ACREAGE PORTFOLIO OF NAMIBIAN SEDIMENTARY BASINS

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Outline

- Introduction
  - Namibia overview

- Petroleum System Offshore

- Petroleum Regulatory System
  - Legislative Framework
  - Fiscal Regime

- Current Licensing Updates

- Namibia’s Geological Database
  - Seismic and Wells

- Recent Exploration Activities

- Future Exploration Activities

- Conclusions
Introduction
Namibia Overview

Key Figures

- Land Area: 825,418 km²
- Population: ~2.2 Million
- GDP: $16.8 Billion (2013)
- GDP per capita: $7,740
- GDP growth rate: ~4.0% (2013)
- FDI inflow: $357.5 Million (2013)
Petroleum System Offshore Namibian Basins
Sedimentary Basins of Namibia

Legend: Offshore Geology
- Early Cretaceous to Tertiary Drift Section overlying continental basement
- ?Late Jurassic to Early Cretaceous Syn-rift section
- Main Area of seaward-dipping reflectors
- Tentative area of syn-rift section underlying seaward dipping reflectors
- Walvis Ridge volcanics
- Oceanic Crust

- 4 Sedimentary basins offshore
- 2 onshore Basins
- First exploration well drilled in 1974 discovered Kudu Gas Field
- Kudu is a significant discovery (mid-case c.1.6 TCF of GIIP) with additional upside

After Serica Energy (Farm-out presentation, 2012)
Source Rocks

Based on available existing geochemical and oil extracts data offshore basins. At least two possible active petroleum system can be recognized offshore Namibian basins:

I. **Barremian- Aptian petroleum system.** This source rock system is also present in the Campos and Santos Basins, Brazil and Congo and Cuanza Basins, Angola. In Brazil and Angola such system is overcharged and represents more than 50 billion bbl of hydrocarbon reserves.

II. **Albian- Cenomanian petroleum system.** Similarly, this source rock system is also present in the Campos and Santos Basins, Brazil and Congo and Cuanza Basins, Angola.
Walvis ridge formed a transition zone.

- Northern basins largely dominated by carbonates and minor siliciclastics sediments.
- Walvis basin recovered 370 m and 170 m of Barremian to Middle-Albian(?) carbonates - average porosity ~20%.
- Southern basins largely dominated by siliciclastics sediments.
Petroleum Regulatory System
Legislative Framework

The legislative framework governing the Namibian upstream petroleum industry is modern and well developed, and has been specially formulated for the international oil and gas industry.

The main legal documents that regulate the petroleum industry in Namibia are:

- Petroleum (Exploration and Production) Act, 1991 (Act 2 of 1991);
- Petroleum Taxation Act, 1991 (Act 3 of 1991);
- Petroleum Laws Amendment Act, 1998 (Act 24 of 1998); and the
- Model Petroleum Agreement (MPA), 2007
# Fiscal Regime

## Summary of main tax charges:

<table>
<thead>
<tr>
<th>Component</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Income tax**   | - 35%, plus Additional Profits Tax (“APT”).  
                   - APT levied on after-tax net cash flows from petroleum operations  
                   - Levied separately for each licence area |
| **Royalties**    | - 5% of gross revenue  
                   - Value of crude oil or gas for royalty and tax purposes based on market value  |
| **Withholding tax** | - 25% on services |
| **Licence fees** | - Initial (license application), annual rental charges, annual training fees |
Current Licensing Updates
Petroleum Exploration Licensing Model

The Government of Republic of Namibia has an **Open Licensing System** adopted in 1999.

- Open to national and international oil and gas companies
- Companies can apply at any time for acreage

**MME on the verge of closing the open licensing system and likely to revert back to bidding rounds in future.**
From 1999 the Government of the Republic of Namibia started issuing licenses

- To date over 50 licenses have been granted.
- **NAMCOR** – Interest in 40 blocks.
- Demand for Namibian acreage - favourable oil prices and encouraging drilling campaigns.

![Bar graph showing the status licenses issued from 2005 to 2013.](image)
Namibia's Geological Database
Seismic & Wells
ERCL Project

- Reviewed all existing datasets
- QC’s
- Reprojection 2D vintage surveys
- Data loaded into SMT projects
- More confident database for exploration
2D Seismic

Offshore Basins

- Excellent 2D data coverage
- Database consist ~131,236 line Km of 2D seismic (mainly non-exclusive)

Onshore Basins

- Poor 2D data coverage
- Hydrocarb and Preview Energy have plans to acquire: Owambo Basin and CSG Energy in the Caprivi area in 2014

“ERCL completed comprehensive data management of 2D seismic and well database of Namibia”.
3D Seismic

- Database consist of 24,313 km² of 3D seismic surveys - Sparsely coverage
- About 12,000 km² have been planned for 2014.
- Tullow and Pancontinental acquired 3000 km² in Block 2012B in Jan 14.

MME emphasis on acquiring 3D before drilling of any prospect.
Wells

- Total of 21 Wells drilled offshore
- 14 Exploration & 7 Appraisal wells (Kudu)
- 4 ODP & 5 DSDP well locations
- In 2012, 2 wells drilled by Chariot Oil & Gas.
- In 2013, 3 wells by drilled by HRT&Galp.
- 3 wells potentially to be drilled in 2014.
- Repsol drilling underway, Chariot and BP-Serica potentially in 4Q-2014.
Recent Exploration Activities
Welwitschia-1 well to be drilled by Repsol & Tower

Welwitschia-1
Water depth: >1000m
TD estimated: 3000m (SubSea)

- Well selected in order to evaluate primary and secondary target reservoirs in both the Maastrichtian and Aptian-Albian reservoir sequences.
- Target risked potential resources of ~496 million barrels of equivalent net across multiple reservoir horizons.
PGS Multi-Client 2D Regional Survey

- Acquired total of 9972 km and (9949 km full fold). PSTM data available from April 2014
- High quality data over unlicensed offshore blocks - Deepwater
- PGS used GeoStreamer GS technology
Wingat-1 (2212/07-1)
Water depth: 1005m
TD: 5000m
Drilled in 68 days

Main target:
Albian carbonate platform

- Low porosity in carbonate target.
- Two well developed source rocks penetrated.
- Reservoir saturated by light oil - 41 °API.
Murombe-1

Murombe-1 (2212/06-1)
Water depth: 1417m
TD: 5729m
Drilled in 62 days

- Penetrated same source rock as Wingat-1.
- The Baobab (secondary) target - Contained 36m net sand within a 242m interval (15% N/G). Average porosity of 19%.
- Poor reservoir quality - main target.

Main target: Barremian basin floor fan turbidites.
Secondary target: Santonian confined channel complex.
Moosehead-1 (2713/16-1)
Water depth: 1716m
TD: 4170m
Drilled in 47 days

- Penetrated two well developed source rocks.
- Penetrated approximately 100m of carbonates at primary target but with very low porosity.
- Wet gas shows were encountered & increased in wetness with depth.

Main target: Barremian carbonate reservoir.
Future Exploration Activities
ION-GXT SPAN. Namibia Regional Survey

- Operating Contractor – SeaBird Exploration
- Implementation Date – Variable starting early Q2
- Estimated survey duration – 3 months
- Full-fold line length (km) – 7,905
- Number of Lines – 16

Combining both PGS and ION surveys we will have a powerful tool for regional study and better understanding of Namibia Offshore geology.
# Kudu Project

## Current ownership structure

<table>
<thead>
<tr>
<th>Upstream partners</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAMCOR</td>
<td>54%</td>
</tr>
<tr>
<td>Tullow</td>
<td>31%</td>
</tr>
<tr>
<td>Cieco</td>
<td>15%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Downstream partners</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>NamPower</td>
<td>51%(1)</td>
</tr>
<tr>
<td>CEC</td>
<td>c. 30%(1)</td>
</tr>
<tr>
<td>Foreign investor</td>
<td>c. 19%(1)</td>
</tr>
</tbody>
</table>

Source: Tullow Oil, NAMCOR and NamPower

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Conclusions

• Progressive seismic acquisition and drilling helps to de-risk Namibia offshore basins.

• Huge petroleum potential, suggest offshore Namibia can be considered as a future giant petroleum province in the South Atlantic margin.

• It is not only a conducive fiscal environment that makes international companies invest in countries rich in natural resources, its also the existence and accessibility of research and modern pre-competitive geoscientific data.

• New multi-client data acquired will open up new opportunities for future exploration and enhance geological understanding of the offshore basins.

• Ministry has been successful in creating exploration momentum resulting in huge interest from various reputable oil and gas companies.

• Kudu Gas to Power Project a strategic project, decrease Namibia’s reliance on imported power and accelerate economic development.
THANK YOU

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