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Petroleum Engineering

PTE 315

Assignment

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?

**Crude Oil Proven Reserve Definition**:  Oil reserve are the amount of technically and economically recoverable oil. Reserves may be for well, for a reservoir, for a field, for a nation, or for the world. Different classification of reserves are related to their degree of certainty. The total estimated amount of oil in an oil reservoir, including both producible oil, is called oil in place. However, because of reservoir characteristic and limitations in petroleum extraction technologies, only a fraction of this oil can be brought to the surface, and it is only this producible fraction that is considered to be reserves. The ratio of producible oil reserves to total oil in place for a given field is often referred to as the recovery factor. The recovery facto r of any particular field may change over time based on operating history and in response to changes in technology and economics. The recovery factor may also rise over time if additional investment is made in enhanced oil recovery techniques such as gas injection, surfactant injection, water-flooding, or microbial enhance oil recovery.

Proven reserves are those reserves claimed to have a reasonable certainty (normally at least 90% confidence) of being recoverable under existing economic and political conditions, with existing technology. Industry specialists refer to this as P90 (i.e , having a 90% certainty of being produced) proven reserves are also known in the industry as 1P.

**1.**

**THE NIGERIA PROVEN CRUDE OIL RESERVES**

Nigeria is the most populous country in Africa. The united national 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. Nigeria is the 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% of gross domestic product, 95% of foreign exchange earnings, and about 65% of budgetary revenues.

Crude Oil Reserves;

Six oil companies- Shell, Chevron, Mobil, Agip, Elf and Texaco – currently dominated the oil industry in the country. Together, they hold some 98% of the oil reserves and operating assets. About 50 other companies have minor interests, some of which were recently acquired (detailed profile of these players are available from the DPR). Today, recoverable reserves are estimated at 28.5 billion barrels, with an average productivity of about 2.5 million barrels per day, including condensates. Average oil depletion rate is 15% but the reserves base has continued to increase due to increase addition from exploration and appraisal drilling and deep offshore exploration. Nigeria association and non-associated gas reserves are estimated to be well over 166 trillion standard cubic feet (TCF). This places Nigeria among the top ten countries with largest gas reserves in the world.

Nigeria’s Oil Fields;

There are 500 fields in the Niger Delta. Over 55% of these are onshore, while the remaining are in the shallow waters (less than 500 meters). Of these fields, 193 are currently producing while 23 have either been closed-down or abandoned.

Major indicators;

|  |  |
| --- | --- |
| Land ( 1000 sq. km) | 910.770 (2010) |
| Head of State | HE Muhamma du Buhari |
| Population (million inhabitants) | 154.7 |
| Capital | ABUJA |
| Language(s) | ENGLISH |
| National currency | Naira |
| Energy sources | Petroleum, Natural Gas, Coal |
| GDP per capital(current US$) | 1,443 (2011) |
| Value of Oil export (billion $) | 108.3 |
| GDP (Current billion US$) | 235.69 |
| Value of Gas export (billion $) | Nil |
| Current account balance (BoP, billion $) | 17.85 (2011) |
| PROVEN CRUDE OIL RESERVES (billion barrels) | 37.2 (2011) |
| Crude oil production, NGPL and other liquid (1,000b/d) | 2,525 (2011) |
| Refinery capacity (1,000 b/d) | 445 (2011) |
| Production of refined petroleum products (1,000b/d) | 101.3 (2011) |
| Consumption of petroleum products (1,000b/d) | 286 (2011) |
| Crude oil export (1,000) | 2,377 (2011) |
| Proven natural gas reserves (trillion cu. m.) | 5.155 (2012) |

**2.**

**GHANA’S PROVEN CRUDE OIL RESERVE**

Ghana discovered its first large-scale, commercially viable oil field in June 2007. The Kosmos Energy team discovered the Jubilee oil field following the drilling of the Mahodany-1 exploration well in Ghana’s deep waters. A string of discoveries in the Jubilee offshore oil field from 2007 onward has resulted in Ghana’s confidence in a reserve of around 1.5 billion barrels, with a potential upside of 2 billion barrel from adjacent sites.

Presently though, the US EIA indicates **G**hana’s **P**roven **R**eserves of **o**il to be 0.66 billion barrels. Ghana is the 11th and 47th largest oil manufacture in Africa and the world respectively.

It took Ghana only three and a half years since discovery of oil in June 2007, until commercial production commenced in December of 2010. That said, there have now been some unexpected delays, which have impended the ramp-up of production at the Jubilee field. Tullow has long targeted 120,000BPD of crude oil output at Jubilee and had once hoped to reach that by 2011. In January 2013, the company said it was producing 110,000BPD of crude. Ghana originally aimed for output of 250,000 BPD by 2013, a production level – this would put the nation among the world’s top 50 producers.

KEY Stakeholders;

UK-listed operator Tullow holds a 36.05% stake in Jubilee. Other shareholders include:

· State oil firm Ghana National Petroleum Corporation (GNPC) with 13.75%

· Private investment group Kosmos with 23.49%,

· Anadarko Petroleum Corp with 23.49 and

· Sabre Oil and Gas with 2.81%.

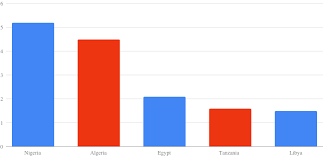
**3.**

**WEST AFRICA PROVEN CRUDE OIL RESERVES**

The Jubilee field is considered to be the largest find offshore West Africa in the last decade. The field produces light, sweet crude, much of which is used by refiners in Europe. The rate of new oil reserves in Africa has been the fastest in the world in the past five years, according to the U.S. corporate Council on Africa. Most of these new proven reserves have been found around the Gulf of Guinea. West Africa, mainly Angola and Nigeria, now supplies about 15 percent of U.S. oil imports, and U.S. officials project Africa oil could account for 25% of their country’s crude imports by 2015. A key factor in U.S. calculation is the role played West Africa by the quota-setting Organization of the Petroleum Exporting Countries (OPEC) or, more accurately, the lack of a role. The only OPEC member in West Africa is Nigeria.

WEST AFRICA RANKING OF CRUDE OIL RESERVES;

|  |  |  |  |
| --- | --- | --- | --- |
| RANK | COUNTRY | (BBL) | DATE OF INFORMATION |
| 2 | NIGERIA | 37,070,000,000 | 1 JANUARY 2015 |
| 11 | GHANA | 660,000,000 | 1 JANUARY 2015 |
| 17 | NIGER | 150,000,000 | JULY 7, 1905 EST |
| 9 | BENIN | 8,000,000 | 1 JANUARY 2015 |
| 13 | LIBERIA | 0 | 1, JANUARY 2015 |
|  | CAPE VERDE | 0 | 1, JANUARY 2015 |
|  | GAMBIA | 0 | 1, JANUARY 2015 |
| 15 | SENEGAL | 0 | 1, JANUARY 2015 |
| 18 | MAURITANIA | 600,000,000 | 1, JANUARY 2015 |
| 15 | COTE D’IVOIRE | 100,000,000 | 1, JANUARY 2015 |
|  | SIERRA LEONE | 0 | 1, JANUARY 2015 |
|  | GUINEA BISSAU | 0 | 1, JANUARY 2015 |
|  | MALI | 0 | 1, JANUARY 2015 |
|  | TOGO | 0 | 1, JANUARY 2015 |
|  | EQUATORIAL GUINEA | 0 | 1, JANUARY 2015 |
|  |  |  |  |

4.

Top 5 African countries by proven crude oil reserves. **Nigeria** holds the second largest crude oil reserves in Africa, and the eleventh largest in the world. The country has 37 billion barrels of proved crude oil reserves.