Session II: The ECOWAS White Paper Process

ECREEE Regional Workshop:
Accelerating Universal Energy Access Through the Use of Renewable Energy and Energy Efficiency

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The strategies to improve Energy Access: Experiences & Lessons from India

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Overview

- About TERI
- Energy Access - Context
- Indian Rural Electrification Program
- TERI’s Lighting a Billion Lives Program
- Lessons and takeaway points
What is TERI

- A not-for-profit research and policy think tank;
- Established in 1974 in New Delhi;
- More than 1000 professionals, with centers spread across 5 cities in India; Overseas presence in London, Washington DC, Tokyo, Dubai and Addis Ababa

Working Areas
- Energy & Power
- Regulation
- Environment
- Water and NRM
- Climate policy
- Bio technology
- Social transformation
TERI’s Africa Portfolio

- Demonstration projects
- Supporting regional initiatives
- Mapping capacity & potential
- Capacity enhancement

- Also working with ECREEE to build capacity of various West African stakeholders – Series of trainings planned
Context

- Low energy access to a large part of global population
  - 2.5 billion people rely on biomass for cooking & heating
  - 1.4 billion people without access to electricity
- Lack of access to modern energy leads to a low HDI
- Energy needs to deliver growth are humungous

How do we define Energy Access

Access to clean, reliable, and affordable energy services for cooking and heating, lighting, communications, and productive uses

Is clean energy available?

If yes, is it accessible?

If yes, is it affordable?

» If yes, is it being used?
Energy Access Focus

Incremental levels of access to energy services

Level 1
Basic human needs
- Electricity for lighting, health, education, communication, and community services (50-100 kWh per person per year)
- Modern fuels and technologies for cooking and heating (50-100 kgoe of modern fuel or improved biomass cook stove)

Level 2
Productive uses
- Electricity, modern fuels, and other energy services to improve productivity e.g.
  - Agriculture: water pumping for irrigation, fertilizer, mechanized tilling
  - Commercial: agricultural processing, cottage industry
  - Transport: fuel

Level 3
Modern society needs
- Modern energy services for many more domestic appliances, increased requirements for cooling and heating (space and water), private transportation (electricity usage is about 2000 kWh per person per year)

Source: IEA
The Indian Electricity Sector

- Electricity is a concurrent subject - both federal and provincial governments can legislate and implement.
- Rural electrification level increased from 1500 villages in 1947 (at the time of independence) to more than half a million villages in 2011 (~ 95% of the villages).
- Current rural electricity access at 95% of villages & 60% of rural households.
- T&D system ~ an extensive network of over 6.5 million circuit-kilometers.
- Almost 250,000 MVA of distribution capacity.
- Installed capacity ~ 1362 MW in 1947 to more than 180,000 MW in 2010.
Earlier mechanism for providing access

Historically, electricity provision in India had two major characteristics:
- Strong public sector presence, and
- Prevalence of excessive subsidies and cross-subsidies

At the initiation of five year plan (1950) focussing on
- Electrification of villages and
- Energisation of irrigation pumps.
Schemes for Providing Electricity Access

- Minimum Needs Program
- Kutir Jyoti (home light) program
- Prime Minister Village Development Scheme
- Accelerated Rural Electrification Program
Lessons from past Electrification Schemes

- Definition of electrification - target for village electrification and not household electrification
- Multiplicity of the programs/policy gaps - funding for each program was not adequate
- Implementation - not properly coordinated or managed at both federal and provincial level
- Greater emphasis - irrigation than household electrification
- High cross subsidy - utilities lukewarm towards electricity supply to rural areas

The Result - Low household access & unsustainable supply
REST Mission: *Power for All by 2012*

- REST (Rural Electricity Supply Technology) Mission for *electrification of 100 thousand villages and 10 million households* - Launched in 2002
- Designed to ensure a integrated approach
  - Both grid extension & distributed generation
  - Changing the legal & institutional framework
  - Promoting, financing & facilitating alternative approaches in rural electrification
  - Provision of capital subsidy @ 40% of project cost
  - At least 10% of the households in each village included in the scheme be electrified
Policy Regime - Electricity Act 2003

.....what does it imply

- Promotion of rural electrification through a competitive and deregulated environment
- Rural power generation, transmission, distribution sectors thrown open for private and public initiatives
- Opens up opportunities like funding of stand alone systems including those based on renewables, and other appropriate delivery mechanisms to the rural households

.....what does it say

- Act obligates ‘Appropriate Government shall endeavor to supply electricity to all areas including villages and hamlets’ (Section 6)
- An enabling environment for the discharge of the above obligations in rural areas is envisaged to be created vide sections 4 & 5 of the Act, which outline the rural electricity delivery mechanism
Rural Electrification - Policy Framework

- Designated Rural Area
  - Areas with existing grid access
    - Licensee or franchisee for existing network
    - Parallel licensee u/s 14
    - License exemption holder u/s 13
  - Areas with no grid access
    - Combined generation and distribution with grid back-up
    - Off-grid systems with no grid back-up
A village would be deemed to be electrified if:

- Basic infrastructure such as distribution transformer and distribution lines are provided in the inhabited locality as well as hamlets where it exists
- Electricity is provided to all public places
- Number of households electrified should be at least 10% of the total number of households in the village
National/Rural Electricity Policy (2005)

- Access to Electricity - Available to all households by 2012;
- Supply of reliable and quality power of specified standards in an efficient manner and at reasonable rates;
- Minimum lifeline consumption of 1 kWh/household/day as merit good by year 2012;
- Per capita availability of electricity to be increased to over 1000 kWh by 2012;
- Financial turnaround and commercial viability of electricity sector; and
- Protection of consumers’ interests
Recent Programs for Enhancing Access

- **Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY)**
  - Launched in April 2005
  - **Scope of the scheme covers provision of:**
    - Rural Electricity Distribution Backbone (REDB) i.e. provision of 33/11 KV (or 66/11 KV) sub-stations of adequate capacity and lines for village cluster
    - Creation of Village Electrification Infrastructure (VEI)
    - Decentralized Distributed Generation (DDG) and Supply
    - Rural Household Electrification of Below Poverty Line (BPL) Households
  - Provides a capital subsidy of 90% & 100% for BPL HH
A unique concept being promoted in India under RGGVY
Appointment of franchisees for feeder management and revenue sustainability
Franchisee means a person authorized by a distribution licensee to distribute electricity on its behalf in a particular area within his area of supply. [Electricity Act 2003: Clause 2 (Definitions): Sub-clause 27]
Involvement of franchisees for local power distribution has led to better MBC practices, higher collection efficiency & reduced loss:
Focused approach by franchisees and close contact with consumers
Improved customer service due to localized operation
Improved and prompt maintenance of distribution network
89.86% of targeted un-electrified villages (120,000) electrified
60.95% of electrified villages (350,000) intensified
74% of the targeted 23.3 million BPL households electrified
103,079 rural electricity distribution franchisees in place
Around US$ 5312 million for rural electrification
Lessons from Rural Electrification

- Government support playing a key role in extending rural electrification
- Firm implementation policies and goals, enforced through legislation, assisting in achieving targets
- Mainstreaming of renewable energy based rural electrification efforts
- Requires a holistic approach - generation, transmission and distribution
The Rural Electrification Boosters

- How to improve the household electrification level?
- Can bundling and access to credit reduce the access gap?
- How to sustain the electrification efforts with adequate electricity supply?
- What institutional structure will be appropriate for sustainability?
- Can economic linkages assist in improving & sustaining access?
The energy access issue...

TERI’s Response...
We commit to enable a billion lives to access light from solar technologies
About LaBL

A commitment to improving the quality of lives of rural communities

- LaBL sets up solar charging stations in energy poor villages that offer certified, bright, and quality solar lanterns for rental to the local people.

- A trained local entrepreneur operates and manages the charging station and rents the solar lanterns every evening for an affordable fee.
Charging stations are expandable to solar energy hubs providing:

- Battery charging
- Mobile charging
- Lantern charging
- Water purification

*A typical Solar Charging Station*
Innovating at LaBL

- CONTINUOUS IMPROVEMENTS in solar lantern designs with reputed technology partners, driving down cost, improving efficiency & quality

- CHARGING STATIONS EXPANDABLE TO SOLAR ENERGY HUBS, providing services like water purification, mobile & battery charging

- TECHNOLOGY RESOURCE CENTRE, an after-sales service network for responsive repair services through local community representatives
Solar Multi Utility

Multiple Energy Sources
- Solar PV
- Wind Aero Generators
- Biomass Gasifier
- Hybrid Systems

Multiple Applications
- Charging lanterns
- Powering computers,
- Charging cell phones
- Water purification
- Micro enterprises

Located near the energy utilization points in a village to provide electricity services as per the community’s need
Institutional model

**Funding Partners**
CSR Initiatives, Co-financing schemes, Government, Individuals

**Technology Partners**
Quality Product suppliers and Service providers

**TERI**
Program coordination, Implementation, Monitoring and supervision, Outreach

**Partner Organizations**
Ground support, Identification of sites and Selection of entrepreneurs

**Entrepreneurs**
(women, village youth, elderly)
Operate & Manage charging stations, Provider of services

**Community: end users and beneficiaries**
Journey so far......

Laltini represents the goal of rural enlightenment through LaBL

- 350,000 lives impacted
- 70,000 solar lanterns
- 1,200 villages covered
- 17 states in India
- 6 countries
- > 1,200 green jobs created
- > 60 NGOs involved

Journey so far......
United Nations’ MDG

Lighting a Billion Lives contributes to 6 UN MDGs:
LaBL initiatives across Africa

- UN Habitat 100 lanterns
  - Cameroon
- UNIDO /UN Habitat
  - 200 lanterns
  - Sierra Leone
- UN Habitat
  - 100 lanterns
  - Central African Republic
- Actis/Umeme
  - 750-1000 lanterns
  - Uganda
- UN Habitat
  - 100 lanterns
  - Malawi
- DFID/UN Habitat
  - 5000 lanterns
  - Kenya
- DFID
  - 5000 lanterns
  - Ethiopia
- EU/ADPP
  - 2000 lanterns
  - Mozambique

Intervention planned in the future
Lighting and beyond…

- LaBL is *not just* about providing clean lighting to communities.
- It is about *adding more hours to their day*, enabling rural community to lead lives more easily and comfortably through:
  - Livelihood and Income Generation
  - Better Health
  - Better Education
  - Environmental Sustainability

*Leading to*

- Empowerment of rural communities
- Women, children & BOP population
http://labl.teriin.org