Electricity Sector in Mauritania

Regional meeting on Sustainable Energy, 5-6 December 2016, Dar es Salam

Ministry of Petroleum, Energy and Mines
General Overview
Main facts:

- Vast and sparsely populated country:
  - 1,030,700 sq km
  - 3.5 million inhabitants

- GDP per capita (2015): $1,035

- 10% per year growth of electricity demand

- Low electrification rate:
  - 72% urban
  - 6% in rural

- High Production Costs due to high hydrocarbons costs

- Annual subsidy to the national electricity company to mitigate fluctuations of oil price (till 2014)

- Limited interconnected grid (expensive isolated plants)
Overview

Chronology:
- 2001: New Electricity Code
- 2002: Unsuccessful Privatization process of National Power Utility
- 2003-2009: Political instability / Lack of Investments / Shortage Power Generation / Frequent blackouts
- 2009: New strategy
- 2010-2016: Massif investments in Production – Transmission – Distribution based mainly on concessionnal loans (AFESD, IsDB, AFD, China Exim Bank...) and grants (UAE, EU, ...).

Sector Strategy:
- Add production capacity from local resource (mainly gas and hydroelectricity);
- Develop grid and interconnection with neighboring counties;
- Enhance part of renewable energies in the energy mix;
- Implement solutions tailored for communities in remoted areas.
Abondant ressources in energy
Wind Energy:

- Winds mainly determined by “Alizés” winds and thermal effects
- Dominant directions North and North-East
- Strongest winds in the northern coastal regions, tapering green south and inland.

Measures have indicated a potential of:

- Nouakchott 7,5 m/s (60m)
- Nouadhibou 8,6 m/s (40m)

Implemented Projects:

- 4,4 MW plant in Nouadhibou (2013)
- 30 MW plant in Nouakchott (2015)
- 100 MW (expected 2018)
**Solar Energy:**

- Geography characterized by:
  - A northern hot desert region crossed by the Tropic of Cancer
  - A southern region near the Senegal River with a hot and humid climate and rainfall up to 400 mm/year

- Radiation GHI range from:
  - 2100 to 2300 kWh/m²/year

- Newly implemented projects:
  - 15 MW PV plant in Nouakchott (2013)
  - 3 MW PV plant in Zoueratt (2013)
  - 16,6 MW PV 8 Cities (2016)
  - 50 MW PV Nouakchott (expected 2017)
**Hydro Power:**

- Mauritania, Senegal, Mali, and Guinea members River Senegal Organisation Authority (OMVS).
- Shared power production
- Felou hydroelectric dam 60 MW (2012)
- Gouina hydroelectric dam 140 MW (expected 2018)
Natural Gas

- Off shore discovery 1.2 TCF for Gas to Power project
- Project under development since 2011, restructured in 2105
- Meet national and regional demand
- Up Stream: Tender for a gas operator in 2017
- Down Stream:
  - 180 MW Dual Plant commissioned 2015
  - 120 MW CCGT with the first gas (2018-2020)
Key achievements 2010-2015
Key achievements

- Adopted and Implemented a strategy

- On Generation:
  - Secured capacity to cover the national demand
  - 358 MW additional capacity for generation;
    - 35 MW Wind;
    - 18 MW Solar PV;
    - 18 MW hydroelectricity.

- On Distribution:
  - 1500 km Low Voltage lines
  - 750 km Medium Voltage lines
  - 115 newly electrified cities
The share of electricity produced from renewable energy has evolved from 27% in 2010 to 34% in 2015.
Major projects in the pipeline 2016-2020
Major projects in the pipeline 2016-2020

- **GENERATION:**
  - *Installed capacity less 1 MW in isolated remoted areas:*
    - ✓ 4 hybrid thermal/Wind plants (IRENA/ADFD 1)
    - ✓ 10 hybrid thermal/solar plants (IRENA/ADFD 2)
    - ✓ 10 Hybrid thermal/Solar (GoM)
    - ✓ ...
  - *Installed capacity between 1 and 10 MW with grid covering a range of 120 km:*
    - ✓ 1 hybrid thermal/solar plant (French Development Agency)
    - ✓ 2 hybrid thermal/solar plant (AFESD)
    - ✓ 16,6 MW Hybridation of 8 plants (UAE)
    - ✓ ...

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[Map of projects and locations]
Major projects in the pipeline 2016-2020

- **Installed capacity over 10 MW on grid:**
  - 120 MW CCGT in Nouakchott (IPP)
  - 100 MW Wind in Boulanouar (AFESD)
  - 30 MW Solar PV in Nouakchott (AFESD)

- **TRANSMISSION:**
  - **HV Transmission lines:**
    - North-South backbone (700 km) (Donors)
    - West – South Est backbone (1600 km) (Donors)
    - West – North Est backbone (700 km) (Donors)

- **DISTRIBUTION:**
  - **MV and LV lines:**
    - 2000 km of 33 kV (Donors)
    - 1500 km of LV lines (GoM)
Asante kwa mawazo yako