Energy Services & the Poor in Urban Africa

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Africa is the fastest urbanization region of the world - moving to South American pattern

- 10-20 year window of opportunity to influence pattern of development and energy use
Africa - Energy Services & the Urban Poor

Dominant capital city accounting for large share of formal economy

<table>
<thead>
<tr>
<th>Town</th>
<th>% total of formal urban employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harare</td>
<td>56</td>
</tr>
</tbody>
</table>
Africa - Energy Services & the Urban Poor

Energy sector problem & opportunity

• **Problem**
  – Fast growing urban energy demand
  – Source of illegal connections & disorganization

• **Opportunity**
  – Concentrated demand: relatively easy to service
  – Often able to pay
### Energy Expenditure as % of Urban Household Income in Selected African Countries

<table>
<thead>
<tr>
<th>Income Level Category</th>
<th>Energy Expenditure as % of Urban Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uganda</td>
</tr>
<tr>
<td>Low income</td>
<td>15.00</td>
</tr>
<tr>
<td>High Income</td>
<td>9.50</td>
</tr>
</tbody>
</table>

*Source: Kebede, 2001; Dube, 2001; Kyokutamba, 2001*
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Opportunity for Energy Sector

- Concentrated demand - relatively easy to service
- Often able to pay
- Potential provider of energy services
- Source of jobs and income creation
- Direct and near term impact on poverty
- Major source of jobs
- Proven entrepreneurial skills and acumen
Energy Services & the Poor in Urban Africa – Case Studies (I)
The Charcoal Industry in Zambia -
Case Study on SME Efficiency for Energy Service Delivery in Urban Africa

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Role of SMEs in Delivery of Energy Services to Urban Africa

1. SMEs are efficient & innovative – have fared well in other sectors
   - Innovative packages for the poor – small packs, credit facilities

2. SMEs currently serve the poor with a variety of services

3. SMES are closer to the urban poor

4. SMEs provide the poor with job opportunities
The Chacoal Industry in Zambia

4- main segments – all SME dominated

- About 50,000 producers
- About 3,500 transporters
- About 10,000 distributors & retailers
The Chacoal Industry in Zambia

The Consumption segment

- The poor usual buy in small quantities – SMEs fulfill this need
  - Average daily household use – 3.8kg (34 US cents or $10.3 per month)
- 75% urban households use charcoal
  - In non-poor households used as stand by fuel (hedge against power failures)
    - SMEs maintain stability of supply
- Poor households use it for a variety of needs
  - All use it for cooking
  - 73% use charcoal for heating in cold season
  - 48% use it for heating water for bathing
  - 48% use it for heating water for drinking
- 15 million by 40kg bags consumed annually – worthy about US$54 million
The Chacoal Industry in Zambia

- SMEs in production segment (50,000 rural job opportunities)
- Important income source in rural areas with large woody cover
  (survey of 45 rural households in 1999)

- A substantial hedge against recent droughts for rained agriculture
Why Charcoal Industry is successful

- SMEs in transportation segment

**Efficient transportation mode**

- Charcoal sources over 200 km for Lusaka (larger vessels used on longer distances)
Why Charcoal Industry is successful

• SMEs in distribution & retail (*Efficient marketers*)
  • Proximity of supply to consumers
  (Charcoal sources for Lusaka Urban consumers, 1997)

• Ability to offer credit facilities
Why Charcoal Industry is successful

- Good value for money - Stable prices
  
  (Charcoal prices in Lusaka; 1992-2000, ave. US Cents 7.5/kg)
This is despite......

- Increasing distances to charcoal sources
- Adverse policy implications

E.g taxation

Zambia, 2000
Uganda 2001
SMEs package their services to suit the poor e.g. low denominated mobile phone units are popular with the poor – hence rapid growth of mobile phone industry in Zambia (compared to main lines)
# Inefficient power utilities

- A depressing performance!

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>South Africa</td>
<td>51.7</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Botswana</td>
<td>49.8</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>39.5</td>
<td>48</td>
<td>40</td>
</tr>
<tr>
<td>Mozambique</td>
<td>38.9</td>
<td>17</td>
<td>62</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>34.6</td>
<td>80</td>
<td>53</td>
</tr>
<tr>
<td>Kenya</td>
<td>32.2</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>Tanzania</td>
<td>31.7</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>Namibia</td>
<td>30.4</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Swaziland</td>
<td>26.1</td>
<td>42</td>
<td>36</td>
</tr>
</tbody>
</table>
Energy Services & the Poor in Urban Africa – Case Studies (II)
Improving Electricity Service Delivery for the Urban Poor: Zimbabwe’s Experience

Eng. S.E. Mangwengwende
CHIEF EXECUTIVE
Zimbabwe Electricity Supply Authority
OUTLINE

• Electrification Statistical Highlights
• Electrification Success Factors
• Lessons from Zimbabwe’s experience
# Electrification Statistics

<table>
<thead>
<tr>
<th></th>
<th>1990</th>
<th>1993</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National</strong></td>
<td>&lt;20%</td>
<td>29%</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td>67%</td>
<td>69%</td>
<td>84%</td>
</tr>
<tr>
<td><strong>Rural</strong></td>
<td>11%</td>
<td>11%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>No. of Customers</strong></td>
<td>310296</td>
<td>333218</td>
<td>499117</td>
</tr>
<tr>
<td><strong>New Connections</strong></td>
<td>~6000</td>
<td>~6500</td>
<td>~25000</td>
</tr>
<tr>
<td><strong>Ave. conn. period</strong></td>
<td>&gt;6 months</td>
<td>&gt;6 months</td>
<td>~30 days</td>
</tr>
</tbody>
</table>
Electrification Success Factors

- Improved cash generation and collection for enhanced power supply security and reliability
- Operational efficiency improvements
- Special focus on the urban poor
# Zimbabwe Power Sector:

## Positive Fiscal Performance

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Surplus (US$mil)</th>
<th>Year</th>
<th>Net Surplus (US$mil)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>(0.8)</td>
<td>1996</td>
<td>10.0</td>
</tr>
<tr>
<td>1991</td>
<td>(24.1)</td>
<td>1997</td>
<td>9.6</td>
</tr>
<tr>
<td>1992</td>
<td>(14.5)</td>
<td>1998</td>
<td>(174.1)</td>
</tr>
<tr>
<td>1993</td>
<td>6.7</td>
<td>1999</td>
<td>(44.1)</td>
</tr>
<tr>
<td>1994</td>
<td>9.9</td>
<td>2000</td>
<td>65.2</td>
</tr>
<tr>
<td>1995</td>
<td>10.0</td>
<td>2001</td>
<td>89.4</td>
</tr>
</tbody>
</table>
Operational efficiency improvements (SME Role)

Focus on efficiency in core activities; outsourcing of non-core activities

Core activities defined as on-line operations and maintenance and revenue collection

Non-core activities defined as off-line operations and maintenance, construction, ancillary services, etc.
Operational efficiency improvements (SME Role)

Fixed staff establishment reduced from 10500 to ~8000 and then to ~6000 to match core function requirements and outsourcing progress.

Most former project staff set up trading and contracting companies that sourced materials and did the construction work. Some have branched off into manufacturing.

Project construction costs significantly reduced as work outsourced (initial cost reduction from Z$11000/km to Z$5000/km of medium voltage line).
Operational efficiency improvements (*SME Role*)

Other outsourced contracting activities:
  - General maintenance work such as power station and substation refurbishment, tree cutting, cleaning services, etc.
  - Support functions such as security, staff training, estates administration, printing

Secondary Benefits from SME Activities:
  - *Manufacturing*: Welding machines, small transformers, power electronics (UPS, surge suppressors, etc.)
  - *Building services and energy efficiency consulting*
  - Contribution to *increased power consumption*
Except where impractical, all small size tenders (< $100 000) were reserved for trading and contracting SMEs. Simple tender documents, affordable bid bonds and performance guarantees.

Low capital labour and transport contracts; materials and contractor staff training provided by utility.

Preference for large companies that have SME sub-contracts
Special Focus on Urban Poor

With few exceptions, historically networks in the poor areas were planned primarily for public lighting.

Extensive reinforcement programs had to be introduced.

Connection costs were reduced for affordability by the poor (e.g. nominal connection fees; compact distribution boards introduced to reduce wiring costs; electricity wiring incorporated into house finance)

Domestic tariff designed to enable urban poor to use electricity as household cooking fuel
**Special Focus on Urban Poor**

*Inverted block tariff introduced to enable urban poor to use electricity as substitute fuel for household use:*

- **Fixed charge** : US$2.430
- **First 50 kWh** : US$0.025
- **51-300 kWh** : US$0.028
- **301-1000 kWh** : US$0.066
- **Above 1001 kWh** : US$0.069

*(figures are average 2002 tariffs)*
Special Focus on Urban Poor

50 kWh provides basic lighting and small power applications e.g. radios

300 kWh provides lighting, small power and basic heating e.g. hot plate stoves, ironing

Bulk of subsidy carried by low capacity industrial, mining and commercial customers who benefit from increased household electricity consumption by the poor
Zimbabwe’s Lessons of Experience

• Better use of local management and SME resources can achieve efficiency gains at least-cost

• Correct policy on targeting subsidies has benefits for both the subsidized groups (the poor) and SMEs
Zimbabwe’s Lessons of Experience

– Benefits of Cross Subsidies

• Subsidized groups (the poor) enjoy benefits of electrification

• Small, medium and micro-enterprises that provide cross-subsidies, nevertheless benefit from increased market for their products and services

• Reduced non-technical losses and improved cash collection
Facilitating further opportunities for SMEs

- Assistance is required for coordinated macroeconomic and power sector reform to ensure sustained electricity industry viability.
- Unbundling of supply (trading) from distribution (wires or transportation) business has potential to create similar opportunities for SMEs based on ex-electricity supply staff in the same way outsourcing of construction did for ex-construction staff.
- More intellectual asset based financing needed as venture capital (with life insurance as principal guarantee).
Energy Services & the Poor in Urban Africa – Way Forward

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Way Forward

• Case for urban & peri-urban energy initiatives to balance over-emphasis on rural energy issues

• Work with Government agencies, NGOs and research agencies that are beginning to work on urban energy issues

• Mc-SME (small, micro, medium enterprises) & informal sector – *one of the few growing economic sectors in Africa*

• Ideal entry point - micro/small credit community
Next Steps – Removing Barriers

- Registration barriers
- Access to infrastructure
- Accessible working premises
- Restrictive by-laws
- Adverse policies
- **Government recognition**
Next Steps – Creating Enabling Environment

• Target reforming urban authorities

• Legal instruments - de-criminalization

• Appropriate urban energy policies

• Institutions
  – Government
  – Urban authorities
  – Utilities
  – Financial
  – Training/capacity building institutions (NGOs, research institutes)
Next Steps – Proving the Concept

• Review activities of clients of micro/small credit institutions

• Identify appropriate energy services
  – Required by the Mc-SME
  – Potential core business of Mc-SME

• Develop a portfolio of investment projects that could be financed by micro/small credit institutions

• Support selected pilot enterprises to demonstrate concept
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Any questions and comments?

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THANK YOU

For more information of AFREPREN’s work on urban energy

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