

**POWER SECTOR
&
Renewable Energy**

National Energy Perspectives

**Dr. P.M.K. Soonarane
(Deputy Director, Technical Services)
Ministry of Public Utilities**

Layout of Presentation

- ❖ Introduction
- ❖ Analysis
 - 1. Supply
 - 2. Demand
- ❖ National Perspectives
 - 1. Government Policy
 - 2. Renewables
 - 3. Coal-Necessary evil
- ❖ Transportation
- ❖ Conclusions

Introduction

- ❖ Rs 9.7-Rs 14.7 2004 to 2005, 52% up
- ❖ Price of oil - \$ 75 may be 100 \$?
- ❖ Crossroads
- ❖ Macro-economic problems
- ❖ Multi-pronged strategy
- ❖ Reduce reliance on oil
- ❖ Constraints - unpredictability and variability of RE
- Technology

Philosophical Note

- ❖ Two extreme school of thoughts
- ❖ Over optimistic – panacea
- ❖ Pessimistic – discard renewables

ANALYSIS-Supply Sources

- ❖ Imported
 - Oil products – 1million tons
 - Coal - 375,000 tons
- ❖ Local Sources
 - *bagasse: 1.6 million tons*

 - *hydro: 100 GWh/annum*

 - *solar: 6 kWh/m²*

 - *wind: 8.1 m/s*

 - *ocean: delta 20 oC*

Analysis- demand

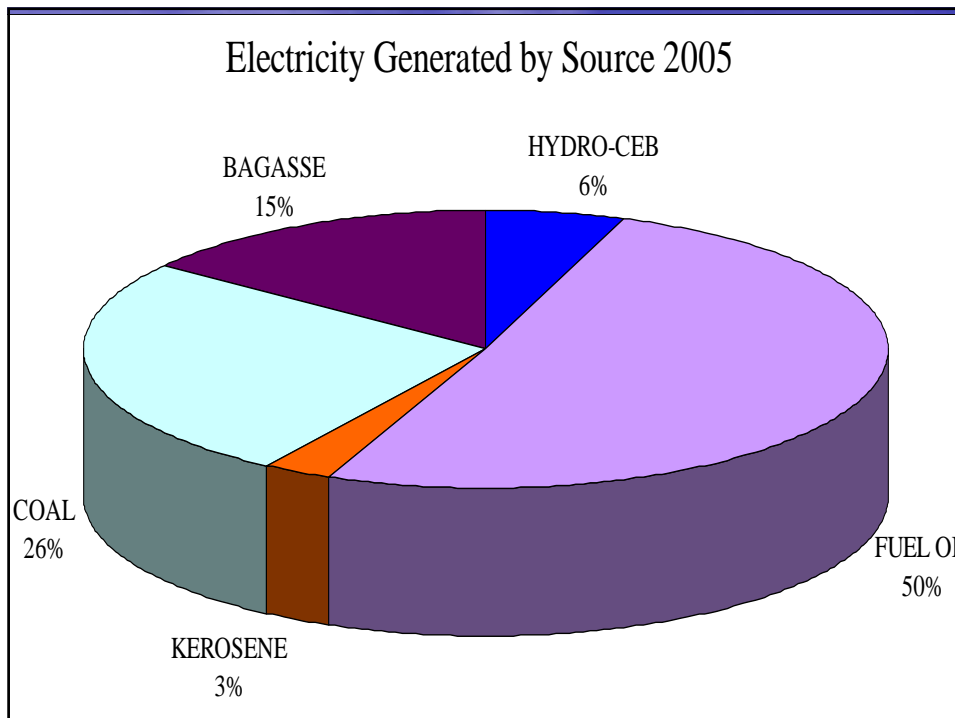
- ❖ Electricity Demand 2005
 - *generated* 2000 Gwh
 - *peak demand* 350 MW
 - *night load* 150 MW
- ❖ Electricity Demand 2025
 - *generated* 4500 GWh
 - *peak demand* 700 MW
 - *night load* 300 MW
- ❖ Transportation 2005
 - *buses*
 - *cars*
 - *diesel 165,000 tons; gasoline: 97,000*
- ❖ Transportation 2025
 - *buses ?*
 - *cars /hydrogen/fuel cell/hybrid?*
 - *modal shift - electricity*

National Perspective 1

- ❖ Government energy policy
 - *availability, security, diversity`*
 - *affordability*
 - *conservation*

- ❖ Dependence
 - 1970: 70% oil
 - 2005: 53% oil, 26% coal, 15% bagasse, 6% hydro
 - 2025: 25% oil, 50% coal, (20% bagasse, 2.5% hydro, 2.5% wind, solar ?, ocean ?)

- ❖ RE Masterplan



Perspective 2 - Bagasse Energy-to date

- ❖ Bagasse Energy (to date)
 - Defer/replace investment of utility
 - Reduce dependence on oil
 - Modernisation of sugar industry
 - Foreign currency savings & improvement of balance of payment
 - Reduction of CO2

- Results 130 GWh in 1997 - 300 GWh in 2005

Perspective 3 Bagasse Energy-Future

- ❖ 4 factories

- ❖ 120kWh/ton cane

- ❖ 600 GWh in short to medium term

- ❖ 900 GWh long term

- ❖ Risks

Perspective 4 Wind Energy

- ❖ potential sites
- ❖ Low plant factor
- ❖ back up required
- ❖ Cyclones
- ❖ Land requirements
- ❖ Environmental issues
- ❖ 25 MW plant at Bigara

Perspective 5 - Solar Energy

- ❖ photovoltaics-exorbitant
- ❖ small scale
- ❖ solar thermal viable
- ❖ not widely diffused
- ❖ life of SWH/cyclones
- ❖ high upfront cost
- ❖ Loan DBM-mitigated results

Perspective 6 Coal Energy - A Necessary Evil

- ❖ sugar industry only
- ❖ 533 GWh in 2005
- ❖ only spreader stoker technology
- ❖ dedicated coal plants by utility
- ❖ pulverized coal technology

Transportation Sector

- ❖ most important user of oil
- ❖ fuel substitution tricky
- ❖ biofuel – 10-20 % gasoline substitution
- ❖ Fuel Cell/Hybrid cars
- ❖ Train system-P.Louis/Curepipe
- ❖ Improved energy intensity
- ❖ Network of train mass transit/electricity RE?

Conclusions

- ❖ **Electricity Sector**
 - bagasse 600 GWh, 900 GWh
 - wind farm, solar ?, ocean?
 - 50 % coal electricity?
 - oil dependence 25%, less with other RE?

- ❖ **Transportation Sector**
 - 10-20 % gasoline substitution
 - more efficient technology-hydrogen or hybrid cars
 - network of electric mass transit

- ❖ **Deliberations – Input to Masterplan**

Thank you

