‘A-B-C’ model for Off-grid Energy Solutions

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Outline

1. Introduction
2. Engaging private-sector for off-grid energy solutions
3. Introducing the ‘A-B-C’ model
4. Moving Forward
INTRODUCTION
The Goals

• Sustainable Energy for All
• The Millennium Development Goals (MDGs)
• Equitable access to energy solutions for all rural consumers
• Development of complementary, incremental approaches
  • Basic energy service
  • Off-grid energy supply
  • Rural electrification
• Greater engagement of the private sector and the non-governmental community
• Commercially viable and sustainable energy solutions
Key Observations

• Many least developed countries have <10% rate of access to energy and >90% rate of access to mobile telephony

• Governments are undertaking major efforts to support clean energy through policies to support Independent Power Producers (IPPs)

• Physical, technical and financial capacity constraints place a natural limit to the pace of achieving goals of expanding access to electricity solely through government action.
Key Messages..

Private sector can play a major role in achieving national development objectives, especially off-grid electrification.

Policy & Regulatory signals such as, government’s policies on feed-in-tariff and import duty waivers for renewable energy equipment are crucial for private sector engagement.

Typically, the Financial sector is keen to do business with IPPs, that have strong off-takers, longer term PPAs and attractive tariffs.

Lessons from mobile telephony and technological innovations can help create new business models that could help bridge the gap.
PRIVATE-SECTOR LED OFF-GRID ENERGY SOLUTIONS
Understanding Complexity:

• Rural consumer specific challenge
• Regulatory and tariff signals for the private sector
• Availability of financing
• Roles of public, private and NGO sectors
State of Play

• Electrification technologies can range from a few watts for solar lighting and phone charging stand-alone PV, to full grid connections or isolated mini-grid electrification that gives 24/7 access to a sufficient amount of power.

• A great deal of current focus at the lower wattage end of this scale, of getting 1-50W of electricity (micro-energy) to households, for 2-12 hours of power per day

• Mobile telephony has shown that gradual increase in customer use of services is possible and is important to ensure local sustainability while allowing for scaling up

• Mobile enabled solutions are changing the payment and financial transaction culture of all consumers
Improved Technology Choice

• Expanded type and scale of Renewable Energy Technologies
  – Locally specific renewable energy options (biomass, hydro)
  – Individual level technologies (e.g., solar lanterns) to large scale generations (e.g., CSP)

• Power lines or Batteries
  – Low Voltage DC or AC mini-grid
  – Smart Grids
  – Battery-based energy supply

• Metering and Payment
  – Smart, small meters
  – Remote, pre-paid metering systems
  – Mobile money based payment
Opportunity to Combine Efforts Across Sectors

Energy for rural areas
- Key element for poverty alleviation & economic development

Cross-Sectoral Synergy
- Rural telephony
- Rural energy
- Public services
- Rural economic development

Win-Win Solution
- Led by the private sector
- Support mechanism from public sector
- Central role of consumers

Energy Supply in Rural Areas

Supply Side
- Limited power supply
  - High generation costs
- Built-in losses

Demand Side
- Limited local income and consumption
- Small customer base
- High transaction costs
INTRODUCING THE ‘A-B-C’ MODEL

A STRUCTURED APPROACH TO ENGAGE THE PRIVATE SECTOR IN PROVIDING OFF-GRID ENERGY SOLUTIONS
What is the ‘A-B-C’ Model?

- The model builds on three sets of customers:
  - Anchors (A)
  - Businesses (B)
  - Community (C)
- For private-sector led commercially viable off-grid energy service provision
- Reduce risks for small private power producers and suppliers
- Improve private-sector access to finance
‘A’nchor Customers

Anchors represent daytime load, predictable in nature, requiring continuous delivery. Anchors need to be located near a rural community.

- Potential Anchor Customers
  - Telecom towers
  - Retail chains
  - Petrol stations
  - Mining companies
  - Agro-processing industry
  - ..
‘B’usiness Customers

*Businesses are local commercial establishments for whom power is a critical input for expanding operations or improving productivity*

- Businesses
  - Local small businesses and shops
  - Charitable institutions
  - Schools, Clinics, Irrigation systems
  - ..

Opportunity for Business consumers to grow into potential Anchor customers
‘Community Household Customers

Community members: Affordability is a major issue; may have many other pressing needs in addition to power

Multiple Energy Solutions for the Community

– **Hand-held energy solutions**
  • Rechargable Lamps

– **Household level solutions**
  • Batteries, DC equipment
  • Solar Home Systems

– **Community level solutions**
  • Mini grids, Micro grids
Exploring an ‘A-B-C’ model linking Mobile Telephony and Energy Sectors
The proposed “A-B-C” business model: From Anchor to Business to Community

A+B+C+ Policy and Financial Support
> Creates an enabling environment to replicate and scale-up off-grid electrification

A+B+C
Anchor + Business + Community
> The new micro-grid provides affordable energy to households

A+B
Anchor + Business
> Local Businesses use power to increase operating hours

A
Anchor, Mobile Network Operator
> Large, reliable, credit-worthy customer needing power for mobile tower

Evolution of power distribution under the A-B-C Model
Anchor customer: Mobile Tower

Key relationship: A multi-year Power Purchase Agreement

Large, reliable, credit-worthy customer needs power for mobile tower

Power Provider: Energy Service Company (ESCO)

Expansion of Energy service to neighboring areas

Location-specific generation: Solar cells with backup generator

Community Customer: Metered Consumers

Households

Shops, Factories, School, Clinic

Business Customer: Local businesses, Public Services

1

2

3
# ABC & Commercial Viability to Attract Private-sector ESCO

<table>
<thead>
<tr>
<th>Type of Customer</th>
<th>High Profit Margin for a Small ESCO Power Supplier?</th>
<th>Do commercial Banks consider this acceptable risk?</th>
<th>Conclusion</th>
<th>Risk Mitigation Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor e.g. telecom tower</td>
<td>NO – telecom tower can squeeze ESCO on prices</td>
<td>YES</td>
<td>Telecom tower may not be profitable, but is Bankable</td>
<td>PPA with a Telecom Tower can give ESCO access to Banks</td>
</tr>
<tr>
<td>Business e.g. local mills, factories, or shops</td>
<td>YES – it is very expensive for local business to supply itself with power, manage fuel logistics etc</td>
<td>NO</td>
<td>Local business is likely to be profitable but not bankable</td>
<td>PPA with local businesses gives ESCO higher margins, most profitibale</td>
</tr>
<tr>
<td>Community Member/House -hold</td>
<td>YES/NO-if household demand is small and variable</td>
<td>NO</td>
<td>Household is neither bankable nor profitable but needs the energy</td>
<td>Supply to local household gives ESCO roots in the community and protection of assets</td>
</tr>
</tbody>
</table>
Adaptations of the ‘A-B-C’ model

• Where companies with national network of shopping outlets, branches or retailers becomes a wholesale buyer of energy from a Energy Service Company (ESCO)
  – Closest to the Telecom tower model: Banks, Supermarkets

• Where the Anchor is also the Energy Service Company
  – Agro-processing industry in rural areas, which currently generate biomass-based energy for self-use

• Where several ‘Business’ customers can be combined to act as an ‘Anchor’ customer
  – Small shopping centers and small industry clusters

• Where programs for supporting construction of schools, health clinics, irrigation systems can be the national ‘Anchor’ customer
Opportunity for New Partnerships

NGO, Youth Organizations, Retail Chains

ESCO play central role

Community Outreach, Awareness, Education

Community level sales and aftersales services

Sale to A, B and C Customers

Energy & Customer Management

Anchors

As Consumer of ESCO services

As Producer with ESCO Partner
MOVING FORWARD..

I) MAJOR CHALLENGES
II) TESTING THE WATERS
III) LEARNING AS WE GO
Major Challenges

• Market Information and **Data Collection**, Mapping of Load Locations and Daily Fluctuation in demand

• Information on latest available **technologies** to reduce transactions costs e.g. ICT enabled pre-paid smart meters

• Information on potential **financing** partners (equity, debt, R&D, grant) for investment and working capital

• Information on **Policy and Regulatory** environment—new incentives, how to access government grants, required paperwork, reporting formats

• Information on **identifying local entrepreneurs** in new areas for implementation of a business model
Testing the Waters

USADF & WBI launched a competition in Malawi to enable private sector to test this model by developing business plans.

- 24 proposals were received and 5 enterprises received grants.
- The winners will be provided advisory support and training.
- Final business plans to be ready by April 2014
Learning As We Go

The challenge of provision of energy services in rural areas is not a new one. Over decades, governments have made tremendous efforts to bridge the energy access gap. With new technologies and new business solutions, private sector has an opportunity to complement government efforts in accelerating the pace of energy access. There is a need for collaboratively create approaches that are commercially viable and sustainable. The ‘A-B-C’ model is a contribution to help initiate this conversation.

We invite you to join the “The Telecom-Energy Initiative” community on the WB hosted platform https://collaboration.worldbank.org/login.jspa and look forward to your feedback and views.
Thank You!