U.S. Energy Information Administration

‹ Countries

Nigeria

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full report

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.

Nigeria is the largest oil producer in Africa and has been a member of the Organization of Petroleum Exporting Countries (OPEC) since 1971. In 2011, Nigeria produced about 2.53 million barrels per day (bbl/d) of total liquids, well below its oil production capacity of over 3 million bbl/d, due to production disruptions that have compromised portions of the country's oil for years. The Nigerian economy is heavily dependent on its hydrocarbon sector, which accounted for more than 95 percent of export earnings and more than 75 percent of federal government revenue in 2011, according to the International Monetary Fund (IMF).

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. Protest from local groups over environmental damages from oil spills and flaring undermined relations between local communities and international oil companies (IOCs). The industry has been blamed for pollution that has damaged air, soil, and water, leading to losses in arable land and decreasing fish stocks.

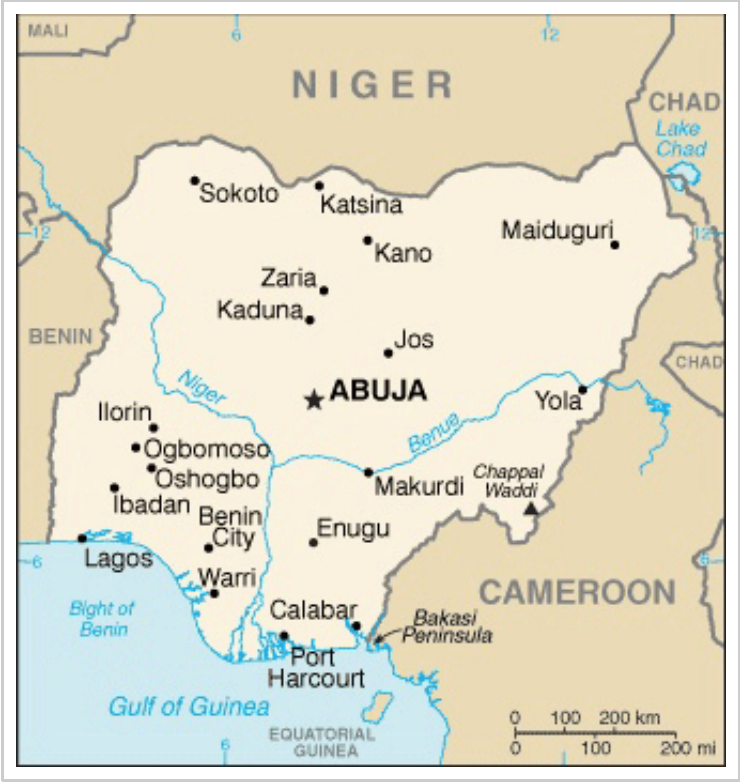
In addition to oil, Nigeria holds the largest natural gas reserves in Africa, but has limited infrastructure in place to develop the sector. Natural gas that is associated with oil production is mostly flared, but the development of regional pipelines, the expansion of liquefied natural gas (LNG) infrastructure, and policies to ban gas flaring are expected to accelerate growth in the sector, both for export and domestic use in electricity generation. Uncertainties in Nigeria's investment policies and regulatory framework have caused a slowdown in oil and gas exploration activity, and delays in project development, including LNG projects. However, the long-awaited and delayed Petroleum Industry Bill (PIB) could potentially iron out investment uncertainties and set a regulatory framework for the country's oil and gas industry.

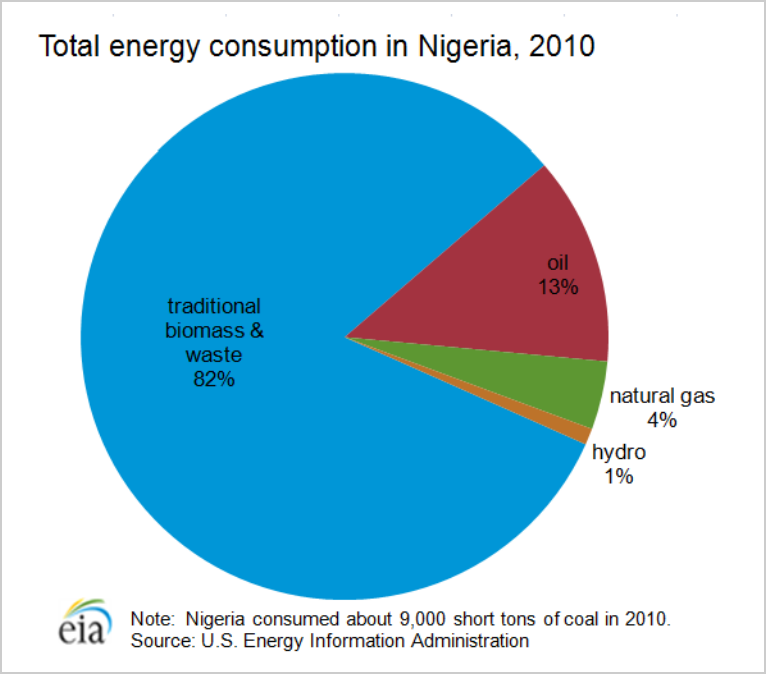
The first draft of the PIB was initially introduced in 2008, with the purpose of restructuring the hydrocarbon sector, clarifying regulatory and operational roles of Nigerian energy institutions, and increasing government take and local content requirements. Passage of the PIB has been stalled by a lack of support, notably by IOCs, and also ongoing debate within the Nigerian government. Nonetheless, after several rounds of revisions, there are

indications that IOCs have a more positive perception of the bill, although concerns have been expressed, most recently by Shell. The PIB has been sent to Nigeria's National Assembly.

EIA estimates that in 2010 total energy consumption was about 4.4 Quadrillion Btu (111,000 kilotons of oil equivalent). Of this, traditional biomass and waste accounted for 82 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 – leaving approximately 76 million people without access to electricity in Nigeria. Other estimates place the countrywide electrification rate as low as 45 percent.

Nigeria has vast natural gas, coal, and renewable energy resources that could be used for domestic electricity generation. However, the country lacks policies to harness resources and develop new (and improve current) 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 2009 installed capacity of 6 GW). Achieving this goal will mainly depend on the ability of the Nigerian government to utilize currently flared natural gas.





Oil

For the last nine years, the U.S. has imported between 9-11 percent of its crude oil from Nigeria; however, U.S. import data for the first half of 2012 show that Nigerian crude is down to a 5 percent share of total U.S. crude imports.

According to *Oil and Gas Journal* (OGJ), Nigeria has an estimated 37.2 billion barrels of proven oil reserves as of the end of 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.

The government hopes to increase proven oil reserves to 40 billion barrels in the next few years; however, exploration activity levels are at their lowest in a decade and only three exploratory wells were drilled in 2011, compared to over 20 in 2005. Rising security problems related to oil theft, pipeline sabotage, and piracy in the Gulf of Guinea, coupled with investment uncertainties surrounding the long-delayed PIB, have curtailed oil exploration projects and impeded the country from reaching its ongoing target to increase production to 4 million bbl/d. Instead, crude oil production averaged 2.13 million bbl/d in 2011, roughly the same as it was a decade ago, and total liquids production averaged 2.53 million that same year, which is still below the peak production of 2.63 million bbl/d reached in 2005.

Production

In 2011, crude oil production averaged close to 2.13 million bbl/d, up from 2.05 million bbl/d in the previous year. EIA's recent estimates show that crude output rose slightly again in 2012 and averaged almost 2.15 million bbl/d for the first half of this year. The recent increase in production is due to the expansion of existing fields and new production from deepwater fields. The latest major deepwater field to come onstream was Total's Usan field, which began producing over 100,000 bbl/d in July 2012 and is expected to reach

180,000 bbl/d by the end of this year.

Oil production in Nigeria reached its peak of 2.63 million bbl/d in 2005, but began to decline significantly as violence from militant groups surged, forcing many companies to withdraw staff and shut in production. The lack of transparency of oil revenues, tensions over revenue distribution, and environmental damages from oil spills, coupled with local ethnic and religious tensions, have created a fragile situation in the oil-rich Niger Delta basin. As a result, crude oil production plummeted by more than 25 percent by 2009, four years after reaching its peak.

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. The rise in oil production after 2009 was partially due to the reduction in attacks on oil facilities following the implementation of the amnesty program, which allowed companies to repair some damaged infrastructure and bring some supplies back online. Another major factor that contributed to the upward trend in output was the continued increase in new deepwater offshore production. The government began taking measures to attract investment in deepwater acreage in the 1990s in order to boost production capacity and diversify the country's oil fields, as security issues in the Niger Delta escalated. In order to incentivize investments in deepwater areas, which involve higher capital and operating costs, the government offered production-sharing contracts (PSC) in which IOCs received a greater share of revenue as the depth increased.

Although terms within the PSCs have been revised over time to provide the government with larger shares in revenue, the policy did facilitate greater investment and production in deepwater fields. The first deepwater field began production in 2003, and since then output from deepwater fields has added over 800,000 bbl/d to the country's production capacity.

As an OPEC member, Nigeria has agreed to a crude oil production quota of 1.704 million bbl/d. However, the country still plans on bringing online several projects in the next few years. Planned upstream developments, particularly deepwater projects, should increase Nigerian oil production in the medium term, but the timing of these startups will depend heavily on the passing of the PIB and the fiscal/regulatory terms it requires of the oil industry. Many of the planned projects described below have already been delayed.

Upcoming oil projects in Nigeria

Project	Capacity ('000 bbl/d)	Est. Startup	Sector	Operator
Agbami[1]	100	2011-2014	Deepwater	Chevron
Ebok (phase 2)	35	2012	Offshore	Afren
Gbaran Ubie[2]	70	2012+	Onshore	Shell
Ehra North (phase 2)	50	2013+	Deepwater	ExxonMobil
Oberan	tbd	2013+	Deepwater	Eni (Agip)
Ofon (phase 2)[3]	90	2014	Offshore	Total
Aje	tbd	2014	Deepwater	Yinka Folawyo Petroleum
Bonga North, Northwest	50-150	2014+	Deepwater	Shell

Bonga Southwest and Aparo	140	2014+	Deepwater	Shell
Egina	150-200	2014+	Deepwater	Total
Bosi	135	2015	Deepwater	ExxonMobil
Nsiko	100	2015+	Deepwater	Chevron
Uge	110	2016	Deepwater	ExxonMobil
Nkarika	tbd	2019	Offshore	Total
Etan/Zabazaba	110	tbd	Deepwater	Eni (Agip)
Okan	35	tbd	Offshore	Chevron

[1]Expansion of existing Agbami field- drilling activities expected to continue through 2014 (Chevron).

[2]Production began in 2010 and is expected to ramp up to 70,000 bbl/d once all wells are drilled.

[3]Ofon (phase 1) is currently producing around 30,000 bbl/d and phase 2 is expected to increase capacity to 90,000 bbl/d.

Note: Deepwater projects have a water depth greater than 200 meters.

Sources: Oil and Gas Journal; IEA Medium Term Oil Market Report; IHS Cera, Wood Mackenzie; Total; Chevron; Rigzone; Business Week; OPEC Secretariat

Security risks

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 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 also caused significant amounts of shut-in production at onshore and shallow offshore fields, and forced several companies to declare force majeure on oil shipments.

The amnesty program implemented in 2009 led to decreased attacks in 2009-2010 and some companies were able to repair damaged oil infrastructure. However, the lack of progress in job creation and economic development has led to increased bunkering and other attacks in 2011.

Bunkering, which in the context of Nigeria's oil industry refers to the theft and trade of stolen oil, has recently surged, and according to NNPC data, pipeline vandalism increased by 224 percent in 2011 over the previous year. Estimates from Nigeria's Ministry of Finance show that about 400,000 bbl/d of oil was stolen in April 2012, which led to a fall of about 17 percent in official oil sales. Royal Dutch Shell, Nigeria's largest producer, recently estimated that 150,000-180,000 bbl/d, or 6 percent of the country's total production, on average is lost to oil bunkering and spills.

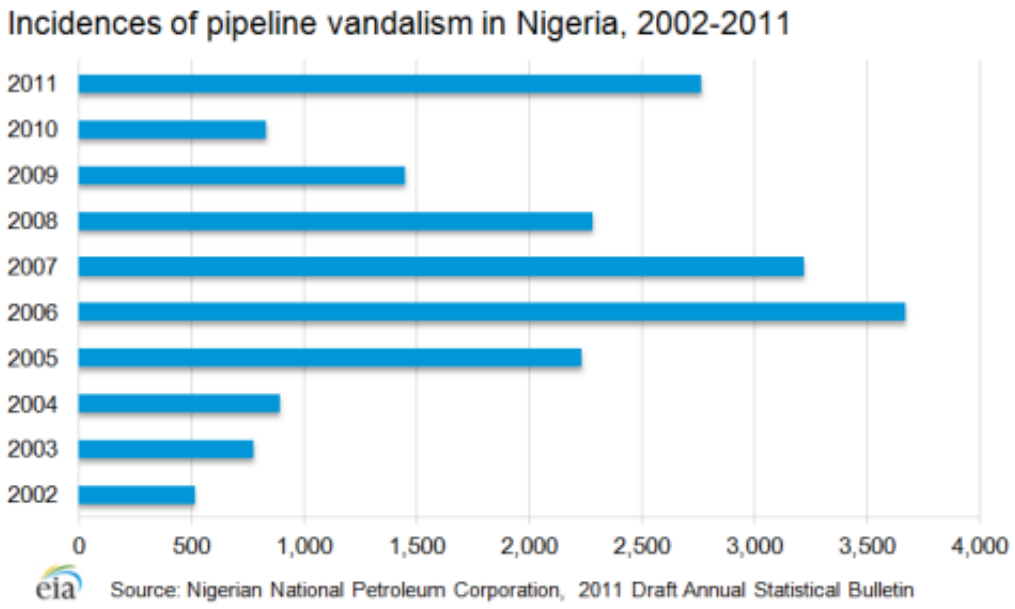
According to information disseminated by an investigative task force in Nigeria, there are three main ways oil is bunkered: by small cargo canoes that navigate the swampy, shallow waters of the Niger Delta where culprits puncture pipelines to siphon crude into small tanks; stealing crude directly from the wellhead; or filling tankers at export terminals, which is referred to as "white collar" bunkering. Some stolen oil is taken to illegal refineries along

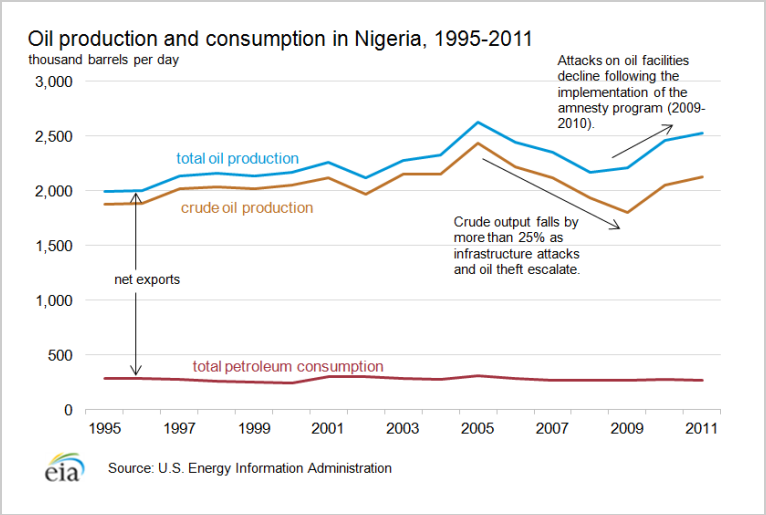
the Niger Delta's swampy bush areas and sold domestically and regionally, while other portions make their way to the international market. Some analysts believe that white collar bunkering is not included in Shell's oil theft estimate and that the average amount stolen is actually closer to the Finance Ministry's estimate, although there is no official number.

In addition to losses in official oil sales, oil theft and illegal refineries are causing environmental damages and costing the country $7 billion a year, according to the Nigerian government. 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 and severely affected surrounding villages by decreasing fish stocks and contaminating water supplies and arable land. 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 that the damage is ongoing and estimating that it could take 25 to 30 years to repair.

Incidents of piracy in the Gulf of Guinea have posed a risk to deepwater offshore operations. According to the International Maritime Organization (IMO), there were 53 piracy related attacks in the Gulf of Guinea in 2011, up from the 47 in 2010. The attacks typically involve stolen cargo, especially crude oil, and violence against crew members. The country's deepwater offshore production has been relatively unharmed by the country's instability, as oil platforms are miles out from the coast, but piracy does pose a security risk to deepwater offshore production. Although incidences of Nigerian piracy are still less than in Somalia, Nigerian piracy is becoming more frequent and happening at greater distances away from the coast, according to IMO.





Sector organization

In 1977, Nigeria created the Nigerian National Petroleum Company (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 managed 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 financing. While these discussions have been underway for many years, a Petroleum Industry Bill (PIB) is currently being debated by the National Assembly to reform the entire hydrocarbon sector. Parts of the bill have recently been approved as standalone laws, 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 under debate, 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 aims to increase 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 competing 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.

The distribution of oil revenue has been a very contentious issue in the country, since all revenue, including production proceeds, corporate tax, customs duties, and value-added tax, goes directly to the federal government account. The lack of transparency and mismanagement of oil revenue has sparked mistrust among the federal government, states, and local councils. The 1999 constitution carved out a revenue-sharing arrangement in which 13 percent of oil revenue from onshore production goes directly to the nine oil

producing states in the Niger Delta, with the remaining revenue allocated to the federal government (47.2 percent), states (31.1 percent), local councils (15.2 percent), and National Priorities Services Fund (6.5 percent).

Disagreement over the current revenue-sharing arrangement is one of the main issues driving the political tension, theft, and sabotage in the Niger Delta, and groups have demanded to extend their revenue-share to offshore production and increase their onshore revenue-share to 50 percent. However, the effect that the PIB will have on the current revenue-sharing arrangement is unclear.

Petroleum Industry Bill (PIB), draft 2012

Key points
Increase exploration activities and expand reserves
Monetize natural gas reserves and reduce flaring
Separate regulators for the upstream, midstream, and downstream sectors
Deregulate the downstream sector
Offer acreage through bid rounds
Increase government take
Higher royalties
Lower production taxes
Increase local participation through employment, related industries, and local oil & gas companies
Petroleum Host Communities Fund (PHCF)

Note: These measures may not appear in the final version of the PIB.
Source: Energy Intelligence, Reuters, Financial Times, and IHS Cera.

International oil companies

Foreign companies operating in joint ventures (JVs) or production sharing contracts (PSCs) with the NNPC include ExxonMobil, Chevron, Total, Eni, 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 largest 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 in shallow water and onshore the Niger Delta. Much of Shell's crude oil production capacity is shut-in, some since as far back as early 2006. According to Shell, the total oil produced from Shell-run operations averaged 974,000 bbl/d in 2011.

Shell operates in Nigeria through the Shell Petroleum Development Company of Nigeria Limited (SPDC) and the Shell Nigeria Exploration and Production Company Limited (SNEPCo). SPDC is the largest oil and gas company in Nigeria and is a joint venture between NNPC (55%), Shell (30%), Elf Petroleum Nigeria Limited — a subsidiary of Total — (10%), and Agip (5%). SPDC's operations include a network of pipelines, nine gas plants, and two export terminals. Shell owns 100 percent of SNEPCo, which was formed in 1993 to develop Nigeria's deepwater oil and gas resources offshore. Under a PSC with NNPC, it operates the Bonga deepwater oil and gas project and is a venture partner in the

Erha deepwater oil and gas project with ExxonMobil.

ExxonMobil, the second largest IOC, operates fields producing approximately 800,000 bbl/d (700,000 bbl/d of crude) in partnership with NNPC. Chevron is the third largest oil producer in Nigeria and produced an average of 516,000 bbl/d of crude oil in 2011. The company operates under its subsidiary, Chevron Nigeria Limited, and holds 40 percent interest in 13 concessions under a joint venture arrangement with NNPC. Most of its oil projects are in shallow water and onshore in the Niger Delta. Chevron also has interests in deepwater projects, particularly its largest deepwater discovery Agbami.

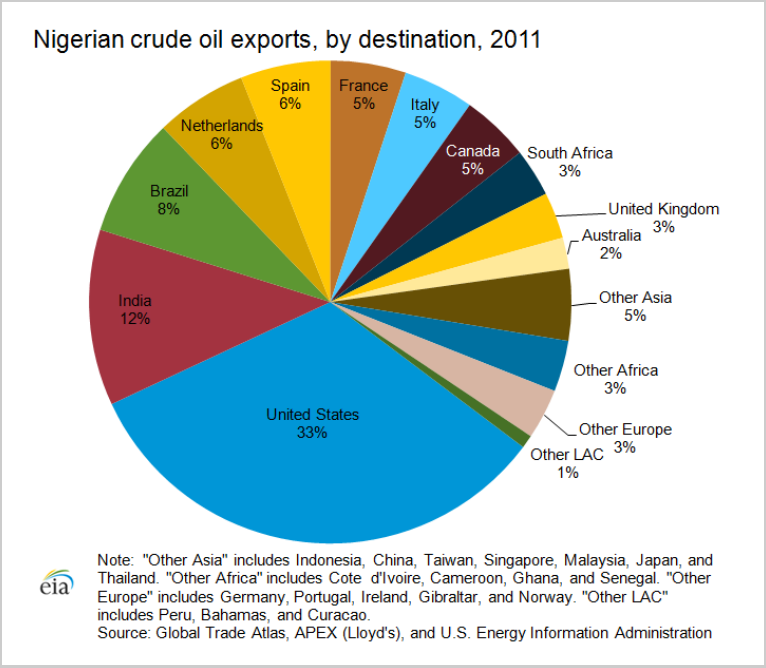
Total and Eni are the fourth and fifth largest oil producers in the country, producing 179,000 bbl/d and 96,000 bb/d in 2011, respectively. Total operates several offshore projects and one onshore. Total is the operator of the Usan deepwater field that came online in July 2012. Total's smaller share 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.

Exports

In 2011, Nigeria exported approximately 2.2-2.3 million bbl/d of crude oil, according to an analysis of data from the Global Trade Atlas (GTA), APEX Tanker Data (Lloyd's Maritime Intelligence Unit), and OPEC. Crude production estimates are sometimes less than crude export estimates for Nigeria due to oil theft, particularly from the wellhead, that reduces the amount of official oil sales and makes it difficult to estimate production.

Nigeria is an important oil supplier to the United States. In 2011, 767,000 bbl/d of crude (33 percent) of Nigeria's crude exports were sent to the United States, making Nigeria the fourth largest foreign oil supplier to the United States. Although Nigeria's high-quality light, sweet crude is a preferred gasoline feedstock, United States imports of Nigerian crude have decreased in volume and as a share of total imports in 2011, with the trend continuing in 2012. According to an EIA article published earlier this year, although total crude imports into the United States are falling, imports from Nigeria have declined at a steeper rate. The main reasons underlying this trend are that some Gulf Coast refiners have reduced Nigerian imports in favor of domestically-produced crude, and that two refineries in the U.S. East Coast, which were significant buyers of Nigerian crude, were idled in late 2011. As a result, Nigerian crude as a share of total United States imports has fallen to 5 percent in the first half of 2012, down from 10 and 11 percent in the first half of 2011 and 2010, respectively, according to EIA.

Despite shut-in production, Nigerian oil trade patterns appear to have remained stable over the past several years, most of which can be attributed to capacity additions and shifting world demand. Other major importers of Nigerian crude oil include Europe (28 percent), India (12 percent), Brazil (8 percent), Canada (5 percent), and South Africa (3 percent). According to the Energy Intelligence Group's International Crude Oil Market Handbook, Nigeria has about 20 exported crude streams and most are light, sweet grades, with gravities ranging from API 29 — 47 degrees and low sulfur contents of 0.05 — 0.3 percent.



Downstream

Refining

In 2011, Nigeria consumed approximately 286,000 bbl/d of petroleum, according to EIA estimates, and about 180,000 bbl/d of which was gasoline, according to estimates from OPEC's Annual Statistical Bulletin. The country has four refineries (Port Harcourt I and II, Warri, and Kaduna) with a combined capacity of around 445,000 bbl/d, according to *OGJ*. As a result of poor maintenance, theft, and fire, none of these refineries have ever been fully operational. In 2009 and part of 2010 particularly low refinery runs forced the country to import about 85 percent of its fuel needs. In 2011, the operational capacity at refineries averaged 24 percent, slightly higher than the 22 percent in the previous year. Refineries have never reached full production capacity due to operational failures and sabotage, mainly on crude pipelines feeding refineries. Refinery utilization rates may improve in 2013 if the planned turn-around maintenance is performed.

For several years, the government has planned the construction of new refineries, but the lack of financing has caused several delays. As part of the PIB energy sector reforms, the government also plans to liberalize domestic fuel prices 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 Ivory Coast's national refiner SIR.

Oil infrastructure

Nigeria has over a dozen domestic crude oil pipelines that funnel crude to export terminals and domestic refineries. The pipelines run from 31 miles to as long as 383 miles, through mostly rural or swampy areas, making them difficult to police. Most of the pipeline systems are jointly owned by the major IOCs and NNPC, while the export terminals are operated by Shell (Forcados and Bonny terminals), ExxonMobil (Qua Iboe terminal), Chevron (Escravos and Pennington terminals) and Eni (Brass terminal). There are also several floating production, storage and offloading (FPSO) vessels that facilitate exports from deepwater offshore fields.

Domestic fuel prices & subsidies

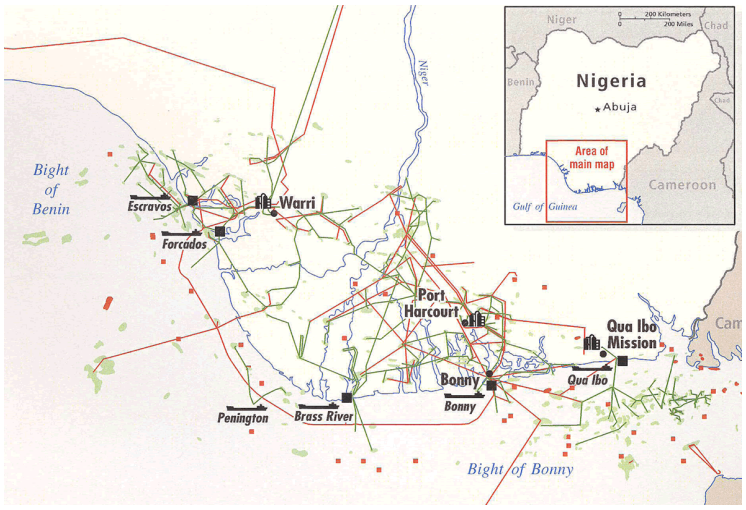
On January 1, 2012, the Nigerian government removed the federal government fuel subsidy on the grounds that it caused market distortions, encumbered investment in the downstream sector, supported economic inequalities (as rich fuel-importing companies were the main beneficiaries), and created a nebulous channel for fraud. However, the government quickly reversed course about two weeks later and reinstated a partial subsidy as public outcry and massive strikes organized by oil and non-oil unions threatened to shut down oil production completely. Many Nigerians consider the fuel subsidy a key benefit of living in the oil-rich country.

Prior to the subsidy removal, the pump price of fuel was 65 naira ($0.40) per liter compared to the actual cost of around 139 naira per liter. According to the United Nations, the fuel subsidy costs the Nigerian government annually 1,200 billion naira ($7.6 billion), or 2.6 percent of the country's GDP. Subsequent to the removal, the government restored a partial subsidy, requiring consumers at the pump to pay 97 naira per liter ($0.60), as opposed to the new price of 141 naira per liter.

Controversy over Nigeria's fuel subsidy resurfaced in August 2012, as Nigerian oil marketing associations launched an open-ended strike over unpaid subsidies. The associations accused the government of stopping payments around March/April, though the government denies this claim. Tensions between Nigerian fuel importers and the government have been high since the government launched an investigation of the industry to mitigate subsidy mismanagement. The investigation has led to the arrest of about a dozen marketers and the suspension of seven companies that were accused of siphoning funds and inflating prices, according to *IHS Cera*.

Debate over Nigeria's fuel subsidy will continue among government officials, oil marketing associations, unions, and citizens, especially since the most recent version of the PIB attempts to deregulate the downstream sector. However, it is unclear how the PIB will affect fuel subsidies. Meanwhile, under the 2012 budget, the government is expected to subsidize at least 104,000 bbl/d of fuel imports for the remainder of 2012, which falls short by about 160,000-170,000 bbl/d of what is needed. According to *PFC Energy*, the government overestimated fuel subsidy savings and underestimated subsidy arrears' claims in 2012, and may have to access the Excess Crude Account to avoid strong public discontent.

Map: Niger Delta Oil Infrastructure



Source: U.S. government

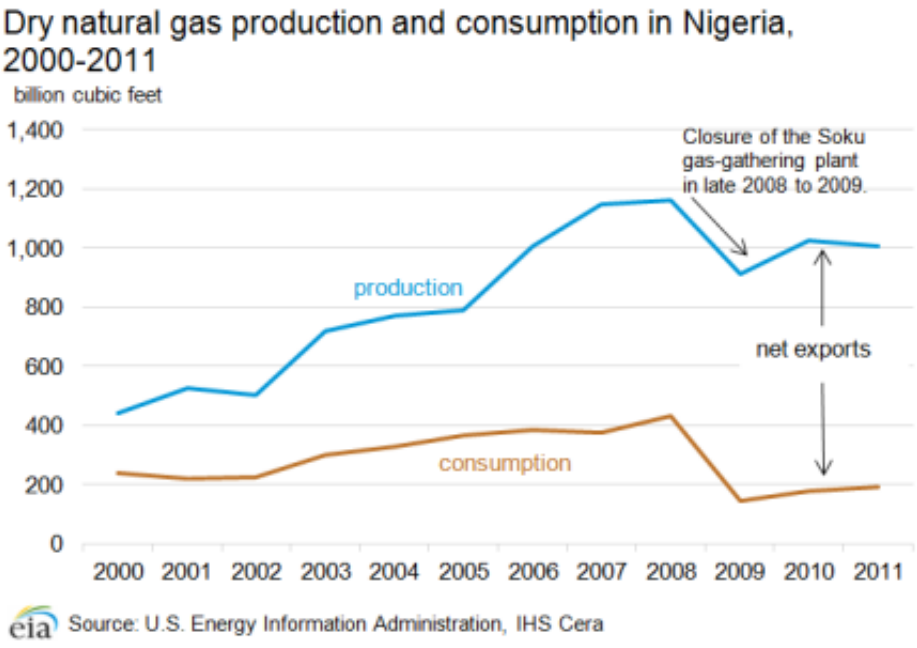
Natural gas

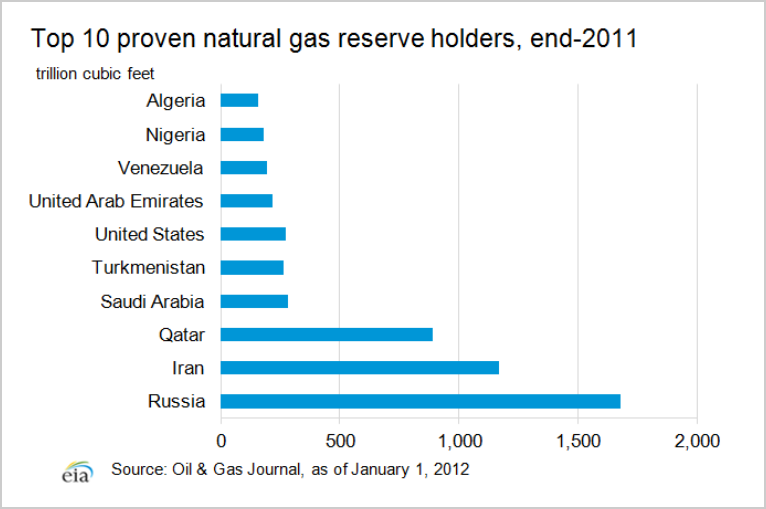
Nigerian LNG exports to the U.S. substantially declined in 2011, while the country's LNG exports to Japan more than tripled in 2011.

Nigeria had an estimated 180 trillion cubic feet (Tcf) of proven natural gas reserves as of the end of 2011, according to the OGJ, making Nigeria the ninth largest natural gas reserve holder in the world and the largest in Africa. Despite holding a top 10 position for proven natural gas reserves, Nigeria produced about 1 Tcf of dry natural gas in 2011 and ranked as the world's 25th largest natural gas producer. The majority of the natural gas reserves are located in the Niger Delta and, therefore, the sector is also impacted by the same security and regulatory issues affecting the oil industry.

Most of Nigeria's marketed natural gas is exported as Liquefied Natural Gas (LNG), with the remainder consumed domestically and other portions exported regionally via the West African Gas Pipeline. Shell Nigeria Gas Limited (SNG), a Shell-owned gas sales and distribution company, also delivers Compressed Natural Gas (CNG) to industries as far as 62 miles away from existing pipelines.

Dry natural gas production grew for most of the last decade until Shell declared a force majeure on gas supplies to the Soku gas-gathering and condensate plant in November 2008. Shell shut down the plant to repair damages to a pipeline connected to the Soku plant that was sabotaged by local groups siphoning condensate. The plant reopened nearly 5 months later, but was shut down again for most of 2009 for operational reasons. The Soku plant provides nearly half of the feed gas to Nigeria's sole LNG facility; therefore, its closure led to a reduction in Nigeria's natural gas production, particularly from Shell's fields in the Niger Delta, and a 33 percent decline in LNG exports in 2009. Gas production partially recovered in 2010 after the plant reopened.





Sector organization

For the most part, the same national regulatory bodies and international oil companies (IOCs) involved in Nigeria's oil industry are also the actors involved in the gas industry. The Nigerian Gas Company Limited (NGC), a subsidiary of NNPC, is tasked with the marketing, transmission, and distribution of gas and oversees pipeline projects. The PIB proposes to divide the NGC into two organizations: the midstream National Gas Transportation Company, and a downstream gas marketing company. Like in the oil industry, NNPC holds interest in gas projects alongside international oil companies.

International oil companies

Shell dominates gas production in the country, as the Niger Delta, which contains most of Nigeria's gas resources, also houses most of Shell's hydrocarbon assets. Shell produced 707 MMcf/d of gas in 2011 and its latest gas project, the Gbaran-Ubie integrated oil and gas project, achieved peak gas production of 1 Bcf/d in early 2011. Gbaran-Ubie's gas is delivered to domestic power plants and to NLNG for export.

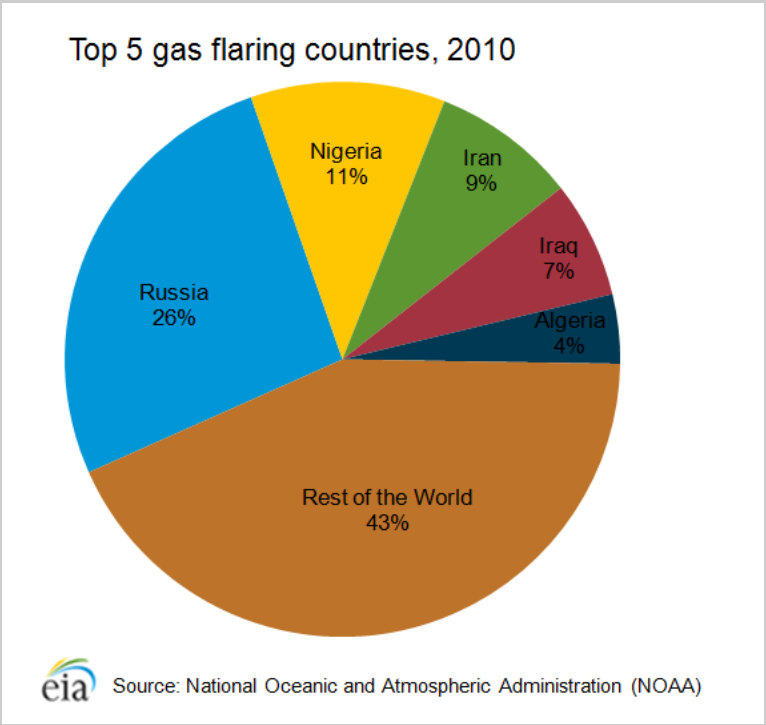
The second largest gas producer, Total, produced 534 MMcf/d in 2011. Total, along with Eni, is developing the Brass LNG facility, which will comprise two trains with the capacity of processing 5 million metric tons per year of LNG sometime after 2014. Eni was the third largest natural gas producer in Nigeria in 2011. The company's natural gas output grew by almost 40 percent in the last three years and reached 354 MMcf/d in 2011. Chevron produced 343 MMcf/d in 2011 and is majority owner of major gas projects in the country, such as the WAGP and the Escravos GTL plant, as noted above.

Gas flaring

Since Nigeria's oil fields lack the infrastructure to produce and market associated natural gas, much of it is flared. According to the National Oceanic and Atmospheric Administration (NOAA), Nigeria flared 536 Bcf of 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 Nigerian government 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 enforced. In 2009, the Nigerian government developed a Gas Master Plan that promotes investment in pipeline infrastructure and new gas-fired power plants to help reduce gas flaring and provide much-needed electricity generation. However, progress is still limited as security risks in the Niger Delta have made it difficult for IOCs to construct infrastructure that would support gas monetization.



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. The project will convert 325 million cubic feet of natural gas per day into 33,000 barrels of liquids, principally synthetic diesel, to supply clean-burning, low-sulfur diesel fuel for cars and trucks, according to Chevron.

Exports

Liquefied natural gas (LNG)

A significant portion of Nigeria's marketed natural gas is processed into LNG. In 2010, Nigeria exported 17.97 million metric tons (875 Bcf) of LNG, making Nigeria the fifth largest LNG exporter in the world and the largest LNG exporter in the Atlantic Basin. Furthermore, Nigeria's LNG accounted for 8 percent of the total supplied to the world market and 30 percent of LNG coming from the Atlantic Basin in 2010. However, although Nigeria's market share of LNG trade in the Atlantic Basin has been increasing, mainly due to decreased LNG exports from Algeria, the country's market share in the world has decreased from the 10 percent it once held to 7 percent, as reported by Nigeria Liquefied Natural Gas (NLNG) Limited in 2012. Nigerian LNG exports rose to 18.86 million metric tons (918 Bcf) in 2011, but due to no recent capacity increases and rising production from Qatar and Australia, Nigeria's world market share of LNG is slipping. Nigeria's LNG production capacity is

currently 22 million metric tons per year, and any major increase is not expected to come online before 2015.

In 2010, most of Nigeria's LNG was exported to Europe (67 percent), mainly Spain (31 percent), France (16 percent) and Portugal (12 percent), with smaller amounts to Turkey, United Kingdom, and Belgium. Other export destinations include Asia (15 percent) and North America (14 percent). The U.S. imported 0.86 million metric tons (42 Bcf) of Nigerian LNG in 2010, providing 1 percent of total U.S. LNG imports.

In 2011, U.S. imports of Nigerian LNG significantly decreased to 0.05 million metric tons (2.5 Bcf), according to EIA data, which is the lowest level recorded since Nigerian LNG exports began. In 2011, more of Nigeria's LNG exports were sent to Japan and other Asian countries due to higher demand for LNG imports in those countries. Most notably, Nigerian exports to Japan more than tripled in 2011, as Japan's LNG demand increased due to the Fukushima nuclear accident.

The Nigeria Liquefied Natural Gas (NLNG) facility on Bonny Island is Nigeria's only LNG complex. NLNG partners, including NNPC (49 percent), Shell (25.6 percent), Total (15 percent), and Eni (10.4 percent), 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 to increase the facility's capacity by 8 million metric tons per year. However, regulatory and political issues, particularly regarding the long-delayed PIB, have delayed the project's start date to beyond 2014.

Three additional LNG plants with a total of seven trains were expected to come online after 2012, but their expected start dates have been postponed beyond 2016. Plans include 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 PIB. Availability of natural gas for export 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

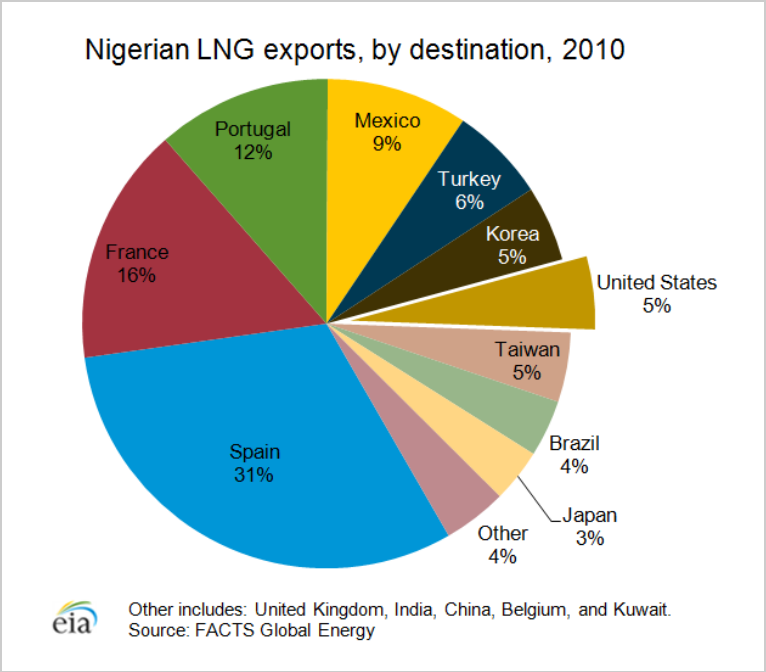
Nigeria began exporting some of its natural gas via the West African Gas Pipeline (WAGP) in 2011. The pipeline is operated by the West African Gas Pipeline Company limited (WAPCo), which is owned by Chevron West African Gas Pipeline Limited (36.7%), Nigerian National Petroleum Corporation (25%), Shell Overseas Holdings Limited (18%), Takoradi Power Company Limited (16.3%), Societe Togolaise de Gaz (2%), and Societe BenGaz S.A. (2%).

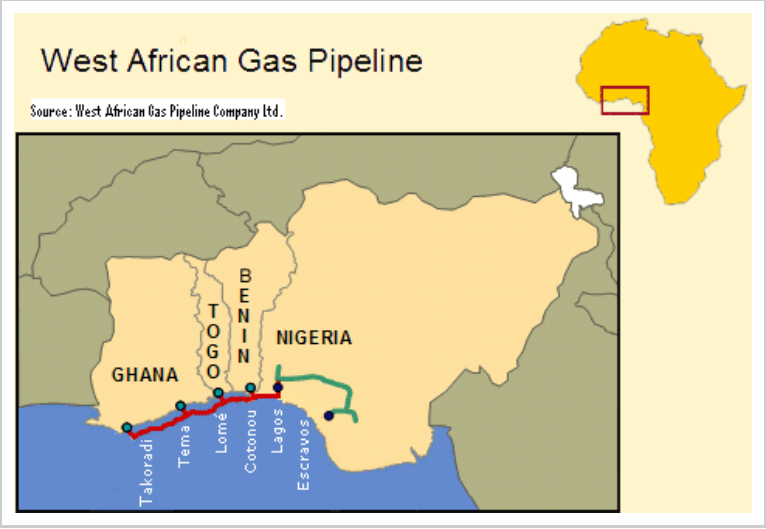
The 420-mile pipeline carries natural gas from Nigeria's Escravos region to Togo, Benin, and Ghana. WAGP links into the existing Escravos-Lagos pipeline and moves offshore at an average water depth of 35 meters. According to WAPCo, roughly 85 percent of the gas is used for power generation and the remainder for industrial applications. Current recipients are Volta River Authority's Takoradi Thermal Power Plant in Ghana and Electricity Community of Benin (CEB), a company co-owned by Benin and Togo. 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 460 MMcf/d and possibly extend the pipeline further west to Cote d'Ivoire.

As of early October 2012, the pipeline is shutdown due to a loss of pressure around the

Lome segment that it experienced at the end of August 2012. The WAPCo has noted that maintenance to the damaged pipeline is planned for completion at the end of December.

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 and is designed to supply gas to Europe. In 2009, the NNPC signed a memorandum of understanding (MoU) with Sonatrach, the Algerian national oil company, 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 regulatory and political uncertainty in Nigeria have continued to delay this project.





Electricity

Nigeria's electricity sector is relatively small. Brazil and Pakistan, two countries with similar population sizes, generate 24 times and 5 times more power than Nigeria, respectively.

Bangladesh, a country slightly smaller in population and with a smaller gross domestic product (GDP) than Nigeria, produces nearly twice as much electricity as Nigeria. The latest EIA estimates show that Nigeria's net generation was 18.8 billion kilowatthours (KWh) in 2009. Installed electricity capacity has remained relatively stable over the last decade at 5.9 GW, although net generation has slightly decreased from its peak of 23 billion KWh in 2004, mainly due to a decline in hydroelectric power.

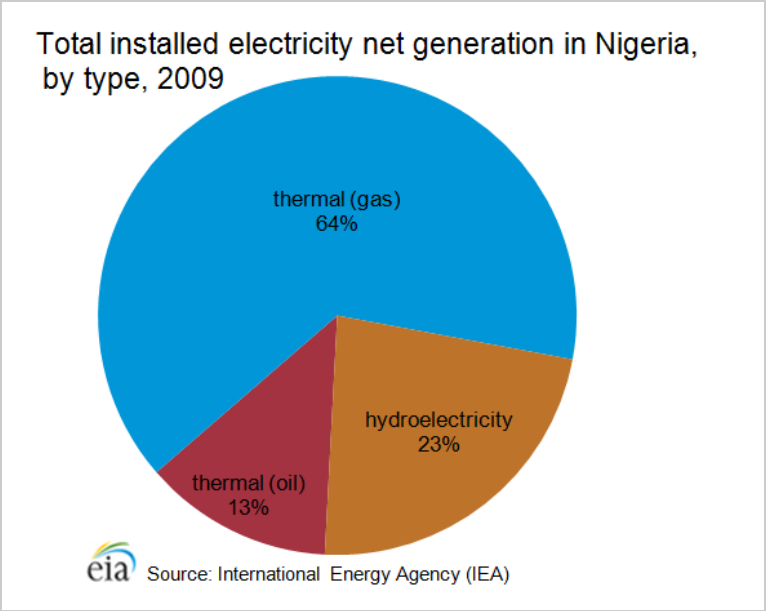
The majority of electricity generation comes from thermal power plants (77 percent), with about two-thirds of thermal power derived from natural gas and the rest from oil. Hydroelectricity (23 percent), the only other source of power generation, has decreased gradually from its peak of 8.2 billion KWh in 2002 to 4.5 billion KWh in 2009. Nigeria's electricity net consumption was 17.7 billion kWh in 2009, slightly less than generation, and exported most of the remainder to Niger through an agreement under the West African Power Pool.

According to a World Bank report, Nigeria experienced power outages on average for 46 days per year from 2007-2008, and outages lasted almost 6 hours on average. Population growth coupled with underinvestment in the electricity sector has led to increased power demand without any significant increases in capacity, in addition to inadequate maintenance, insufficient feedstock and an inadequate transmission network. Businesses often purchase costly generators to use as back-up during outages and the majority of Nigerians use traditional biomass, such as wood, charcoal, and waste, to fulfill household energy needs, such as cooking and heating.

Nigeria's electricity sector is divided into three sub-sectors: existing Federal Government of Nigeria (FGN) Power Generation facilities, Independent Power Projects (IPPs), and National Integrated Power Projects. The majority of power stations, both thermal and hydro, are FGN facilities funded by the government, while IPPs are backed by the private sector. The largest IPP and power plant in Nigeria is the 650 megawatt (MW) Afam VI Power Generating Plant owned by Shell. According to Shell, between 14-24 percent of overall generation contributes to the national grid.

The National Integrated Power Project (NIPP) is a plan launched by the Nigerian government to construct multiple new power plants and reduce gas flaring for feedstock. However, plans to bring NIPPs online have repeatedly been delayed, as government plans to privatize electricity generation and distribution companies have been slow. Two major challenges of privatization is unbundling the state-owned Power Holding Company of Nigeria, which was established to regulate pricing and competition, and publically managing the expected 88 percent rise in electricity tariffs once privatization is underway. The Nigeria Electricity Regulatory Commission has also said that new tariffs will be imposed on selected cities.

Currently, there are some IPPs under construction such as ExxonMobil's 388-MW gas-fired plant in Bonny and ABB's 450-MW gas and steam turbine in Abuja. Nonetheless, according to the government, the country needs $10 billion of investment a year for at least a decade to meet its power sector needs. In addition to funds, Nigeria's ability to meet power demand heavily relies on its ability to reduce gas flaring, increase gas distribution infrastructure, and diversify power generation sources.



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