

An Overview of the Oil &
Gas Exploration Sector

Oil & Gas Report Mozambique

Prepared by IQPC for:



Overview

Mozambique was not a country famous for its oil and gas industry, except for one gas producing project that exports to South Africa. However, recent discoveries have been made offshore and more international companies are drawn by the possibilities of investment in this industry. There are plans to create LNG Export terminals and two oil refineries.

Mozambique's upstream potential appears to lie in natural gas rather than oil. The critical factor in the future exploitation of the country's gas, however, is the emergence of sound commercial criteria for the establishment of a south-east African gas-gathering network capable of serving developing markets in the region. There are three ports in Mozambique: Maputo, Beira, and Nacala which offer an economic supply corridor to neighbouring landlocked countries.

Substantial reserves of natural gas have been established and Mozambique is likely to become a major producer of gas in the area in the medium term. The recent natural gas discoveries off the coast of Mozambique are important because of the size of the reserves as well as the country's relative proximity to markets in Asia because it is easier to export from offshore Mozambique to Asia than it is from many other places. There are three onshore gas fields, Pande, Temane and Buzi-Divinhe. Pande has reserves estimated to be in excess of 2.1 Tcf, Temane reserves in the order of 1.0 Tcf and Buzi has recoverable reserves in the order of 10Bcf. Actual gas production is limited to an insignificant amount from the Pande gas field that supplies the needs of local villages. Mozambique's Prosperidade gas complex in the Rovuma block is thought to contain recoverable reserves of 17tcf to 30tcf of gas – the discovery that brought Shell and PTT to the table for Cove. America's Anadarko and Italian company ENI have also made giant Mozambique finds.

The main players in the upstream industry include: Enron Oil and Gas Resources Inc, Energy Africa, Sasol Petroleum International, Leopardus Resources Limited, Zarara Petroleum Resources, TotalFinaElf SA, Trefoil Ltd, and Lonrho de Provuma Petroleum. BP, Elf and Western are involved in geophysical surveys of offshore areas.

The downstream oil industry relies on imports, mostly from South Africa. Distribution and marketing of fuel products and lubricants is carried out by the state owned oil company Petromoc. Other companies include BP, Mobil, Caltex.

A major project is being negotiated between ENH, the state oil company, Sasol Petroleum International and Enron Oil and Gas to construct a pipeline that will transport gas from both the Pande and Temane gas fields to the Gauteng area in South Africa. The pipeline between Beira and Harare has been extended and is operating close to full capacity even with an expansion through the addition of pumping stations.

History of Petroleum Exploration in Mozambique

The first accounts of hydrocarbons in Mozambique date back to 1904, when explorers discovered thick sedimentary basins onshore Mozambique, but the poor technology and lack of funds halted those early exploration attempts.

Extensive exploration by international oil companies started in 1948, mainly onshore with limited activity offshore. The Pande Gas Field was discovered in 1961 by Gulf Oil, followed by the gas discoveries of Búzi (1962) and Temane (1967). Exploration activity declined in the early 1970's due to political unrest.

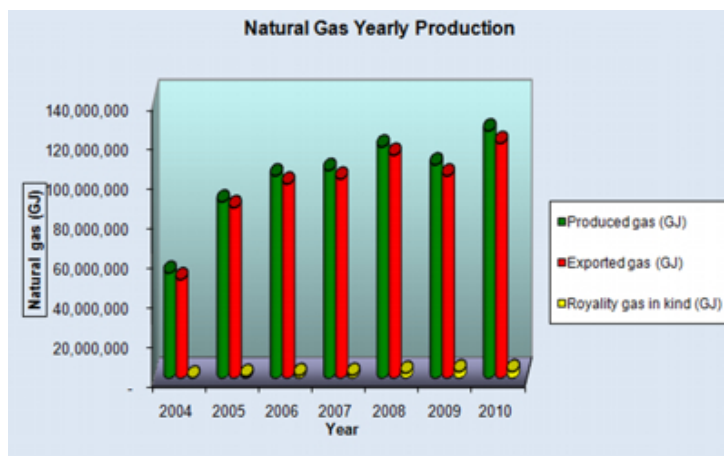
New activity was established in the early 1980's with the enactment of law 3/81 and creation of ENH. In the following years extensive work was carried out to map and appraise the Pande Field.

A breakthrough was made in 1993 when the Pande Field was mapped using direct hydrocarbon indicators (DHI) from seismic data and it was discovered that there was a giant bright spot at the top of the reservoir. The same method was then used to map the Temane field with good result.

From 1970 to 1980, only 6 wildcat wells were drilled in Mozambique, out of which half were offshore. An extensive drilling campaign conducted by Sasol in 2003 which included exploration and production wells in the Pande/Temane Block allowed the expansion of gas reserves and the discovery of Inhassoro Gas Field, making total of 5.504 trillion cubic feet (TCF).

In 2001, The Petroleum Law was enacted and in 2004, The Mozambique South Africa Gas Pipeline opened.

Mozambique launched its First Offshore Licensing Round on 31 March 2000, offering 14 blocks mainly in the Mozambique Basin covering the shallow and deep Zambezi delta area. The Second Mozambique License Round was launched in 2005 and was completed a year later, with Anadarko & Wentworth winning concessions. In 2008, Sasol & OSHO Consortium won concessions in the Third Mozambique License Round and in 2010, 7 more companies won concessions. Mozambique will offer around 12 new exploration blocks for oil and gas early next year, according to government officials.



Source: National Petroleum Institute -

<http://www.inp.gov.mz/Exploration-Production/Production>

Upstream

Although a number of gas fields in Mozambique were discovered in the early 1960's by Gulf Oil, they remained unexploited owing to continuing civil war and a lack of major gas consumers. The further discovery of large reserves (estimated at more than 60 bcm) of commercially exploitable natural gas in the Pande gas field in Inhambane province and the possibility of utilising natural gas in regional industrial growth has brought renewed interest in Mozambique's upstream prospects by foreign oil companies.

The main gas producing areas are Pande Gas Field, discovered in 1961, with 2.7 TCF of reserves and Temane Gas Field, discovered in 1967, with 1.0 TCF of reserves. There are two other proven fields: Buzi Gas Field and Inhassoro Gas Field. These were initially not exploited due to the lack of opportunities to sell the gas. The Pande fields produce insignificant amounts of gas that are utilised by the villages in the area. However, there are plans to develop the fields Pande, Temane and Buzi-Divinhe.

The Temane, Sofala and M10 blocks cover a combined area of about 21,500 square kilometres.

Active Companies

The Mozambique national hydrocarbon exploration company, Empresa Nacional de Hidrocarbonetos de Mocambique (ENH), is involved both as a licensor on behalf of the government and as a participant in some of the fields.

Anadarko is the operator of a 2.6-million-acre Offshore Area 1 with a 36.5-percent working interest. Co-owners in the area are Mitsui E&P Mozambique Area 1, Limited (20 percent), BPRL Ventures Mozambique B.V. (10 percent), Videocon Mozambique Rovuma 1 Limited (10 percent) and Cove Energy Mozambique Rovuma Offshore, Ltd. (8.5 percent). Empresa Nacional de Hidrocarbonetos, E.P.'s 15-percent interest is carried through the exploration phase.

Statoil has a 90% interest in and the operatorship for blocks 2 and 5 in the Rovuma basin off northern Mozambique.

Wentworth Resources is an independent oil and gas company with gas production and a committed exploration programme in the Rovuma Basin of southern Tanzania and northern Mozambique.

Downstream

The downstream oil industry in Mozambique is relatively small and relies on imports mainly from South Africa.

Petromoc is the state owned oil company and controls the major market share. Other companies involved in the industry include BP, ExxonMobil and Caltex.

There are three ports in Mozambique - Maputo, Beira and Nacala. There is an existing pipeline between Beira and Harare. Enron and Sasol will be co-operating on the construction of a single pipeline from central Mozambique to Maputo and the South African markets.

There are no active refineries, but there are two projects being considered, the Oilmoz Refinery Project and the Ayr Petro Nacala Refinery Project.

Malawi, Zimbabwe and Mozambique are planning a joint fuel refinery in Mozambique with a capacity of 10,000 bpd. The project is to be funded by the Iranian government.

OIL & GAS COMPANIES IN MOZAMBIQUE

Companhia Moçambicana de Petróleos, Limitada {COMOPETRO}
Empresa Nacional de Hidrocarbonetos de Mocambique {ENH}
Jupiter Juan de Nova Limited
Mozambican Hydrocarbon Company
OILMOZ – Investimentos e Participações, Lda {OILMOZ}
Rachana Global LDA {Rachana}
Sasol Petroleum Temane (Mozambique)
Wentworth Moçambique Petróleo Limitada
BP Mozambique Ltd
Chevron Oil Mozambique [Caltex Oil (Mozambique)]
Companhia do Pipeline Mozambique-Zimbabwe Lda
Engen Mozambique Ltd
ExxonMobil Mocambique Ld [Mobil Oil Mocambique Ld]
Importadora Moçambicana de Petróleos {Imopetro}
Lonropet SARL {LONROPET}
Matola Gas Company {MGC}
Ministry of Mineral Resources and Energy (Mozambique)
Mobil Oil Mozambique
National Directorate of Coal and Hydrocarbons
Petrogal Mocambique
Petróleos de Moçambique {PETROMOC}
Sasol Natural Gas
Sasol Petroleum International (Mozambique) {SPI}
TOTAL Mocambique SARL

Exploration Activities

The following gives an overview of recent exploration activities in the present concession areas:

Mozambique Basin

Concession Area (present size)	Present ownership	Recent Activities
Pande/Temane PPA (1741)km2 onshore)	SASOL 70% (operator), ENH 25%, IFC 5%	In 2008 Sasol formally finished the drilling campaign which resulted in drilling of 11 production wells, 5 exploration wells, 10 appraisal wells as well as the abandonment of 14 old wells at the Pande/Temane PSA/PPA Area. 3 new discoveries were made during the exploration drilling in the Pande, Temane and Inhassoro area.
Pande/Temane PSA (8049 km2 onshore)	Sasol 100% (Operator)	
Area 16 & 19 (10548 km2 offshore)	Sasol Petroleum Sofala 50% (Operator), Petronas Carigali Moçambique 35%, ENH 15%	In the period October 2008-February 2009 the Operator drilled two exploration wells (Njika-1 & Njika-2) which resulted in the discovery of gas at several stratigraphic levels. Further work on the evaluation of the discoveries will be performed by the operator. The wells were drilled at a water depth of 460 m and 350 m respectively, and to a TD of 1615 m and 1925 m below sea level. In 2007 SASOL acquired the first 3D seismic survey (2,050 sq.km) in Mozambique, and in 2008 they acquired about 2,000 km of 2D seismic within the concession area.
Buzi (10195 km2 onshore)	Empresa Nacional de Hidrocarbonetos de Moçambique (ENH) 100%	The National Oil Company (ENH) signed the EPC for the Buzi concession area in October 2008. The signed contract is valid for a period of 8 years and a minimum of 36 million USD is due to be invested in exploration activities. As part of its commitments ENH will have to acquire 600 km of 2D data and drill two exploration wells. ENH managed to farm out to a new partner, Kallila PT, from Indonesia that will act as operator, and the new

		participation structures is of 70% for the new partner and 30% for ENH.
M-10 (4120 km2 offshore)	Terralliance 100% (Operator)	In 2008 the US company Terralliance, acquired a total of 2,300 km of 2D seismic survey over the M-10 and Sofala Areas, of which 1,000 km are within the M-10 concession area.
Sofala (11639 km2 offshore)	Terralliance 60% (Operator), Bang (40%)	In 2008 the US company Terralliance, acquired total of 2,300 km of 2D seismic survey, of which 1,300 km are within the Sofala concession area.
Inhaminga (12037 km2 onshore)	DNO 100% (operator)	Following the drilling in 2008 of Sangussi-1 well Northeast of Beira which had some gas shows at the Domo Formation, as well as the acquisition of 200 km of 2D seismic in 2007, the Norwegian company DNO have entered the 4th exploration Phase. DNO has recently entered the 4th exploration period and will have to shoot 400 km of 2D seismic and drill 1 well.
Onshore Zambezi Delta (27710 km2)	Terralliance 60% (Operator), British American Natural Gas 40%	In 2008 Terralliance finalized the drilling of Chipondene 1 well as part of their commitment for the 1st exploration phase. The well was drilled to a TD of 1590 m, and registered some gas shows in different stratigraphic levels.
Offshore Zambezi Delta (34 934 km2)	Petronas 42.5% (operator), PetroSA 25.5%, Petrobras 17%, ENH 15%	In 2008 the Malaysian oil company Petronas finished the acquisition of 5,000 km 2D seismic. In 2007 Petronas drilled one dry exploration well, ZD-E-1. The well was drilled at a water depth of 95 m and to a TD of 3600m. Petronas is in its second exploration phase due to end soon.

Source: National Petroleum Institute - <http://www.inp.gov.mz/News-Events/Mozambique-Basin>

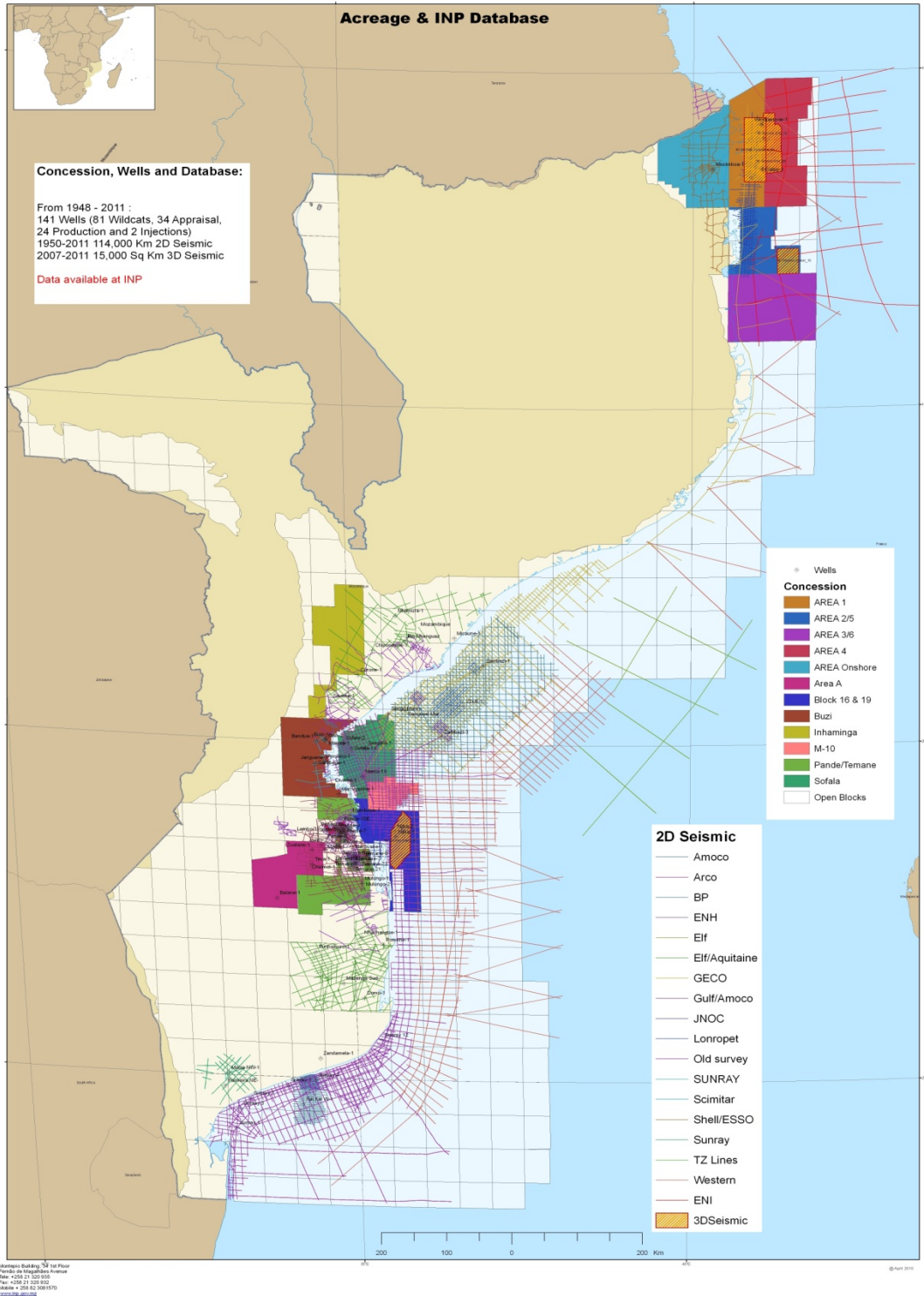
Rovuma Basin

Concession Area (present size)	Present ownership	Recent Activities
Onshore Rovuma Basin (15122km²)	Anadarko Moçambique Area 1 35.7% (Operator), Artumas Moçambique Petroleum 49.3%, ENH 15%	In 2008 the Canadian oil company Artumas finished the acquisition of 648 km of 2D seismic. Anadarko (from USA) took over as operator from January 2009. A minimum of one exploration well will be drilled in the concession area during 2009.
Offshore Area 1 (10683km²)	Anadarko 56.5% (operator), Mitsui 20%, ENH 15%, Artumas 8.5%	In 2008 the US oil company Anadarko acquired the second 3D seismic survey in Mozambique in their concession area, offshore the northern part of Cabo Delgado. A total of 3,370 sq. km of 3D seismic was acquired, in addition to 1000 km of 2D seismic in 2008. The current year of 2009, Anadarko acquired a total of 5000 km of 2D seismic. Two exploration wells are planned to be drilled in 2009 or early 2010.
Offshore Area 2 & 5 (13648 km²)	StatoilHydro (operator) 90%, ENH 10%	In 2007 the Norwegian company StatoilHydro acquired 3,000 kilometers of 2D seismic data within the offshore concession area, northeast of Pemba. StatoilHydro entered the second exploration phase, and have a firm commitment for 3D seismic acquisition. Statoil hydro have entered the second exploration phase in December 2008 and they are committed to acquire over a 1000 km ² and drill one exploration well.
Offshore Area 3 & 6 (15259km²)	Petronas Carigali Moçambique 90% (Operator), ENH 10%	The EPC was signed in October 2008. The contract is valid for a period of 8 years and a minimum of 40.6 million USD is due to be invested in exploration activities. As part of their commitment they are going to acquire 7000 km of 2D seismic.
Offshore Area 4 (17646 km²)		

Source: National Petroleum Institute - <http://www.inp.gov.mz/News-Events/Mozambique-Basin>



Instituto Nacional de Petróleo



Source: National Petroleum Institute : <http://www.inp.gov.mz/Exploration-Production/Maps/Acreage-Map-INP-Database>

Regulations

The Government's Department of Mineral Resources and Energy regulates the industry. The Instituto Nacional de Petróleo (INP) is authorised to manage the petroleum resources of Mozambique and administer the related operations for the benefit of the Society, and in compliance with the existing laws, government policies and contractual commitments.

The sector is governed by the Petroleum Law No. 3/2001 which provides for three types of contract:

- Reconnaissance Contract: Maximum two years exclusivity.
- Exploration and Production Contract: Exploration period maximum 8 years. Production period maximum 30 years.
- Pipeline contract: Period depends on the project.

The law is currently under revision and a new update is likely to be announced by the end of this year.

Control of the country's upstream oil industry rests with the parastatal upstream oil company, Empresa Nacional de Hidrocarbonetos de Mocambique (ENH) which has exclusive rights to explore for and develop petroleum in Mozambique, and is permitted to exercise these rights in association with foreign investors.

References:

- A Barrel Full: <http://abarrelfull.wikidot.com/mozambique-oil-and-gas-profile>
- MBendi Information Services: <http://www.mbendi.com/indy/oilg/af/mz/p0005.htm>
- National Petroleum Institute: <http://www.inp.gov.mz/>

Learn more about the current exploration projects at the **Oil and Gas Mozambique 2012 Conference**, running from December 3-6 in Maputo, Mozambique. This event will explore the potential that lies below the Mozambique coastal waters and what is hidden on shore.

To register for the event, [contact us](#) now or click [here](#) to download the agenda.