

Bonga FPSO facility lies in deep water, Gulf of Guinea

SHELL IN NIGERIA **UNLOCKING NIGERIA'S POTENTIAL IN DEEP WATER**

The deep waters of the Gulf of Guinea hold rich abundant oil and gas resources. Tapping into these fields will deliver vital energy to help meet the growing energy demand in Nigeria and international markets.

The Shell Nigeria Exploration and Production Company's deep water production comes from the Bonga and Erha fields which accounted for 15% of Nigeria's total oil production in 2018. This translates to 37% of Nigeria's deep water production in 2018.



Production capacity of
Bonga FPSO

225,000

barrels of oil per day, and

170 MILLION

standard cubic feet of gas per day

96%

of Bonga's core
offshore staff are
Nigerians

10% increase

in Nigeria's oil production
capacity when Bonga
began producing in 2005

The Bonga field
achieved a cumulative
export of more than

**819 MILLION
BARRELS OF OIL**

by the end of 2018

Deployed state of the art

**7th generation
drillship**

in Bonga Field

GLOBAL DEEP WATER EXPERTISE DEPLOYED OFFSHORE NIGERIA

History of deep-water expertise of Shell in Nigeria

- Shell has a long history of successfully developing deep-water energy projects worldwide.
- We continue to use our knowledge, experience and proven deep-water technologies to unlock new resources safely and efficiently.

Shell Nigeria Exploration and Production Company Limited (SNEPCo)

- SNEPCo was established in 1993 and carries out Shell Companies in Nigeria's offshore activities.
- The company draws on Shell's global deep-water expertise as well as that of its Nigerian engineers and technicians to deliver safe, world class and economically viable projects that provide jobs and training for Nigerians.
- Over the last two decades, SNEPCo's exploration activities have resulted in the discovery of several significant oil and gas resources, including the Bonga, Bolia, Zabazaba and Doro fields.

FACTS ABOUT BONGA FIELD

SNEPCo pioneered the country's deep-water oil and gas production at the Bonga Field.

- Located 120 kilometers offshore in the Gulf of Guinea in more than 1,000 metres deep across an area of 60 square kilometers.
- Named after the Bonga fish, which is found along the coast of Nigeria and West Africa.
- Operated by SNEPCo in partnership with Esso Exploration and Production Nigeria (Deepwater) Limited, Total E&P Nigeria Limited and Nigerian Agip Exploration Limited under a Production Sharing Contract with the Nigerian National Petroleum Corporation.

- Production started in 2005 that increased Nigeria's oil production capacity by 10%.
- Oil is exported globally from the Bonga floating production, storage and offloading (FPSO) vessel, which:
 - Is three hundred metres long.
 - Has an equivalent height of a 12-storey building.
 - Its deck spans an area as large as three football fields.
 - Has the capacity to produce 225,000 barrels of oil and 170 million standard cubic feet of gas per day.
 - Sends oil to a Single Point Mooring (SPM) buoy anchored nearby that is used to load it onto tankers.
 - When fully laden with oil, weighs 300,000 tonnes and is held in place by 500-tonne anchors linked by 20 kilometers of mooring lines.
- Supplies gas via underwater pipeline to the Nigeria Liquefied Natural Gas Company (NLNG) at Bonny Island, from where it is exported as LNG to global markets.
- By the end of 2018, more than 819 million barrels of oil cumulatively had been produced.
- In 2018, operated at about 85% availability and was therefore a stable source of revenue for the Federal Government of Nigeria (FGN) throughout the year.



Worker monitoring Bonga Floating Production Storage and Offloading vessel, Gulf of Guinea

EXPANSION OF BONGA FIELD AND DEVELOPMENT OF BONGA NORTH WEST FIELD

Bonga Field expansion

- The FPSO vessel's capacity has been upgraded in recent years, allowing SNEPCo to expand the main Bonga field with further drilling of wells in Bonga Phases 2 and 3.
- Phase 3 production commenced in October 2015 with peak production of 50,000 boe/d.

Bonga North-West Field development

- In August 2014, through a subsea tie-back to the FPSO, the nearby Bonga North West field, which is capable of producing approximately 75,000 barrels of oil equivalent a day, was unlocked.
- The Bonga North West field development was named Engineering Project of the Year 2015 at the prestigious Platts Global Energy Awards in New York and represented an important achievement for Nigeria's deep-water industry.

PARTNER IN ERHA FIELD

SNEPCo is also a co-venture partner in the Erha field, which is operated by the ExxonMobil subsidiary Esso Exploration and Production Nigeria (Deepwater) Limited.

- Located 140 km offshore in the Gulf of Guinea at water depths of between 1,200 and 1,800 metres, production commenced in 2006.
- The Erha FPSO has a production capacity of 210,000 barrels of oil per day.
- In recent years, the field has expanded production with both the North Phase 2 and 3 projects coming on stream ahead of schedule in 2015 and 2017 respectively.

LEVERAGING GLOBAL EXPERTISE TO BENEFIT LOCAL WORKFORCE

Transfer of knowledge

- With thousands of people working on deep water projects across the world, Shell works to ensure that the knowledge gained from one project is transferred to others.
- By leveraging international experience, SNEPCo helped create the first generation of Nigerian deep-water oil and gas engineers.

New skills for Nigerians

- The Bonga fields not only unlocked new energy resources in Nigeria, they also opened new skills that strengthened the country's engineering and technical education capabilities.
- Bonga North West was the first project to be executed under the Nigerian Oil and Gas Industry Content Development Act and the project supported the establishment in 2010 of a local fabrication yard for subsea components, a pipe coating plant and a welding laboratory in Nigeria.

Growth of local support industries

- Bonga also stimulated the growth of support industries vital to deep-water projects.
- Deep-water projects benefited the wider Nigerian economy by boosting demand for a range of goods and services including offshore vessels and platforms, materials, floating hotels, helicopters and manpower, creating jobs and providing a range of training and maintenance services to the industry locally.



Bonga service vessel, Gulf of Guinea

Increasing local capacity

- Since 2005 when production started at Bonga, the Managing Director role at SNEPCo has been held by Nigerians. Today, 96% of SNEPCo's staff is Nigerian, with significant numbers of Nigerian staff trained or taking temporary assignments abroad, further increasing the potential for local capacity for the future.
- SNEPCo has also provided specialised training for semi-skilled Nigerians to work in the energy industry, as welders and scaffolders, for example.

Fabrication and installation of a Single Point Mooring (SPM) buoy

As operator of Bonga, SNEPCo pioneered the use of deep-water technology in Nigeria. For example:

- Bonga boasts the first, largest and most technologically advanced polyester moored deep-water buoy built in Nigeria in 2003/4.

- The SPM buoy was fabricated and installed at Nigerdock, Snake Island in Lagos.
- Shell Companies in Nigeria demonstrate that its logistics base in Nigeria can support other deep-water developments in other regions.

Refurbishment of Subsea Tree

In 2015, five subsea trees were refurbished at a fabrication yard at Onne in Rivers State, the first in Sub-Saharan Africa with Nigerian engineers and technicians playing key roles.

- A subsea tree is an arrangement of valves and other components installed at the wellhead to control and monitor production flow and manage fluids injection.
- The refurbishment of the subsea trees has helped to increase oil production in the Bonga field.
- In 2017, the achievement earned Shell Companies in Nigeria the Best Performing International Company in Technology and Innovation at the Nigeria International Petroleum Summit in Abuja.

Bonga Maintenance Turnaround

In March and April 2017, Bonga undertook a major turnaround maintenance, which covered statutory and regulatory checks, inspections, recertification, repairs and replacement of equipment as well as an upgrade of facilities.

- More than 1,000 people and 50 Nigerian contractor and sub-contractor companies participated in the 2017 turnaround.
- All fabrications were done in Nigeria, an innovation that marked a turning point in SNEPCo's efforts to develop the capabilities of Nigerian companies in the provision of goods and services in deep water oil and gas production.



SUSTAINING PRODUCTION AND GROWTH OPPORTUNITIES

SNEPCo is committed to further unlocking Nigeria's deep-water resources and along with its co-ventures and government partners is sustaining production and evaluating opportunities to increase production of the Bonga field in an efficient and cost-effective way.

Seventh generation drillship

During 2018-2019, wells are being drilled in the Bonga field to sustain production by using a newly built 7th generation Enesco DS10 drillship. The rig has several state-of-the-art features:

- A specialised drill (dual rotary) and crane (heave-compensated) for enhanced capability.
- Capable of drilling in water depths up to 3,600 meters and maximum drilling depths of 12,100 meters.
- The rig has two blow out preventers that are compliant with Tier 2 emission standards.

Bonga South West Aparo project

- After receiving bids in 2015, the project scope was reviewed to significantly reduce cost.
- In early 2019, following the conclusion of OML 118 negotiations between SNEPCo and the NNPC, a clear commercial framework is in place, supported by the government and project investors, toward a potential Bonga South West Aparo Final Investment Decision.
- In early 2019, SNEPCo also announced the release of Invitation To Tender (ITT) for engineering, procurement and construction contracts for the 150,000 barrels per day development of the Bonga South West Aparo (BSWA) oil field.

The project's initial phase includes a new FPSO vessel, more than 20 deep-water wells and related subsea infrastructure. The field lies across Oil Mining Leases 118, 132 and 140, about 15km southwest of the existing Bonga Main FPSO.



Pre-job safety meeting in the doghouse of the 7th generation Enesco DS10 drillship, Gulf of Guinea



7th generation Enesco DS10 drillship