NATIONAL ENERGY REGULATOR OF SOUTH AFRICA

SOUTH AFRICA RENEWABLE ENERGY SECTOR – NERSA PROGRESS & CHALLENGES



Renewable Energy Workshop for Regulators – Kenya (16-18 March 2011)

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Overview of SA and ESI

South Africa:

- **Population: 49million**
- **Geographical area:1.2 million square meters**
- **9 provinces**
- **187 Municipalities including 6 Metros**

Electricity Supply Industry: Vertically integrated Market Structure; Installed capacity: 43 308 MW; 2010 system peak: 36 450MW

- **Generation : Eskom- 96%(including firm Imports from HCB); Municipalities – 1%; IPPs – 3%**
- **Generation mix (09): Total operational generation capacity = 38 334 MW ; Spread across 24 power stations:**
  - **33 156 MW coal fired (11)**
  - **600 MW hydroelectric (6)**
  - **1 800 MW nuclear (1)**
  - **1 400 MW pumped storage (2)**
  - **342 MW gas turbine (2)**
  - **1036 MW OCGT (2)**
- **Transmission – Eskom : 100% owned = 28 205 km of lines**
- **Distribution – Eskom 60% and 187 Municipalities – 40% and reseller market**

NERSA History

The National Energy Regulator (NERSA) was established on 1 October 2005 in terms of the National Energy Regulator Act, 2004 (Act No. 40 of 2004) to regulate:

- Electricity industry (Electricity Regulation Act, 2006 (Act No. 4 of 2006))
- Piped-Gas industry (Gas Act, 2001 (Act No. 48 of 2001))
- Petroleum Pipelines industry (Petroleum Pipelines Act, 2003 (Act No. 60 of 2003))

NERSA's predecessor, the National Electricity Regulator (NER) regulated the electricity industry between 1995 until 16 July 2006

NERSA is expected to implement its mandate and to proactively take necessary regulatory actions in anticipation of and in response to the changing circumstances in the energy industry

NERSA Mandate

- NERSA reports to the Department of Energy
- NERSA's Mandate is anchored in
  - 4 Primary Acts:
    - National Energy Regulator Act, 2004 (Act No. 40 of 2004)
    - Electricity Regulation Act, 2006 (Act No. 4 of 2006)
    - Gas Act, 2001 (Act No. 48 of 2001)
    - Petroleum Pipelines Act, 2003 (Act No. 60 of 2003)
  - 3 Levies Acts:
    - Gas Regulator Levies Act, 2002 (Act No. 75 of 2002)
    - Petroleum Pipelines Levies Act, 2004 (Act No. 28 of 2004)
    - Section 5B of the Electricity Act, 1987 (Act No. 41 of 1987)

NERSA Structure

- 9 Regulator Members
  - 5 part-time Members
  - 4 full-time Members
- Appointed by Minister of Energy
- Chairperson and Deputy Chairperson part-time
- Full-time Regulator Members:
  - Chief Executive Officer
  - 3 Members primarily responsible each for one of electricity, piped-gas and petroleum pipelines regulation
- Electricity Division
  - Electricity Licensing and Dispute Resolution (ELC)
  - Electricity Infrastructure Planning (EIP)
  - Electricity Pricing and Tariff (EPT)
  - Electricity Regulatory Reform (ERR)

NERSA Role in facilitating Renewables

- In 2003, Government's White Paper on Renewable Energy outlined a target of having 4% (10 000 GWh) of renewable energy capacity in the country's power mix by 2013.
- Government finalised and approved the Integrated Resources plan (IRP2) for the country for the next 20years (until 2030) which will diversify the countries energy mix with renewable energy target of 42% for new generation by 2030. (Cabinet memo – 17 March 2011)
- The IRP2 aims to balance affordability with the need to reduce carbon emissions and ensure security of supply
- There are a number of Strategies that have been developed to facilitate the implementation of the White Paper
  - The Energy Efficiency Strategy (EEDSM Policy)
  - The Renewable Energy Strategy
  - The Biofuel Industrial Strategy (4.5% of liquid fuel in Transport)

2003 White Paper

- The 2003 White Paper outlined potential barriers to RE implementation. Key issues being:
  - RE technologies remain expensive, on account of higher capital costs,
  - Implementation of RE technologies needs significant initial investment and may need support before reaching profitability.
  - Financial, legal, regulatory and organisational barriers.
  - A lack of non-discriminatory open access to the national electricity grid

NERSA ROLE

- In trying to address the outlined cost related barrier, the National Energy Regulator of South Africa commissioned a study on the Renewable Energy Feed-in Tariffs in 2007.
  - The study culminated with the approval of REFIT guidelines, outlining qualifying technologies and Phase I tariffs, on 26 Mar 2009.
  - On 29 October 2009, the National Energy Regulator approved REFIT phase II.
- In 2010, Finalized the Cost Recovery Mechanism
- In 2010,NERSA approved funding via the Eskom MYPD2 for 725MW of renewable– allocation to the Buyer (REPA)
- In 2010,NERSA approved funding via the MYPD2 for 460 000 solar water heaters to be rolled out in line with the gov. initiative of rolling out 1million SWH by 2013.

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Renewable Energy Feed-In Tariffs

REFIT Phase I Tariffs – 2009 (R/kWh)

Technology	Unit	REFIT
Concentrated Solar Power Trough plant with 6 hours storage	R/kWh	2.10
Wind	R/kWh	1.25
Small hydro	R/kWh	0.94
Landfill gas	R/kWh	0.90

REFIT Phase II Tariffs – 2009 (R/kWh)

Technology	Unit	REFIT
Concentrated Solar Power (CSP) trough without storage	R/kWh	3.14
Large scale grid connected PV systems (≥ 1 MW)	R/kWh	3.94
Biomass solid	R/kWh	1.18
Biogas	R/kWh	0.96
CSP Tower with storage of 6 hrs per day	R/kWh	2.31

Policy & Regulatory environment – DoE Role

- On 5 August 2009, the Department of Energy promulgated the New Generation Capacity Regulations “the Regulations”.
- The objectives of these regulations, in relation to the identified barriers, are:
  - The regulation of entry into a PPA by a Buyer and an IPP.
  - Facilitation of fair treatment and non-discrimination between IPP generators an Buyer.

NERSA s role informed by the “Regulations”

- NERSA drafted the of rules and guidelines that are applicable in the procurement of IPP for purposes of New Generation capacity – *NERSA issued a consultation paper for the public hearing process to solicit comments*
- NERSA drafted the framework of approving the IPP bid programme, the procurement process, the REFIT programme (selection criteria) and other agreements – *NERSA issued a consultation paper for the public hearing process to solicit comments*

NERSA Challenges: Policy & Regulatory environment

- The Regulations that mandated the NERSA to develop criteria for selecting REFIT projects are under revision.
- The new “Regulations, take away the responsibility that NERSA develops these stand alone doc (selection criteria and standardised PPA).
- The new Regulations designates the DoE as the purchaser of power and still REPA (Eskom) to be the Buyer but the selection criteria and procurement docs are to be finalised at DoE/NT with input from NERSA- *ongoing to be finalised soon*

Way Forward: Policy & Regulatory environment

- The fact that the utility (System Operator) will do the final selection of preferred projects raised concerns with the private sector.
- These concerns necessitated a review of these Regulations to be promulgated soon (31 March 2011).
- Currently the DoE with support of the National treasury are drafting the procurement documentation, incl. standard PPA, that will kick-start the long awaited process of IPP participation in the ESI.

Other RE Initiatives in SA

1. Financial instruments

•These ensures that equitable national resources are invested in renewable technologies

• Introduces sustainable financing mechanisms for delivering renewable energy systems and fiscal incentives. e.g. Eskom Incentive Scheme for solar water heaters, Renewable Energy Finance Subsidy Office (REFSO) and tax incentives for energy efficiency; IDC (3CSP, 3 PV, 29 Wind – 1300MW)

2. Legal instruments (NERSA)

These are developed in order to ensure appropriate legal and regulatory framework for pricing and tariff structures e.g. Renewable Energy Feed In Tariff (REFIT) introduced by NERSA in 2009

3. Technology development (SANERI)

This promote the development and implementation of appropriate standards, and guidelines for the appropriate use of energy technologies and research.

Other RE Initiatives in SA

4.Awareness raising, capacity building and education (DOE)

- This instrument promote knowledge of renewable energy through dissemination of information

5. Market Based Instruments (Collaboration- eg. World Bank)

- Developed to subsidise renewable electricity generation, pollution taxes, finance energy efficient housing and appliances. Examples of initiatives in this regard are as follows: REFSO, Renewable Energy Market Transformation Programme (REMP) and Tradable Renewable Energy Certification (TREC)

6. Regulatory instruments

- These instruments give effect to legal prescripts by setting targets for renewable electricity generation, commercial building codes, household appliance labelling etc

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GRID CONNECTED RENEWABLE ENERGY PROJECTS

Bethlehem Hydro

- The potential to generate power in the As River using the outflow from Lesotho Highlands Water project was first identified in 1999.
- The As River has an average (guaranteed) flow, which is artificially regulated, from Lesotho Highlands.
- The water flows via the As River over the distance of approximately 300 Km to Johannesburg where it is used for drinking purpose.
- Bethlehem Hydro (Pty) Ltd is the developer, owner and operator of 3.9 MW of hydro powered independent power plants (IPP) from two sites.

- - 2.2 MW - run of river site located on the As River with a flow rate of 26 cubic meter per second and a head of approximately 15 m and;
- - 1.7 MW – located at the existing Dam wall of the Saulpoort Dam with a head of 10 - 12 m and a flow rate of 26 cubic meters per second.
- Annual power production is expected to be 28.6 GWh. Grid connection will be through dedicated power lines to substations in the town of Bethlehem.

GRID CONNECTED RENEWABLE ENERGY PROJECTS

Tongaat Hullet Sugar Biomass

- The Tongaat - Hullet Group owns the bagasse power generation facilities installed at their Maidstone, Amatikulu and Felixton Mills.
- Boiler Plant: Standard thermal cycle steam boilers with turbo alternators operating in backpressure mode. The exhaust steam is used for processing sugar.
- Installed capacity: 72 MW
- Export capacity available: 8.5 MW
- About 80 per cent of the installed capacity is renewable energy and the other 20 per cent is usually coal, which is used to balance the fuel needs in case where the bagasse is used as a product for paper manufacture or animal feed.

GRID CONNECTED RENEWABLE ENERGY PROJECTS

Durban (eThekwini) Landfill

- The project comprises two complementary components as follows
  - a) Extraction, collection and flaring of methane from three landfill sites and;
  - b) Generation and supply of electricity to the municipal grid.
- The Durban (eThekwini) municipality plans to generate electricity from rubbish, at the same time reducing green house gas emissions.
- The project will capture methane rich landfill gas from three landfill sites to provide fuel for the production of 10 MW of electricity. The gas is captured by sinking wells up to 40m deep in the landfill waste sites.

Darling Wind Farm

- The project is to be developed into two phases:

- - Phase one comprises four 1.3 MW wind turbines producing 5.2MW of electricity from wind power.
- - Phase two comprises a further six 1.3 MW wind turbines making a total installed capacity of 13 MW.
- The gentle consistency of strong winds over the hills of the Swartland landscape provides an ideal opportunity to build the wind farm to generate electricity.

GRID CONNECTED RENEWABLE ENERGY PROJECTS

Friedenheim Hydro

- Developed by Friedenheim Irrigation Board as a 2.5 MW run of river hydro powered IPP.
- The electricity generated is used to drive 4 x 300 Kw electrically driven water pumps for Friedenheim Irrigation Scheme's own use, the rest of electricity (93 per cent) is available for sale.
- The Friedenheim hydro plant is located in the Crocodile River near Nelspruit in Mpumalanga Province of South Africa. It has been in operation since 1988.

Eastern Cape Wind Farm

- The project is being developed on an industrial site with good grid connection. Initially Nelson Mandela Metropolitan Council will purchase the power. In addition a number of consumers in the area have expressed an interest in purchasing a portion of their energy from renewable sources.
- The project will most likely be developed in two phases:

- - 15 MW in Phase One
- - 15 MW in Phase Two

Conclusion

• Instruments emanating from White Paper on Renewable Energy Policy are fairly new, and hence the slow pace of implementation in renewable energy.

• Constraints in renewable energy sector include, among other, the following: inadequate research and development, limited funding instruments, low electricity tariffs, lack of technical capacity.

• Cheap electricity available in South Africa is a further barrier to the implementation of renewable energy technologies which are expensive.

• Support funding options such as REFSO, CDM, TREC and other development finance institutions that fund renewable energy projects need to be strengthened as they are still at their infancy.

• These measures are not yet legally mandated by regulations or laws.

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THANK YOU!