

World Bank Energy Week Discussion Panel: Different Institutional Approaches to Electrification

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Overview of institutional approaches for rural electrification presented by Ralph Karhammar, WB-GTZ

Speakers/Panelists:

- Eng. Joseph Kibere Njoroge, Managing Director & Chief Executive Officer, KPLC, Kenya
- Ato Shiferaw Telila Senbetu, Executive Officer, Ethiopian Electric Power Corporation, Ethiopia
- Dr. Alassane Agalassou, Manager, Rural Electrification Program, AMADER, Mali
- Ms. Justina Uisso, Project Manager, Rural Energy Agency, Tanzania
- Miguel Revolo, Manager of Electric Distribution, OSINERGMIN, Peru
- James VanCoevering, NRECA International, Bangladesh Rural Electrification Program

Institutional Approaches

This panel discussed the role of institutions for both grid and off-grid electrification. An introductory presentation of the main discussion themes on **institutional approaches** to rural electrification addressed models for scaling up, subsidy schemes, regulation, master plans and productive uses. Large national concessions for state owned utilities to pursue electrification through grid extension (the centralized approach) were contrasted with the decentralized approach of multiple private or community based entities typically building and operating isolated mini-grids. In addition, there are hybrid institutional models such as i) a national utility selling bulk power to local distribution entities who then resell it at retail and ii) top down concessions by private companies who typically bid for an exclusive franchise to serve a large geographic area (Senegal).

- The approach of **Kenya's** electrification model highlighted the interaction between Kenya's Power and Lighting Company (KPLC), the country's utility company, and the REA. After connections are built by the REA, KPLC steps in to operate the new distribution system and provides retail service. As a result of the establishment of the REA three years ago, the number of rural customers has increased from 5% to 15%. The scheme operates under the general oversight of the Energy Regulatory Commission (ERC).
- **Ethiopia's** electrification efforts are led by the Ethiopian Electric Power Corporation (EEPco), the vertically integrated utility, and largely based on grid extension using local renewable energy resources (hydro). In 2005, the government launched the electricity access program focusing on high population density areas. Off-grid electrification is under the purview of Ethiopian Rural Energy Development and Promotion Center (EREDPC), which established the Rural Electrification Executive Secretariat (REES), for project assessment and implementation, and which administers the Rural Electrification Fund (REF) providing concessional loans for private producers. The Ethiopian Electricity Agency (the national regulator) is responsible for licensing of private investment, tariffs, and other standards.

- **Mali's** model emphasizes a bottom-up approach of local entrepreneurs carrying out electrification schemes using local capital and sometimes remittances from overseas Malians. Two regulators exist—one for the national company (EDM) and the other (AMADER) for rural electrification. AMADER wears two hats: it acts as the grant provider and the regulator for the small isolated mini-grids. The Rural Energy Fund is managed by AMADER.
- **Peru's** successful and ongoing rural electrification experience includes efforts led by the government and the unbundled distribution utility companies, with a concession law to promote investment through the private sector. OSINERGMIN is an autonomous regulatory body that was set up to fix tariffs and monitoring service quality. The regulator also administers a sophisticated rural electrification fund. Residential consumers who consume 100 kwhs or more per month pay a surcharge of 2.5% of their monthly bills to provide subsidies to rural consumers served by both grid and off-grid systems. While Peru does not have a mandated uniform national tariff, the goal of the rural electrification fund is to ensure that rural consumers pay about the same tariffs as urban consumers in Lima.
- The REA of **Tanzania**, established in 2005, encourages private and community based investment into rural areas and make use of renewable resources available in the local contexts. REA provides matching grants for pre-investment support and market development, performance grants of \$500 per connection to offset investment costs for new connections and technical assistance to the developers. The vertically integrated national utility TANESCO is the main responsible for grid extension. A multi-sector regulator – for water and energy – EWURA is responsible for issuing licenses for generators with capacity larger than 1MW, setting tariffs, and performance monitoring.
- **Bangladesh** electrification effort is led by the Bangladesh Rural Electrification Program (BREP), which operates under the direction of the Rural Electrification Board (REB). The constructed systems are turned over to rural distribution cooperatives (PBSs) and paid for using long-term, soft loans of 3% interest, with 3 year grace period, over a period of up to 30 years. The PBSs buy their electricity in bulk from the national utility and then resell it at retail to their members and non-members. The Bangladeshi system has been modeled after the US rural electric cooperative system. At present, there are 70 rural cooperatives serving over 5 million households. Many of the PBSs are now facing financial difficulties because the differential between the bulk supply price and the retail price set by the national regulator is too small to cover their distribution expenses.

Subsidies

The second part of the discussion focused on **subsidies**. Subsidies for electrification typically fall in three categories: i) initial capital subsidies to the supplying entity, ii) connection cost subsidies to new consumers and iii) tariff or consumption subsidies (such as lifeline tariffs).

A recurring challenge stressed by participants was that **utilities have little incentive to electrify villages** because of high connection costs and also mandated tariffs set at levels that do not cover supply costs. Unlike Bangladesh where connection costs are lower, in most of the SSA countries the distribution and connection cost are reflected in high, prohibitive connection charges. However, an important point was raised about **optimizing construction costs** before applying subsidies. Subsidies often cover costs that are higher than they need to be and thus lowering construction costs may help lower required subsidies.

There is a strong need and political pressure to **make tariffs uniform throughout the country**. This goes against the economic reality that providers will have different costs, and different compositions of customers and loads. Thus, there are often significant cost differences in serving urban and rural users and also between users living in the same area but served by different distribution companies.

- In **Kenya**, initial capital costs are subsidized by the government using donor and own resources as well as revenue from the 5% levy from existing customers to finance rural electrification. A utility policy to charge fixed connection rates of \$400 for those living close to a transformer has been implemented but since this amount is still high there has been a plan to i) partner with banks who will provide soft loans to new users and ii) a revolving fund that will be used for the same purpose. Lifeline tariffs financed by cross subsidies are also in place.
- The experience in **Peru** shows that tariffs must be aligned with the consumer's ability and willingness to pay. Peru has several levels of subsidies including i) the initial cost of capital subsidy for isolated mini-grids outside of utility's concession; ii) Internal tariff subsidy for reducing the price of isolated generation and distribution and iii) a consumption cross subsidy coming from levies on urban users. Since 2008, new customers in Peru have not had to pay connection fees at all since this has become part of the capital investment costs.

Capacity to attract private investors

- On the question of the capacity of the sector to attract private investors, **Mali** described its spontaneous electrification bottom-up model. There are approximately 50 local operators using diesel fired generator who are often motivated by their desire to electrify own villages. Their projects are commercially viable because AMADER (the rural electrification agency) allows them to charge tariffs that are approximately two to three times higher than the tariff charged by the national utility (EDM) for customers on the social or lifeline tariff. This creates problems for operators of isolated mini-grids that are located near EDM's main grid. Their customers complain that it is unfair that their tariff should be so much higher than the tariffs in grid-connected villages
- Some **Bangladeshi** private sector participants have entered through the construction of IPPs. Good contract terms such as time to recover costs of investment are key.