Mozambique Gas Master Plan: GTL Plant Project

by

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Introduction

- This Session will focus on GTL Technology as a complimentary monetization route for Mozambican Gas.

- While 1st LNG shipment from Mozambique is anticipated in 2018/19, it goes without saying that “diversification”:
  - is key to sustainable development
  - and would be a proactive response to market uncertainties

- A Comparative Assessment of the PetroSA GTL Facility, in RSA and the GTL Concept for Mozambique will help facilitate this session!
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PetroSA was established in 2002*
• Employs ~1900 total staff
• Owns one of the world’s largest, fully operational GTL refinery
• Business spans petroleum value chain
• Currently produces ~ 5% of RSA fuel needs
• Produces diesel, gasoline, kerosene and specialty products
• Has produced ~70 MMbbl crude oil & 1 Tcf of natural gas to date.
• Has upstream presence in South Africa, Equatorial Guinea, Ghana & Namibia
• Has a trading office in Rotterdam

* Following the merger of Soekor E & P and Mossgas Pty Ltd
Our Core Business

• Exploration, development and production of oil and gas
• Participation in and acquisition of local as well as international upstream petroleum ventures
• Production of synthetic fuels from gas
• Development of domestic refining and liquid fuels logistical infrastructure
• Marketing and trading of oil and petro-chemicals
PetroSA Strategic Focus

- Sustain the GTL refinery at Mossel Bay,
- Use the GTL refinery as a platform for growth,
- Grow PetroSA to a significant industry player in RSA and regionally,
- Contribute meaningfully to security of energy supply,
- Support economic growth, job creation and drive transformation.
Location PetroSA GTL vs MozGTL
3rd largest African gas reserves: Mozambique

Source: BP Statistical Review of World Energy June 2012
Gas Master Plan production profile

Mozambique GTL
Gas Master Plan priority: LNG in Palma

Mozambique LNG Project: Conceptual Design

Source: Anadarko
Mozambique GTL Concept Study

Concept proposal

- GTL capacity: 40,000 b/d
- GTL Capex: $4-6 billion
- Diesel prod: 34,600 b/d
- Gas rqmts: 400 MMscfd
- Power export: 150 MW
- Biodiesel blending

23,000 b/d diesel demand in 2020

* Source: PFC 2013 update
New Technology: High Diesel yield

Commercialisation of technology
The joint venture project has now proven the viability of advanced F-T cobalt catalyst and reactor technology at a scale that minimises the risk of further scale up to commercial plants.
PetroSA GTL Process flowsheet

FA platform

LNG storage

Imported condensate

Condensate

Gas

Gas separation

NGL

Methane reforming

Syngas

Synthol

C_3

C_4

C_5+ oil

C_3 = , C_5 - C_7 =

C_4 =

C_8+ synthetic oil

Oil refining and blending

LPG

Unleaded petrol

Leaded petrol

Illuminating Kerosine

Diesel

Fuel oil

Low-aromatic distillates

Gasoline

Distillate

Reaction water

Olefin Oligomerisation

Acid water to effluent treatment

Light alcohol

Heavy alcohol

Alcohol recovery

The Petroleum Oil and Gas Corporation of South Africa (SOC) Ltd  Reg. No. 1970/008130/07
MozGTL (LTFT) Concept flowsheet

- **FA platform**
  - Condensate
  - Gas

- **LNG storage**
  - Imported condensate

- **Imported condensate**
  - LPG
  - Unleaded petrol
  - Lead petrol
  - Illuminating Kerosine
  - Diesel
  - Fuel oil
  - Low-aromatic distillates

- **Hydrocracker & Hydrotreater**
  - C3
  - C4
  - C5 oil
  - C5+ oil

- **Methane reforming**
  - Power
  - Syn gas
  - C3
  - C5 – C7

- **LTFT**
  - Wax
  - Synthetic oil
  - C3 =, C5 – C7 =

- **Olefin Oligomerisation**
  - Olefin
  - Distillate
  - Gasoline
  - Reaction water

- **Acid water to effluent treatment**

- **Alcohol recovery**
  - Light alcohol
  - Heavy alcohol
Impact of technology on MozGTL products

MozGTL (LTFT)
- Naphtha 13.5%
- Diesel 86.5%

PetroSA GTL (HTFT)
- Gasoline 48%
- Diesel & Kerosene 39%
- Fuel oil 3%
- LPG 1%
- Alcohols 9%
Project Benefits for Mozambique

• MozGTL supports local natural resource beneficiation and industrial development

• Advances security of energy supply, in-country and regionally, could help meet domestic and regional diesel demand

• Positive balance of payments, through minimization of fuel imports

• Elevates Mozambique to a strong regional player, regional markets are a growth opportunity

• Strong Cooperation between RSA and Mozambique could help advance regional development and integration
Thank You
GTL growing internationally

- Nigeria
- Qatar
- Malaysia
- Mossel Bay
- Sasolburg
PetroSA’s GTL Operational Expertise

**E&P**
- Gas production
- Condensate production
- Satellite fields
- Gas compression
- Platform logistics
- Maintenance

**Gas and condensate processing**
- Gas liquids recovery
- Condensate stabilisation import
- Back-up LNG
- Sulphur removal
- Mercury removal
- Maintenance

**GTL**
- Air separation
- Methane reforming
- CO₂ removal
- H₂ production
- HTFT
- HTFT catalyst
- COD
- LTFT
- Maintenance

**Refining**
- Standard refinery operations
- Low aromatic distillate
- Condensate refining
- Alcohol recovery
- Maintenance

**Sales**
- Marketing
  - International
  - Local
- GTL products development
- Technical support

PetroSA is operating across the full value chain.

PetroSA’s GTL Operational Expertise