PACE - Private Public Partnerships in Rural Electrification Uganda

International Stakeholders Meeting

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Country Background

- 24.6 million People
- Physical area 236,040 Km²
- GDP Per Capita US $ 300
- Urban Rural Mix 25:75
- Percentage Electrification 4%
- Generation Installed Capacity 320MW
- Literacy Rate 65%
- Overland Temperature 26-28°C
Energy Situation

- Uganda has one of the World’s Lowest Per Capita Consumption of Modern Energy – Petroleum and Electricity

- 90% of Uganda’s total Energy consumption is Provided by Biomass

- Only 4% of the Population have access to Electricity yet Uganda has an Energy demand growth of 7% per annum
Energy Situation – Cont’d

- Up till the early 90’s there was little concern for Energy sector issues and energy was synonymous with Grid power.
- Policy concerns were governed by the annual budgetary allocations by the MOF.
- In early 90’s the Energy department was established.
- In 1999 the Electricity Act was passed.
Energy Situation – Cont’d

• In September 2002 the MEMD published the Energy Policy

• Mechanisms are now in place for the guidance of the developments of a broader range of energy forms

• Opportunities are now ripe for investments in solar, biomass, mini & micro grids
Key Developments

- Power sector Restructuring and Privatization based on the June 1999 Strategic plan
  - The plan emphasizes the need for competition in promoting efficiency and on private sector participation
  - The Electricity Act, 1999 gave legal backing to the reforms and ended the monopoly by the state Utility
  - IPP’s have since embraced the sector
Recent Renewable Energy and Energy Efficiency Developments

- The power sector currently requires new investments. The options include:
  - Decentralized power systems
  - IPP projects
  - M’gt contracts with large utilities
- Gov’t in collaboration with the W Bank has initiated the 10 year phased Energy for Rural Transformation Program (ERT)
Renewable Energy Dev’pts

- Solar PV market - The private sector being the major actor over 10,000 units have been installed to date
- The solar market development has had to overcome a series of barriers with support of the GEF funded UPPPRE project
- A lot still has to be done
Renewable Energy Dev’pts

- Micro Hydro formerly reserved to Churches and the mines scattered around the Country
- The key sizes ranging between 60 - 90kW
- Mini hydro common with the mines ranging from 1mW – 5mW
- The newest at KCC installed capacity 8 - 10mW
Renewable Energy Dev’pts

- Efficient Biomass Use
- This has largely been the preserve of the NGO’s attempts have been made to:-
  - Popularize, increase efficiency and disseminate cooking devices
  - Improve the environment via afforestation
- A lot still remains to be done
Private Sector Involvement in Electricity provision

Prior to passing the Electricity Act 1999 private sector Electricity provision was largely through “Auto-generation” based on petroleum generators the total capacity in 1997 standing at 70mW
Private Sector Involvement in Electricity provision

New IPP’s

- Uganda Rural electrification Co ltd – W Nile
- Mt Elgon Hydropower
- Hydromax Ltd – Baseruka Hoima
- Kakira Sugar works – planned 2.6mW /4.5mW
- Sugar Corporation of Uganda 2mW Installed
- Kinyara Sugar Works proposed 1.5mW
- Uganda Rural electrification Co ltd-Bushenyi
- Kilembe mines 3mW and Kasese Cobalt 8mW
Private Sector Involvement in Electricity provision

- Smaller Projects Micro hydros
  - Kisiizi Hospital 60kW installed planned 120kW
  - Kagando Hospital 60kW installed
  - Kuluva Hospital Nebbi 90kW

- Other independent Grids
  - Magale Hospital 37.5kW diesel genset powered minigrid
Assessment of PPP’s

- Private participation in provision of power is still a new development therefore there are lessons to be learnt and experiences to be borrowed/shared
Case study – Magale Hospital; E. Uganda

Sponsor: Magale Catholic Mission

- Diesel powered (37.5kVA) minigrid
  - Fuel consumption 700 L diesel Pm
  - Had an over capacity
  - Financial constraints

- Opportunity
  - Sell excess power to surrounding community
  - Decentralized system of governance (LC1)
  - Technical capacity
  - Committee
Case study – Magale Hospital; E. Uganda cont’d

- Charisma
- Low cost grid design

**Arrangements**

- Initially
  - Cost sharing the maintenance - the mission 10 days a month & the community 20 days a month

- After experience
  - Tariff based on fixed category payments one bulb UGX 3000, commercial 7000 – 12000 per mo
  - Institutions flat rate 80,000 per mo
  - Served 43 customers
Case study – Magale Hospital; E. Uganda cont’d

- **Growth**
  - Month one (June 1999) 6 Connections
  - Month five (October 1999) 61 connections
  - Month nine (Feb 2000) 36 consumers 20 disconnections

- **Operation**
  - 7:00 – 10:00 pm daily
  - 3 phases 40 Amps; 12 Amps and 8Amps
Case study – Magale Hospital; E. Uganda cont’d

- Trading centre consumed 75% of generation
- Had to meet 75% of the maintenance costs

**Tariff raise**

- Month six need for an increased tariff
  - Domestic 600018
  - Commercial 10000 – 20000
Case study – Magale Hospital; E. Uganda cont’d

- Benefits of the Mini-grid
  - To the Hospital
    - Community contribution to health services
    - Increased hospital visitation
    - Higher staff retention
    - More non-resident medical staff (town power)
    - Job seekers
    - Increased medical services-Surgery, lighting etc
    - Reduced generator bill for hospital (March 2000)
    - Public health programs e.g. Video and TV progs
Case study – Magale Hospital; E. Uganda cont’d

- Benefits of the Mini-grid
  - To the trading centre
    - Increased population and visitors
    - Increased food
    - Reversed migration
    - Increased and renovated infrastructure
    - Increased hours of business
    - Increased security
    - Better property and lodging rates
    - Battery and mobile phone charging stations
Benefits of the Mini-grid

To the Institutions

- Improved academic performance 40% pass rate
- Today all schools have own gensets or PV systems
Case study – Magale Hospital; E. Uganda cont’d

Month 17 - Collapse

- Problems
  - Increased load and fuel prices; regular tariff hikes
  - Suspicion of the elec. Committee
  - Switch from energy efficient bulbs to incand.
  - Introduction of high power gadgets – irons etc.
  - Trip switches shut down an entire phase and resulted in indignation by the “clean users”
  - Demand for compensation for supply fluctuations
  - Bill collection problems and Defaults
  - Demands for national tariff rate and a 24-hour service
  - Network depreciation
Case study – Magale Hospital; E. Uganda cont’d

- New developments
  - Magale down sized its Genset to 3kVA
  - Installed a 325wp Solar PV system

- Other institutions
  - All purchased gensets

- Community
  - Lobbying the Gov’t for a 30 km grid extension
Case study – Magale Hospital; E. Uganda cont’d

- Lessons learnt
  - Based on Charisma
  - Lack of legal and regulatory framework
  - Need for tariff subsidy

- Hopefully the issues shall be covered under the ERT and other sector programs e.g. Power IV