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**DEPT: PETROLEUM ENGINEERING.**

**COURSE: ENG 317(Introduction to Petroleum Industry)**

**Assignment Title:** PROVEN RESERVES

**Question**

1. **What is Nigeria’s proven crude oil reserve?**
2. **What is Ghana’s proven crude oil reserve?**
3. **What is West Africa’s proven crude oil reserve?**
4. **What is Africa’s proven crude oil reserve?**

**ANSWER.**

* 1. The Federal Republic of Nigeria is located in western Africa on the Gulf of Guinea and has a total area of 924,000 km2. It shares a 4,047 kilometers border with Benin, Niger, Chad, Cameroon, and has a coastline of at least 853 km. Nigeria is the most populous country in Africa. The United Nations estimates that the population in 2009 was at 154,729,000, distributed as 51.7% rural and 48.3% urban, and with a population density of 167.5 people per square kilometer. The President of Nigeria is HE Muhammadu Buhari and Vice – President HE Yemi Osinbajo. Nigeria is the 12th largest producer of petroleum in the world and also possesses the largest natural gas reserves in the continent. The capital-intensive oil sector provides 20 per cent of gross domestic product, 95 per cent of foreign exchange earnings, and about 65 per cent of budgetary revenues. Natural gas reserves are well over 5 trillion m³ and are several times as substantial as the crude oil reserves. The biggest natural gas operator is the Nigerian Liquefied Natural Gas Company which began exploration and production in 1999. Currently a lot of effort is made to make use of the abundant reserves of associated gas and avoid flaring, as many Nigerian oil fields are saturated, and have primary gas caps. Apart from petroleum and gas, The Federal Republic of Nigeria also has a wide array of natural resources which include coal, bauxite, gold, tin, iron ore, limestone, niobium, lead and zinc. Nigerian economy also has well-developed financial, legal, communications, transport sectors and stock exchange (the Nigerian Stock Exchange) which is the second largest in Africa.

 Although Libya has more reserves, there were 37.2 billion barrels (5.91×109 m3) of proven oil reserves in Nigeria as of 2011, ranking the country as the largest oil producer in Africa and the 11th largest in the world, averaging 2.28 million barrels per day (362×103 m3/d) in 2006. At current rates this would be 45 years of supply if no new oil was found. Pipeline vandalism, kidnappings, and militant takeover of oil facilities have reduced production, which could be increased to 3 million barrels per day (480×103 m3/d) in the absence of such problems. The Nigerian government hopes to increase oil production capacity to 4 Mbbl/d (640×103 m3/d) by 2010. Nigeria is the world’s eighth largest exporter of crude oil and no longer sends 43% of its exports to the United States due to the recent shale boom of the US. The Oil industry accounts for about 14% of Nigeria's economy. Therefore, though the petroleum sector is important, it remains in fact a small part of the country's overall vibrant and diversified economy.However, Nigeria's foreign exchange is heavily dependent on the oil sector, which accounts for majority of its export revenues.

 Nigeria is a member of OPEC and is one of the major exporters of crude oil in the world. Nigeria is the 6th largest producer of crude oil and the 5th largest supplier of crude oil to America and Western Europe. Most recently, Asia and India both have an average of 120,000 barrels and 150,000 barrels respectively per day crude oil allocation from Nigeria.

Nigeria’s economy is heavily dependent on the oil sector, which accounts for nearly 80% of government revenues. Nigeria’s estimated proven oil reserves is currently about 36 billion barrels per day with a further 4 billion barrels per day forecast to be added by 2010 when most recently discovered oil wells in the continental oil shelve will have started production. With these findings and proven reserves, Nigeria can conveniently produce more than 3 million barrels per day, but this is grossly limited by OPEC quota, which creates room for surplus stock for refining within Nigeria.

For this reason, the project stands to benefit immensely from the excess crude oil produced, and as such guarantee the supply of feedstock to the refinery. Nigeria’s crude oil gravities range from 210 API to 450 API. The main export crude oil blends are Bonny, Qua, Brass and Forcados sweet crude (low Sulphur content) oil.

Major International Oil Company operating in Nigeria include British Gas, BP, Royal Dutch/Shell, Statoil, Chevron Texaco, and Exxon Mobile, Petro bras, ENI/Agip, Tenneco, Total Fine Elf, and Conoco etc. They have continuously invested in excess of US$6 billion annually in Nigeria. The recent deregulation of the oil and gas sectors of the Nigerian economy has given rise to increased investment opportunities in these sectors. Many Asians and some Eastern European companies are investing extensively in the downstream sector, with their major interests in the gas sector. The construction of three LNG plants, worth over US$12 billion in five years and the investment of US$6 billion by BP (British Petroleum) in 2006 is a plus to our investment climate, and the limitless opportunities Nigeria can offer to credible investors. Nigeria has one of the highest gas reserves in the world, rich in (C1-C5) up to 85% content. This has continued to attract investors to the Nigeria’s virgin gas sector. These investments will also help to reduce gas flaring.

As most African countries are aggressively pursuing transition to democracy and free market economy, there now exist investment and joint venture situations that will not only interest and benefit foreign investors, but will guarantee higher return on investment over a short period of time. Nigeria, with a proven oil reserve of over 36 billion barrels and a population of about 140 million people, will continue to make those natural and human resources available to its clients (investors) that have an interest in seriously considering business initiatives in the country. Nigerian government incentives and tax rebates also serve to encourage investment in the oil and gas sector.

The Nigerian government offers liberalized rules governing market entry, reparation of profit, maintenance of an offshore escrow account by investors, as well as better fiscal incentives to investors. Further aspects include security of tenure, generous tax holidays, guaranteed export earnings, provision of feedstock at fair price, capital allowance, sale of crude oil, and 50% duty reduction on construction materials. These incentives have been actively exploited by multinational oil companies.

The shift of Global FDI is gradually favoring African countries rich in oil and gas reverses, due to new economic reforms in respect of liberalization and privatization policies, adequate supply of raw materials, low cost of production, plentiful supply of skill and semi-skilled manpower, cheap labor, expanding domestic and international market and robust growth opportunities in the world.

 Crude oil and natural gas are at present the world’s most important derived energy supplier, and Nigeria is well endowed with the existence of these natural resources. At an average of 2.2 million barrels of oil per day, Nigeria has a reserve-to-production ratio of 42 years for oil and 152 years for gas. The long-term vulnerability of the country is underscored by the nonrenewable nature of the crude oil and natural gas resources. This is further aggravated by the on-going research and development efforts of oil-importing nations such as the United States of America on renewable and alternative sources of energy geared towards reducing their dependence on imported crude oil. Indeed, there is an attestable gradual reduction in the level of crude oil importation by USA, occasioned by the country’s discovery and utilization of shale oil and gas. It is for these reasons that Nigeria really needs to take advantage of the present and future revenue inflows from oil and gas to develop other sectors in order to sustain revenue generation within the dynamics of a competitive global economy. Therefore, Nigeria is expected to pay due attention to the relatively neglected shale oil as a potential alternative source of energy. In 2002, our research group in Petroleum Chemistry characterized the organic matter potentials of some oil shale from an area geologically designated as Lower Benue Trough of Nigeria following the landmark discovery of Lokpanta oil shale’s by Professor Ekweozor’s group in 1990. An oil shale is a Compact rock of sedimentary origin with an ash content of more than 33% and containing organic matter that yields oil when destructively distilled (pyrolysis). The Nigerian oil shale were first discovered in a 1.5x 1.0 km belt in Lokpanta near Okigwe in Imo State, an area geologically designated as Lower Benue Trough. Since then, not much has been done to explore the enormous resource potential of the oil shale deposits, perhaps due to the relatively high fiscal demand of the research and development enterprise. Aside from the Lokpanta shale oil reserves of the Lower Benue Trough, oil shale deposits have also been found to exist in the Abakiliki Anticlinorium in South Eastern Nigeria. In this paper, I shall attempt to unveil the precarious future of Nigeria’s non-renewable petroleum resource within the travesties of her crude oil reserves vis-à-vis the nation’s untapped potentials of shale oil and gas. Crude Oil Reserves Typically, a crude oil reserve can be defined as a composite of flowing oil and trapped or non-flowing oil. The latter comprises the vast quantities of petroleum left over after more readily accessible oil has been recovered. Trapped in the rock pores and cracks, the amount of oil involved may range up to 50 or 60 percent of the original gross oil deposit estimates. With proven reserves of more than 24 billion barrels of crude oil, Nigeria ranks among the top ten petroleum provinces in the world. Table (1) elucidates Nigeria’s crude oil proven reserves and production from 1982 to 2011.

**Table 1**: Nigeria’s Crude Oil Proven Reserve and Production from 1982-2011

|  |  |  |  |
| --- | --- | --- | --- |
| YEAR | CRUDE OIL PROVEN RESERVE (BBL/YEAR) | PRODUCTION(MBL/DAY) | MBL/YEAR) |
| 1982 | 16 500 000 000 | 1295 000 | 472 675 000 |
| 1983 | 16 750 000 000 | 1241 000  | 452 965 000 |
| 1984 | 16 550 000 000 | 1388 000 | 506 620 000 |
| 1985 | 16 650 000 000 | 1495 000  | 545 675 000 |
| 1986 | 16 600 000 000 | 1467 000 | 535 455 000 |
| 1987 | 16 000 000 000 | 1341 000 | 489 465 000 |
| 1988 | 15 980 000 000 | 1450 000 | 529 250 000 |
| 1989 | 16 000 000 000 | 1716 000 | 626 340 000 |
| 1990 | 16 000 000 000 | 1810 000 | 660 650 000 |
| 1991 | 17 100 000 000  | 1891 000  | 690 507 000 |
| 1992 | 17 900 000 000 | 1943 000  | 709 195 000 |
| 1993 | 17 900 000 000 | 1960 000 | 715 400 000 |
| 1994 | 17 900 000 000 | 1930 000 | 704 450 000 |
| 1995 | 17 900 000 000 | 1992 750  | 727 353 750 |
| 1996 | 20 828 000 000 | 2000 530  | 730 193 450 |
| 1997 | 15 521 000 000 | 2132 450 | 778 344 250 |
| 1998 | 16 786 000 000 | 2153 460 | 786 012 900 |
| 1999 | 22 500 000 000 | 2129 860 | 777 398 900 |
| 2000 | 22 500 000 000 | 2165 000  | 790 225 000 |
| 2001 | 22 500 000 000 | 2256 000 | 823 498 400 |
| 2002 | 24 000 000 000 | 2117 860  | 773 018 900 |
| 2003 | 24 000 000 000 | 2275 000 | 830 375 000 |
| 2004 | 25 000 000 000 | 2328 960 | 850 070 400 |
| 2005 | 35 255 000 000 | 2627 440 | 959 015 600 |
| 2006 | 35 876 000 000 | 2450 000 | 894 250 000 |
| 2007 | 36 220 000 000 | 2349 640 | 857 618 600 |
| 2008 | 36 220 000 000 | 1000 000 | 365 000 000 |
| 2009 | 36 220 000 000 | 2300 000 | 839 000 000 |
| 2010 | 37 220 000 000  | 2600 000 | 949 000 000 |
| 2011 | 37 220 000 000 | 2600 000 | 949 000 000 |
| **TOTAL** | 683 896 000 000  | 58,025 740  | 21318017150 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  Year | Ghana | Change, percent | Ghana, percent of Africa | Ghana, percent of World |
| 1980 | 0.007 | N/A | 0.012% | 0.001% |
| 1981 | 0.006 | -14.286% | 0.011% | 0.001% |
| 1982 | 0.002 | -66.667% | 0.004% | 0.000% |
| 1983 | 0.005 | 150.000% | 0.009% | 0.001% |
| 1984 | 0.004 | -20.000% | 0.007% | 0.001% |
| 1985 | 0.004 | 0.000% | 0.007% | 0.001% |
| 1986 | 0.004 | 0.000% | 0.007% | 0.001% |
| 1987 | 0.002 | -50.000% | 0.004% | 0.000% |
| 1988 | 0.001 | -50.000% | 0.002% | 0.000% |
| 1989 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1990 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1991 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1992 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1993 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1994 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1995 | 0.001 | 0.000% | 0.002% | 0.000% |
| 1996 | 0.016 | 1,500.000% | 0.022% | 0.002% |
| 1997 | 0.017 | 6.250% | 0.025% | 0.002% |
| 1998 | 0.017 | 0.000% | 0.024% | 0.002% |
| 1999 | 0.017 | 0.000% | 0.023% | 0.002% |
| 2000 | 0.017 | 0.000% | 0.023% | 0.002% |
| 2001 | 0.017 | 0.000% | 0.023% | 0.002% |
| 2002 | 0.017 | 0.000% | 0.022% | 0.002% |
| 2003 | 0.017 | 0.000% | 0.022% | 0.001% |
| 2004 | 0.017 | 0.000% | 0.020% | 0.001% |
| 2005 | 0.017 | 0.000% | 0.017% | 0.001% |
| 2006 | 0.017 | 0.000% | 0.017% | 0.001% |
| 2007 | 0.015 | -11.765% | 0.013% | 0.001% |
| 2008 | 0.015 | 0.000% | 0.013% | 0.001% |
| 2009 | 0.015 | 0.000% | 0.013% | 0.001% |
| 2010 | 0.015 | 0.000% | 0.013% | 0.001% |
| 2011 | 0.660 | 4,300.000% | 0.534% | 0.045% |
| 2012 | 0.660 | 0.000% | 0.531% | 0.043% |
| 2013 | 0.660 | 0.000% | 0.517% | 0.040% |
| 2014 | 0.660 | 0.000% | 0.521% | 0.040% |
| 2015 | 0.660 | 0.000% | 0.522% | 0.040% |
| 2016 | 0.660 | 0.000% | 0.524% | 0.040% |
| 2017 | 0.660 | 0.000% | 0.525% | N/A |

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The petroleum industry of [Ghana](https://en.wikipedia.org/wiki/Ghana) is regulated by the state-owned [Ghana National Petroleum Corporation](https://en.wikipedia.org/wiki/Ghana_National_Petroleum_Corporation) (GNPC) and administered by the state-owned [Ghana Oil Company](https://en.wikipedia.org/wiki/Ghana_Oil_Company) (GOIL).

##  1970s–1980s

The 100% state-owned [filling station](https://en.wikipedia.org/wiki/Filling_station) company of Ghana, [Ghana Oil Company](https://en.wikipedia.org/wiki/Ghana_Oil_Company) (GOIL) is the number 1 petroleum and gas filling station of Ghana; and commercial quantities of offshore [oil reserves](https://en.wikipedia.org/wiki/Oil_reserves) in Ghana were discovered in the 1970s. In 1983 the government established the 100% state-owned state oil company [Ghana National Petroleum Corporation](https://en.wikipedia.org/wiki/Ghana_National_Petroleum_Corporation) (GNPC) to promote [hydrocarbon exploration](https://en.wikipedia.org/wiki/Hydrocarbon_exploration) and production of Ghana's entire [petroleum](https://en.wikipedia.org/wiki/Petroleum) and [natural gas](https://en.wikipedia.org/wiki/Natural_gas) reserves.[[1]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-cs2-1)

These GNPC prospected in ten [offshore blocks](https://en.wikipedia.org/wiki/Oil_platform) between [Ada](https://en.wikipedia.org/wiki/Ada_Foah) along the eastern [international border](https://en.wikipedia.org/wiki/International_border) of Ghana and in the [Tano River](https://en.wikipedia.org/wiki/Tano_River) Basin and in the [Keta](https://en.wikipedia.org/wiki/Keta) Basin. In 1989, CN¥184 million or GH₵64.9 million (US$30 million) was spent drilling wells in the Tano basin, and on 21 June 1992, an offshore Tano basin well produced about 6,900 barrels (1,100 m3) of [crude oil](https://en.wikipedia.org/wiki/Crude_oil) daily.

**1990s**

In the early 1990s, GNPC reviewed all earlier crude oil and natural gas discoveries to determine whether a predominantly local operation might make exploitation more commercially viable. GNPC wanted to set up a [floating system](https://en.wikipedia.org/wiki/Floating_production_storage_and_offloading) for production, storage, off-loading, processing, and [gas-turbine](https://en.wikipedia.org/wiki/Gas_turbine) electricity generation, hoping to produce 22 billion cubic feet (620,000,000 m3) per day, from which 135 megawatts of power could be generated and fed into the national and regional grid. GNPC also signed a contract in 1992 with [Angola](https://en.wikipedia.org/wiki/Angola)'s state oil company, [Sonangol Group](https://en.wikipedia.org/wiki/Sonangol_Group), that provides for drilling and, ultimately, production at two of Sonangol's offshore [oilfields](https://en.wikipedia.org/wiki/Oil_field). GNPC was paid with a share of the crude oil.

The [Tema Oil Refinery](https://en.wikipedia.org/wiki/Tema_Oil_Refinery) in Ghana underwent the first phase of a major rehabilitation in 1989. The second phase began in April 1990 at an estimated cost of CN¥220.8 million or GH₵77.8 million (US$36 million). Once rehabilitation was completed, distribution of [liquefied petroleum gas](https://en.wikipedia.org/wiki/Liquefied_petroleum_gas) was to be improved, and the quantity supplied was to rise from 28,000 to 34,000 barrels per day. Construction on the new Tema-[Akosombo](https://en.wikipedia.org/wiki/Akosombo) oil products pipeline, designed to improve the distribution system further, began in January 1992.

The pipeline was to carry refined products from [Tema](https://en.wikipedia.org/wiki/Tema) to Akosombo Port, where they will be transported across [Lake Volta](https://en.wikipedia.org/wiki/Lake_Volta) to [northern regions](https://en.wikipedia.org/wiki/Northern_Region%2C_Ghana). Distribution continued to be uneven. Other measures to improve the situation included a CN¥171.7 million or GH₵60.5 million (US$28 million) project to set up a national network of storage depots in all [regions](https://en.wikipedia.org/wiki/Regions_of_Ghana).[[1]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-cs2-1)

The Tema Lube Oil Company commissioned its new oil blending plant, designed to produce 25,000 tons of oil per year, in 1992. The plant was to satisfy both North Ghana and Ghana's requirements for motor and [gear lubricants](https://en.wikipedia.org/wiki/Gear_oil) and 60% of the country's need for industrial lubricants, or, in all, 90% of Ghana's demand for lubricant products. Shareholders per [equity](https://en.wikipedia.org/wiki/Equity_%28finance%29) included state-owned Ghana National Petroleum Corporation, and the 100% state-owned national insurance company, [Social Security and National Insurance Trust](https://en.wikipedia.org/wiki/SSNIT) (SSNIT).[[1]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-cs2-1)

**2000s**

Ghana's [Jubilee Oilfield](https://en.wikipedia.org/wiki/Jubilee_oil_field) which contains up to 3 billion barrels (480,000,000 m3) of [sweet crude oil](https://en.wikipedia.org/wiki/Sweet_crude_oil) was discovered in 2007, among the many other oilfields in Ghana.[[2]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-2) [Oil and gas exploration](https://en.wikipedia.org/wiki/Oil_and_gas_exploration) in Ghana is ongoing, and the amount of both crude oil and natural gas continues to increase.[[3]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-3)

**2010s**

The Ghanaian government, indicated that the country could expand its reserves up to 5 billion barrels (790,000,000 m3) of oil in [reserves](https://en.wikipedia.org/wiki/Oil_reserves) within a few years.

The expected annual tremendous inflow of capital from crude oil and natural gas production into the Ghana economy began from the first quarter of 2011 when Ghana started producing crude oil and natural gas in commercial quantities in 2011.[[5]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-Ghana%27s_Jubilee_oil_field_nears_output_plateau_-operator1-5) At the end of 2012, declining productivity at one of the country’s largest oil projects, the [Jubilee oil field](https://en.wikipedia.org/wiki/Jubilee_oil_field), led to a decline in revenues for the government, who had budgeted for oil revenue of more than $650 million.[[6]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-GNN-6) The corresponding shortfall was more than $410 million.[[6]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-GNN-6) The oil firm blamed the decline on “sand contamination of the flow lines that carry the oil from the underwater wells” into the storage facility on the surface.[[6]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-GNN-6)

In the first and second financial quarters of 2013, Ghana produced 115,000-200,000 [barrels](https://en.wikipedia.org/wiki/Barrel) of crude oil per day and 140 million-200 million [cubic feet](https://en.wikipedia.org/wiki/Cubic_feet) of [natural gas](https://en.wikipedia.org/wiki/Natural_gas) per day.[[5]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-Ghana%27s_Jubilee_oil_field_nears_output_plateau_-operator1-5) The 100% Iranian state-owned oil companies [National Iranian Oil Company](https://en.wikipedia.org/wiki/National_Iranian_Oil_Company) and [Iranian Offshore Oil Company](https://en.wikipedia.org/wiki/Iranian_Offshore_Oil_Company), and [Singapore Petroleum Company](https://en.wikipedia.org/wiki/Singapore_Petroleum_Company) with [Vetro Energy](https://en.wikipedia.org/wiki/Vetro_Energy) and [PetroSeraya](https://en.wikipedia.org/wiki/PetroSeraya) of Singapore have declared interests to provide assistance in construction of [offshore platforms](https://en.wikipedia.org/wiki/Offshore_platform) and [drilling rigs](https://en.wikipedia.org/wiki/Drilling_rig) for Ghana's state-owned oil company, Ghana National Petroleum Company on rapidly developing Ghana's oil and gas infrastructure and industry as Ghana aims to further increase output of oil to 2 million barrels per day and gas to 1.2 billion cubic feet per day with an expected annual generating revenue of [GH₵](https://en.wikipedia.org/wiki/Ghana_cedi)140.7 billion ([US$](https://en.wikipedia.org/wiki/United_States_dollar)65 billion) in 2014.[[7]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-Singapore_Opens_Investment_Office_In_Ghana-7) [[8]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-Iran_pledges_assistance_to_Ghana%E2%80%99s_oil_and_gas_sector-8)

## Ghana is believed to have up to 5 billion barrels (790,000,000 m3) to 7 billion barrels (1.1×109 m3) of petroleum in reserves,[[4]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-bloomberg.com-4) which is the sixth largest in Africa and the 25th [largest proven reserves](https://en.wikipedia.org/wiki/List_of_countries_by_proven_oil_reserves) in the world and Ghana has up to 6 trillion [cubic feet](https://en.wikipedia.org/wiki/Cubic_feet) of [natural gas](https://en.wikipedia.org/wiki/Natural_gas) in reserves.[[9]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-Atuabo_gas_project_to_propel_more_growth-9) Ghana's experience with the oil and gas industry has been more complex than is often assumed.Recent res 1970s–1980s

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**1990s**

In the early 1990s, GNPC reviewed all earlier crude oil and natural gas discoveries to determine whether a predominantly local operation might make exploitation more commercially viable. GNPC wanted to set up a [floating system](https://en.wikipedia.org/wiki/Floating_production_storage_and_offloading) for production, storage, off-loading, processing, and [gas-turbine](https://en.wikipedia.org/wiki/Gas_turbine) electricity generation, hoping to produce 22 billion cubic feet (620,000,000 m3) per day, from which 135 megawatts of power could be generated and fed into the national and regional grid. GNPC also signed a contract in 1992 with [Angola](https://en.wikipedia.org/wiki/Angola)'s state oil company, [Sonangol Group](https://en.wikipedia.org/wiki/Sonangol_Group), that provides for drilling and, ultimately, production at two of Sonangol's offshore oilfields. GNPC was paid with a share of the crude oil.

The [Tema Oil Refinery](https://en.wikipedia.org/wiki/Tema_Oil_Refinery) in Ghana underwent the first phase of a major rehabilitation in 1989. The second phase began in April 1990 at an estimated cost of CN¥220.8 million or GH₵77.8 million (US$36 million). Once rehabilitation was completed, distribution of liquefied petroleum gas was to be improved, and the quantity supplied was to rise from 28,000 to 34,000 barrels per day. Construction on the new Tema-Akosombo oil products pipeline, designed to improve the distribution system further, began in January 1992.

The pipeline was to carry refined products from [Tema](https://en.wikipedia.org/wiki/Tema) to Akosombo Port, where they will be transported across [Lake Volta](https://en.wikipedia.org/wiki/Lake_Volta) to [northern regions](https://en.wikipedia.org/wiki/Northern_Region%2C_Ghana). Distribution continued to be uneven. Other measures to improve the situation included a CN¥171.7 million or GH₵60.5 million (US$28 million) project to set up a national network of storage depots in all [regions](https://en.wikipedia.org/wiki/Regions_of_Ghana).

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**2000s**

Ghana's [Jubilee Oilfield](https://en.wikipedia.org/wiki/Jubilee_oil_field) which contains up to 3 billion barrels (480,000,000 m3) of sweet crude oil was discovered in 2007, among the many other oilfields in Ghana.[[2]](https://en.wikipedia.org/wiki/Oil_reserves_in_Ghana#cite_note-2) Oil and gas exploration in Ghana is ongoing, and the amount of both crude oil and natural gas continues to increase.

**2010s**

The Ghanaian government, indicated that the country could expand its reserves up to 5 billion barrels (790,000,000 m3) of oil in [reserves](https://en.wikipedia.org/wiki/Oil_reserves) within a few years.

The expected annual tremendous inflow of capital from crude oil and natural gas production into the Ghana economy began from the first quarter of 2011 when Ghana started producing crude oil and natural gas in commercial quantities in 2011. At the end of 2012, declining productivity at one of the country’s largest oil projects, the Jubilee oil field, led to a decline in revenues for the government, who had budgeted for oil revenue of more than $650 million. The corresponding shortfall was more than $410 million. The oil firm blamed the decline on “sand contamination of the flow lines that carry the oil from the underwater wells” into the storage facility on the surface.

In the first and second financial quarters of 2013, Ghana produced 115,000-200,000 barrels of crude oil per day and 140 million-200 million cubic feet of natural gas per day. The 100% Iranian state-owned oil companies [National Iranian Oil Company](https://en.wikipedia.org/wiki/National_Iranian_Oil_Company) and Iranian Offshore Oil Company, and Singapore Petroleum Company with Vetro Energy and Petro Seraya of Singapore have declared interests to provide assistance in construction of offshore platforms and drilling rigs for Ghana's state-owned oil company, Ghana National Petroleum Company on rapidly developing Ghana's oil and gas infrastructure and industry as Ghana aims to further increase output of oil to 2 million barrels per day and gas to 1.2 billion cubic feet per day with an expected annual generating revenue of GH₵140.7 billion (US$65 billion) in 2014.

Ghana is believed to have up to 5 billion barrels (790,000,000 m3) to 7 billion barrels (1.1×109 m3) of petroleum in reserves, which is the sixth largest in Africa and the 25th largest proven reserves in the world and Ghana has up to 6 trillion cubic feet of natural gas in reserves.Ghana's experience with the oil and gas industry has been more complex than is often assumed. Recent [research](http://www.unrisd.org/obeng-odoom) shows that the challenges and prospects of the oil and gas industry go beyond the often discussed issues about macroeconomic stability to pressing current concerns about energy. This research shows the possibility that the rents from oil and gas can be used for social change in Ghana.