The energy sector of Botswana: Vision, Action Plan and Investment Opportunities

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Presentation by
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Country Energy
Sector Overview
### Botswana Energy Sector Snapshot

#### Potential

**Annual Solar Radiation**

- **2100 kWh/m²/day**

**Hydro energy to be exploited**

- **1 MW**
  - no perennial rivers and large dams and therefore has no potential for hydro-power, but, there is a potential for development of **1 MW**, located in the north of the country

**Biogas potential**

- **2.2 M cattle (3kg dung/LSU/day)**
  - The cattle population, estimated at **2.2 million head** indicates promising biogas potential, few domestic biogas digesters have been installed in the country

**Coal to be exploited**

- **200 Billion tonnes**
  - Morupule A and B run on coal

#### Production in MW

<table>
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<tr>
<th>Source</th>
<th>Total installed capacity</th>
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<tbody>
<tr>
<td><strong>Import</strong></td>
<td>22%</td>
</tr>
<tr>
<td><strong>Coal</strong></td>
<td>62%</td>
</tr>
<tr>
<td><strong>Thermal</strong></td>
<td>20%</td>
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#### Key Indicators

- **System losses**: 15%
- **Peak demand in 2018**: 613 MW
- **Access Rate**: 70%
  - Population electrified localities / Total Population
- **Average growth in demand per year**: 4%
Energy Sector Stakeholders

- Botswana Power Corporation (BPC) - is a state-owned company responsible for electricity generation, transmission and distribution, and reports to the Ministry
- The Botswana Energy Regulatory Authority- (BERA)

Country generation programs/Expansion plans

The country has several electricity-generation projects in the pipeline, including the mostly unexplored potential of solar generation. In November 2018, BPC issued a Request for proposals relating to the development, financing, construction, operation and maintenance of 12 solar PV power projects. In a few years Botswana could be generating enough power internally to supply all of its domestic needs

Country’s Priorities

Rural electrification along with safe and affordable access to energy is a key priority for Botswana to support economic growth. Diversification and decentralisation of the country’s energy mix through renewables integration are important aspects in achieving these priorities. Investments in energy efficiency projects will also be a priority and will help reduce carbon emission

Energy Policies and Reforms

General electrification is the main objective of the Government. The feed-in tariffs (FITs) are yet to be developed by the government. The National Development Plan (NDP) 11 places an emphasis on self-sufficiency. The intention of the NDP is to establish a cost-reflective tariff. The National Energy Policy (2015) takes this ambition further by aiming to become a net exporter of energy.
Energy Supply and Demand
THE BOTSWANA ELECTRICITY SUPPLY INDUSTRY (ESI) OVERVIEW

Botswana Power Corporation (BPC)
(Wholly Owned by GoB)

Key Aspects
- Energy Regulator Established in 2017
- Private Sector Participation in Generation
- BERA Functions Include
  - Licensing of Entities in Power Sector
  - Tariff Determination
  - Enforcement of Standards
BOTSWANA SOURCES OF ELECTRICITY

Morupule A (Coal)
Commissioned 1986/9

Morupule B (Coal)
Commissioned 2012/13

Orapa (Diesel) 90 MW
Commissioned 2011

Matshelfagabedi (Diesel)
Commissioned 70MW – 2010

SOURCES OF SUPPLY: MARKET SHARE

Towards Self Sufficiency

Imports 64%
Imports 22%
Local Generation 16%
Local Generation 78%

2009

2018

Botswana
ELECTRICITY DEMAND FORECAST (2018 – 2030)

GROWTH RATES

- Capacity (MW) = (3.5) %
- Energy (MWH) = (1.5 – 3) %
Expansion Plan and New Energy Mix
GENERATION EXPANSION PLAN (2018 – 2030)

Capacity Plan 2018 to 2030

<table>
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<tr>
<th>No.</th>
<th>Source</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>1</td>
<td>Morupule A (Existing)</td>
<td>132 MW, Period 2018 – 2033</td>
</tr>
<tr>
<td>2</td>
<td>Morupule B (Existing)</td>
<td>600 MW, Period 2012 – 2042</td>
</tr>
<tr>
<td>3</td>
<td>New Capacity (Future)</td>
<td>300 MW, Period Post 2023</td>
</tr>
<tr>
<td>4</td>
<td>Solar PV (Future)</td>
<td>100 MW, Period 2021 Onwards</td>
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</tbody>
</table>
1. 100MW Solar PV (2X50MW)
   - Procurement of Developer In progress (Open Tender).
   - Commercial Operation 2021

2. 12 X Grid Connected PV
   - At Tender Stage - Developer Selection
   - Commercial Operation 2020/21

3. 20 Solar PV Off Grid for Villages
   - At Inception Stage
BOTSWANA’S TRANSMISSION GRID INVESTMENTS

1. North West Transmission Grid (Phase 1)
   - Construction In Progress
   - Completion Dec 2019

2. North West Transmission Grid (Phase 2)
   - Project Specification and bid documents in place
   - Funding to be Secured

3. ZIZABONA INTERCONNECTION
   - Sponsors (Power Utilities) to Secure Funding
Thank you for your attention.