TRANSPORT, RED TRANSPORT, SDV, WEST AFRICA CONTAINER TERMINAL, WORLDWIDE ENERGY LOGISTICS LTD.

**Environmental, Waste Management, Remediation Services:** ALBA, ATLANTIC WASTE MANAGEMENT, AUGIAS ENVIRONMENTAL & CONSULTING SERVICES, BIOGEOCHEM ASSOCIATES, BOSKEL, CHIFY, CKS ENVIRONMENTAL, DELTA ENVIRONMENTAL LOGISTICS, DUBI, EHARIME, ELP INTEGRATED SERVICES, ENVIRONQUEST, FUGRO CONSULTANTS (PRODEC FUGRO), GEOCARE TECHNOLOGIES, GEO-GROUP, GLOBAL ENVIRONMENTAL TECHNOLOGY INTERNATIONAL TOOL & SUPPLY NIGERIA (ITS), NAUTILUS NIGERIA ENGINEERING AND CONSTRUCTION (NNEC), REID CROWTHER, TITAN PROJECTS, TRIPLE 'E' SYSTEMS ASSOCIATES, ZITADEL.

**Equipment & tools Supplies, Workshops, OCTG Stockists, Multinationals:** AFRICA OILFIELD SERVICES (AOS), CAMERON OFFSHORE SYSTEMS, C. WOERMANN, DRESSER FLOW SOLUTIONS / DRESSER FLOW CONTROLS, DRESSER-RAND - DRIL-QUIP, EQUIPMENT & CONTROLS AFRICA, FMC INTERNATIONAL / FMC TECHNOLOGIES, GENERAL ELECTRIC NP GENP, HALLIBURTON ENERGY SERVICES, LBD INTERNATIONAL, MCJUNKIN, MULTIVALVE TECHNOLOGY MVT, N.D.C.C. (DYNAMITE NOBEL), PLANTGERIA, SCOA PETROLEUM SERVICES, SMITH INTERNATIONAL, SNL SALES & SERVICES (SWAGELOK), SOFITAM (CFAO/TOKHEIM), SOLAR TURBINES SERVICES, SWIFT NIGERIA, TENARIS GLOBAL SERVICES, TITAN TUBULARS, UNISTOCKISTS, VETCO GRAY, WASCO OIL

SERVICES, WAYNE (WEST AFRICA), WEATHERFORD, WESCO, WEST AFRICAN OILFIELD SERVICES (WAOS), WEST AFRICAN ROPES .

**Training Services:** BOWEN & BROWN, M&O BLISSTON, OPEANS, PPI TECHNOLOGY SERVICES (PPS PPI).

**HSE, QA/QC, QMS Services:** ARTS IN SCIENCE, TEMEC, TRICONTINENTAL OIL SERVICES.

**Naval Yards, Shipyards:** CONTINENTAL SHIPYARD (CSL), EPENAL BOAT BUILDERS, NAVAL DOCKYARD, Q. BOATS, STARZS MARINE & ENGINEERING, STEELWAYS, STROKE OIL SERVICES, WEST AFRICAN DRYDOCKS, WEST ATLANTIC SHIPYARD.

**Risk Assessment, Security Services :** ARMORGROUP , CONTROL RISKS SERVICES WEST AFRICA.

**Telecom, IT Services:** BRISCOE TELECOM , RADIAL CIRCLE TELECOMMUNICATIONS, SCHLUMBERGER DOWELL.

## 14.6 Market overview: oil and gas

**Oil refineries:** According to NNPC data, the country's four state-owned oil refineries have a combined nameplate capacity of 505,000b/d. Two of the plants, both in Port Harcourt, are run as a single unit but are counted separately by NNPC. Despite capacity being theoretically well ahead of domestic consumption, problems including sabotage, fire, poor management and lack of regular maintenance contribute to output of regularly less than 300,000b/d and most are often nearer 100,000b/d. Official data from the NNPC shows that the country's average utilization rate for the last 10 years was around 27% with a peak of 47.55% reached in 2002 and a low of 5% in 2007(although EIA data suggests it was closer to 21% in 2007).

**Table: Refineries in Nigeria**

Refinery	Capacity (b/d)	Owner (Contractor)	Completed	Details
New Port Harcourt	210,000	NNPC	1988	Joint facility with OPH
Warri	125,000	NNPC	1978	na
Kaduna	110,000	NNPC	1980	Acquired in 1975
Old Port Harcourt	60,000	NNPC	1965	Joint facility with NPH
Ahaoda East	1,000	Niger Delta Petroleum Resources (NDPR)	2011	Mini-diesel refinery
<b>Total Capacity</b>	<b>505,000</b>			
<b>Proposed Additional Capacity</b>				
Lekki	300,000	CSCEC, NNPC	2014	Announced in 2010
Zamfara	200,000	NNPC, State	na	na
na	180,000	ONGC, Mittal	na	na
Lamaka	30,000	(Lohrmann Group)	2011	Transported from Cyprus
Brass	na	CSCEC, NNPC	2014	Announced in 2010
Lokoja	na	CSCEC, NNPC	2014	Announced in 2010
<b>Total Additions</b>	<b>710,000</b>			

na = not available/applicable. Source: BMI, Company Data

**Zamfara Refinery (Proposed):** Nigeria's Zamfara State is planning to build a 200,000b/d refinery that would reduce northern Nigeria's dependence on oil products transported from the south and centre of the country.

**Ogun State Refinery (Proposed):** Private German second-hand infrastructure dealer Lohrmann Group reportedly plans to transport a mothballed 30,000b/d refinery from Cyprus to Nigeria.

**Lekki, Brass And Lokoja Projects (Proposed):** Under an MoU signed on May 13 2010 between Chinese investors and NNPC, three refineries and one petrochemicals complex will be built in Nigeria. The refineries will be located in Lekki (Lagos state), Brass (Bayelsa state) and Lokoja (Kogi state). In an announcement made at the time, NNPC managing director Shehu Ladan said that the three refineries would save Nigeria US\$10bn in fuel import costs and would allow the country to start exporting refined products. According to Ladan, the construction start

date will be determined by the speed at which the loans are raised by the Chinese partners. Media reports at the time suggested that the refineries would be completed by 2015.

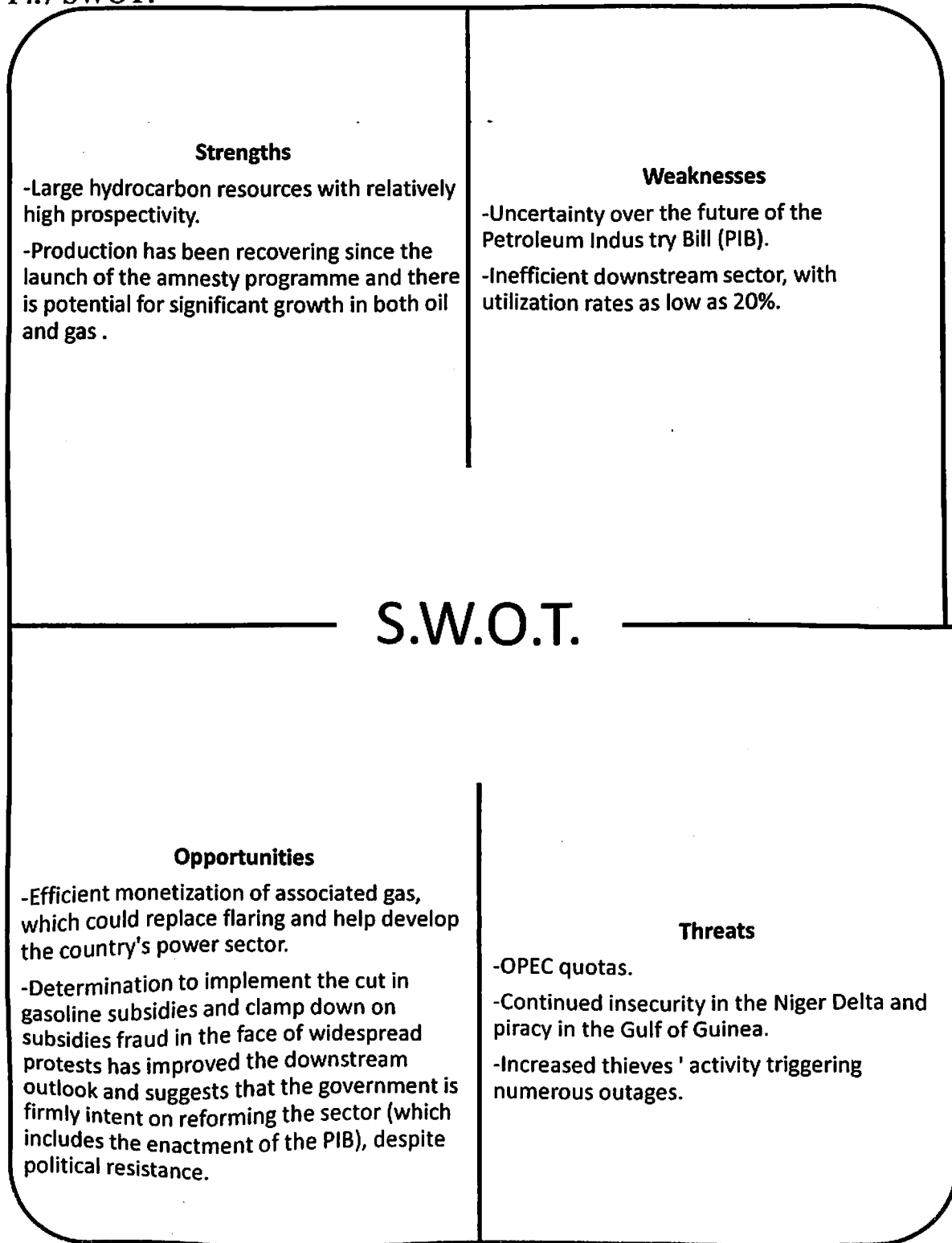
**LNG:**

**LNG Projects In Nigeria**

<b>Project</b>	<b>Trains</b>	<b>Capacity (mn tpa)</b>	<b>Capacity (bcm)</b>	<b>Start-up</b>
NLNG 1 & 2	2	5.9	8.14	1999
NLNG 3	1	2.95	4.07	2002
NLNG 4/5: NLNG Plus	2	8.2	11.32	2005
NLNG 6	1	4.1	5.66	2008
<b>Total</b>	<b>6</b>	<b>21.15</b>	<b>29.19</b>	
<b>Proposed Additions</b>				
NLNG 7plus	1	8.4	11.59	2012
OK LNG	4	22	30.36	2012
Progress LNG (floating)	1	1.5	2.07	2011+
Brass LNG	2	10	13.8	2013
<b>Total additions</b>	<b>8</b>	<b>41.9</b>	<b>57.82</b>	

**Source: Petroleum Economist, 2009**

14.7 SWOT:



#### 14.8 Key trends in Nigeria oil and gas sector:

-BMI therefore forecast that 2013 production will only be slightly higher than in 2012 estimates, reaching 2.27mn b/d.

-BMI expects oil production to increase from an estimated 2.2mn b/d in 2012 to 2.70mn b/d by 2020, as ambitious projects such as Usan (180,000b/d) peak in the coming years and Egina (150,000b/d-200,000b/d) come on-stream.

-Consumption of crude is forecast to rise at a compounded annual rate of 7% y-o-y between 2012 and 2022, boosted by anticipated strong GDP growth. BMI forecast consumption rising from an estimated 252,000b/d in 2012 to 429,000b/d by 2020.

-BMI forecasts gas production increasing from an estimated 36.4bn cubic metres(bcm) in 2012 to more than 75bcm by 2020, as the authorities and companies reduce the practice of flaring and start monetising associated gas resources .

-BMI see Nigerian gas consumption rising from an estimated 5.8bcm in 2012 to 12.4bcm by 2020.

**-In terms of infrastructure, the authorities have ambitious plans in liquefied natural gas (LNG) and refining.** However, the downstream sector remains highly inefficient and, despite a nameplate capacity of 505,000b/d, actual output is often around 100,000b/d.

-Many projects have been proposed, but there has been no update indicating that any are progressing. Considering the country's past woes in the sector, BMI have decided not to include these projects in our forecasts.

-Nigeria National Petroleum Cooperation (NNPC) is aiming to more than double its annual production of LNG, from 22mn tonnes per annum (mtpa) (30.36bn cubic metres ) to over 52mtpa (71.76bcm). This was announced on September 19 2012, at a forum of LNG producers and consumers held in Japan. Group managing director of NNPC, Andrew Yakubu, gave no deadline as to when this target would be met, but he did clarify that new LNG projects in Nigeria will help the company meet this goal.

-In October 2012, Nigeria's Petroleum Minister, Diezani Alis on-Madueke, announced that the government is planning to direct more than **US\$1.6bn towards the repair of three of its refineries.** -The maintenance work started in late 2012 and is due for completion in October 2014. The three refineries are located in Port Harcourt, Warri and Kaduna respectively. The Port Harcourt refinery is currently halted indefinitely as oil thieves damaged the feeding pipeline early 2013.

-Nigeria's dependence on oil prices leads to high volatility in the country's export revenues. Continuing tight supply, due to booming demand in emerging markets, is clearly an opportunity for the country.

#### 14.9 Risks associated in operating in Nigeria:

- 1- Terrorist activities prevailing in the country.
- 2- Scams, corruption rate is high in this country.

## 14.10 Future projections:

### Oil and gas reserve:

#### Nigeria Reserves and Petroleum Short Term Forecasts, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	37.2	37.2	37.1	37.8	38.4	39.0
Proven Oil Reserves bbl mn	37,200.0	37,200.0	37,117.4	37,770.8	38,425.9	39,044.8
Proven Oil Reserves % change y-o-y	0.0	0.0	-0.2	1.8	1.7	1.6
Reserves to production ratio (RPR), years	39.9	45.9	44.8	45.4	44.8	42.5
Natural Gas Proven Reserves, tcm	5.3	5.5	5.5	6.0	6.0	6.0
Natural Gas Proven Reserves, bcm	5,291.9	5,500.0	5,500.0	5,950.0	5,950.0	5,950.0
Natural Gas Proven Reserves, % change y-o-y	0.9	3.9	0.0	8.2	0.0	0.0
Natural Gas Reserve to Production Ratio, years	168.7	151.0	133.1	128.0	115.4	105.2
<b>Petroleum Production, Consumption and Net Exports</b>						
Total Petroleum Production, boe/d	3,094.9	2,847.5	2,979.9	3,081.9	3,236.3	3,492.9
Total Petroleum Production, boe/d, % change y-o-y	4.6	-8.0	4.6	3.4	5.0	7.9
Total Petroleum Production, US\$bn	53.4	52.2	54.8	55.7	57.5	61.1
Total Petroleum Production, US\$, % change y-o-y	46.1	-2.1	5.0	1.5	3.3	6.2
Total Petroleum Consumption, boe/d	333.1	352.5	374.1	398.3	431.2	466.9
Total Petroleum Consumption, boe/d, % change y-o-y	1.3	5.8	6.1	6.5	8.3	8.3
Total Petroleum Consumption, US\$bn	12.3	13.2	13.8	14.2	14.9	15.8
Total Petroleum Consumption, US\$, % change y-o-y	40.2	7.6	4.5	2.3	5.0	6.0
Total Net Petroleum Exports, boe/d	2,761.9	2,495.0	2,605.8	2,683.6	2,805.1	3,026.0
Total Net Petroleum Exports, boe/d, change y-o-y	5.0	-9.7	4.4	3.0	4.5	7.9
Total Net Petroleum Exports, US\$bn	104.7	95.3	97.8	96.5	97.6	103.1
Total Net Petroleum Exports, US\$, % change y-o-y	45.7	-9.0	2.6	-1.3	1.2	5.6
Total Net Petroleum Exports, US\$mn at US\$50/bbl, US\$bn	48.7	43.5	45.3	46.4	48.3	52.1
Total Net Petroleum Exports, US\$mn at US\$100/bbl, US\$bn	97.4	87.0	90.5	92.8	96.6	104.1

e = estimate, f = forecast. Source: EIA, BMI Calculation



## Refining:

### Nigeria Refining Production And Capacity, 2011-2016

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	445.0	445.0	445.0	508.0	528.0	628.0
Crude Oil Refining Capacity, % change y-o-y	-11.9	0.0	0.0	14.2	3.9	18.9
Crude Oil Refining Capacity, Utilisation, %	32.5	38.5	40.0	40.5	41.0	42.0
Refined Petroleum Products Production, 000b/d	144.6	171.3	178.0	205.7	216.5	263.8
Refined Petroleum Products Production, % change y-o-y	22.0	18.5	3.9	15.6	5.2	21.8
Refined Products Production (inc ethanol and non-conventional), 000b/d	167.6	195.3	203.0	231.7	243.5	291.8
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	18.4	16.5	3.9	14.2	5.1	19.8
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	240.0	252.0	264.6	277.8	298.7	321.1
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	-0.9	5.0	5.0	5.0	7.5	7.5

e=estimate, f=forecast. Source: EIA, BMI

### 14.11 Industry news:

1-The US\$4.5bn modular refinery project in Nigeria may miss its take-off deadline due to project partner **Petroleum Refining and Strategic Reserve (PRSR)**'s ongoing negotiation of commercial terms. The Nigerian government signed a memorandum of understanding with US Nigerian joint venture (JV) - PRSR - in 2012 to build six modular refineries with a combined capacity of 180,000 barrels per day. Although the JV promised to construct the modular refineries in the next 18 months, the status of the project still remains uncertain.

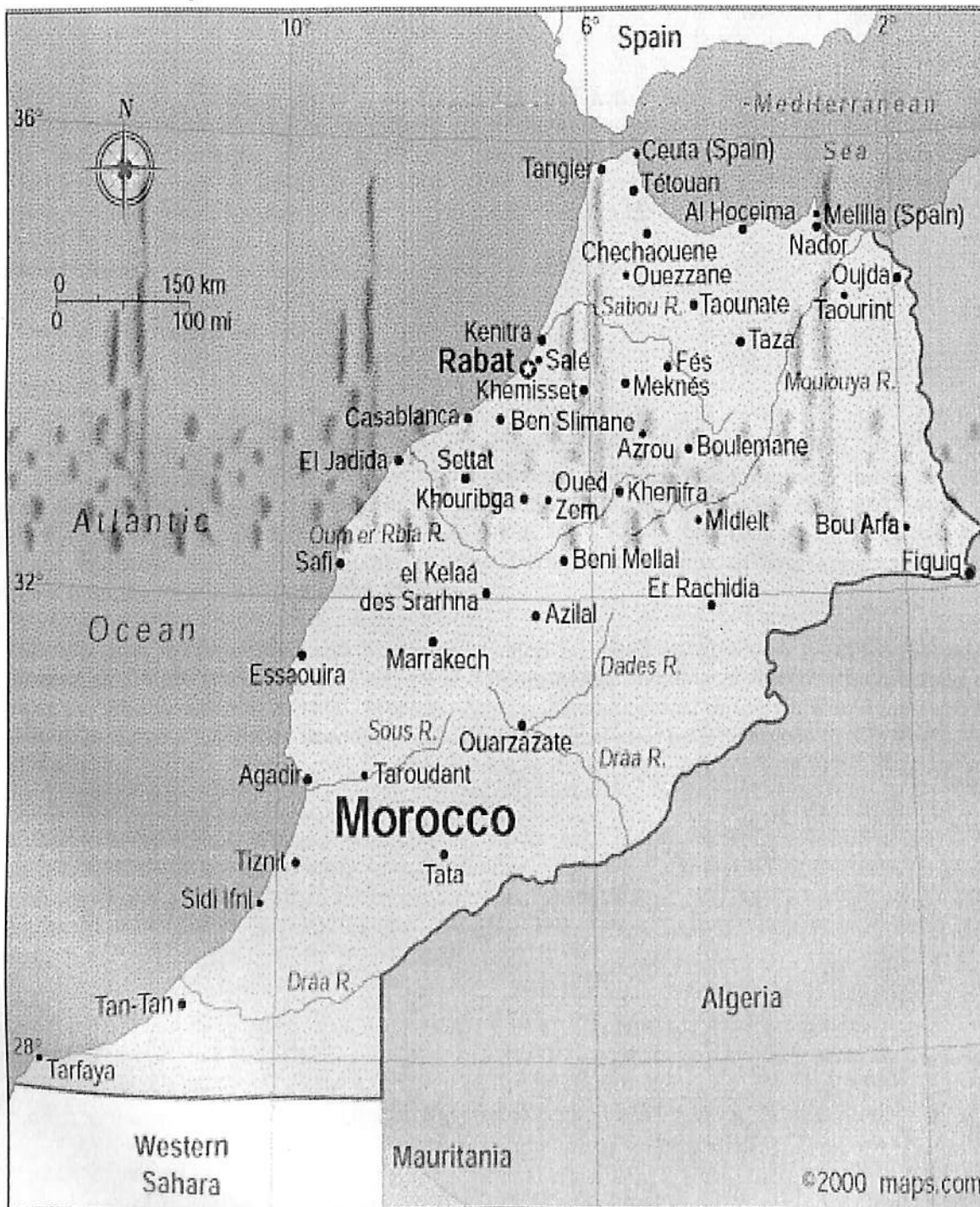
2-**Alhaji Aliko Dangote, a Nigerian businessman and Africa's richest man, has announced plans to spend around US\$8bn on the construction of a crude oil refinery in Nigeria.** The refinery will have a production capacity of 400,000 barrels per day and is expected to become operational in late 2016. The proposed refinery would create thousands of jobs and reduce fuel importation into the country. Dangote is expected to announce details of the project in the week ending April 27 2013.

3-The main focus for the petrochemicals industry in coming years will be the fertilizer sector. By 2017, Nigeria will have almost tripled its urea capacity from 1mn tpa in 2011 to 2.75 mn tpa. In olefins and polymers, progress will be slower and largely dependent on the Thailand's **Indorama Group's** plans for its **Eleme Petrochemicals Company** subsidiary (BMI 2013)

4-The Erha North and the Egina projects undertaken by US oil major **ExxonMobil Corporation** and French oil and gas firm **Total**, respectively, in Nigeria are expected to increase the country's oil production, reports UPI. Speaking at an energy conference held in Texas, US, Nigerian petroleum minister Diezani Alis on-Madueke said the projects are likely to produce an additional 350,000 barrels per day of oil upon their completion in 2015-16.

15 Country:

Morocco



## 15.1 About<sup>74</sup>:

### Geography

Morocco, about one-tenth larger than California, lies across the Strait of Gibraltar on the Mediterranean and looks out on the Atlantic from the northwest shoulder of Africa. Algeria is to the east and Mauritania to the south. On the Atlantic coast there is a fertile plain. The Mediterranean coast is mountainous. The Atlas Mountains, running northeastward from the south to the Algerian frontier, average 11,000 ft (3,353 m) in elevation.

### Government

Constitutional monarchy.

### History

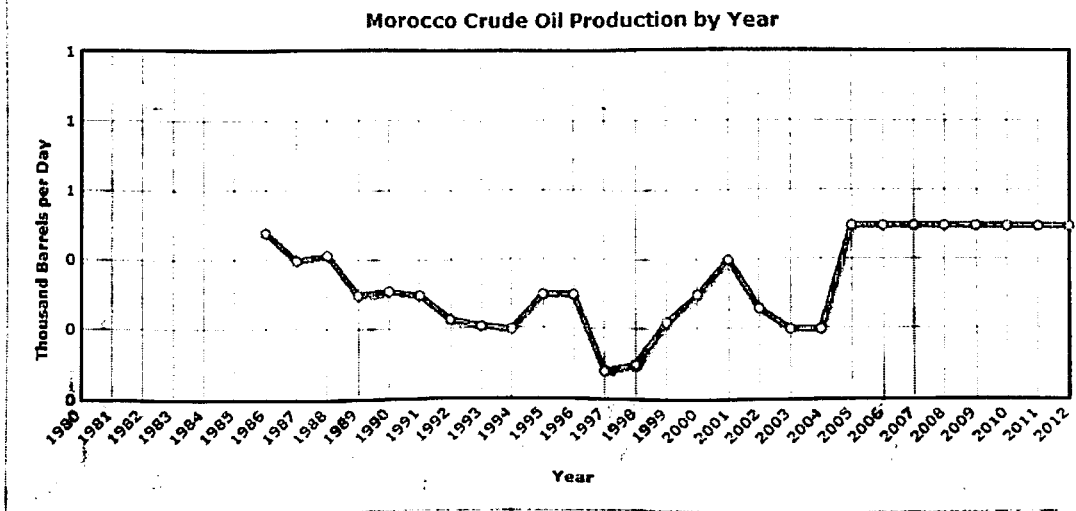
Morocco has been the home of the Berbers since the second millennium B.C. In A.D. 46, Morocco was annexed by Rome as part of the province of Mauritania until the Vandals overran this portion of the declining empire in the 5th century. The Arabs invaded circa 685, bringing Islam. The Berbers joined them in invading Spain in 711, but then they revolted against the Arabs, resenting their secondary status. In 1086, Berbers took control of large areas of Moorish Spain until they were expelled in the 13th century.

The land was rarely unified and was usually ruled by small tribal states. Conflicts between Berbers and Arabs were chronic. Portugal and Spain began invading Morocco, which helped to unify the land in defense. In 1660, Morocco came under the control of the Alawite dynasty. It is a sherif dynasty—descended from the prophet Muhammad—and rules Morocco to this day.

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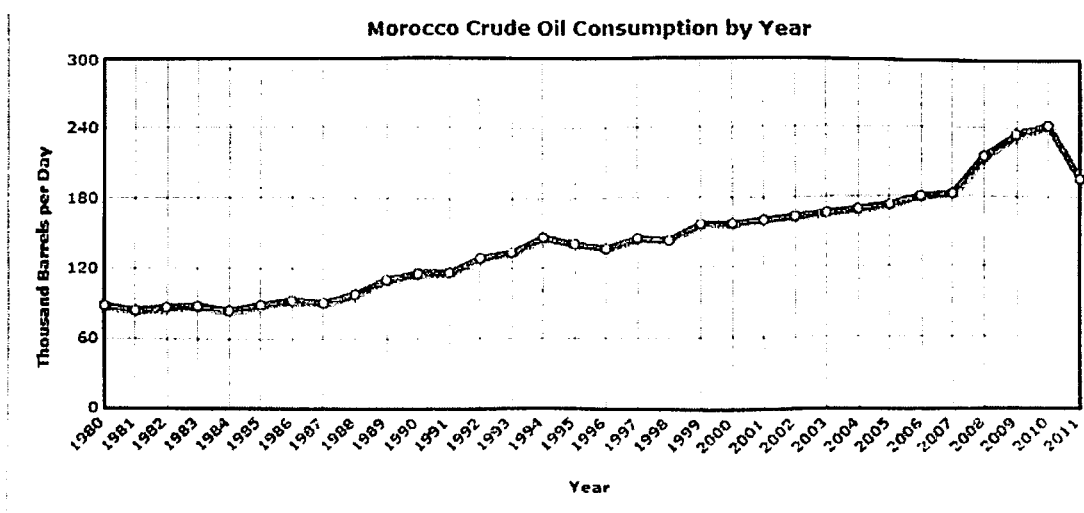
<sup>74</sup> Source: [www.infoplease.com](http://www.infoplease.com)

15.2 Morocco crude oil production<sup>75</sup>:



Source: United States Energy Information Administration

15.3 Morocco crude oil consumption<sup>76</sup>:



Source: United States Energy Information Administration

<sup>75</sup> Source: EIA

<sup>76</sup> Source: EIA

15.4 Energy scenario of Morocco<sup>77</sup>:

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	20.09 billion kWh (2009 est.)	22.21 billion kWh (2009 est.)	0 kWh (2010 est.)	4.623 billion kWh (2009 est.)
<b>World ranking</b>	<b>73</b>	<b>69</b>	<b>102</b>	<b>39</b>
<b>Crude oil</b>	5,500 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	95,460 bbl/day (2009 est.)
<b>World ranking</b>	<b>89</b>	<b>N.A.</b>	<b>153</b>	<b>50</b>
<b>Refined petroleum products</b>	113,300 bbl/day (2008 est.)	203,600 bbl/day (2011 est.)	15,100 bbl/day (2008 est.)	107,000 bbl/day (2008 est.)
<b>World ranking</b>	<b>70</b>	<b>58</b>	<b>81</b>	<b>47</b>
<b>Natural gas</b>	70 million cu m (2010 est.)	570 million cu m (2010 est.)	0 cu m (2010 est.)	500 million cu m (2010 est.)
<b>World ranking</b>	<b>82</b>	<b>98</b>	<b>146</b>	<b>67</b>

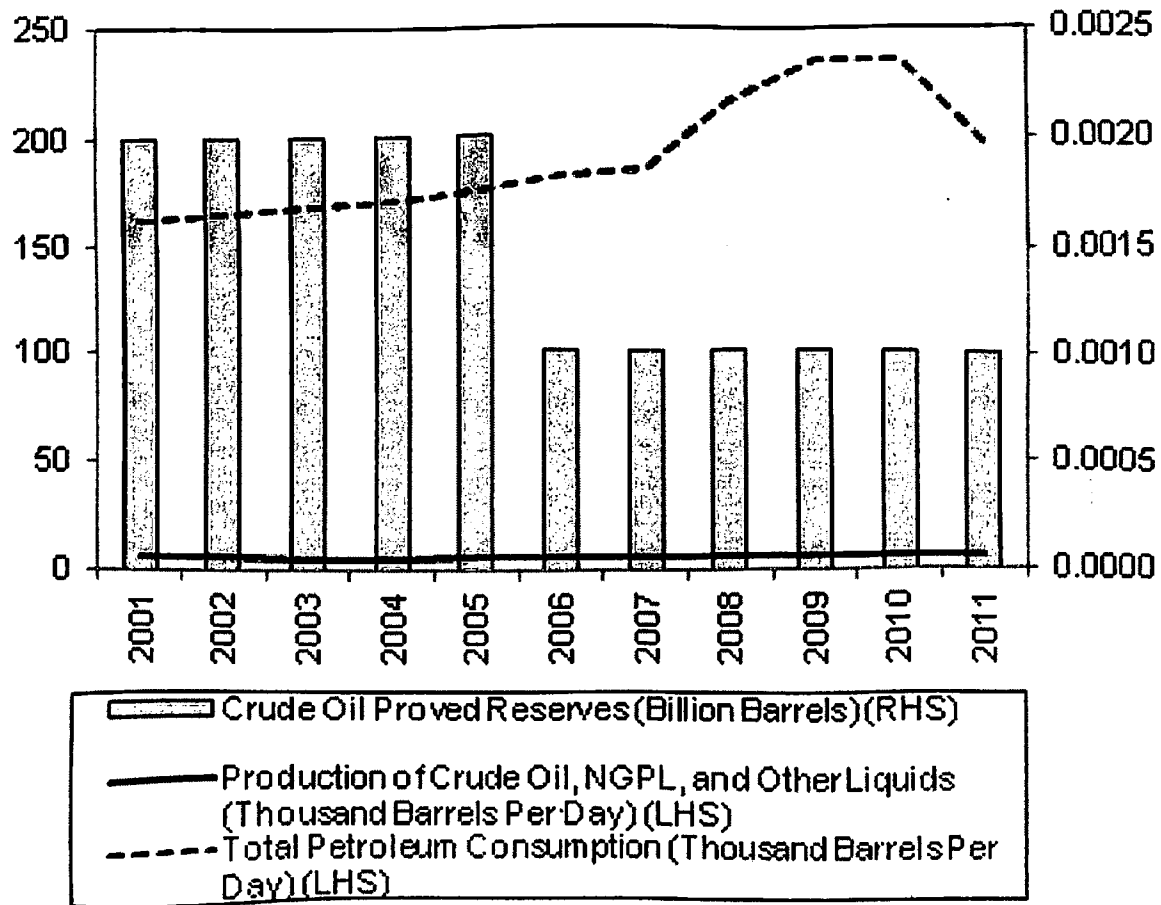
<sup>77</sup> Source: CIA world fact book

**15.6 Market overview:**

Activity across Morocco's nascent energy sector looks set to gain serious momentum. After a steady series of acquisitions by small independent companies over several months, **supermajor Chevron has now announced it will enter the country.** The decision will bring additional and much-needed investment into the sector; yet, perhaps more importantly, the fact a global player is prepared to take a stake in the country will likely draw even more attention to the North African market's largely under-explored prospectivity.

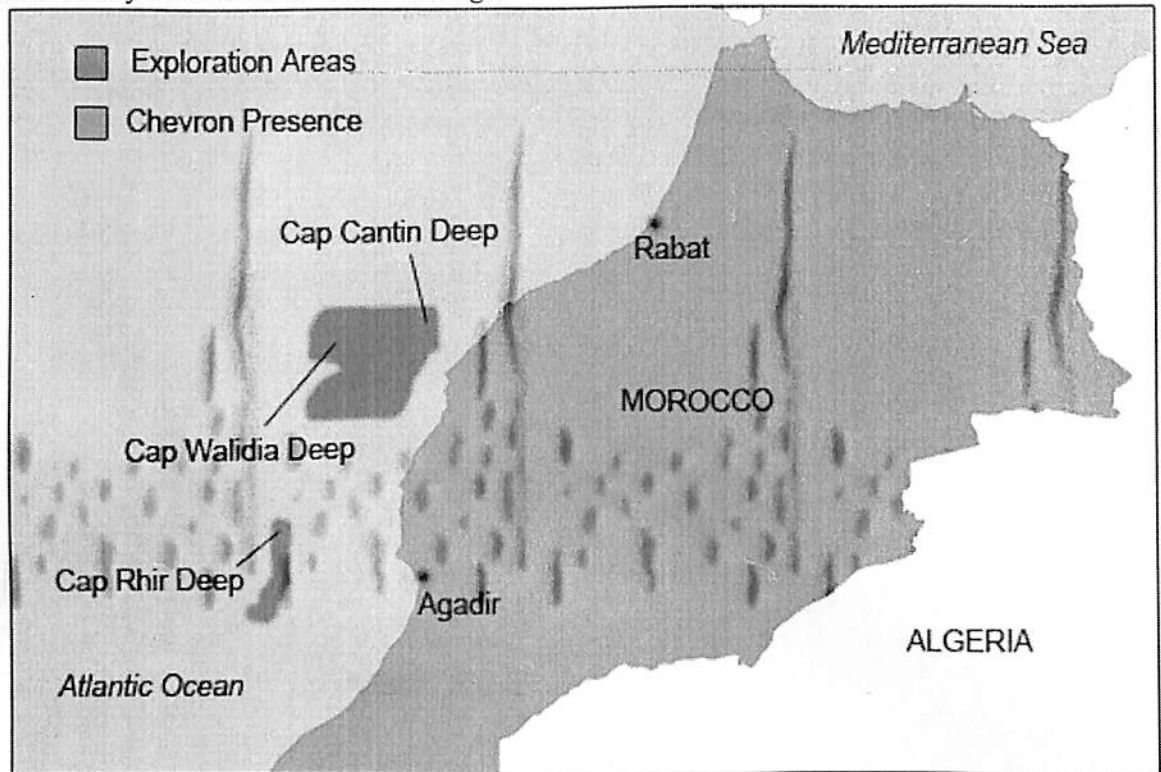
**Oil reserve, production and consumption:**

**Morocco's Proven Oil Reserves, Production, And Consumption**



### 15.7 Industry news:

#### 1- Chevron buys Moroccan offshore holdings:



Source: Chevron. CFW

Chevron Corp.'s subsidiary, Chevron Morocco Exploration Ltd, signed petroleum agreements with Morocco's ONHYM for three offshore areas. The agreements cover the Cap Rhir Deep, the Cap Cantin Deep, and the Cap Walidia Deep.

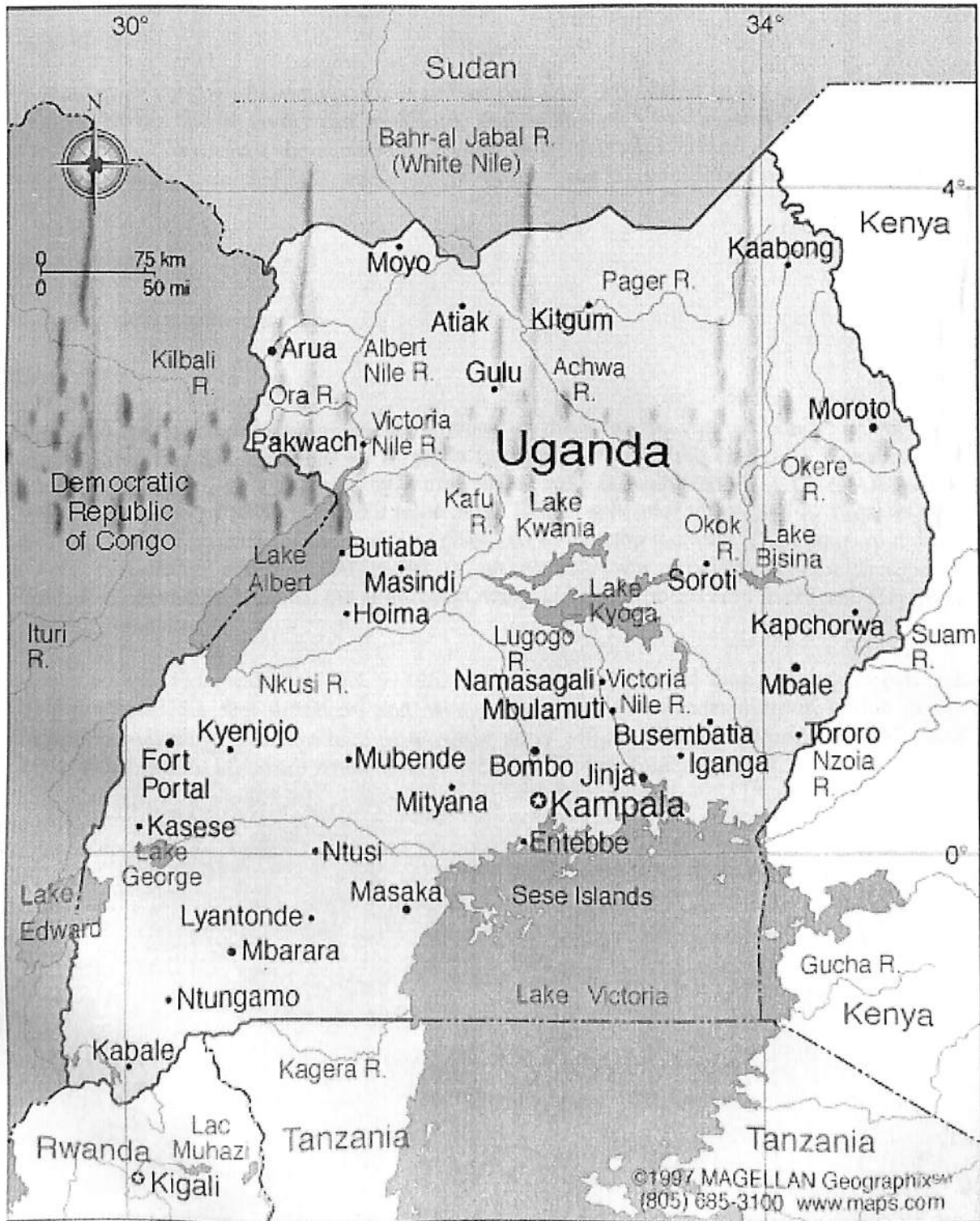
- 2- Fastnet Oil & Gas' wholly owned subsidiary, Pathfinder Hydrocarbon Ventures, has entered into an exclusive option agreement with **Oil and Gas Investments Funds (OGIF)** to farm-in to eight exploration blocks comprising the Tendirara Lakbir Petroleum Agreement onshore Morocco.
- 3- Kosmos Energy has contracted the Atwood ultra-deepwater drillship *Atwood Achiever* for an exploration program commencing in Morocco. The *Atwood Achiever* is currently under construction at Daewoo Shipbuilding and Marine Engineering (DSME) shipyard in South Korea and should be ready for delivery in June of next year. Once completed, the *Atwood Achiever* will be mobilized to its first location in Morocco.
- 4- Longreach Oil & Gas completed its 2D seismic program on the Sidi Moktar License, onshore Morocco. The survey was completed on time and within budget. The company

acquired 520 km of seismic data in 47 lines over the portfolio of prospects and leads in fulfillment of the license commitment.



16 Country:

Uganda



## 16.1 About<sup>78</sup>:

### Geography

Uganda, twice the size of Pennsylvania, is in East Africa. It is bordered on the west by Congo, on the north by the Sudan, on the east by Kenya, and on the south by Tanzania and Rwanda. The country, which lies across the equator, is divided into three main areas—swampy lowlands, a fertile plateau with wooded hills, and a desert region. Lake Victoria forms part of the southern border.

### Government

Multiparty democratic republic.

### History

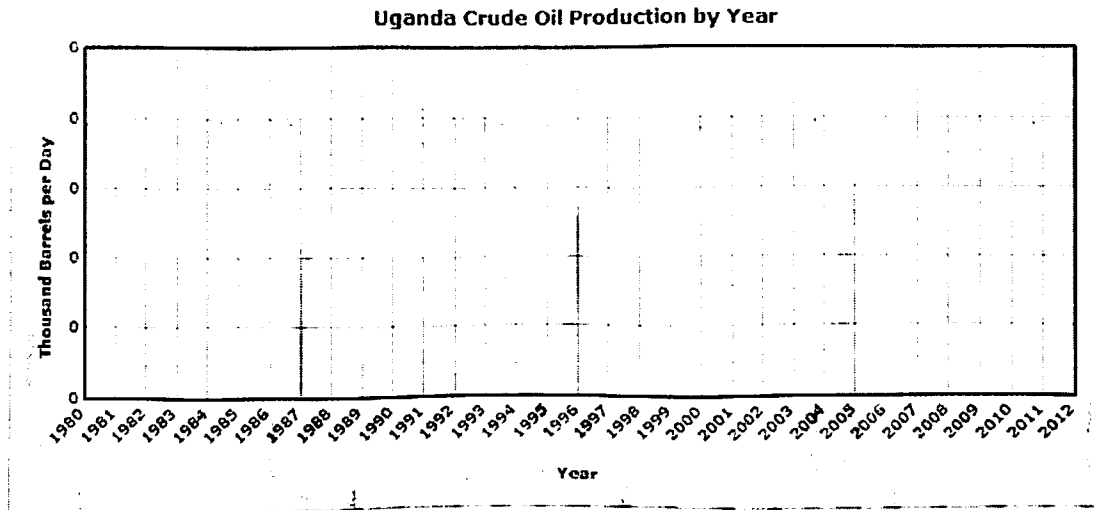
About 500 B.C. Bantu-speaking peoples migrated to the area now called Uganda. By the 14th century, three kingdoms dominated, Buganda (meaning "state of the Gandas"), Bunyoro, and Ankole. Uganda was first explored by Europeans as well as Arab traders in 1844. An Anglo-German agreement of 1890 declared it to be in the British sphere of influence in Africa, and the Imperial British East Africa Company was chartered to develop the area. The company did not prosper financially, and in 1894 a British protectorate was proclaimed. Few Europeans permanently settled in Uganda, but it attracted many Indians, who became important players in Ugandan commerce.

Uganda became independent on Oct. 9, 1962. Sir Edward Mutesa, the king of Buganda (Mutesa II), was elected the first president, and Milton Obote the first prime minister, of the newly independent country. With the help of a young army officer, Col. Idi Amin, Prime Minister Obote seized control of the government from President Mutesa four years later.

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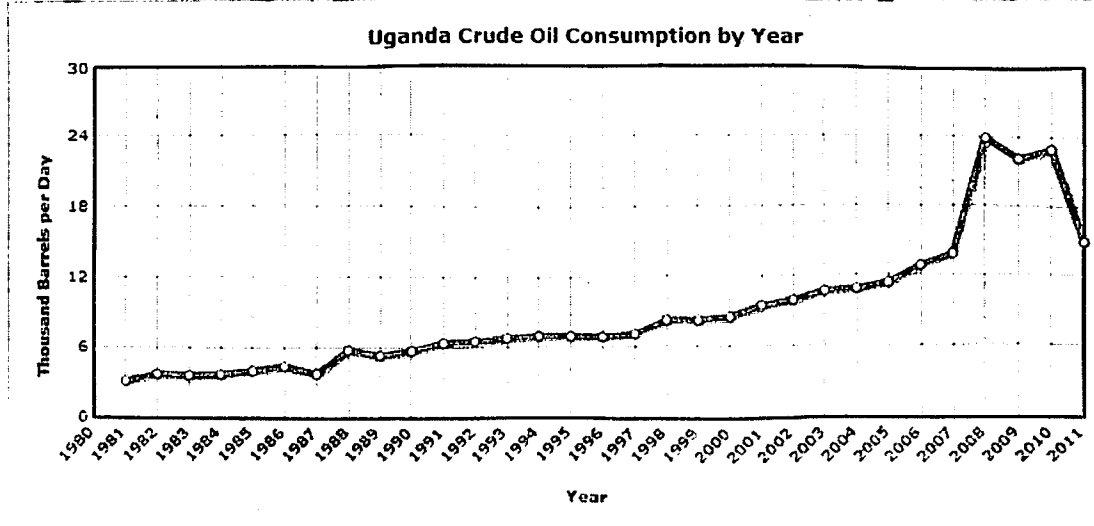
<sup>78</sup> Source: [www.infoplease.com](http://www.infoplease.com)

16.2 Uganda crude oil production<sup>79</sup>:



Source: United States Energy Information Administration

16.3 Uganda crude oil consumption<sup>80</sup>:



Source: United States Energy Information Administration

<sup>79</sup> Source: EIA

<sup>80</sup> Source: EIA

16.4 Energy scenario of Uganda<sup>81</sup>:

Electricity	production	consumption	exports	imports
	2.445 billion kWh (2009 est.)	2.217 billion kWh (2009 est.)	75 million kWh (2010)	29 million kWh (2010 est.)
<b>World ranking</b>	<b>133</b>	<b>139</b>	<b>76</b>	<b>104</b>
<b>Crude oil</b>	0 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>198</b>	<b>N.A.</b>	<b>197</b>	<b>134</b>
<b>Refined petroleum products</b>	0 bbl/day (2008 est.)	16,930 bbl/day (2011 est.)	0 bbl/day (2008 est.)	23,950 bbl/day (2008 est.)
<b>World ranking</b>	<b>203</b>	<b>140</b>	<b>139</b>	<b>98</b>
<b>Natural gas</b>	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>201</b>	<b>202</b>	<b>197</b>	<b>141</b>

<sup>81</sup> Source: CIA world fact book

### 16.5 Uganda oil and gas industry directory<sup>82</sup>:

- Dominion Uganda Limited
- Neptune Petroleum
- Agip (Uganda) Ltd
- Chevron Oil Uganda Ltd
- Fina Exploration Uganda Ltd
- Gapco Uganda Ltd
- Heritage Oil and Gas Ltd
- Kengrow Industries Ltd
- Mbale Soap Works Ltd
- Ministry of Energy and Mineral Development
- MOGAS Uganda
- Mukwano Industries (U) Ltd (AK Oils and Fats)
- Petroleum Exploration and Production Department
- Rio Oil
- Shell (Uganda) Ltd
- Uganda Petroleum Co Ltd
- Uganda Trade and Industrial

### 16.6 Market overview: oil and gas

All International institutions / agencies of repute such as CIA Factbook, EIA country profile, World Bank country report, MBendi Information Services, etc., unanimously reveal that there are **no proven oil or gas resources (excerpts attached) in Uganda.**

But recently, it came forth that there are signs that the western Rift Valley in Uganda contains moderate hydrocarbon deposits. Uganda has joined forces with neighboring Democratic Republic of Congo to explore possible oil reserves in Lake Albert region which lies on their common border.

Ugandan Government, through its Petroleum Exploration and Production Department is promoting the open acreage in Albertine Graben (in Lake Albert and on its shores in Hoima district of Western Uganda) and believes that the Albertine Graben is underexplored and that good hydrocarbon potential, in terms of source rocks, reservoirs and seals, has been proved in recent studies. Five oil seeps have been identified over an expanse of the graben. A considerable amount of crude deposits estimated at between 2 to 2.5 billion barrels have been discovered in Lake Albert region.

Uganda being a land-locked nation, cannot export its crude via sea route. Thus, it becomes imperative for Uganda to plan its own refineries. Ugandan government, thus, has planned to build a refinery at Hoima with a capacity of somewhere between 60,000 to 120,000-barrel per day to exploit its crude oil production discovered in Lake Albert region. Uganda expects to start refining crude oil from its fields in 2014 for which it is looking for strategic investors. However, there is a considerable amount of skepticism prevalent at present among investors, donors, civil society groups and international oil companies for Hoima Refinery and it is understood that this project shall not come up before 2 to 3 years.

Apart from the above prospective refinery, no other Oil & Gas and Petrochemical project is expected to come up in Uganda in near future.

<sup>82</sup> Source: [www.mbendi.com](http://www.mbendi.com)

### 16.7 Future projections:

Developments in Uganda's oil and gas sector present a mixed picture. On the one hand, the government has developed a progressive National Oil and Gas Policy which states the government's intention to adhere to international best practice standards. On the other, the industry is born into a deteriorating governance environment, characterized by the consolidation of Uganda's neo-patrimonial regime; increasing perceptions of corruption and high-level state looting; and some early warning signs that the government's own commitments to good governance standards laid out in its oil and gas policy are not being implemented. Global Witness' experience working in other resource rich, governance-poor environments suggests that, without immediate intervention, this will not end well. There is a clear and pressing need for donors – collectively – to change their approach to oil in Uganda. The task is made more urgent by the advent of a potentially impressive mineral industry on the horizon. Many of the recommendations below would also help to strengthen the governance of this sector. Instead of seeing oil as a distant risk/benefit prospect which can be addressed by discrete technical and fiscal projects, Uganda's donors should place good governance of the sector front and centre of their engagement strategies to proactively address all stages of the oil production value-chain. Establishing a credible position will mean creating and maintaining a unity of purpose within a core group of significant bilateral and multilateral donors, and willingness to trade off short-term development objectives against the possibility of sustainable development over the longer term. In other words, donors need to collectively set limits and stick to them. Building upon the government's policy principles outlined in its National Oil and Gas Policy and translating these into specific, measurable and time-bound indicators for the joint budget support framework would be the first step towards doing this.

#### **Total Petroleum Consumption (Thousand Barrels Per Day)**

	2007	2008	2009	2010	2011
<b>Kenya</b>	73.1	67.8	75.6	79.8	81.0
<b>Mozambique</b>	14.4	13.2	15.0	16.1	17.0
<b>Tanzania</b>	30.3	32.7	34.4	30.7	35.0
<b>Uganda</b>	13.9	13.4	22.2	23.0	23.0

**Source: IEA**

## 16.8 Industry news:

1-UK-listed oil explorer **Tullow Oil** is near from signing a memorandum of understanding (MoU) with the Ugandan government pertaining to the final outline of a plan to unlock Lake Albert oil. The MoU paves the way for investments of around US\$12bn to develop crude resources discovered in the Lake Albert Rift basin in Uganda. The agreement includes a 30,000 barrels per day refinery and an export pipeline to supply the crude from the Lake Albert Rift basin oil fields that Tullow is developing with partners **Total** and China's **CNOOC**.

2-**Uganda's decision to accept plans for a smaller refinery project is a victory for Total and its partners, whose upstream development plans had previously been held hostage to an agreement to invest in a 200,000b/d refinery.** The move reveals that the Ugandan government has recognized it is not helpful to insist on building a refinery that has garnered little commercial interest - at the expense of delaying first revenue from oil output. First oil may now finally come on-stream, although an ongoing law suit between Tullow and the government could push back the regulatory approval needed for upstream development to finally proceed.

3-The Ugandan refinery aspirations seem to have suffered another blow as Kampala now appears to hunt for new investors. In an interview with the East African Business Week, Peter Lokeris, the Ugandan Minister for Mineral Development said that the government was looking for new partners to fund their planned Hoima refinery - if implemented (though risks weigh heavy) it would be Uganda's largest infrastructure project to date, with a price-tag up to US\$5bn.

4-Kenya and Uganda are looking for a private investor to build a refined fuel pipeline. This project could yield large cost reductions for both countries and have consequent economic implications. However, this increases the chances that increased pipeline capacity may act as a deterrent to the development of a downstream industry in Uganda and could therefore be a large opportunity cost.





## 17.1 About<sup>83</sup>:

### Geography

Mozambique stretches for 1,535 mi (2,470 km) along Africa's southeast coast. It is nearly twice the size of California. Tanzania is to the north; Malawi, Zambia, and Zimbabwe to the west; and South Africa and Swaziland to the south. The country is generally a low-lying plateau broken up by 25 sizable rivers that flow into the Indian Ocean. The largest is the Zambezi, which provides access to central Africa.

### Government

Multiparty republic.

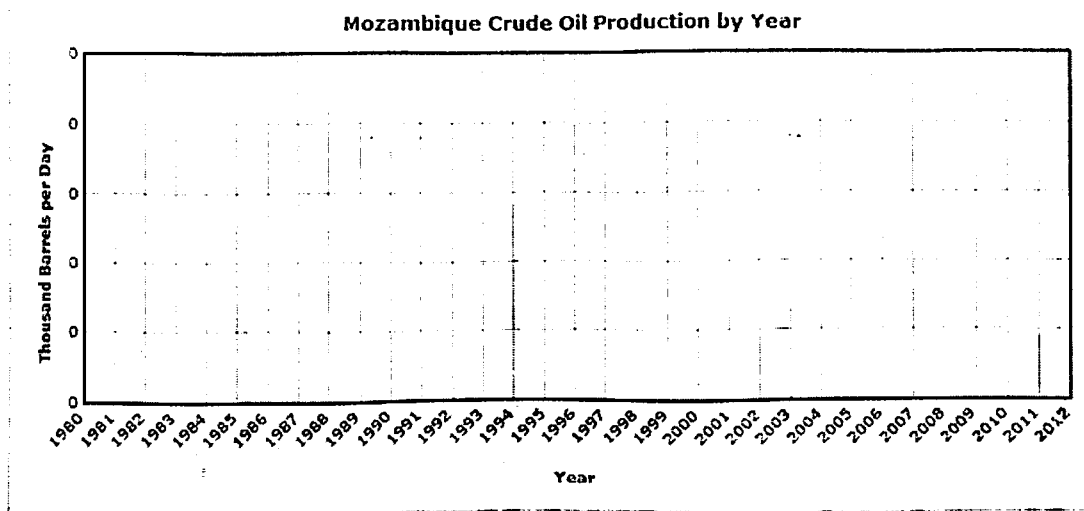
### History

Bantu speakers migrated to Mozambique in the first millennium, and Arab and Swahili traders settled the region thereafter. It was explored by Vasco da Gama in 1498 and first colonized by Portugal in 1505. By 1510, the Portuguese had control of all of the former Arab sultanates on the east African coast. Portuguese colonial rule was repressive.

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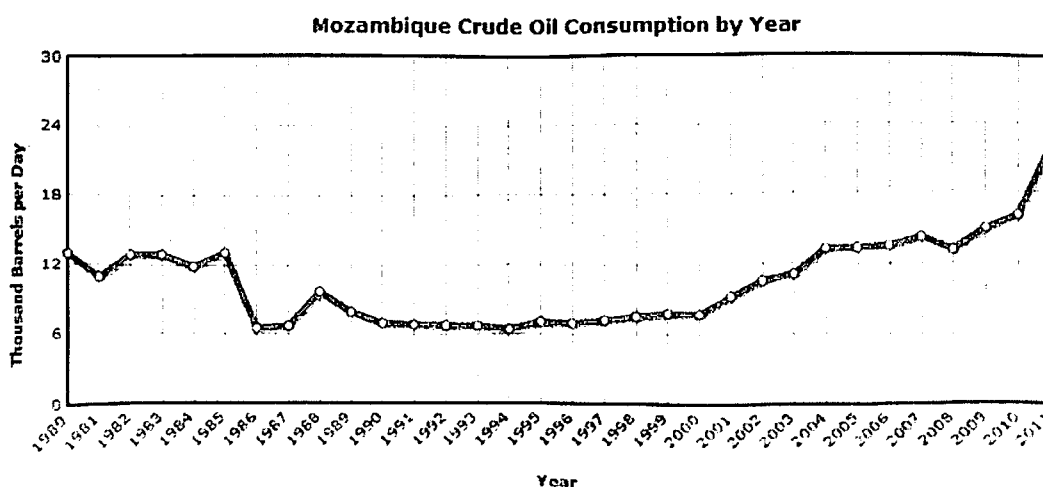
<sup>83</sup> Source: [www.infoplease.com](http://www.infoplease.com)

17.1 Mozambique crude oil production<sup>84</sup>:



Source: United States Energy Information Administration

17.3 Mozambique crude oil consumption<sup>85</sup>:

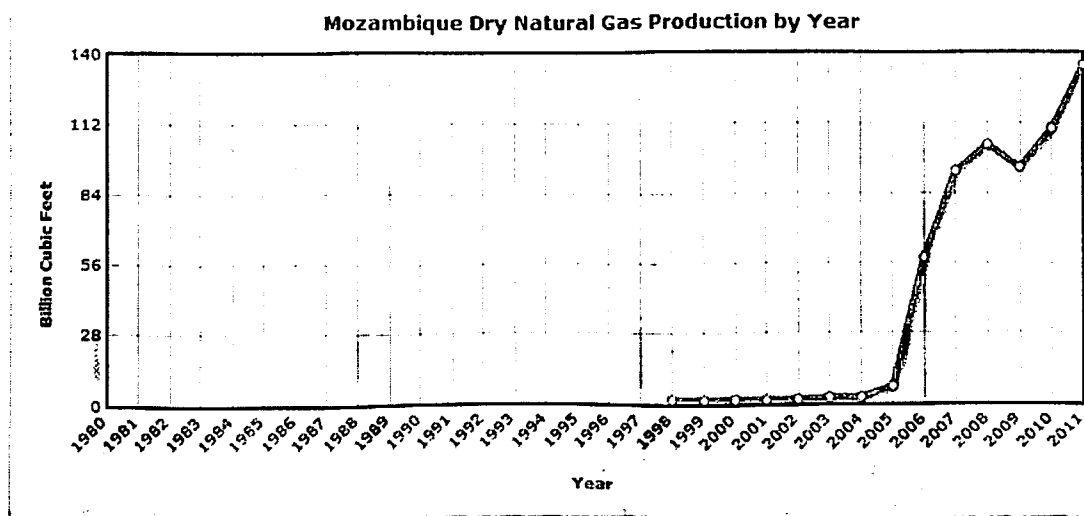


Source: United States Energy Information Administration

<sup>84</sup> Source: EIA

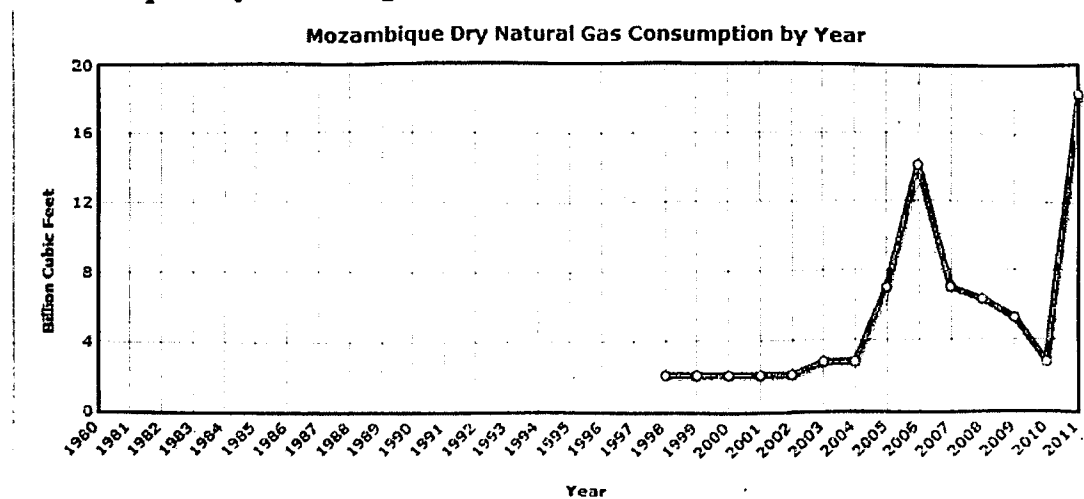
<sup>85</sup> Source: EIA

**17.4 Mozambique dry natural gas production<sup>86</sup>:**



Source: United States Energy Information Administration

**17.5 Mozambique dry natural gas consumption<sup>87</sup>:**



Source: United States Energy Information Administration

<sup>86</sup> Source: EIA

<sup>87</sup> Source: EIA

**17.6 Energy scenario of Mozambique<sup>88</sup>:**

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	14.83 billion kWh (2012 est.)	10.19 billion kWh (2012 est.)	9.462 billion kWh (2012 est.)	8.537 billion kWh (2012 est.)
<b>World ranking</b>	<b>84</b>	<b>88</b>	<b>22</b>	<b>26</b>
<b>Crude oil</b>	0 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>170</b>	<b>N.A.</b>	<b>157</b>	<b>103</b>
<b>Refined petroleum products</b>	0 bbl/day (2008 est.)	19,580 bbl/day (2011 est.)	0 bbl/day (2008 est.)	13,200 bbl/day (2008 est.)
<b>World ranking</b>	<b>180</b>	<b>129</b>	<b>205</b>	<b>124</b>
<b>Natural gas</b>	3.12 billion cu m (2010 est.)	80 million cu m (2010 est.)	3.04 billion cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>55</b>	<b>108</b>	<b>36</b>	<b>102</b>

<sup>88</sup> Source: CIA world fact book

### 17.7 Mozambique oil and gas industry directory<sup>89</sup>:

- Companhia Moçambicana de Petróleos, Limitada {COMOPETRO} Company in Mozambique
- Companhia Mocambicana do Gasoduto Company in Mozambique
- Empresa Nacional de Hidrocarbonetos de Mocambique {ENH} Parastatal in Maputo, Nampula, Mozambique
- Jupiter Juan de Nova Limited Company in Mozambique
- Mozambican Hydrocarbon Company Listed Company in Mozambique
- OILMOZ – Investimentos e Participações, Lda {OILMOZ} Company in Maputo, Maputo City, Mozambique
- Rachana Global LDA {Rachana} Company in Mozambique
- Sasol Petroleum Temane (Mozambique) Company in Mozambique
- Wentworth Moçambique Petróleo Limitada Company in Maputo, Maputo City, Mozambique
- BP Mozambique Ltd Company in Maputo, Nampula, Mozambique
- Chevron Oil Mozambique (Mozambique) [Caltex Oil Company in Maputo, Nampula, Mozambique
- Companhia do Pipeline Mozambique-Zimbabwe Lda Company in Mozambique
- Engen Mozambique Ltd Company in Maputo, Nampula, Mozambique
- ExxonMobil Mocambique Ld [Mobil Oil Company in Maputo, Nampula, Mozambique Ld]
- Importadora Moçambicana de Petróleos {Imopetro} Association in Mozambique
- Lonropet SARL {LONROPET} Company in Mozambique
- Matola Gas Company {MGC} Company in Mozambique
- Ministry of Mineral Resources and Energy (Mozambique) Company in Mozambique
- Mobil Oil Mozambique Company in Maputo, Nampula, Mozambique
- National Directorate of Coal and Hydrocarbons Company in Mozambique
- Petrogal Mocambique Company in Maputo, Nampula, Mozambique
- Petróleos de Moçambique {PETROMOC} Parastatal in Maputo, Nampula,

<sup>89</sup> Source: www.mbendi.com

- |   |  |
|---|--|
|   | Mozambique                                     |
| - <u>Sasol Natural Gas</u>                                | Company in Mozambique                          |
| - <u>Sasol Petroleum International (Mozambique) {SPI}</u> | Company in Mozambique                          |
| - <u>TOTAL Mocambique SARI</u>                            | Company in Matola, Maputo Province, Mozambique |

### 17.8 Market overview: oil and gas

In April, the country's cabinet approved a new petroleum law, which is now to on course to be sent the current parliament (ending in May) for further debate and approval. The country's energy regulator, the National Petroleum Institute (INP), is also revising its regulation of operations, including exploration and production contracts. Although greater details will emerge as the legislative process moves forward, the recommendation produced by the international consultant hired to complete the initial draft appeared geared towards striking a balance which both encourages investment and monetisation of gas but ensures benefits for local communities and industries.

The revised draft law, perhaps in part to address rising tensions and expectations in the region, calls for a dedicated segment of revenues from gas to be allocated to communities located near to development sites. While this is unlikely to generate much concern among foreign operators, there were previous reports that some proposed revisions had done so: Reports that production licences would be limited to 30 years threaten long-term development, as new discoveries and new recovery methods could unlock greater volumes that may not be economic to develop without a longer timeline.

Operators are unsure if the 'megaprojects' law passed in 2011 is applicable to liquefied natural gas (LNG) developments. If so, this could give the country's national oil company (NOC) ENH equity of 5-20% in proposed projects.

There are also concerns with regard to a proposed Facility Concession Contract (FCC) which would require new legal contracts for downstream development. Under some interpretations of a complicated legal structure, it would reportedly require individual negotiations for each train. Under a particularly problematic scenario advanced by some, the government would be able to require stakeholders in one train to take gas from a third party, even if that required modifying existing equity arrangements.

These potential flashpoints, many of which reflect concerns that are predictable given current Uncertainty and pressure from both regulators and operators to quickly monetise gas, also reflect larger tensions between officials keen to maximize gas production and commercial players keen to ensure profitability. Current indications suggest that while there are likely to be headaches, a framework that ensures profitable production of offshore gas discoveries is likely to be introduced; however, we are watching for more populist measures in response to social and political pressures.

**17.9 Future projections:****Mozambique Proven Oil & Gas Reserves And Total Petroleum Data, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	0.0	0.0	0.0	0.0	0.0	0.1
Proven Oil Reserves bbl mn	0.0	0.0	0.0	0.0	0.0	100.0
Proven Oil Reserves % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Reserves to production ratio (RPR), years	0.0	0.0	0.0	0.0	0.0	13,698.6
Natural Gas Proven Reserves, tcm	0.1	0.1	0.1	0.3	0.5	0.5
Natural Gas Proven Reserves, bcm	127.4	127.4	127.4	250.0	450.0	500.0
Natural Gas Proven Reserves, % change y-o-y	0.0	0.0	0.0	96.2	80.0	11.1
Natural Gas Reserve to Production Ratio, years	33.8	33.1	32.3	61.7	108.7	108.7

**Mozambique Refining - Production and Consumption**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	0.0	0.0	0.0	0.0	0.0	0.0
Refined Petroleum Products Production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Petroleum Products Production, % change y-o-y	-	100.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	-98.0	0.0	0.0	0.0	0.0	0.0
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	17.0	17.3	17.6	18.1	18.7	19.4
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	5.4	1.5	2.0	2.5	3.5	3.8

*e=estimate, f=forecast. Source: EIA, BMI*

**e=estimate, f=forecast. Source: EIA, BMI**

**Mozambique Oil Production, Consumption And Net Exports, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Total Oil Production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, mn bbl/year	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn, % change y-o-y	38.9	1.8	-1.4	-3.7	-2.9	-2.0
Total Oil Production, US\$bn at US\$50/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn at US\$100/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn at US\$150/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Consumption, 000b/d	17.0	17.3	17.6	18.0	18.7	19.4
Total Oil Consumption, % change y-o-y	5.3	1.5	2.0	2.5	3.5	3.8
Total Net Oil Exports (crude and products), 000b/d	-17.0	-17.2	-17.6	-18.0	-18.7	-19.4
Total Net Oil Exports (crude and products), % change y-o-y	5.3	1.5	2.0	2.5	3.5	3.8
Total Net Oil Exports (crude and products), US\$bn	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	46.3	3.4	0.6	-1.3	0.5	1.7
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	-0.6	-0.6	-0.6	-0.7	-0.7	-0.7
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	-0.9	-0.9	-1.0	-1.0	-1.0	-1.1

**17.10 Industry news:**

1- The National Oil Company (ENH) signed the EPC for the Buzi concession area in October 2008. The signed contract is valid for a period of 8 years and a minimum of 36 million USD is due to be invested in exploration activities. As part of its commitments ENH will have to acquire 600 km of 2D data and drill two exploration wells.

2-ENH managed to farm out to a new partner, Kallila PT, from Indonesia that will act as operator, and the new participation structures is of 70% for the new partner and 30% for ENH.

3-ENH partnered with Sasol in the Pande and Temane gas fields extraction process.

4 -Also involved in many joint Oil and Gas exploration projects in Zambezi delta and Rovuma Basin.

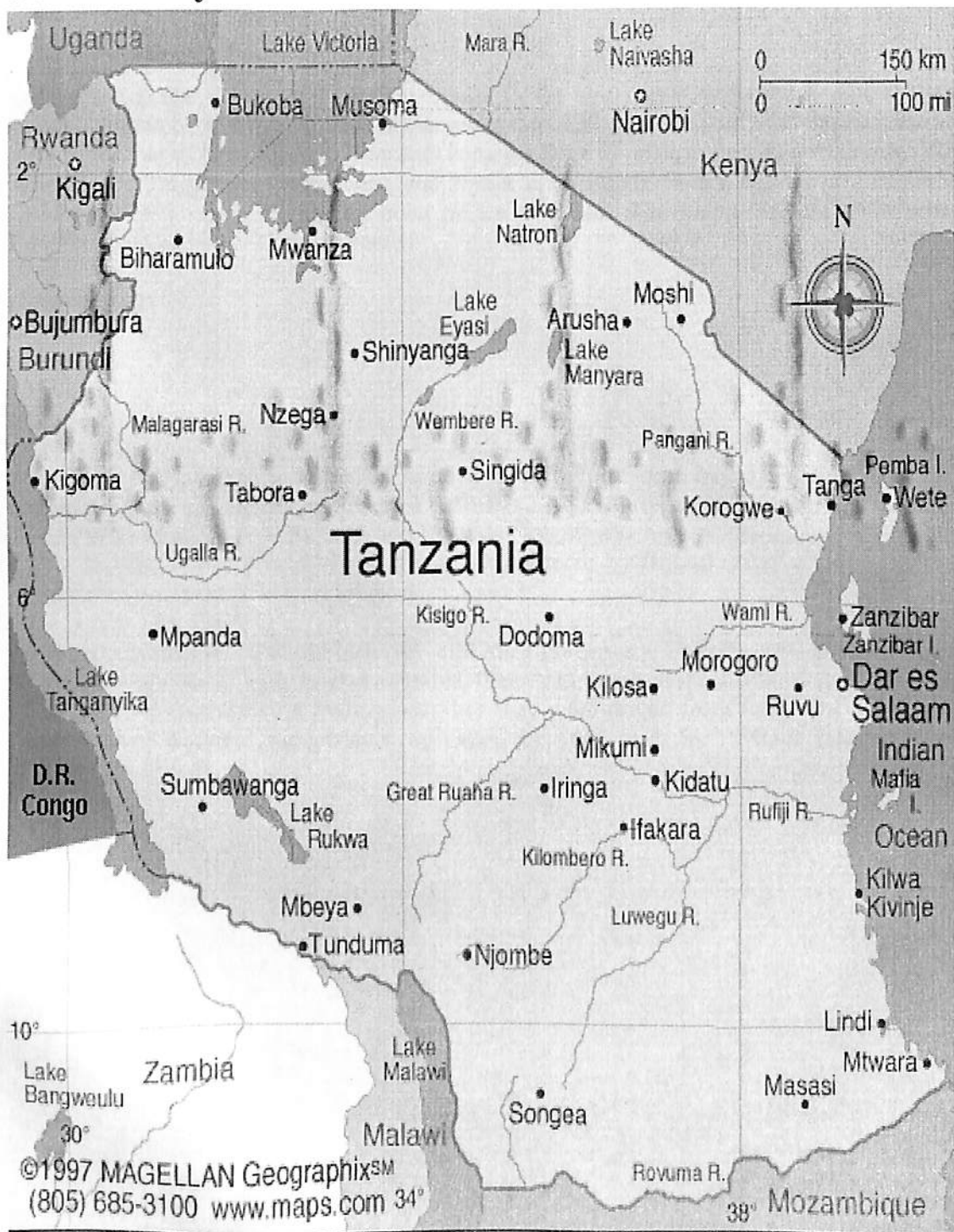
5-A major project is being negotiated between ENH, the state oil company, Sasol Petroleum International and Enron Oil and Gas to construct a pipeline that will transport gas from both the Pande and Temane gas fields to the Gauteng area in South Africa.



6-Anadarko along with ENI have decided to jointly plan and construct common onshore LNG( Liquefied Natural Gas) liquefaction facilities in the Cabo Delgado Province of northern Mozambique.

18 Country:

Tanzania



## 18.1 About<sup>90</sup>:

### Geography

Tanzania is in East Africa on the Indian Ocean. To the north are Uganda and Kenya; to the west, Burundi, Rwanda, and Congo; and to the south, Mozambique, Zambia, and Malawi. Its area is three times that of New Mexico. Tanzania contains three of Africa's best-known lakes—Victoria in the north, Tanganyika in the west, and Nyasa in the south. Mount Kilimanjaro in the north, 19,340 ft (5,895 m), is the highest point on the continent. The island of Zanzibar is separated from the mainland by a 22-mile channel.

### Government

Republic.

### History

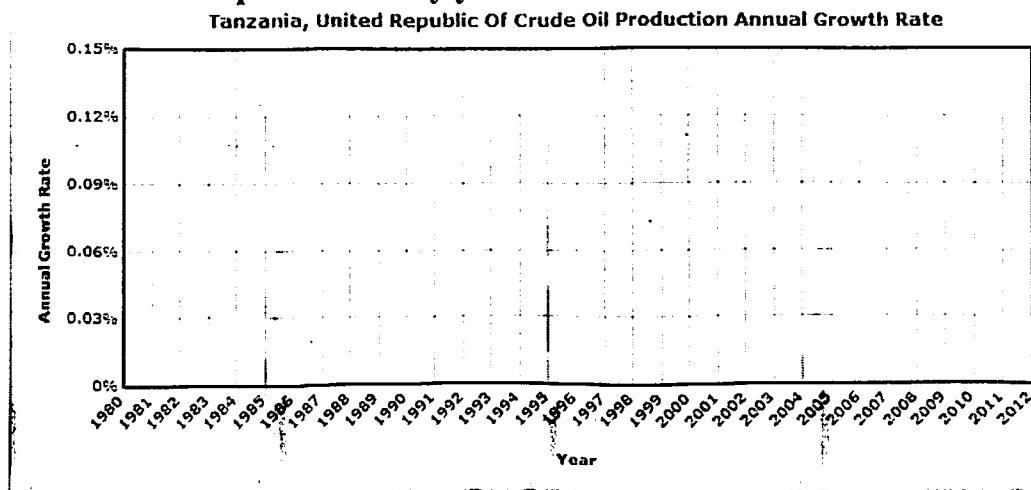
Arab traders first began to colonize the area in 700. Portuguese explorers reached the coastal regions in 1500 and held some control until the 17th century, when the sultan of Oman took power. With what are now Burundi and Rwanda, Tanganyika became the colony of German East Africa in 1885. After World War I, it was administered by Britain under a League of Nations mandate and later as a UN trust territory.

Although not mentioned in old histories until the 12th century, Zanzibar was always believed to have had connections with southern Arabia. The Portuguese made it one of their tributaries in 1503 and later established a trading post, but they were driven from Oman by Arabs in 1698. Zanzibar was declared independent of Oman in 1861 and, in 1890, it became a British protectorate.

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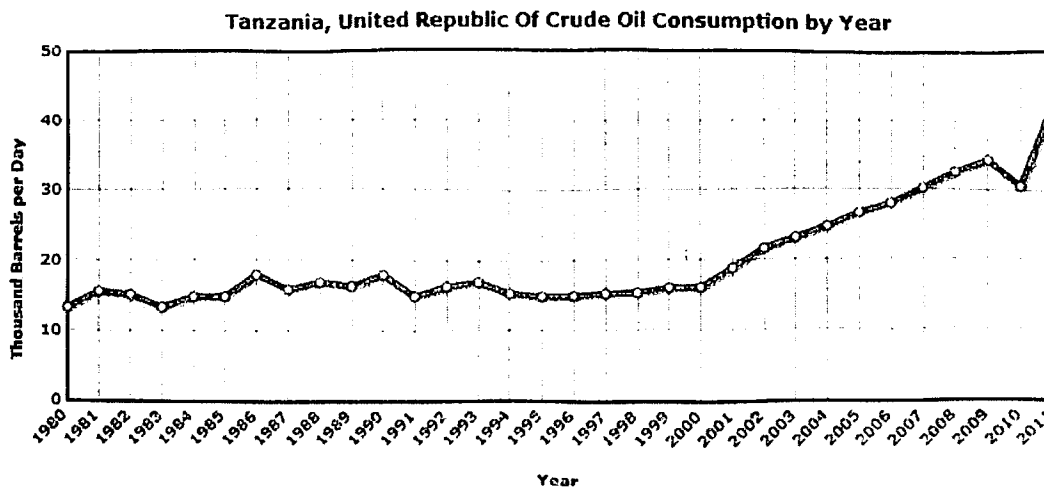
<sup>90</sup> Source: [www.infoplease.com](http://www.infoplease.com)

**18.2 Tanzania crude oil production by year<sup>91</sup>:**



Source: United States Energy Information Administration

**18.3 Tanzania crude oil consumption by year<sup>92</sup>:**



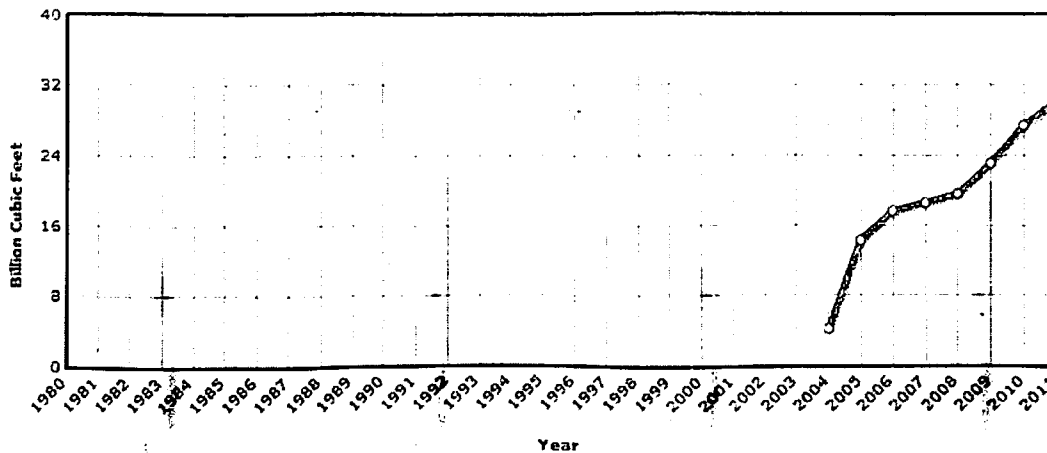
Source: United States Energy Information Administration

<sup>91</sup> Source: EIA

<sup>92</sup> Source: EIA

**18.4 Tanzania dry natural gas production by year<sup>93</sup>:**

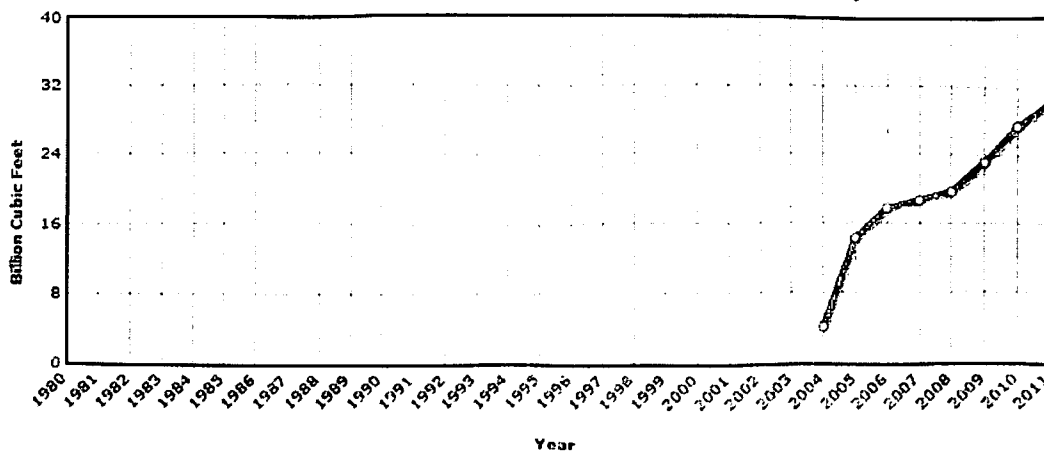
Tanzania, United Republic Of Dry Natural Gas Production by Year



Source: United States Energy Information Administration

**18.5 Tanzania dry natural gas consumption by year<sup>94</sup>:**

Tanzania, United Republic Of Dry Natural Gas Consumption by Year



Source: United States Energy Information Administration

<sup>93</sup> Source: EIA

<sup>94</sup> Source: EIA

**18.6 Energy scenario of Tanzania<sup>95</sup>:**

<b>Electricity</b>	<b>production</b>	<b>consumption</b>	<b>exports</b>	<b>imports</b>
	4.489 billion kWh (2009 est.)	3.589 billion kWh (2009 est.)	0 kWh (2010 est.)	0 kWh (2008 est.)
<b>World ranking</b>	<b>121</b>	<b>128</b>	<b>142</b>	<b>145</b>
<b>Crude oil</b>	0 bbl/day (2011 est.)	N.A.	0 bbl/day (2009 est.)	0 bbl/day (2009 est.)
<b>World ranking</b>	<b>197</b>	<b>N.A.</b>	<b>196</b>	<b>133</b>
<b>Refined petroleum products</b>	0 bbl/day (2008 est.)	43,310 bbl/day (2011 est.)	0 bbl/day (2008 est.)	32,680 bbl/day (2008 est.)
<b>World ranking</b>	<b>202</b>	<b>106</b>	<b>138</b>	<b>86</b>
<b>Natural gas</b>	780 million cu m (2010 est.)	780 million cu m (2010 est.)	0 cu m (2010 est.)	0 cu m (2010 est.)
<b>World ranking</b>	<b>67</b>	<b>93</b>	<b>196</b>	<b>140</b>

<sup>95</sup> Source: CIA world fact book

### 18.7 Tanzania oil and gas industry directory<sup>96</sup>:

- <u>BP Tanzania Ltd</u>	Company in Dar es Salaam, Dar es Salaam, Tanzania
- <u>Dominion Oil &amp; Gas Limited</u>	Organisation in Dar es Salaam, Tanzania
- <u>Gulf Africa Petroleum {GAPCO}</u>	Company in Dar es Salaam, Dar es Salaam, Tanzania
- <u>Orca Exploration Group [East Coast Energy Corporation]</u>	Company in Dar es Salaam, Tanzania
- <u>Taningra Contractors Ltd {Taningra}</u>	Company in Kurasini, Tanzania
- <u>Venture Risk Management</u>	Company in Dar es Salaam, Dar es Salaam, Tanzania
- <u>Wentworth Resources Limited</u>	Company in Dar es Salaam, Dar es Salaam, Tanzania
- <u>Abood Seed Oil Industries Ltd</u>	Company in Tanzania
- <u>AES Tanzania Holdings Ltd</u>	Company in Tanzania
- <u>Agip (Tanzania) Ltd</u>	Company in Dar es Salaam, Tanzania
- <u>Bibiti Oil Ltd</u>	Company in Tanzania
- <u>Birchand Oil Mills</u>	Company in Tanzania
- <u>Bulk Oil Tanzania</u>	Company in Tanzania
- <u>Caltex (Tanzania)</u>	Company in Tanzania
- <u>Coastal Oil Industries Ltd</u>	Company in Tanzania
- <u>Engen Petroleum (Tanzania) Ltd</u>	Company in Dar es Salaam, Tanzania
- <u>Independent Power Tanzania</u>	Company in Tanzania
- <u>Ministry of Energy and Minerals</u>	Government in Dar es Salaam, Tanzania
- <u>Mount Meru Products Ltd</u>	Company in Tanzania
- <u>Murzah Oil Mills Limited</u>	Company in Tanzania
- <u>Petrobras Tanzania</u>	Company in Tanzania
- <u>Shell (Tanzania)</u>	Company in Tanzania
- <u>Songas</u>	Company in Dar es Salaam, Tanzania
- <u>Tanzania Petroleum Development Corporation</u>	Parastatal in Dar es Salaam, Tanzania
- <u>Tanzanian &amp; Italian Petroleum Refining Company Ltd {Tiper}</u>	Company in Dar es Salaam, Tanzania
- <u>Tanzanian and Italian Petroleum Refining Company Ltd</u>	Company in Tanzania
	Parastatal in Dar es Salaam, Tanzania

<sup>96</sup> Source: www.mbendi.com

## 18.8 Market overview: oil and gas

Tanzania has released a draft of its proposed energy overhaul, which it hopes to formally adopt in 2013 - clearing the way for a delayed auction of nine oil and gas blocks in Q413 (possibly September). The government hopes to have a final draft of the new hydrocarbons law available by June, but with dates already pushed back from 2012, the risks are high that these targets could be missed despite enthusiasm from supermajors such as BP which have expressed interest in offshore acreage.

A 2012 review of existing licences and the suspension of new agreements pending a wider overhaul led to concerns over the direction of the regulatory environment. Given rising political and social pressure, we believe the coming amendments will seek to ensure tangible benefits from offshore gas production and LNG exports. Although the draft plan found that LNG exports would generate the largest economic benefits, the report endorsed other ideas such as utilizing offshore gas to feed domestic industry and power generation, which we expect will also be given priority in a bid to spread gains.

As the government lacks the resources to develop offshore gas on its own, we believe that while changes to existing fiscal regimes are likely - with current royalty rates set at 12.5% - they will not seriously threaten the strong interest from foreign players in Tanzanian gas. Risk to this view comes from the adoption of a more populist stance in the wake of growing tensions as the bill works its way through the political system.

With the bill set to give priority to the domestic market over exports, the fact that the majority of the population is not connected to the grid (some estimates suggest only 14% of the population has access to electricity) and the poor condition of state-run utility Tanesco indicate that finances will prove problematic to such provisions.

Although it was reported that a second draft is now ready and could be adopted by June, the bill must be published for public comment and be given three hearings in parliament before it can be passed. Given the amount of debate the measure is likely to cause, delays to a 2013 passage date are sizable and thus could delay investment decisions by international oil companies (IOCs).

## 18.9 Future projections:

**Tanzania Proven Oil & Gas Reserves And Total Petroleum Data, 2011-2016**

	2011	2012e	2013f	2014f	2015f	2016f
Proven Oil Reserves bbl bn	0.0	0.0	0.0	0.0	0.0	0.0
Proven Oil Reserves bbl mn	0.0	0.0	0.0	0.0	0.0	0.0
Proven Oil Reserves % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Reserves to production ratio (RPR), years	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas Proven Reserves, tcm	0.0	0.0	0.0	0.1	0.2	0.2
Natural Gas Proven Reserves, bcm	6.5	6.5	6.5	112.5	150.0	175.0
Natural Gas Proven Reserves, % change y-o-y	0.0	0.0	0.0	1,627.3	33.3	16.7
Natural Gas Reserve to Production Ratio, years	7.6	6.3	6.1	61.1	61.2	68.4



**Tanzania Oil Production, Consumption And Net Exports, 2017-2022**

	2017f	2018f	2019f	2020f	2021f	2022f
Total Oil Production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, mn bbl/year	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn at US\$50/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn at US\$100/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Production, US\$bn at US\$150/bbl	0.0	0.0	0.0	0.0	0.0	0.0
Total Oil Consumption, 000b/d	52.5	56.1	60.1	64.6	69.6	75.0
Total Oil Consumption, % change y-o-y	6.9	6.9	7.0	7.6	7.6	7.8
Total Net Oil Exports (crude and products), 000b/d	-52.5	-56.1	-60.1	-64.6	-69.6	-75.0
Total Net Oil Exports (crude and products), % change y-o-y	6.9	6.9	7.0	7.6	7.6	7.8
Total Net Oil Exports (crude and products), US\$bn	-1.8	-1.9	-2.0	-2.2	-2.3	-2.5
Total Net Oil Exports (crude and products), US\$bn, % change y-o-y	4.2	3.5	4.7	7.7	7.7	7.9
Total Net Oil Exports (crude and products), US\$bn at US\$50/bbl	-1.0	-1.0	-1.1	-1.2	-1.3	-1.4
Total Net Oil Exports (crude and products), US\$bn at US\$100/bbl	-1.9	-2.0	-2.2	-2.4	-2.5	-2.7
Total Net Oil Exports (crude and products), US\$bn at US\$150/bbl	-2.9	-3.1	-3.3	-3.5	-3.8	-4.1

**Tanzania Refining - Production and Consumption**

**Table: Tanzania Refining - Production and Consumption**

	2011	2012e	2013f	2014f	2015f	2016f
Crude Oil Refining Capacity, 000b/d	14.9	14.9	14.9	14.9	14.9	14.9
Crude Oil Refining Capacity, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Crude Oil Refining Capacity, Utilisation, %	0.0	0.0	0.0	0.0	0.0	0.0
Refined Petroleum Products Production, 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Petroleum Products Production, % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), 000b/d	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Production (inc ethanol and non-conventional), % change y-o-y	0.0	0.0	0.0	0.0	0.0	0.0
Refined Products Consumption (inc ethanol and non-conventional), 000b/d	35.0	37.5	40.2	42.9	45.9	49.1
Refined Products Consumption (inc ethanol and non-conventional), % change y-o-y	13.8	7.0	7.1	6.9	7.0	6.9

e=estimate, f=forecast. Source: EIA, BMI

e=estimate, f=forecast. Source: EIA, BMI

### 18.10 Industry news:

- 1- Statoil and ExxonMobil have added another discovery notch to their belt in Tanzania with the drilling of the Tangawizi-1 well. According to reports the latest discovery added an additional 4-6 Tcf of natural gas to Block 2's already impressive totals. Block 2 is now estimated to have between 15-17 Tcf of gas in-place; this includes the Zafarani and Lavani discoveries made previously.
- 2- Brazil's state-run firm Petrobras reported that its subsidiary in Tanzania, Petrobras Tanzania Ltd., has farmed down its stake in Tanzania's Block 6. The company signed a farm-out agreement for the sale of a 12% working interest in the block to Statoil Tanzania AS.
- 3- Tanzania's new drafted policies for its burgeoning natural gas industry are aimed at benefiting the whole country and not just a few in the upper echelons. The policy is being enacted to "ensure that the domestic market is given first priority over the export market in gas supply."

The draft policy paper seen by *Reuters* proposes gas companies list on the local stock exchange. It also calls for the creation of a gas revenue fund and locating plants onshore to liquefy the gas from the offshore fields.

- 4- Tanzania's state-run oil and gas firm, Tanzania Petroleum Development Corp. (TPDC), has announced the official date for the launch of its 4<sup>th</sup> Tanzania Deep Offshore and North Lake Tanganyika Licensing Round 2013. The official launch of the licensing round is now October 25 during the 2<sup>nd</sup> Tanzania Oil & Gas Conference and Exhibition.

The licensing round, originally scheduled for September 2012, was delayed until after the government presented its Natural Gas Policy to the parliament in October 2012.

### Conclusion

EIL has been involved in setting up of almost all the large projects that have come up in India in the Oil & Gas Sector in the last four decades and has also successfully executed several assignments in the middle-east and south-east Asia. EIL has to its credit more than 400 major projects successfully completed and operating smoothly at the rated capacity, creating an array of satisfied clients. In the course of setting up various projects, EIL has worked with a large number of process licensors and engineering/construction/contracting companies worldwide and is well versed with the latest engineering codes and practices followed internationally.

Africa's share of global oil and gas production has stood at 10% and 6% respectively over the past 24 months. 2012 has been marked by extensive activity by IOCs and expectations that the mostly unexplored acreages of African coasts would yield substantial resources. Africa also produced an estimated 230 billion cubic meters of natural gas in 2012, and this is likely to increase to around 250 bcm in 2013, with new supplies from Angola, Mozambique and Tanzania.

By analyzing current market trend and on the basis of large amount of oil and gas resources holding of African countries, it can be forecasted that in the coming years, African region will be a huge investment hub for companies all over the world. African region will have an ample amount of opportunities in it.

EIL is a complete engineering consultancy company and has a vast experience in rendering services like EPC contracts, turnkey projects, project management and commissioning services in India as well as overseas, in African countries such as Algeria, EIL has its presence from last three decades. EIL can take a first mover advantage and enter into the African market as soon as possible to capitalize on this opportunity and therefore expand its overseas business.

By analyzing several African countries in which oil and gas business is going on or has future potential in this report. I want to conclude with following opportunities holding countries in which EIL can focus to enter and grow its business:-

Serial no.	Country	Opportunity description	Source
1	Algeria	New 6 refineries are planned within 5 years	BMI, Reuters
2	Angola	<ul style="list-style-type: none"> <li>- SONANGOL planning for Lobito refinery, scheduled to start from 2017</li> <li>- Angola plans for 200,000 bpd refinery in Zaire.</li> </ul>	BMI

3	Cameroon	SONARA plans to boost Limbe refinery capacity from 45,000 bpd to 70,300 bpd	
4	Congo	<ul style="list-style-type: none"> <li>- New oil port planned</li> <li>- Construction of second refinery in the country</li> <li>- New pipelines construction</li> </ul>	Reuters
5	Egypt	<ul style="list-style-type: none"> <li>- Major refinery capacity expansion in expected b/w 2015-2017</li> <li>- Egypt will spend US \$18 bn in investment in downstream segment through to 2017</li> </ul>	BMI, Egypt government
6	Gabon	New refinery at port-Gentil is planned in 2015	BMI
7	Ghana	New alpha refinery of 200,000 bpd is planned for 2015 startup of US \$6 bn investment	BMI
8	Libya	<ul style="list-style-type: none"> <li>- New exploration activities are planned in the country: potential for downstream sector in the coming years.</li> <li>- ENI- the Italian firm plans to spend US \$ 8 bn in the country over a decade.</li> </ul>	BMI
9	South Africa	New refinery complex construction is planned of 400,000 bpd capacity named as project Mthombo.	BMI
10	Sudan	New refining facility is planned of 50,000 bpd capacity, FID yet to come	BMI
11	Kenya	Oil production to be started in a decade: upcoming potential for downstream and midstream sector	BMI
12	Nigeria	<ul style="list-style-type: none"> <li>- Nigeria zamfara state is planning to build a 200,000 bpd refinery.</li> <li>- A total capacity of 710,000 bpd refining capacity is planned in Nigeria in coming years.</li> <li>- In 2016 african richest man Alhaji Aliko Dangote to invest US \$ 8 bn in Nigerian refining sector</li> </ul>	BMI Africa News Petroleum Africa
13	Uganda	<ul style="list-style-type: none"> <li>- Uganda to install new 200,000 bpd refinery in coming years</li> <li>- Hoima refinery may also come up which has a price tag of US \$5 bn.</li> </ul>	BMI

14	Mozambique	-with increased gas production recently: potential for new LNG terminals	BMI
15	Tanzania	- Emerging as new gas producing region: potential for new gas export oriented based petrochemical plants	BMI

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