Alternative participatory business models for off-grid electrification

OASYS Project Workshop
6th July 2011
Dundee, UK

Structure of the presentation

- Objective and approach
- Business models – An overview
- Comparison of various models
- Lessons learnt
- Way forward
Objective

To review alternative participatory business models in off-grid electrification in South, South East Asia and Sub Saharan Africa and identify key factors that have contributed to failures and successes

Approach

Business Models in RE – An overview
Past experiences

- World Bank defines various electricity supply models based on the form of ownership and type of technology (ESMAP, 2006) (See figure)

Solar PV delivery models
- World Bank - Cash sales, consumer financing, leasing, fee-for-service
- UNDP - Commercially led, Multi stakeholder programmatic, utility led and grant based (UNDP, 2004)

Classification of business models

Five models identified

- Electric cooperatives
- Franchisees
- Fee for service/ESCO
- Community managed
- Private sector

Source: ESMAP, 2006

Source: TERI
Electricity cooperatives

- Organisation owned and operated by its members for their mutual benefit
- Implemented in India, Nepal, Bangladesh
- Intrinsic requirement to offer universal coverage in the its designated service territories
- Amenable to political power struggles and very little operational autonomy

Bangladesh - PBS model

- PBS buys bulk power
- Patlip Bidyut Samities (PBS)
- Rural Electrification Board (REB)
- Organises, finances, administers and monitors activities of PBS
- Performance target agreement
- Sells electricity
- Consumers
- Removes, administers and monitors activities of PBS
- Management
- Substation and line maintenance
- Tariff setting with REB
- Billing and revenue collection
- Grievance redressal

Source: TERI
Franchisees

- Organization empowered by the discom to develop/operate a generation and distribution system or to distribute electricity in an area for a prescribed duration and collect revenues directly from rural consumers
- Implemented in India
- Focused attention at the local level resulting in improved performance, reduced losses and better customer service

India - Input Based Franchisee model

- Distribution company
- Input based Franchisee
- Consumer

- Retains ownership of the assets after the contract period
- Sets incentive and penalty mechanism
- Operation of supply from input points, metering, billing, collection and O&M
- Right on revenue

Fee for service/ ESCO

- ESCO is a company that owns, installs and operates electricity systems and provides energy services to consumers for a fixed fee. Leasing for a rental fee is also common
- Found to be successful in India, Zambia, Kenya, etc.
- Low monthly payments make it attractive for remote areas. Very good customer service and assured maintenance.
- Are an offshoot of existing businesses, difficult to set up new ESCO. Carries greater commercial risk due to the longer cost-recovery period.
Private sector
- A for-profit entity arranges and manages an implementation model, identifies suitable villages, builds the electricity supply, and arranges for operations and maintenance, often with the help of local partners. Eg Husk Power systems, SELCO - India
- Number of private models implemented to-date have used a private model paired with government resources to support their initiatives. Eg Srilanka, Bangladesh
- Ability to scale up, innovate and provide good service
- Profit oriented model means bottom of pyramid consumers not served

Husk Power System model

MNRE

Designs engines

Husk Power Systems (Rice husk based)

Sign contract with HPS

Provides subsidy (optional)

- Generates, transmits and distributes electricity
- Trains local people to operate gasifiers
- Negotiated tariffs
- Billing and revenue collection
- Grievance redressal

Technology partner

Sells electricity

Consumers

Comparison of models
### Characteristics

<table>
<thead>
<tr>
<th>Models</th>
<th>Cooperative/community</th>
<th>Franchisee</th>
<th>Fee-for-service</th>
<th>Private sector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology</strong></td>
<td>Mini grids, grid extension</td>
<td>Grid extension</td>
<td>Standalone SPV systems</td>
<td>Mini grids, solar home systems</td>
</tr>
<tr>
<td><strong>Ownership</strong></td>
<td>Members of the cooperative</td>
<td>Ownership of assets vests with discom</td>
<td>Energy service company (ESCO)</td>
<td>Private operator</td>
</tr>
<tr>
<td><strong>Management</strong></td>
<td>Elected Members</td>
<td>Franchisee operator</td>
<td>ESCO</td>
<td>Private operator</td>
</tr>
<tr>
<td><strong>Financial sustainability</strong></td>
<td>Medium to low</td>
<td>Good to medium</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Pricing</strong></td>
<td>Low upfront cost and monthly tariffs (regulated/mutually decided)</td>
<td>Moderate electricity tariffs (regulated)</td>
<td>Low to moderate tariffs (mutually decided)</td>
<td>Moderate to high tariffs (set up service provider)</td>
</tr>
</tbody>
</table>

### Characteristics

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<td><strong>Maintenance</strong></td>
<td>Average</td>
<td>Good</td>
<td>Very good</td>
<td>Very good</td>
</tr>
<tr>
<td><strong>Grievance redressal</strong></td>
<td>Very good</td>
<td>Satisfactory</td>
<td>Very good</td>
<td>Good</td>
</tr>
<tr>
<td><strong>Community Participation</strong></td>
<td>High</td>
<td>Medium</td>
<td>Medium to high</td>
<td>Low to medium</td>
</tr>
<tr>
<td><strong>Risks</strong></td>
<td>•Lack technical &amp; managerial skills (esp for village level) •Amenable to political interference</td>
<td>•Short duration of contracts act as deterrent to invest in distribution network • Franchisee depends fully on discom for supply</td>
<td>•ESCO carries primary risk of theft. •Sensitive to uncertainty regarding grid extension</td>
<td></td>
</tr>
<tr>
<td><strong>Suitability</strong></td>
<td>Rural areas with socially progressive and cohesive structures</td>
<td>Grid connected areas and ‘not so remote’ off-grid areas</td>
<td>Usually for very remote rural areas</td>
<td>Rural areas with productive as well as domestic load</td>
</tr>
</tbody>
</table>

*Will be context specific, including the traits listed in the table*
Lessons & Way Forward

• For any model to be sustainable, scalable & socially acceptable
  ✓ Choice of technology – Size vs. Demand?
  ✓ Financing – Capital & Operational
  ✓ Electricity tariffs – Regulated or Negotiated
  ✓ Service delivery
    ➢ Operational and financial sustainability – Do we require cross-subsidy?
    ➢ Management - Community based or Private/ Organized vs. Un-organized approach
    ➢ Community participation – What should be their role – Operator/Local Regulator/??
    ➢ Customer service – How do we define?
  ✓ Socio economic benefits –
    ➢ Casual relationship between GDP/capita with RE – Influences of each on the other
    ➢ Productive applications – Is economic linkages essential for sustainability

Thank you
Electricity cooperatives

Cooperative

Consumers

- Generation, transmission and distribution of electricity
- Management
- Sales and revenue collection
- Grievance redressal

MNES

State Government

Government Subsidy

WBREDA

Rural Energy Cooperative

Consumers

India

Sundarban Cooperative model

Expenditure on creating infrastructure

Provision of electricity

Bills Collection

Government Subsidy

India Sundarban Cooperative model

MNRE and State Government

Funding Support

Zila Parishad

Planning & Co-ordination with

WBREDA

Operation, maintenance & ownership given to

Rural Energy Co-operative Society (Sagardweep Rural Energy Development Cooperative Society Ltd.)

Supply of PV Panels

Gramin Bank

SPV Companies

Consumer

Provide Infrastructure

Metered Connection

Member of

Bills Collection

Consumer