Swaziland Electricity Company

Current Status of Energy sector in Swaziland and Future Plans

Presenter

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General Information

- Capital - Mbabane
- Languages - English language,Swazi language
- ISO Code - SZ, SWZ
- Area :17.364 km^2
- Population:1.185.000 (2009)

General Information - Swaziland

Swaziland Electricity Company

General Information

General Information - Swaziland

- Swaziland, officially the Kingdom of Swaziland is a landlocked country in Southern Africa, bordered to the north, south and west by South Africa, and to the east by Mozambique.
- Swaziland is a small country, no more than 200 kilometres (120 mi) north to south and 130 kilometres (81 mi) east to west.

Energy sources

- Total installed electricity capacity (2012)- 69.4 MW
- Hydropower: 60.4MW
- Diesel : 9MW
- Total primary energy supply : 1,703 ktoe
- Combustible Renewables and Waste: 48%
- Petroleum Products: 23%
- Coal: 16%
- Electricity Imports: 13%

Energy sources

- Biomass, especially wood fuel, constitutes about 90% of the total final energy consumption, and is still dominant in cooking and heating in rural areas. Biomass is not only the major fuel in households, but also the major source of electricity self-generation in the sugar, pulp and saw mill industries

Energy sources

- SEC operates four hydropower stations; Maguga, Ezulwini, Edwaleni, and Maguduza, all serving as peaking and emergency power stations.These stations contribute 14 -24% of the total energy consumed in the country. A further 2 x 4.5 mw diesel engines are installed at Edwaleni, however due to their high operational costs, they are no longer used.

Energy sources

- **THE OFFICIAL LAUNCH OF THE MAGUGA HYDRO ELECTRIC POWER STATION**
- **His Majesty King Mswati III launching the operation of the Maguga Hydro Electric Power Station, on the 13th May 2011 at 13h10.**

Reliance

- Swaziland imported an estimated 4,464 barrels of oil per day in 2009.
- The country imported 80.7% of its electricity needs in 2011, largely from ESKOM in South Africa, but also from EDM in Mozambique, through its membership of the Southern African Power Pool (SAPP). Total imports from ESKOM were 841.5 GWh in 2007, with EDM supplying a further 93.7 GWh.

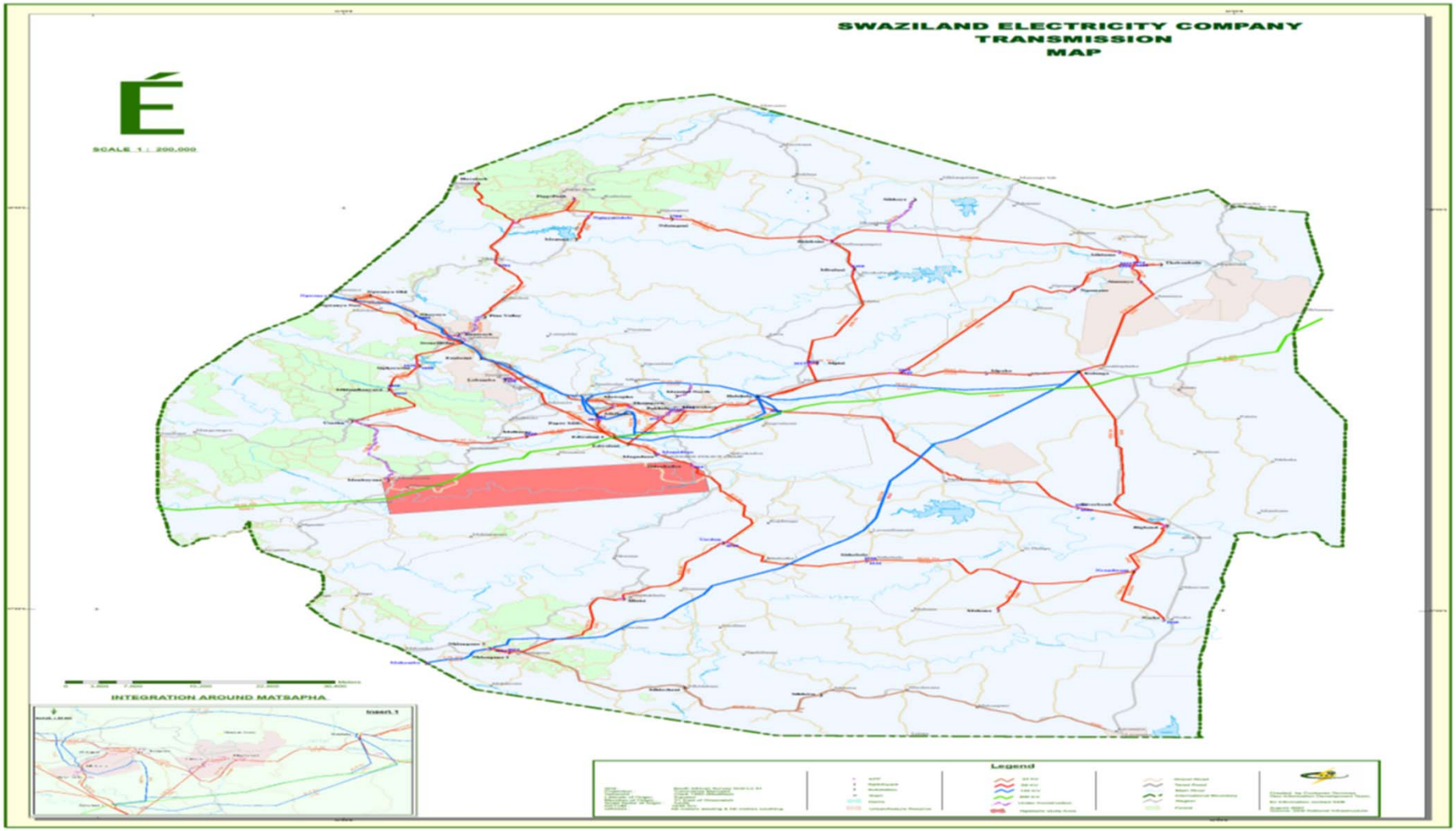
TECHNICAL PERFORMANCE

Year	2012	2011	2010	2009	2008
System Requirements (GWh) Sent Out	1129.8	1138.1	1186.3	1162.8	1143.6
Imported Power (GWh)	813.44	805.5	909.4	923.3	983
Local Generation (GWh)	272.3	333.4	288.1	245.5	160
Local Generation(%)	25	29	24	21	14
System Losses (%)	15.5	14.2	14.9	15.5	14.6
Number of Domestic Customers (000)	99.4	88.5	77.6	68.3	59.6
Number of Non-Domestic Customers	10.2	11.1	10.7	10.7	10.9
System Maximum Demand (MW)	203.73	200.77	204.48	200.65	200.3

Extended network

- There is an inadequate electricity supply. The overall electrification rate is approximately 27%. It is estimated that 40% of urban areas and 4% of rural areas are electrified.
- One 400 kV transmission line crosses through Swaziland, and connects to the network at the Edwaleni II substation. Country-scale transmission occurs via a 132 kV grid, with 66 kV lines

SEC Transmission Network



System Supply Outlook cont.

- SEC installed capacity is at 69.4 MW which makes 14 - 24% of the energy needs and the other 80% is sourced from ESKOM and EDM
- The Energy is supplied by:
- – 5 local power stations(excluding Ubombo Sugar Limited an IPP providing 3% annually electricity needs and 1% from SAPP - DAM)
- –Camden –Maputo 400 kV Line
- –Eskom (Normandie) 132 kV Line

System Supply Outlook

- SEC transmit at 66 –132kV and distribute at 11kV. The network is made up of:
  - –four 132/66 kV substations
  - –Two 132/11 kV substations
  - –Forty two 66/11 kV substations

System Supply Outlook cont.

The system is operated as two islands.

- 400 kV line and local generation supply West, central and North parts the country
- South and East parts are fed from Eskom Normandie132 kV feeder.
- A system peak of 203.73 recorded for 2012.

Renewable energy

- Solar Energy

  Swaziland's solar regime is not well documented and it is necessary to collect sufficient and reliable data in order to map out the resource. However, indications from SADC maps, satellite images, and hourly sunshine data indicate that the annual averages could lie between 4 to 6 kWh/m2/day. A program to install solar water heaters in public institutions as an energy efficiency measure is also underway

- Pilot project of 10MW by SEC planned for year 2014/15 – tendering on-going.

Renewable energy

Hydropower.

- It is estimated that Swaziland has a gross theoretical hydropower potential of approximately 3800 GWh/year, with a potential installed capacity of 200 MW.
- SEC in collaboration with the Ministry of Natural Resources and Energy established a database on the potential of developing mini-micro hydropower electricity schemes.
- Feasibility studies completed – 140MW potential capacity.

Renewable energy

- Wind Energy

❑Wind speed measurements are continuing in the country, with preliminary results indicating a mean average wind speed of 4 m/s across the country, suggesting a moderate potential for wind energy use.

Energy efficiency

- Energy efficiency potential exists in a number of sectors in the country, in both the supply and demand sides. Imported electricity in Swaziland predominantly comes from South Africa's ESKOM, and emissions associated with these imports are extremely carbon-intensive. Distribution losses equated to 33 GWh in 2008.

Energy efficiency cont.

- The Swaziland Electricity Company is running an extensive demand-side management program, initiated in 2008. Compact fluorescent lighting is promoted under this program, and approximately 90% of electrified households are now using smart meter technology. In addition, to promote efficiency in the industrial sector, a time-of-use tariff has been introduced for industrial customers.

Ownership

Electricity Market

- Swaziland's power is supplied and distributed by the Swaziland Electricity Company (SEC) which was established by the Swaziland Electricity Company Act (2007).

Ownership cont.

Oil and Gas Market

- Swaziland has no known oil or natural gas reserves, and no upstream oil industry. The country's downstream industry is heavily dependent on fuel imports from South Africa. A number of private companies, including BP, Caltex, Galp Energia, and Engen are active in the oil product distribution sector in the country.

Ownership cont.

Competition

- The Swaziland Electricity Company currently owns a monopoly on the import, distribution and supply of electricity via the national power grid, as well as the majority of the country's power stations.
- There are also five private power stations. Almost 25% of energy used in the Kingdom has been supplied by self-generators in recent years

Ownership cont.

Competition Cont.

- A reform of the energy sector was undertaken to reduce the monopoly of the utility, including the structural change from a board to a company in 2007. This established a regulatory body and preserved the state company as a more disciplined corporate entity. However, the introduction of new market-oriented structures into a system that has not previously supported them has been difficult

Energy framework

- The legal energy policy and planning framework in Swaziland is controlled solely by the government via the Ministry of Natural Resources and Energy.
- They support the position that investment in energy and industrial development in a sustainable manner can eradicate poverty in the country.
- The Ministry also takes the lead role in oil sector management

Energy framework

- The Government has stated clearly that rural electrification will continue to be a priority and efforts in that regard shall be led by the State

Energy framework cont.

- The Electricity Act of 1963 was replaced in 2007 by both the new Electricity Act and the Swaziland Electricity Company Act.
- This created a regulatory authority for the electricity sector and the structural reformation of the national utility.

Energy framework cont.

- The Electricity Act created the framework for independent power providers to enter the electricity sector, with licensing provided by the new regulatory authority; however uptake has been limited

Energy Sector – Future Plans

- The 2007 energy reform has raised some concerns, and the potential 'privatisation' of the energy market in Swaziland has raised some opposition, especially regarding the position of foreign investors.
- Feasibility studies have been completed and SEC still awaiting mining licence (in partnership with stakeholders) to the possibility of constructing a 1,000 MW coal-fired power plant. Swaziland has considerable proven coal reserves of 207.6 million tonnes.

Regulatory framework.

- On the 1st of March 2007, the Electricity Act of 1963 was repealed, as a result of the promulgation of the Electricity Act of 2007 and the Swaziland Electricity Company Act of 2007.
- The Electricity Act of 2007 provides for the regulation of the Electricity Supply Industry in Swaziland. It gives provisions for the regulation of generation, transmission, distribution and supply of electricity in Swaziland.

Energy regulator.

- The Swaziland Energy Regulatory Authority (SERA) as established by the Energy Regulatory Authority Act of 2007.
- The Act establishes the Authority as an independent corporate body, with the power to sue and be sued in its own name.

Regulatory roles

- Powers and functions have been given to the Swaziland Energy Regulatory Authority (SERA):
  - Receive and process applications for licenses, and modify/vary licenses.
  - Approve tariffs, prices, charges and terms and conditions of operating a license.
  - Monitor the performance and the efficiency of licensed operators.

Regulatory roles cont.

- SERA is also charged with setting standards for the quality of supply and service, as well as encouraging the development of an industry-wide set of standards and operating codes of conduct.

Regulatory barriers.

- The main identified barriers (regulatory and others) include:
  - Difficulty of mobilising funding for investment, which can lead to severe delays in project implementation.
  - The small size of the local energy market.
  - Limited natural resources.
  - Diminishing power capacity in the Southern African region

Regulatory barriers cont.

- Swaziland imports the bulk of its commercial energy from neighbouring countries.
- The high costs of renewable energy technologies, and the fact that investment flows are still insufficient, are major barriers to project implementation

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THANK YOU!