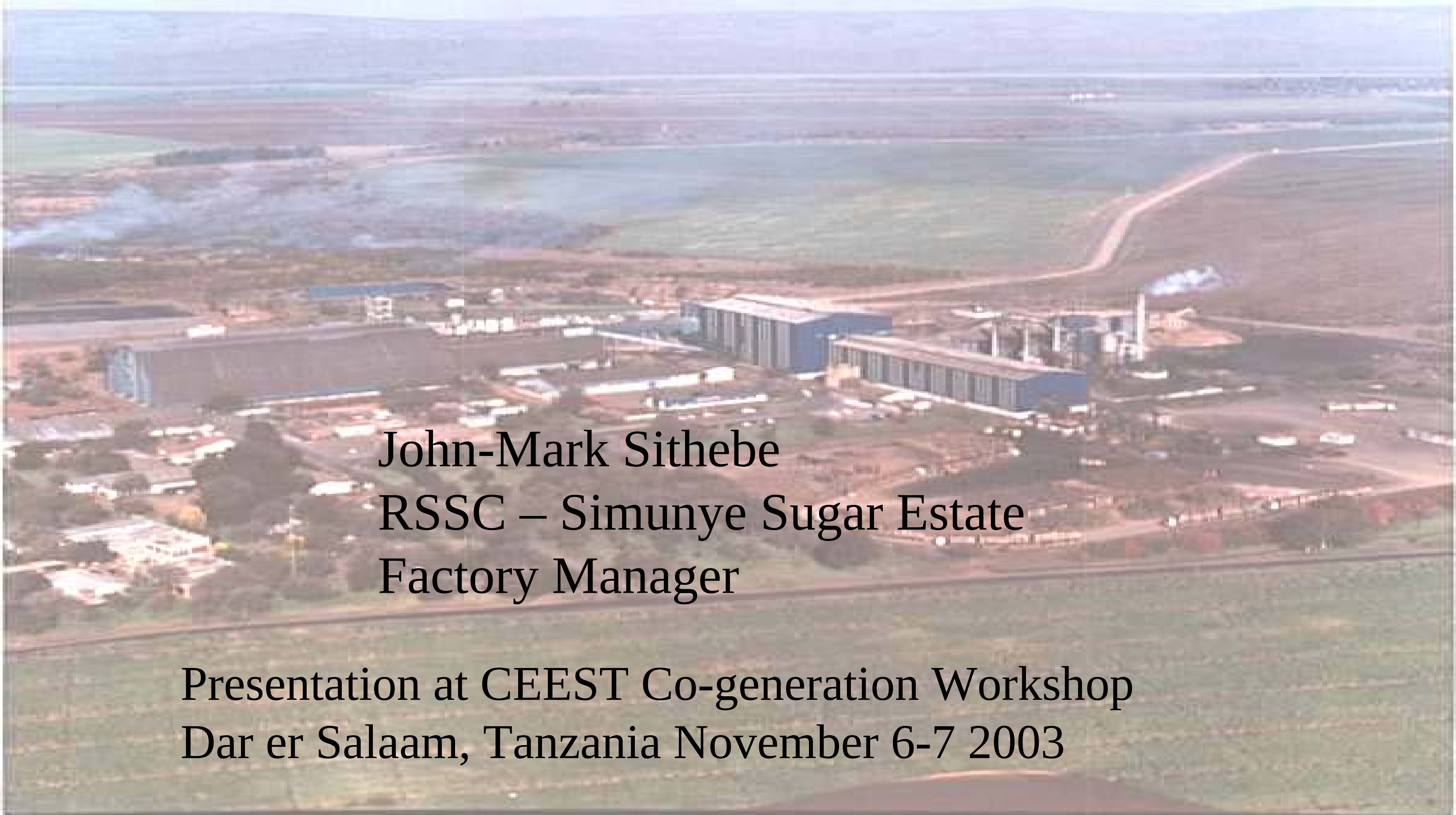
Current and future Co-generation Potential In Swaziland



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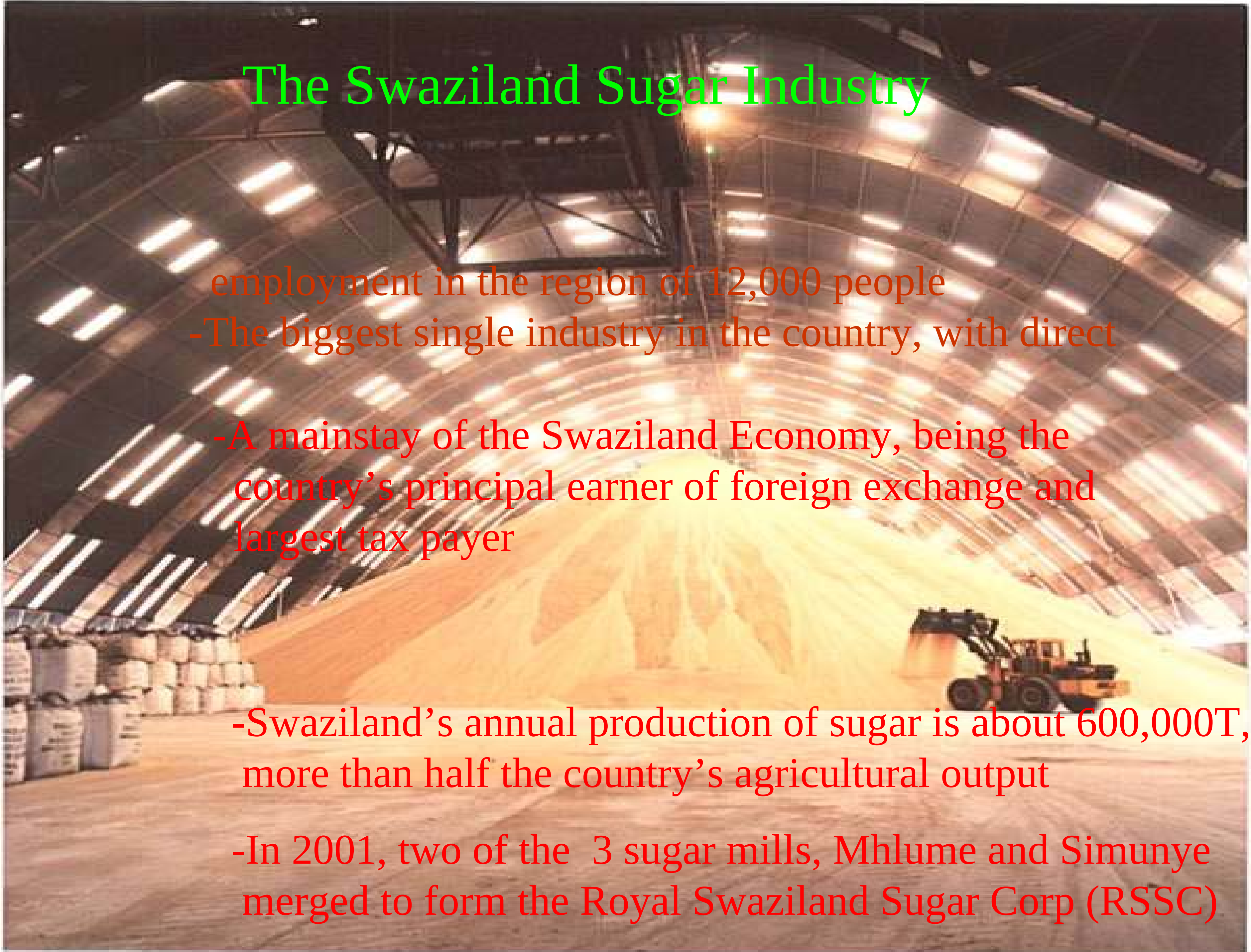
Presentation Objectives

- To outline the current activities in Swaziland and specifically in RSSC in regard to Cogeneration
- To give an indication of the challenges and obstacles in the way of making the Cogeneration projects real
- To give specific information on a current Cogeneration project investigation being carried out at RSSC in conjunction with other partners



The Swaziland Sugar Industry

-The biggest single industry in the country, with direct employment in the region of 12,000 people

-A mainstay of the Swaziland Economy, being the country's principal earner of foreign exchange and largest tax payer

-Swaziland's annual production of sugar is about 600,000T, more than half the country's agricultural output

-In 2001, two of the 3 sugar mills, Mhlume and Simunye merged to form the Royal Swaziland Sugar Corp (RSSC)

The Electricity Supply Industry in Swaziland

- Approx 40% of Swaziland’s total electricity usage is generated locally. The country’s sole utility, SEB, generates for the grid using hydro power plants, and the sugar and pulp mills self generate using crop residues – bagasse and wood waste
- Balance of SD’s power requirements are met through power purchases by SEB from ESKOM (RSA)
- SEB is vertically intergrated, ie. it owns all the generation units feeding the national grid; owns the grid infrastructure and is the sole distributor of power
- Any player wanting to enter the supply industry needs permission from SEB. None have entered since 1963.

Barriers to Cogeneration

- From a costing and tariff study for SEB in 1996, the current electricity tariff does not reflect the costs and does not cover long run marginal costs. SEB has difficulty financing large projects without Government support
- Eskom import price for power is low, this makes it difficult to find economically viable alternatives to coal-based imported electricity from South Africa
- However, some local consumers regard the electricity price in Swaziland as already too high in comparison to RSA, makes price increases difficult politically

Changes to the Electricity Supply Industry (ESI) in Swaziland

- The ESI is presently undergoing changes both regionally and internationally, with increased focus on:

  (a) a market oriented approach,

  (b) new legal, regulatory and fiscal frameworks to attract investments,

  (c) environmental sustainability and

  (d) improved services to the consumer

The Swaziland Government has shown keen interest in pursuing the above objectives for the country

Planned Restructuring of the Swaziland ESI

- SD Govt policy is to commercialize the SD ESI in order to prepare for private sector participation and to facilitate 3rd party access to the national grid
- The restructuring process aims to facilitate the commercialization of the SD ESI through new legal frameworks and regulatory reform. There are 3 major components, each requiring a separate act of parliament:
  - Setting up of an Independent Energy Regulatory Authority to oversee all energy matters including electricity, which is currently the mandate of SEB
  - Rewriting the Electricity Act of 1963, which establishes SEB as a player as well as a regulator
  - Establishing SEB as a company

Restructuring of the Swaziland Electricity Supply Industry

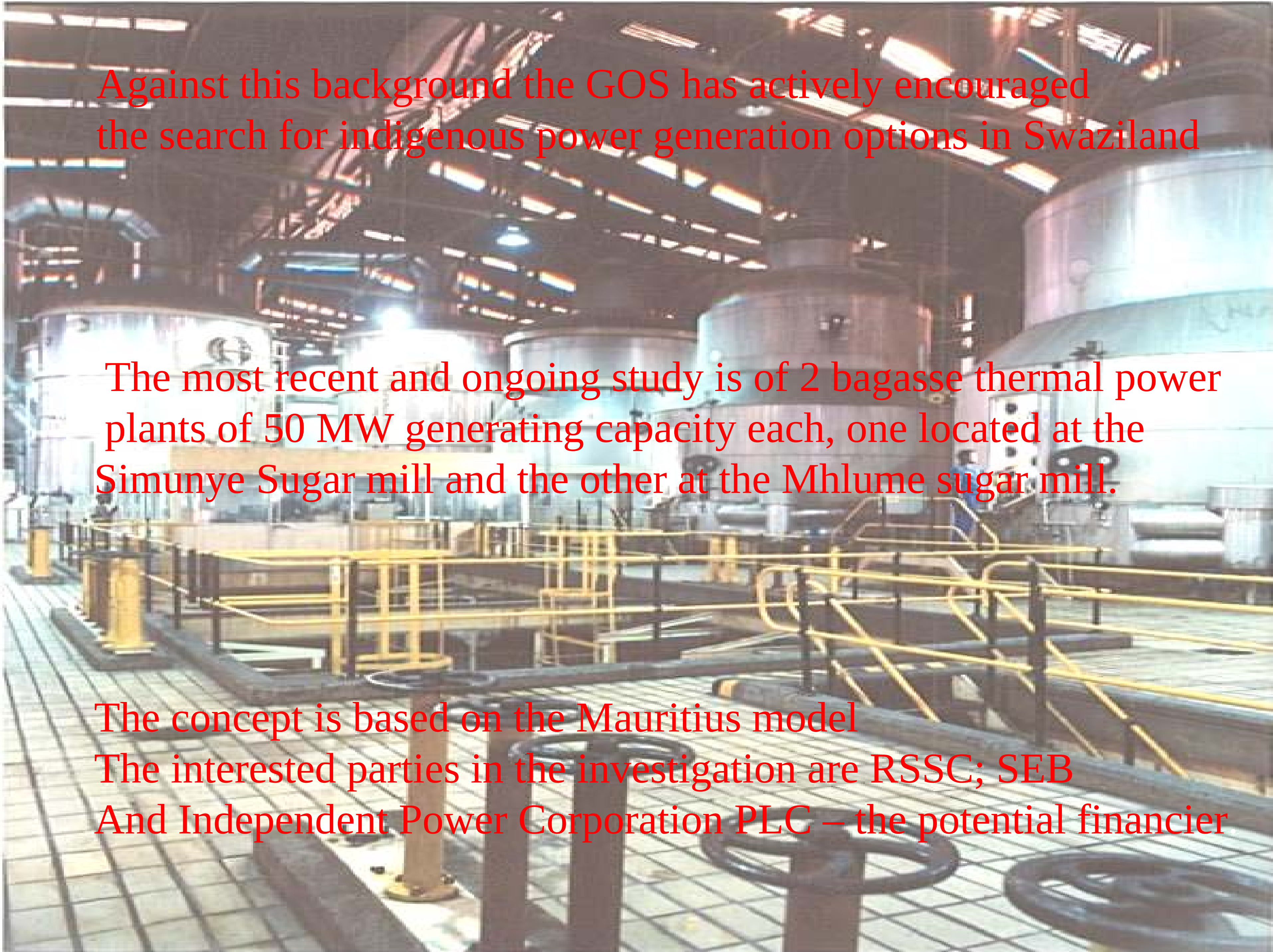
- Once the reform process is complete and the new institutional framework is in place, it is anticipated that there will be opportunities for:

  - Private sector participation with SEB (either as a whole or with one of its components)
  - The establishment of Independent Power Producers (IPPs) in the country
  - Electricity trading within the Southern African Power Pool (SAPP)

- With these reforms, a number of opportunities for coal fired, bagasse fired, wood-waste fired and hydro-generation are anticipated to emerge, which can be developed by independent entities.

Security of Energy Supply

- In its recently drafted Energy Policy (2002), the GOS acknowledges the country's extreme dependence on energy imports, in particular electricity
- Dependence is further accentuated in that the energy imports come through one country, South Africa
- Politically, this dependence is seen as a potential problem, as it could lead to supply security problems and vulnerability to disruptions in energy imports. Self sufficiency in power generation based on indigenous sources is desirable, and is technically is seen as feasible.



Against this background the GOS has actively encouraged the search for indigenous power generation options in Swaziland

The most recent and ongoing study is of 2 bagasse thermal power plants of 50 MW generating capacity each, one located at the Simunye Sugar mill and the other at the Mhlume sugar mill.

The concept is based on the Mauritius model
The interested parties in the investigation are RSSC; SEB
And Independent Power Corporation PLC – the potential financier

Proposed Bagasse Fired Thermal Power Plants

- Basis of project is that the Simunye and Mhlume mills would supply free fuel to the stand-alone power stations in the form of bagasse, and in turn would receive steam and power for the sugar mills
- The surplus power generated by the power stations would be sold to SEB through the existing grid.
- The base case case would require import of coal from RSA as supplementary fuel during the off-crop
- Other scenerios using cane trash as supplementary fuel are also under consideration, though the technical feasibility of these is still being investigated.

Initial Results of Study- Potential available net sale of electricity

Sugar Mill	Crop	Off-Crop
Simunye	28.5 MW	44.5 MW
Mhlume	34.0 MW	48.5 MW
Total Sales to SEB	62.5 MW	93.0 MW

Economics to make Project Viable

- Currently SEB purchases power from ESKOM at around 12c/kWhr. The electricity sold to SEB by the project would be required to be in that price range.
- Base Case figures (bagasse/off-crop coal)

Sugar Mill	Electricity Price	Steam Price
Simunye	11-14c/kWhr	38-33R/Ton
Mhlume	11-14c/kWhr	38-33R/Ton

Additional Scenerios

1) Coal, bagasse and cane trash as a fuel

Sugar Mill	Electricity Price	Steam Price
Simunye	11-14 c/Kwhr	29-25 R/Ton
Mhlume	11-14 c/Kwhr	29-25 R/Ton

2)Carbon credits, Coal, bagasse & Cane Trash

Simunye	11-14 c/Kwhr	24-20 R/Ton
Mhlume	11-14 c/Kwhr	24-20 R/Ton

Preliminary Project Economics and Conclusions

- On investment of R350m per plant, the initial economic evaluation resulted in a 20% IRR for both plants after 20 years
- These returns seem to suffice to interest a developer to consider such projects
- The bagasse to the power plants is assumed to be free, but the exhaust steam would need to be purchased by the mills in the price range R30-40/Ton
- Further investigations are still continuing

Next Phases in the Investigation

- Finalization of the true biomass fuel availability in the country including realistic access to cane trash
- Conceptual design and budget
- Techno-economical feasibility preparation
- Debt/equity plans
- Funding plan
- Preliminary electricity off-takes and other heads of agreement
- This project is still in its infancy and is continuing


The End