ENERGY EFFICIENCY

CASE For Zambia & Southern African Region
Presentation Outline

- Looming Power Shortage
- Southern African Region Power Pool
- Rural-Zambia Electricity Energy Poverty
- Zambian National Electricity Grid Structure
- Regional & Country Energy Efficient Infrastructure Development Planning
- Need for Measured Energy Efficiency Capability
- Need for Integrated Implementation Institutional Frameworks for Developing Country Energy Efficiency Training of All Engineering Professionals [craftpersons to engineer]
- Need Networked EE-Demonstration Centres connected to World-EE-Centre
LOOMING POWER SHORTAGE

- The entire Southern African region is experiencing a looming power shortage.
- The SAPP Planning Data is indicating that SAPP runs out of generation surplus capacity after the year 2007.
  - The forecast for 2007 indicates that actual generation reserve capacity would be lower than normally planned.
### GENERATION CAPACITY AND MIX

#### INSTALLED CAPACITY AND 2006 WINTER PEAK DEMAND

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<td>53,224</td>
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Non-coincidental 2006 peak demand for the interconnected SAPP grid: 40,554 MW.
DIMINISHING GENERATION SURPLUS CAPACITY

- **Installed capacity**: 53,000 MW
- **Available capacity**: 45,000 MW
- **Dependable Capacity**: 41,000 MW
  - Available hydro capacity varies depending on season.
  - Other constraints.
- **Non-coincident 2006 Peak Demand**: 42,000 MW
The SAPP Planning Data is indicating that SAPP runs out of generation surplus capacity after the year 2007.
Potentially Rich Poor Developing Country
80% Rural Population in Electrical Energy Poverty
Access to electricity: 25% urban, 2% rural
Generation Mix: predominantly hydro, with 1% thermal
Large Hydro power stations located to the south of the country
Major load centre are the copper mines in the north
Zambian Electricity Supply Industry

ZESCO Distribution Divisions

KEY
- Lusaka
- South
- North
- Copperbelt (new division)
Total Installed Capacity

- Total Generation Potential: 6,000MW
- Total Installed Capacity: 1,750 MW, broken down as follows:

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<th>Undertaking</th>
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<td>CEC Plc</td>
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<td>Lusemfwa</td>
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<td><strong>Total</strong></td>
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Electricity Industry Structure

- Generation
- Transmission
- Distribution
- Supply
  - Mines
  - Domestic Market
  - Other Consumers
- CEC
- ZESCO
  - Lusemfwa
- Export Market

Power Flow

Financial Flow
CONCEPT OF ENERGY EFFICIENCY

- Energy Efficiency is the utilization of energy in the most cost effective manner to carry out a manufacturing process or provide a service;
- Energy efficient practices or systems will seek to use less energy while conducting any energy-dependent activity;
- At the same time, the corresponding (negative) environmental impacts of energy consumption are minimized.
THE REGULATOR AND ENERGY EFFICIENCY

The Energy Regulation Board’s involvement in Regional & Country Energy Efficiency:

- Promoting energy awareness and disseminating useful information on energy efficiency measures and on recommended procedures for all sectors of the economy.
- Carrying out technical audits on business such as farmers, and advising them appropriately on the usage of energy, and
- Developing appropriate license conditions on EE such as metering all customers.
- Developing Integrated Regional & Country Institutional Frameworks Involving Regulators & Southern African Power Pool
WHY ENERGY EFFICIENCY

- Measured Regional & Country Efficient use of Fuel & Electric Energy results in greater availability of the scarce resources for Social Sector Health & Educational Development Programmes for Majority Rural & Peri-Urban Poor Regional & Country Power Generation Shortage

- Inefficient Unmeasured use of Energy results in higher costs
  - To AgroBusiness, Govt, companies and industry
  - To the end user & Promoting Electricity Energy Poverty
  - To the environment
    - Locally (soil degradation, poor air quality)
    - Fast Rate Forest Destruction for Wood Fuel
    - Globally (climate change)
EXTENDED NATIONAL POLICY ON ENERGY EFFICIENCY INFRASTRUCTURE DEVELOPMENT

- Energy Regulation Board Promoter for Developing and Implementation of Integrated EE Institutional Frameworks & Policies

- From Zambian Govt point of view, there is not yet any legislation relating to Energy Efficiency Infrastructure covering all Economic Sectors

- However Government has a major responsibility for long-term Energy Efficiency Infrastructure Development planning to meet present & Future needs of society as a whole.
  - This is accomplished through DOE National Electrification Master Plan
  - Rural Electrification Authority Master Plan
DEVELOPING COUNTRY NEEDS

- Integrated Regional EE Policies based on National Energy Policy Frameworks
- Network Institutional Frameworks Implementation Centres connected to World-EE Centre
- Developing Fit-for-Purpose Training Programmes & Implementation Demonstration Centres in Energy Efficiency for Engineering Professionals [Craft-Persons, Technician, Technologist & Engineers]

Thank You