Overview of the Petroleum Sector in Mozambique

AAPG PROSPECT AND PROPERTY EXPO
London - 2019
Mozambique Location & Economic Outlook

- **Location:** South-eastern Africa
- **Land area:** approximately 800,000 Sq.km
- **Coastline:** Approximately 2,700 Km
- **Population:** 28 million (2017)
- **Capital city:** Maputo (5 million inhabitants)
- **Natural Resources:** Hydropower, natural gas, coal, minerals, raw wood
- **Export:** natural gas, coal, heavy sands, prawn, cashew-nut, sugar, tea, coconut oil and cotton
Legal Framework

- Law 21/2014 – Petroleum Law
- Decree 34/2015 – Regulation of Petroleum Operations
- Strategy for Concession of Areas for Exploration and Production
- Resolution 25/2016 of 6th October – EPCC Model
- Law 14/2017 – Specific Taxation and Fiscal Benefits Scheme for Petroleum Operations
- Decree 32/2015 – Regulation of the Specific Taxation and Fiscal Benefits System of Petroleum Operations
- Decree 35/2014 – Regulation on Management of Explosive Substances
- Natural Gas Master Plan Strategy, June/2014
- Law 25/2014 – Legislative authorization for the Natural Gas liquefaction Projects in Areas 1 and 4 in the Rovuma Basin
- Decree 56/2017 – Supplementary Agreement to the EPCC of Area 4 in the Rovuma Basin
Mozambique Fiscal Regime

Production Tax (royalty)
- Oil: 10%
- Gas: 6%

Profit sharing
- 15% - 60% assumed on a sliding scale linked to R Factor.

Back in rights
- Government can participate in all projects undertaken

Recovery provisions
- Ranges from 60 – 70%

Income Tax
- 32% of contractor's gross revenue
SEDIMENTARY BASINS

**Explored basins**

Passive Continental Margin basins:
- Rovuma Basin (1)
- Mozambique Basin (2)

**Unexplored basins**

Graben and Rift Type basins:
- Maniamba Basin (3)
- Lake Niassa Basin (4)
- Lower Zambeze Graben (5)
- Middle Zambeze Basin (6)
Exploration History
Seismic Data

Seismic:

- 70,526 km$^2$ of exclusive 3D seismic
- 248,000 km of 2D seismic

Other Data & Availability:

- Well Data
- Grav-Mag Data
- 2D & 3D seismic
- Access through Data Room & Multiclient Contract Agreement (CGG, WesternGeco, Spectrum)
A total of 223 wells drilled since the 50’s to date

- 141 Onshore
- 82 Offshore
Mozambique Discoveries

Rovuma Basin

• **Source:** Assumed Jurassic marine shale

• **Reservoirs:** Tertiary – fans and channels reservoir sandstones and Cretaceous – Basin Floor Fan reservoir sands.

• **Traps:** mainly Stratigraphic, but also Structural and combined.

• **Seal:** Paleocene to Miocene Shale deposits.

• **Resource Estimate:** Approximately 165 tcf of GIIP (115 tcf Rec.)
Mozambique Discoveries

Mozambique Basin

• **Source:** Assumed Albian – Cenomanian shallow marine shale

• **Reservoirs:** Upper Cretaceous - Sandstone of Lower Domo and Lower Grudja FMS, Paleocene and Oligocene fans and channels from Zambezi Delta complex

• **Traps:** Stratigraphic and structural

• **Seal:** Transgressive Marine deposits (mudstone stratum)- Grudja FM.

• **Resource Estimate:** Approximately 8 tcf of GIIP (6tcf Rec.) and 250 mmbbl of OIIP (35mmbbl Rec.)
Petroleum Geology
Rovuma Basin

Stratigraphy

Proved Prospectivity for Gas in Tertiary Deep Water Turbidite Systems

Play Types & Cross Section

www.inp.gov.mz
Mozambique Basin

Stratigraphy

Play Types & Cross Section Central Part

Proved Prospectivity for Oil & Gas in Shallow Marine Systems
Mozambique Hydrocarbon Resources

Rovuma Basin, gas-in-place for each resource class

Mozambique Basin, gas produced and remaining in-place for each resource class
State Take as a Percentage of Undiscounted Total Net Project Cash Flows

- Australia PRRT Terms for areas under Federal jurisdiction: 57.7%
- Philippines 2006 Model Service Contract: 61.8%
- Trinidad & Tobago 2010 Deep Water Model PSC: 69.1%
- Kenya 2008 Model PSC: 71.0%
- Israel 2011 Royalty Tax Terms: 72.4%
- Mozambique 2010 EPCC Model Contract: 73.9%
- Tanzania 2004 Deep Water Model PSC with 2010 Gas Addendum: 79.9%
- Equatorial Guinea 2006 Model PSC: 82.3%
- Egypt EGAS 2008 Model Concession Contract: 87.7%
E&P Activity vs Fiscal Rating

High E&P activity (<2.5) and favourable fiscal rating (~2.5 or below)

Low E&P Activity (close to 0), moderate fiscal terms (2.5-3)

Relatively active E&P, but tougher fiscal terms (~3)

High E&P Activity (<2.5), but State Take >100% under current assumptions and unfavourable investor economics.

E&I INSTITUTO NACIONAL DE PETRÓLEO

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Investments in Oil & Gas Sector

Total Investments (bi USD) (2004-2017)

- ENI East Africa SPA
- Anadarko Moçambique Offshore
- Wentworth Moçambique Petróleo, Limitada
- TOTAL S.A.
- Sasol Petroleum International PSA
- Sasol Petroleum Sofala
- Sasol Petroleum Sengala, Lda
- BUZI Hydrocarbons
- Sasol Petroleum Mozambique

Values: 3.24, 5.05, 0.31, 1.03, 0.35, 0.29, 0.27, 0.03, 1.06
Success Rates through time (1953-2017)

- **Rovuma Basin** 47% success rate
  - 38 wells with (partly or fully) wildcat targets, only six drilled without 3D seismic data coverage
- **Mozambique Basin**: 21% success rate (first 45 wells: 13%, last 45 wells: 29%)
  - 90 wells with (partly or fully) wildcat targets, only three drilled with 3D seismic data coverage
New Concessions Areas - 2018

- Angoche Area A5-A
- Angoche Area A5-B
- Zambezi Area Z5-C
- Zambezi Area Z5-D
- Pande/Temane Area PT5-C
- Mazenga
### Angoche Area

#### OFFSHORE - ANGOCHE

<table>
<thead>
<tr>
<th>%</th>
<th>AREA A5-A (5,145 Sq Km)</th>
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<tbody>
<tr>
<td>Operator</td>
<td>34.0 eni Mozambico S.p.A</td>
</tr>
<tr>
<td>Partner</td>
<td>25.5 Sasol Petroleum Mozambique Exploration Ltd.</td>
</tr>
<tr>
<td>Partner</td>
<td>25.5 Statoil Holding Netherlands B.V.</td>
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<td>ENH Carried Interest</td>
<td>15.0 ENH</td>
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<tr>
<td>First Period Duration</td>
<td>4 Years</td>
</tr>
<tr>
<td>First Period Financial Commitment</td>
<td>115 M$</td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>3 Wells</td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>4,400 sq km of 3D seismic</td>
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#### OFFSHORE - ANGOCHE

<table>
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<tr>
<th>%</th>
<th>AREA A5-B (6,080 Sq Km)</th>
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<td>Operator</td>
<td>60.0 ExxonMobil Exploration and Production Mozambique Offshore Ltd.</td>
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<td>Partner</td>
<td>20.0 RN-Exploration LLC (Rosneft)</td>
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<td>Partner</td>
<td>(20) (Up to 20% available to Total/Sonangol subject to negotiation)</td>
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<tr>
<td>ENH Carried Interest</td>
<td>20.0 ENH</td>
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<tr>
<td>First Period Duration</td>
<td>4 Years</td>
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<tr>
<td>First Period Financial Commitment</td>
<td>257 M$</td>
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<tr>
<td>First Period Work commitment</td>
<td>2 Wells</td>
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<tr>
<td>First Period Work commitment</td>
<td>8,000 sq km of 3D seismic</td>
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## Zambezi Delta Area

### OFFSHORE - ZAMBEZI

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<th>%</th>
<th>AREA Z5-C (5,821 Sq Km)</th>
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<td>ExxonMobil Exploration and Production Mozambique Offshore Ltd.</td>
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<td>RN-Exploration LLC (Rosneft)</td>
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<tr>
<td>ENH Carried Interest</td>
<td>20.0</td>
<td>ENH</td>
</tr>
<tr>
<td>First Period Duration</td>
<td>4 Years</td>
<td></td>
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<tr>
<td>First Period Financial Commitment</td>
<td>128 M$</td>
<td></td>
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<tr>
<td>First Period Work commitment</td>
<td>1 Well</td>
<td></td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>1,500 km of 2D and 2,500 sq km of 3D</td>
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### OFFSHORE - ZAMBEZI

<table>
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<th>%</th>
<th>AREA Z5-D (4,384 Sq Km)</th>
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<tr>
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<td>20.0</td>
<td>RN-Exploration LLC (Rosneft)</td>
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<tr>
<td>ENH Carried Interest</td>
<td>20.0</td>
<td>ENH</td>
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<tr>
<td>First Period Duration</td>
<td>4 Years</td>
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<tr>
<td>First Period Financial Commitment</td>
<td>142 M$</td>
<td></td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>2 Wells</td>
<td></td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>3,500 sq km of 3D</td>
<td></td>
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</table>
### ONSHORE - PANDE TEMANÉ

<table>
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<th>/operator</th>
<th>%</th>
<th>AREA PT5-C</th>
<th>(3,012 Sq Km)</th>
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<tr>
<td>ENH</td>
<td>70.0</td>
<td>Sasol Petroleum Mozambique Exploration Ltd.</td>
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<td>30.0</td>
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<tr>
<td>First Period Duration</td>
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<td>First Period Financial Commitment</td>
<td>49 M$</td>
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<tr>
<td>First Period Work commitment</td>
<td>2 Onshore Wells</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Period Work commitment</td>
<td>1,600 sq km of 2D</td>
<td></td>
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### ONSHORE – MAZENGA BLOCK

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<th>operator</th>
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<th>AREA MAZENGA</th>
<th>(22,811.7 Sq Km)</th>
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<tr>
<td>ENH</td>
<td>100</td>
<td>ENH</td>
<td></td>
</tr>
<tr>
<td>First Period Duration</td>
<td>2 Years</td>
<td></td>
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<tr>
<td>First Financial Commitment</td>
<td>25 M$</td>
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<tr>
<td>First Period Work Commitment</td>
<td>N/A</td>
<td></td>
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<tr>
<td>First Period Work Commitment</td>
<td>1,500 km of 2D 15,000 km Grav. Mag. Data</td>
<td></td>
<td></td>
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</table>
Projects & Developments of Infrastructures
Pande & Temane Natural Gas Venture

Production started in 2004 from Pande/Temane Fields

865 km gas pipeline from Temane to Secunda (South Africa)

Capacity

- CPF: 197 MGJ/a (processing)
- ROMPCO: 212 MGJ/a @ 26” (nominal)
- MGC: 22 MGJ/a @ 8”

Use of Natural gas in Mozambique:

- Power generation
- Fuel to industries (Mozal, cement plant, etc)
- Fuels to vehicles (CNG - Compressed natural gas)
- Commercial and domestic use - Gas distribution Project
Rovuma Basin – Area 4 Coral Field FLNG Project

Project Components

- 1 Train, 3.4 MTPA (Coral South)
- ~10 Billion USD investment
- FID reached June 17 EPCC already adjudicated
- Expected drilling of 6 development wells in 2Q 2019
- Expected first production in 2023
- Construction of FLNG started, March 2018
Rovuma Basin – Area 1 Golfinho/Atum Project

**LNG Trains**
- 2 trains in 2023 (6MTPA)
- 12 wells (7’’)
- Up to 25 Billion USD in investment
- FEED contract adjudicated to Chyoda/ CB&I/ Saipem (CCSV)
- MoU for Domestic Gas
- Resettlement Plan approved
- Expected FID in 2019
Rovuma Basin – Area 1 and Area 4 Project

Prosperidade/Mamba Complex

- Natural gas straddling reservoirs Mamba and Prosperidade (Oligocene and Eocene)
- Equal joint venture (MRV and AMA1) through a joint Operator
- Unitization and Unit Operating Agreement signed in 23 Nov 2015, subject to Government approval
- PoD and Master depletion Plan (MRV and AMA1) submitted for Area 4 submitted in 2018
Tender & Bidding Process
6th Bidding Round Roadmap

- Nomination Process (2 months), March & April 2019
- Launching of the bidding round – Feb. 2020
- Bid proposals submission (6 months)
- Bid evaluation (3 months)
- Announcement of Bid evaluation results (TBA)
- EPCC signature process (TBA)
Final Remarks

- Mozambique offers competitive fiscal regime in comparison with other petroleum resource rich countries;

- Approval of new Development Plans will contribute to production of infra-structures for development of gas resources, boosting the country income, and exploration interest in Mozambique;

- Further Exploration will result from the 5th Bidding Round contracts, with firm commitments of 10 wells and approximately 18000 Sq.Km of 3D seismic data;

- Conditions are in place for further frontier exploration activities after (6th Public bidding round TBA).
Thank you
Obrigado