

COUNTRY ANALYSIS BRIEFS

Nigeria

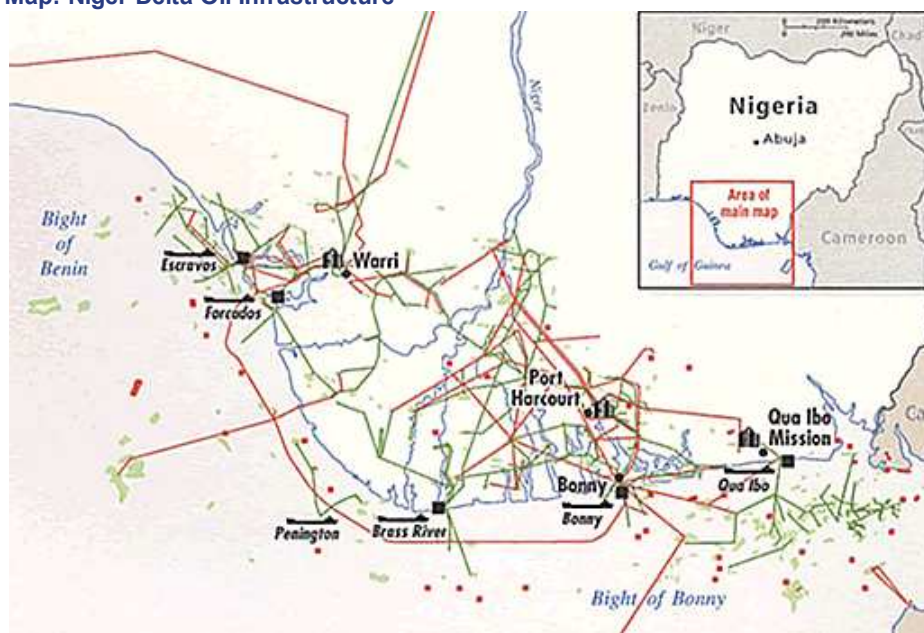
Last Updated: August 2011

Background

Nigeria's hydrocarbon resources are the mainstay of the country's economy but development of the oil and natural gas sectors is often constrained by instability in the Niger Delta.

The Nigerian economy is heavily dependent on the oil sector which, according to the [International Monetary Fund \(IMF\)](#), accounts for over 95 percent of export earnings and about 40 percent of government revenues. The oil industry is primarily located in the Niger Delta where it has been a source of conflict. Local groups seeking a share of the oil wealth often attack the oil infrastructure and staff, forcing companies to declare *force majeure* on oil shipments. At the same time, oil theft, commonly referred to as "bunkering", leads to pipeline damage that is often severe, causing loss of production, pollution, and forcing companies to shut-in production. The industry has been blamed for polluting air, soil and water leading to observed losses in arable land and decreasing fish stocks.

Map: Niger Delta Oil Infrastructure

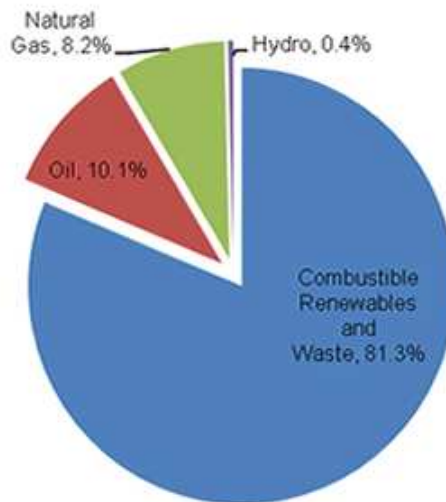


Source: U.S. Government

In addition to oil, Nigeria holds the largest natural gas reserves in Africa but has limited infrastructure in place to develop the sector. Natural gas that is associated with oil production is mostly flared but the development of regional pipelines, the expansion of liquefied natural gas (LNG) infrastructure and policies to ban gas flaring are expected to accelerate growth in the sector, both for export and domestic use in electricity generation.

In order to remedy some of the oil, natural gas and electricity industry problems, the Nigerian government is currently debating a Petroleum Industry Bill (PIB) that is designed to reform the entire energy sector (see oil section). The Bill was first introduced in 2009 and although parts of the PIB have recently been made into law, the Bill in its entirety continues to be debated by the National Assembly. This ongoing debate had delayed investments in oil exploration, project development and has also affected the natural gas sector by delaying planned liquefied natural gas (LNG) projects.

Total Energy Consumption in Nigeria, by Type (2008)



Source: International Energy Agency (IEA)

According to the International Energy Agency (IEA), in 2008, total energy consumption was 4.4 Quadrillion Btu (111,000 kilotons of oil equivalent). Of this, combustible renewables and waste accounted for 81.3 percent of total energy consumption. This high percent share represents the use of biomass to meet off-grid heating and cooking needs, mainly in rural areas. IEA data for 2009 indicate that electrification rates for Nigeria were 50 percent for the country as a whole -- approximately 76 million people do not have access to electricity in Nigeria.

Nigeria has vast natural gas, coal, and renewable energy resources that could be used for domestic electricity generation. However, the country is lacking in policies to harness resources and develop and/or improve the electricity infrastructure. The Nigerian government has had several plans to address the need for power, including a recent announcement to create 40 gigawatts (GW) of capacity by 2020 (compared to 2008 installed capacity of 6 GW). Much will depend on the ability of the Nigerian government to utilize currently flared natural gas.

Oil

Nigeria has been an OPEC member since 1971. The country has the second largest oil reserves in Africa and is the continent's primary oil producer. The light, sweet quality of Nigerian crude makes it a preferred gasoline feedstock.

According to the *Oil and Gas Journal*, Nigeria had an estimated 37.2 billion barrels of proven oil reserves as of January 2011. The majority of reserves are found along the country's Niger River Delta and offshore in the Bight of Benin, the Gulf of Guinea, and the Bight of Bonny. Current exploration activities are mostly focused in the deep and ultra-deep offshore with some activities in the Chad basin, located in the northeast of the country.

Since December 2005, Nigeria has experienced increased pipeline vandalism, kidnappings and militant takeovers of oil facilities in the Niger Delta. The Movement for the Emancipation of the Niger Delta (MEND) is the main group attacking oil infrastructure for political objectives, claiming to seek a redistribution of oil wealth and greater local control of the sector. Additionally, kidnappings of oil workers for ransom are common and the Gulf of Guinea is also an area that has seen [incidents of piracy](#). Security concerns have led some oil services firms to pull out of the country and oil workers unions to threaten strikes over security issues.

The instability in the Niger Delta has caused significant amounts of shut-in production and several companies to declare *force majeure* on oil shipments. EIA estimates Nigeria's nameplate oil production capacity to have been close to 2.9 million barrels per day (bbl/d) at the end of 2010 but as a result of attacks on oil infrastructure, daily crude oil production ranged between 1.7 million and 2.1 million barrels. Disruptions have been attributed to direct attacks on oil infrastructure as well as pipeline leaks and explosions resulting from bunkering activities.

Towards the end of 2009 an amnesty was declared and the militants came to an agreement with the government whereby they handed over weapons in exchange for cash payments and training opportunities. This amnesty has led to decreased attacks and some companies have been able to repair damaged oil infrastructure. However, the lack of progress in job creation and economic development has led to increased bunkering and other criminal attacks, which can significantly damage oil infrastructure.

Considerable attention has been drawn to the environmental damage caused by oil spills in the Niger Delta. According to the Nigerian National Oil Spill Detection and Response Agency

(NOSDRA) approximately 2,400 oil spills had been reported between 2006 and 2010 that resulted from sabotage, bunkering and poor infrastructure. The amount of oil spilled in Nigeria has been estimated to be around 260,000 barrels per year for the past 50 years according to a [report cited in the New York Times](#).

The oil spills have caused land, air, and water pollution severely affecting surrounding villages by decreasing fish stocks, contaminating water supplies and arable land. More recently, the United Nations Environment Program (UNEP) released a [study](#) on Ogoniland and the extent of environmental damage from over 50 years of oil production in the region. The study confirmed community concerns regarding oil contamination across land and water resources, stating that the damage is ongoing and estimating that it could take 25 to 30 years to repair.

Production

In 2010, total oil production in Nigeria was slightly over 2.46 million bbl/d, making it the largest oil producer in Africa. Crude oil production averaged close to 2.15 million bbl/d for the year. Recent offshore oil developments combined with the restart of some shut-in onshore production have boosted crude production to an average of 2.17 million bbl/d for the month of July 2011.

Planned upstream developments should increase Nigerian oil production in the medium term but the timing of these startups will depend heavily on the PIB and the fiscal/regulatory terms it imposes on the oil industry. Many of the planned projects described below have already been delayed.

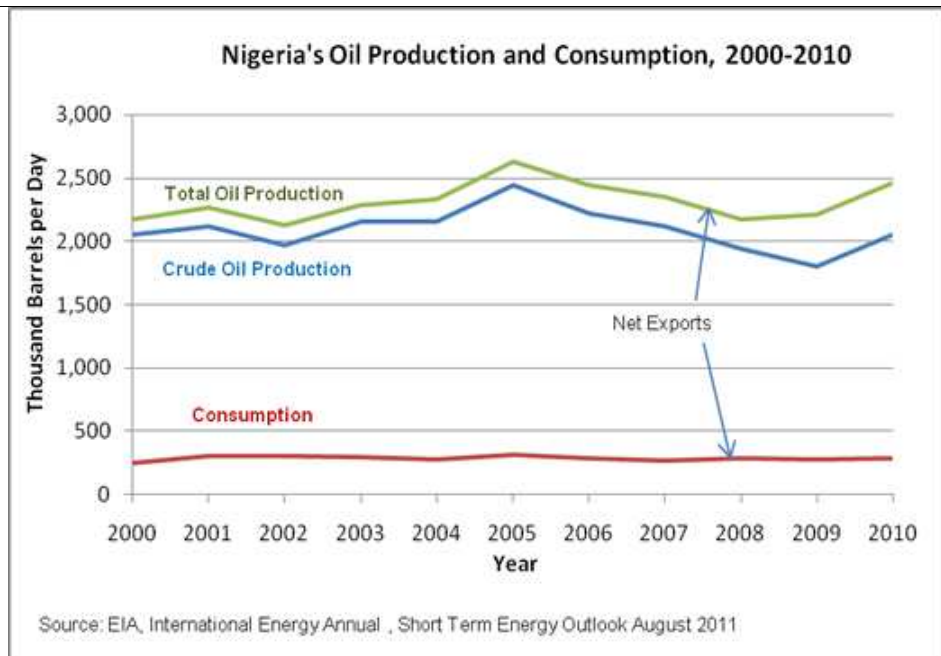
Nigeria: Upcoming Projects			
Project	Capacity ('000 bbl/d)	Est. Startup	Operator
Agbami 2**	100	2011-2014	Chevron
Usan	180	2012	Total
Gbaran Ubie Phase 1	70	2012+	Shell
Ehra North Phase 2	50	2013+	ExxonMobil
Bonga North, Northwest	50-150	2014+	Shell
Bonga Southwest and Aparo	140	2014+	Shell
Egina*	150-200	2014+	Total
Bosi	135	2015	ExxonMobil
Nsiko	100	2015+	Chevron
Uge	110	2016	ExxonMobil

* Final investment decision expected in 2011

** Expansion of existing Agbami field- drilling activities expected to continue through 2014 (Chevron)

Sources: *Oil and Gas Journal*; *IEA Medium Term Oil Market Report*; *Wood Mackenzie*; *Total*; *Chevron*; *Rigzone*; *Business Week*.

As a member of the Organization of Petroleum Exporting Countries (OPEC), Nigeria has agreed to crude oil production limits that have varied over the years but are currently set at 1.673 million bbl/d. OPEC quotas do not appear to have an impact on production volumes or investment decisions to the same degree as unrest in the Niger Delta.

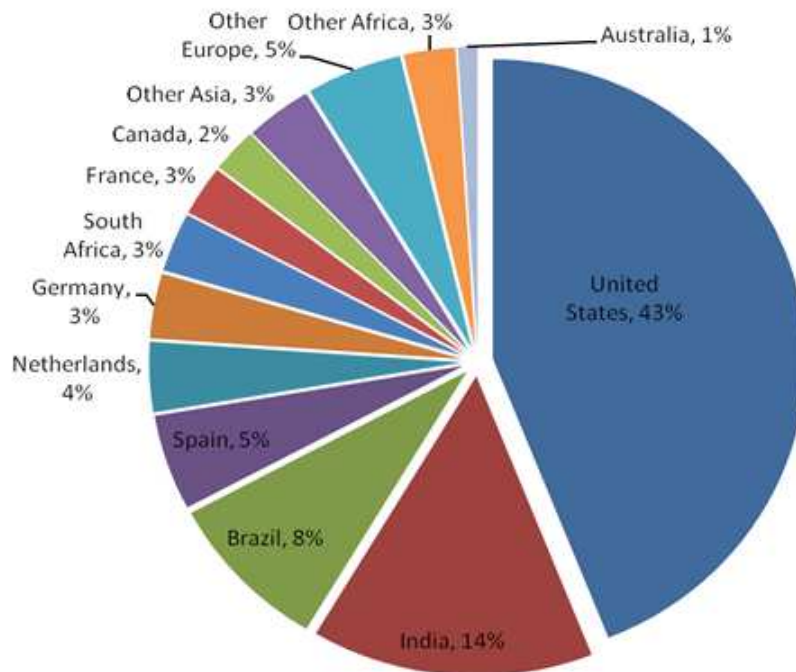


Exports

In 2010, Nigeria exported approximately 2.2 million bbl/d of total oil and 1.8 million bbl/d of crude oil. Nigeria is an important oil supplier to the United States. Over 40 percent of the country's oil production (980,000 bbl/d of crude oil, and slightly over 1 million bbl/d of total oil and products) is exported to the United States making Nigeria the 4th largest foreign oil supplier to the United States in 2010. The light, sweet quality crude is a preferred gasoline feedstock. Consequently, disruptions to Nigerian oil production impacts trading patterns and refinery operations in North America and often affect world oil market prices.

Available information indicates that additional importers of Nigerian crude oil include Europe (20 percent), Asia (17 percent), Brazil (8 percent), and South Africa (4 percent). Despite shut-in production, Nigerian trade patterns appear to have remained stable over the past several years, most of which can be attributed to capacity additions combined with slightly decreasing domestic consumption and shifting world demand.

Nigerian Crude Oil Exports by Destination, 2010



Sources: *Global Trade Atlas*, *APEX (Lloyd's)*, *FACTS Global Energy*, *EIA*

According to the Energy Intelligence Group's *International Crude Oil Market Handbook*, Nigeria's export blends are light, sweet crudes, with gravities ranging from API 29 - 47 degrees and low sulfur contents of 0.05 - 0.3 percent. Most Nigerian crudes trade at a premium to Brent, the North Sea benchmark crude.

Refining

In 2010, Nigeria consumed approximately 280,000 bbl/d of oil. The country has four refineries (Port Harcourt I and II, Warri, and Kaduna) with a combined capacity of around 450,000 bbl/d. As a result of poor maintenance, theft, and fire, none of these refineries have ever been fully operational. In 2009 and some of 2010 these refineries operated at their lowest levels of between 0 and 30 percent of capacity, and led to the country importing about 85 percent of its fuel needs. By early 2011, operational capacity increased to between 60 and 75 percent but the country still requires product imports to meet demand.

New refineries have been planned for several years now but lack of financing has caused several delays. As part of the PIB energy sector reforms described below, the government plans to end price subsidies and privatize the refining sector. In the meantime, according to *Business Monitor International*, NNPC has signed contracts to swap crude for products under yearly contracts with Trafigura, an oil trading company, and Cote d'Ivoire's national refiner SIR.

International Oil Companies

Foreign companies operating in joint ventures (JVs) or production sharing contracts (PSCs) with the Nigerian National Petroleum Corporation (NNPC) include ExxonMobil, Chevron, Total, Eni/Agip, Addax Petroleum (recently acquired by Sinopec of China), ConocoPhillips, Petrobras, StatoilHydro, and others.

Shell has been working in Nigeria since 1936 and currently operates the most nameplate crude oil production capacity, estimated to be between 1.2-1.3 million bbl/d. However, the company has been hardest hit by the instability as much of its production is onshore. Much of Shell's crude oil production capacity is shut-in, some since as far back as early 2006. However, in July 2011, Shell reportedly lifted *force majeure* on about 300,000 bbl/d of Bonny Light crude oil, increasing volumes of this much sought-after light, sweet blend. The company is also divesting from some of its smaller, onshore holdings.

ExxonMobil operates fields producing approximately 800,000 bbl/d (700,000 bbl/d of crude) in partnership with NNPC. Although most of ExxonMobil's production is offshore, the company has also been forced to shut-in production. In 2008, supply disruptions took place as a result of worker strikes carried out by the Petroleum and Natural Gas Senior Staff Association of Nigeria (PENGASSAN) that shut-in all of ExxonMobil's production for about 10 days in late April/early May

of that year.

Chevron operates between 600,000 and 700,000 bbl/d of production capacity, some of which has been shut-in since January 2005 (Escravos Field). Total's smaller share of production has been unaffected in recent years whereas Eni/Agip has had some incidents, specifically at the Brass River terminal that have shut-in varying volumes of production since December of 2006.

Sector Organization

In 1977, Nigeria created NNPC. At that time, NNPC's primary function was to oversee the regulation of the Nigerian oil industry, with secondary responsibilities for upstream and downstream developments. In 1988, the Nigerian government divided the NNPC into 12 subsidiary companies in order to better manage the country's oil industry. The majority of Nigeria's major oil and natural gas projects are funded through JVs, with the NNPC.

Recent Developments

The government has been planning to transform NNPC into a more profit-driven company that can seek out private funds in the market. While these discussions have been underway for many years, a Petroleum Industry Bill (PIB) is currently being debated by the National Assembly. The PIB is designed to reform the entire hydrocarbon sector to increase the government's share of revenue; increase natural gas production; streamline the decision making process by dividing up the different roles of NNPC including the creation of a profit-driven company; privatize NNPC's downstream activities; and promote local content. The Bill would also provide for a greater share of oil revenues to the producing communities and expand the use of natural gas for domestic electricity generation.

Parts of the Bill have recently been approved as stand alone laws (see below) while the different agencies and roles of the new National Oil Company and the NNPC have yet to be fully defined. Differing versions of the PIB are currently being debated, especially around more contentious points such as the renegotiation of contracts with international oil companies, the changes in tax and royalty structures and clauses to ensure that companies use or lose their assets. The ongoing debate has delayed investments in both the oil and natural gas sectors.

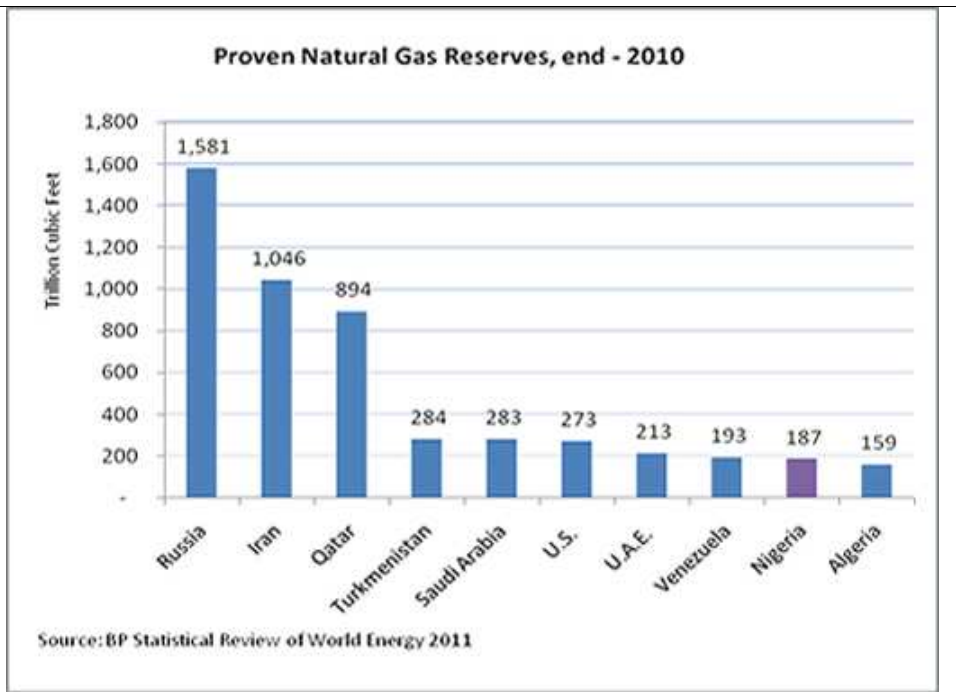
As part of the energy sector reform, in April 2010, then acting president (now president) Goodluck Jonathan signed the Nigerian Content Development Bill (NCD) into law. The bill is aimed at increasing the role of Nigerian companies in all aspects of the oil and gas industry. The new law requires that Nigerian companies obtain contracts and win bids so long as the local company is capable, the Nigerian content is higher, and the bid is not more than 10 percent higher than the otherwise winning bid. According to the *African Oil and Gas Monitor* (Afroil) the NCD applies to all contracts worth over US\$1 million and also applies to insurance, banking, and other sectors tied into the oil industry.

Natural Gas

Overview

Nigeria had an estimated 187 trillion cubic feet (Tcf) of proven natural gas reserves as of December 2010 according to the *BP Statistical Review of World Energy*, which makes Nigeria the ninth largest natural gas reserve holder in the world and the largest in Africa. The majority of the natural gas reserves are located in the Niger Delta and the sector is also impacted by the security and regulatory issues affecting the oil industry.

The Nigerian natural gas sector is expected to grow as new infrastructure is developed and the government implements zero gas flaring policies.

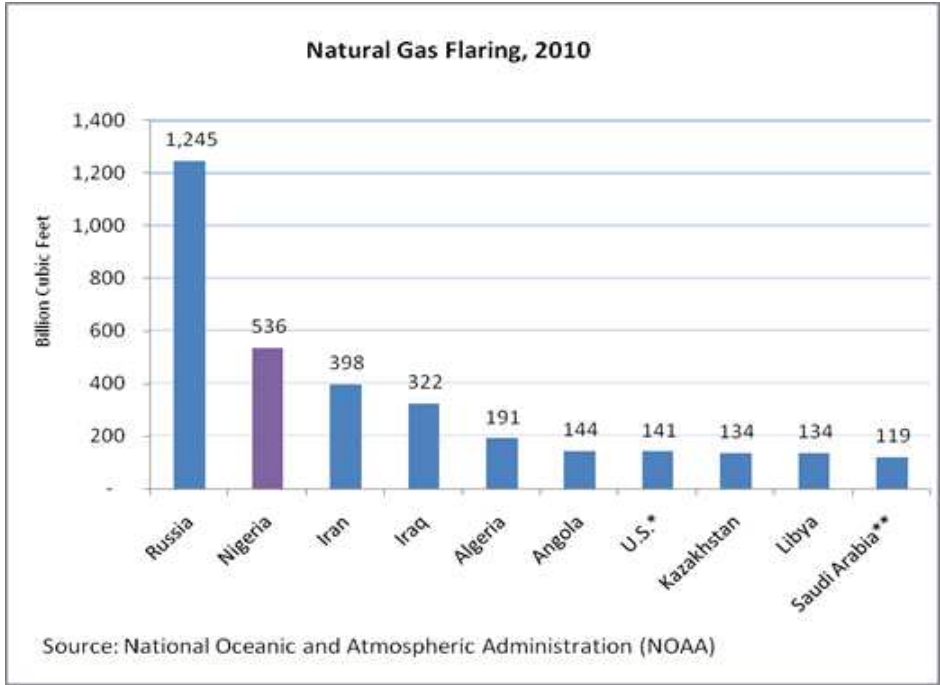


In 2009, Nigeria produced about 820 Bcf of marketed natural gas and consumed about 255, mostly for electricity generation where, according to the International Energy Agency (IEA) natural gas accounts for about 60 percent of generated electricity.

Gas Flaring

Because many of Nigeria's oil fields lack the infrastructure to produce and market associated natural gas, it is often flared. According to the National Oceanic and Atmospheric Administration (NOAA), Nigeria flared 536 Bcf natural gas in 2010 -- or about a third of gross natural gas produced in 2010 according to NNPC. In 2011, the NNPC claimed that flaring cost Nigeria US \$2.5 billion per year in lost revenue.

The government of Nigeria has been working to end natural gas flaring for several years but the deadline to implement the policies and fine oil companies has been repeatedly postponed with the most recent deadline being December 2012, which appears unlikely to be met. In 2009, the Nigerian government developed a Gas Master Plan that promotes new gas-fired power plants to help reduce gas flaring and provide much-needed electricity generation; however, progress is still limited.



* U.S. data includes all 50 states

** Saudi Arabia data includes Saudi Neutral Zone

Gas to Liquids (GTL)

A Chevron-operated Escravos Gas to Liquids (GTL) project is currently underway. The project is a joint venture with NNPC and South Africa's Sasol and began in 2008. Escravos GTL has faced multiple delays and cost overruns but is currently scheduled to be operational by 2013.

Exports

Liquefied Natural Gas (LNG)

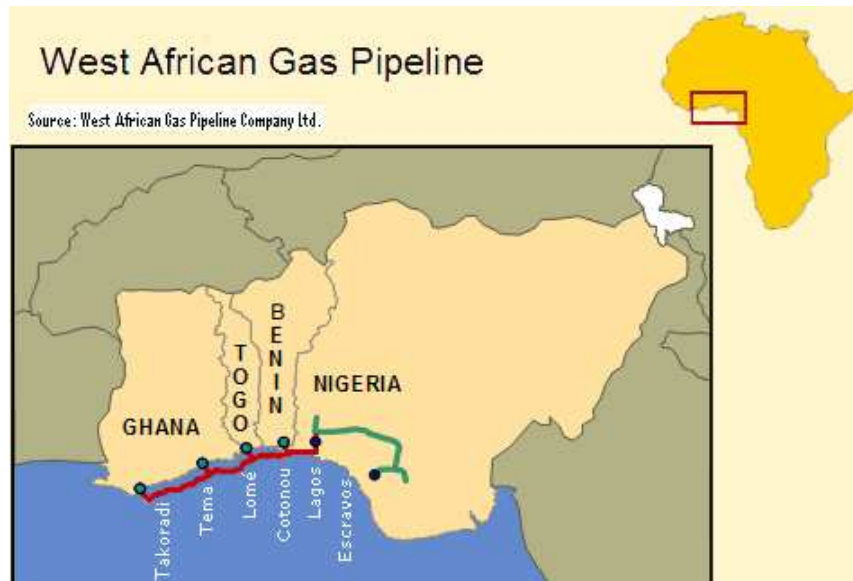
A significant portion of Nigeria's marketed natural gas is processed into LNG. In 2009, Nigeria exported close to 500 Bcf of LNG. Of this, 13.3 Bcf went to the United States, providing 3 percent of total U.S. LNG imports (2 percent of Nigerian exports). Most of Nigeria's LNG was exported to Europe (66 percent), mainly Spain (31 percent), France (15 percent) and Portugal (13 percent). Other export destinations include Asia (15 percent) and Mexico (16 percent). Nigerian LNG exports were down close to 30 percent from 2008 volumes which can also be attributable to problems in the Niger Delta, specifically problems at the Soku gas processing facility. Available U.S. EIA data indicate that the U.S. imported 41 Bcf of LNG from Nigeria in 2010 representing 10 percent of LNG imports but only about 1 percent of total U.S. natural gas imports.

Nigeria's main natural gas project is the Nigeria Liquefied Natural Gas (NLNG) facility on Bonny Island. Partners including NNPC, Shell, Total, and Agip (Eni) completed the first phase of the facility in September 1999. NLNG currently has six trains and a production capacity of 22 million metric tons per year (1.1 Tcf). A seventh train is under construction but this addition has been delayed until sometime after 2012.

Three additional LNG plants with a total of seven trains were expected to come online after 2012, but their expected startups have been postponed beyond 2016. Plans included OK LNG (4 trains), Brass LNG (2 trains), and Progress LNG (1 train). These are in varying stages of development and investment decisions will depend heavily on security, world LNG markets, and the final outcome of the Petroleum Industry Bill. Availability of natural gas will also depend on Nigerian efforts to expand the use of natural gas for domestic electricity generation -- efforts that are included in both the Gas Master Plan and the PIB.

International Pipelines

In addition to LNG, Nigeria began exporting some of its natural gas via the West African Gas Pipeline (WAGP) in 2010. The 420-mile pipeline carries natural gas from Nigeria to Ghana via Togo and Benin. Exports should eventually reach initial capacity of 170 million cubic feet per day (MMcf/d) and plans are underway to expand capacity to as much as 450 MMcf/d and possibly extend the pipeline further west to Cote d'Ivoire.



Nigeria and Algeria continue to discuss the possibility of constructing the Trans-Saharan Gas Pipeline (TSGP). The 2,500-mile pipeline would carry natural gas from oil fields in Nigeria's Delta region to Algeria's Beni Saf export terminal on the Mediterranean. In 2009 the NNPC signed a memorandum of understanding (MoU) with Sonatrach, the Algerian national oil company in order to proceed with plans to develop the pipeline. Several national and international companies have shown interest in the project including Total and Gazprom. Security concerns along the entire pipeline route, increasing costs and ongoing uncertainty in Nigeria will continue to delay this project.