OPTIMIZING DOMESTIC RESOURCE POTENTIAL IN NAMIBIA

Promoting Renewable Energy Development :Introductory Workshop for Regulators March 16-18,Nairobi,Kenya

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Presentation Outline

- > Background(Namibia)
- > Overview of Namibia's Energy Sector
- > Renewable Energy Sources
- Renewable Energy Policies and Legislation
- Renewable Energy Policy implementation
- > Activities promoting the use of RE
- > Challenges
- > Way Forward





Background :Namibia



 Situated in Southern Africa bordering the Atlantic ocean , Angola, Zambia , Zimbabwe, Botswana and South Africa.



Background : Namibia

- Population is estimated to be 2 million.
- > 60 % of the population resides in the northern part where electrification rates are very low.
- The existing electricity grid supplies 30% 40% rural population and 98% urban population.
- The Central & Southern parts of Namibia are sparsely populated, increasing the challenge of grid extension on the basis of population density under the rural electrification program.





Overview of Namibia's Energy Sector





Key Players in the Electricity Supply Industry (ESI)

- Ministry of Mines and Energy (Policy maker)
- > Electricity Control Board (Electricity Regulator)
- NamPower (State Owned utility responsible for generation, transmission & partial distribution of)
- Private and Regional Electricity Distributors (REDs), Municipalities, NP and Local Authorities
- REEEI Renewable Energy & Energy Efficiency Institute – arm of MME in collaboration with PoN – responsible for research





Energy Consumption by Sources - 2009

Total ~18 TWh



Electricity Generation Options (summary)

- The current total installed capacity is 381MW, from Ruacana -64%, Van Eck -30% & Paratus -6%. Scenario will change with commissioning of Ruacana 4th unit and Anixas).
- Maximum Demand is 500 MW

- Thus, Namibia imports the rest of the electricity (50% average) from Southern Africa Power Pool (SAPP) countries –Zambia, Mozambique, Zimbabwe and South Africa.
- Short term plans DSM programs & construction of Caprivi Link – creates new wheeling program to mitigate against Tx capacity constraints



Installed capacity (summary)



RENEWABLE ENERGY SOURCES





Renewable Energy Potential-Solar



Renewable Energy Potential-Wind

Renewable Energy Potential-Biomass

Source: von Oertzen 2007, adapted from Bester (1999), Agricola 10: 1 - 3

Other Renewable Energy Sources

> Hydro

Geothermal

> Tidal/Wave

Renewable Energy Policies ,Legislation & Frame Work

Renewable Energy Policies and Legislation

- 1. The White Paper on Energy Policy (1998) sets out specific national energy policy goals for the ESI: To promote and enhance:
- > Effective governance
- Economic competitiveness and efficiency

- Security of Supply
- Social benefits
- Sustainability
- Investment and growth
- 2. In 2005 Namibia initiated a Renewable Energy Programme with the support of the Global Environment Facility – increase affordability and access to RE services and accelarate market development for RE technologies by reducing exisiting barriers, i.e human capacity, financial, technical, awareness and other market limitations.
 - 3. Currently, Namibia apart from the Energy White Paper does not have an overarching RE framework and is in the process of developing one.
- 4. This process is being administered by the Renewable Energy & Energy Efficiency Institute (REEEI) .REEEI is an arm of the Ministry of M¹ and the Polytechnic of Namibia(

Renewable Energy Policy and Legislation

1.Energy White Paper

- 2. The Electricity legislation 2007 (repealed 2000 Act) resulted into the establishment of Namibia's electricity regulator, the Electricity Control Board (ECB) whose main responsibility is to regulate Namibia's electricity supply industry effectively and efficiently.
- 3.Expanded the regulatory powers, objects and mandate of ECB

Mandate - Promote private sector investment in the electricity industry - ensure competitive environment in the ESI - increase sector efficiency and ensure reasonable and affordable tariffs

Renewable Energy Policy Implementation

Renewable Energy Policy implementation

To Implement the goals set in the Energy White paper (1998), thereby promoting the use of renewable energy, the Namibian government through the ministry of mines and energy (MME):

- Initiated a renewable energy committee(NamReP) to spearhead renewable energy activities in the country.
- Regulates the oil industry

- > Administers the solar revolving fund
- > Over sees rural electrification process.

Electricity projected price path

Projected price path observation

- Due to the fact that the new generation options are coming on board electricity will not strictly follow its projected price path.
- Higher tariff increases will be needed in the beginning of the new projection period.
- The unsaved energy in 2014 will lead to a cash outflow from the utility (NamPower).
- The Long run marginal cost (LRMC) projection is estimated at 110c/kWh.
- Impact of higher tariffs will be reducing the gap with RET

Source : H Vosloo,2010

Activities promoting RE

Role of the Regulator

- To support the Promotion of Renewable Energy the regulator (ECB):
- Facilitates a smooth license application process for the independent power producers(IPPs).
- Currently in the process to convert and expand into an Energy regulator.

Renewable Energy Licensed activities

- C-Bend at Otavi (250kW)–poc biomass gasification
- Aeolus at Luderitz (40MW) wind
- > Electrawinds at Walvis Bay (50MW)
- Innowind at Walvisbay (60MW)

Role of the Regulator cont...

Renewable Energy awareness programs

- ECB has also been conducting Renewable Energy awareness activities at exhibitions (trade fairs) such competitions whereby winners receive geyser blankets, gifts such as pens, bags or caps conveying a message on energy saving/efficiency.
- In addition, ECB dispatches booklets on energy saving and energy efficiency tips.
- ECB is currently supporting Demand Side Management implementation programs such as the Ripple Control Technology initiative.

Other Successful RE Projectsexamples

- Solar thermal heaters successfully installed at higher learning institutions such as the University of Namibia and the Polytechnic of Namibia.
- Cabinet Directive on SWH
- Most households have replaced the ordinary incandescent light bulbs with energy efficient light bulbs.
- The City of Windhoek (Electricity distributor) has been installing ripple control switches to newly built houses as part of the demand side management (DSM) implementation progr

Successful RE Projects-examples cont.

- Policy initiatives on:
- Off grid rural electrification master plan development and implementation
- Cabinet Directive on Solar Water Heaters (SWH)
- NamRep initiative on identification of RE uptake barriers.

Major Challenges regarding RE implementation

- The high cost of RE technologies remains a challenge for economic competitiveness and efficiency as well as for promotion of investment and growth
- A lack of a Renewable Energy Framework in place is a major set back to investors .i.e. procurement mechanism not yet established.

Role of the Regulator in promoting RE uptake -Summary

- > ESI Capacity Building Initiative-articulation of the role of RE
- Licensing of IPP's (Biomass, wind & solar)
- Financing of the Procurement Mechanisms project
- Developing TOR & implementation of the NIRP project
- Conversion of the regulator expansion of scope to include RE and Gas

Developing Technical and Economic Rules on RE

Role of the Government in promoting RE uptake- summary

- Clear Energy Policy goals (E₂S₃I)
- Effective governance
- Economic competitiveness and efficiency
- Security of Supply
- Social Upliftment
- Sustainability
- Investment and growth
- NamREP implementation on barrier identification
- > Off-grid electrification master plan
- Government policy directive on SWH
- Establishment and funding of REEEI

Funding the NIRP Project implementation

Challenges to commercial uptake

- Large price gap between conventional and RE
- Capacity and grid integration issues
- Market resilience and investor financial expectation mismatch

End of Presentation 1 – to be followed by Presentation 2 on Procurement Mechanisms Presentation 3 Status of current wind facility **3MINUTES BREAK!**

STATUS OF THE CURRENT WIND FACILITY AND NEW INITIATIVES

WALVIS BAY WIND PILOT PROJECT

Objectives

- Installation of a small generator 100kw with Danish assistance as a phase 1 pilot project.
- For Capacity building and demonstration.
- Once enough experience is gained with operation and management of such an installation, the RE initiative can be expanded with own resources as a generator supplying into the national transmission grid. Possibly Phase 2= 10MW?

PROGRESS

- The Town Council of Walvis Bay approved the "Wind Generation project in Walvis Bay" which was funded by Danida as a grant of DKK 2,200,000.00 (N\$ 2,272,727.00).
- A 220kW refurbished wind energy converter (WEC) was installed and connected to the local electrical grid to supplement the energy needed for pumping water from the Kuiseb River into reservoirs as well as to supply local consumers connected to the grid.

PROGRESS (2)

- The Wind Generator was commissioned and handed over to Erongo RED On 30 November 2005.
- Approximately 10 000 to 15 000 units (kWh) are generated per month.
- No substantial effects on quality of supply were measured.

ORGANISATIONS INVOLVED IN THE PROJECT

DANIDA	Funding agency
Municipality of Walvis Bay/Erongo RED	Host, co-funding agency, implementer, operator, owner
Global Consulting Services	Consultant for Danida in Namibia
EMCON Consulting Group/AGAMA	Project management
EnviroSolution cc	EIA
Engineering Centre cc	Main contractor
Storstroms Vindkraft	Danish sub-contractor
CTLab	QOSupply metering/monitoring

PROGRESS SINCE INSTALLATION

- Erongo Red expects a 10 MW wind farm to be viable taking certain factors such tariffs and grid capacity into consideration.
- Many international visitors have been taken to site.
- Some interested parties to date to extend wind generation at Mile 7 Wind Park(WalvisBay):
 - >Aeolus
 - T-Elec Namibia

- Elektrawind
- InnoWind

LUDERITZ WIND POWER DEMO

WHAT IT'S ABOUT

- Luderitz town has strong southwesterly winds and known to be one of the windest places on earth.
- Involves the installation two wind turbines
 800W at Luderitz Secondary School.
- Initiated by members of the Luderitz community.

BENEFITS

- Provides electricity supply to the school
- Exposed people in the area to new technology with great potential for expansion.
- Potential to contribute to industrial development in turn contributing enhancement of living conditions of the population.

CHALLENGES FACED

- Technical Failures
- Lack of Renewable Energy Framework
- Lack of technical and business development skills

WAY FORWARD

- This project has created awareness within the entire Luderitz community.
- Luderitz has good wind resources hence suitable locality for research and development of wind plants.
- This is good example of areas along the coast that are not connected to the central electrical power grid.
- Project team members intend to upscale this project to a grid connected system depending on Policy frameworks and technical capacity.

THANK YOU

