Community Power from Mobile: The Ecology Foundation

By Declan Murphy

Affordable electric power is the underlying currency of all global society. Delivering electric power to off-grid rural communities is a challenge well under way in developing countries.

Many approaches are being tried, but the most pragmatic is to use existing infrastructures to facilitate power generation in communities. The goal is to roll out low cost energy systems to empower the lives of millions of people within the next decade. In this context, the mobile communications industry has already proven the ability to reach off-grid populations rapidly and affordably. Now, many rural areas have an infrastructure poised for further positive social impact, the delivery of micro power to communities!

The Ecology Foundation has been developing concepts and models for sustainable and affordable micro power since 2008 and has collaborated with GSMA to pilot systems in 2011. The approach is simple and effective; to extract about 10% of the excess power generated at existing operator base stations and deliver this directly to off-grid communities. The communities' initial usage for power would be for cell phone charging followed by domestic lighting and eventually micro businesses. This in turn supports the usage of local base station traffic; a win-win relationship.

There are a few important factors to consider in order to deliver this concept successfully:

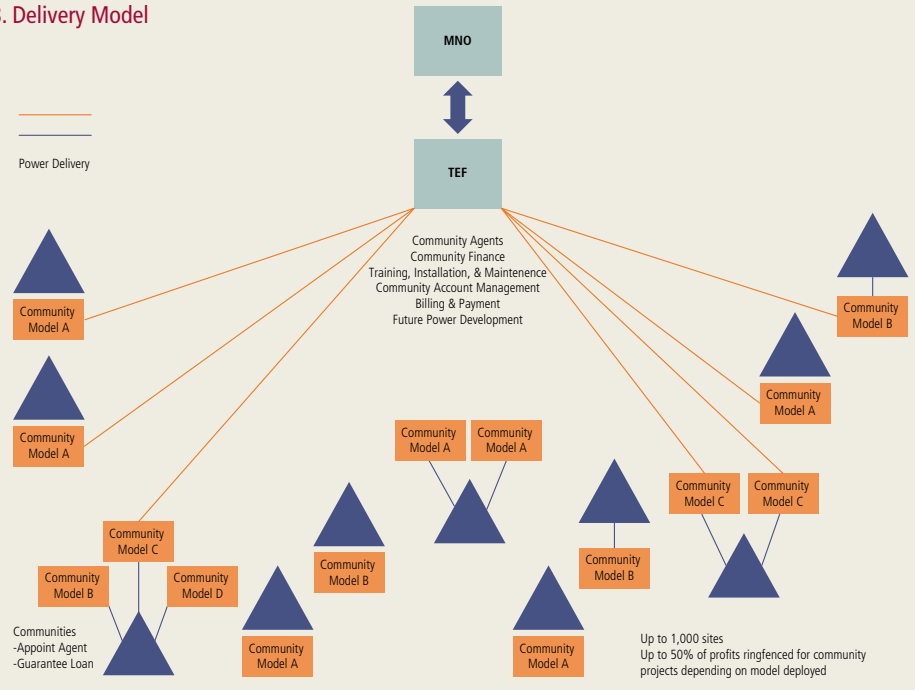
- Proper charging solutions
- Trained human resource
- A strong supply chain
- Partnerships with key organisations

There can be many different models for this concept. The easiest and most efficient model is:

- The Ecology Foundation (TEF) and Mobile Operator select suitable base station sites
- TEF appoints a local 'Energy Agent'. The energy agent is provided wih sufficient training for maintaining daily activities as well as being the first level of local social networking
- TEF sets up an energy kiosk.
- TEF delivers energy services to community as follows:
  - Individual/multiple phones charging.
  - Airtime sales (free charging if bundled with airtime)
  - Household electric lanterns & battery exchange service
  - A micro-finance institution can assist local community with purchasing household lighting devices.

As the sites will be located at remote areas, creating a strong supply chain will be a challenge for TEF. TEF can partner with existing organisations to overcome the supply chain constraints. An overall delivery model as follows:

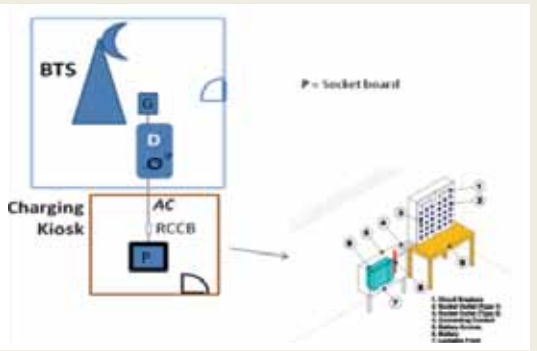
Figure 18. Delivery Model



In different locations, the community scenario is different. The charging model should be compatible with community needs as well as being within reach. Sometimes the base station is located inside the community centre, but on occasion located a bit further away from the community centre. Considering both scenarios, there are two potential charging models:

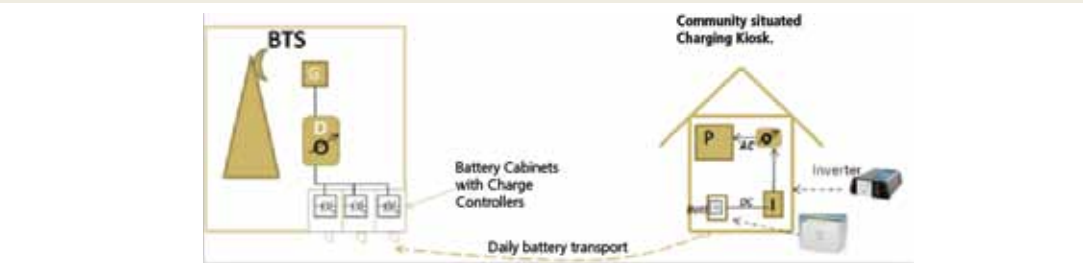
- Charging at Base station
- Charging at Community

Figure 19: Charging at BTS:



- TEF sets up energy kiosk outside the BTS
- Power is direct from a standard metered charge controller of the kiosk
- Kiosk consists of plug board with approximately 34 standard sockets
- Agents charge handsets, lights and other small domestic devices for end-users
- Community agent pays TEF directly through mobile money

Figure 20. Charging at Community:



- TEF sets up kiosk inside the community (which may be 1-2 km away from BTS)
- A large deep cycle battery is charged by the agent at the BTS
- Power is brought by battery several times a day to the energy kiosk
- Kiosk consists of plug board with approximate 34 standard sockets
- Agent charge handsets, lights and other small domestic devices for end-users
- Community agent pays TEF directly through mobile money.

The concept targets to extract only 2-4kWh power per day from the base station diesel generator. This requirement may increase due to the community demand. Independent solar panels can be integrated to cope with extra power requirements, if any. The charging service for mobile phones can be delivered with a minimum fee, or no fee when bundles with airtime, to the local community. Having a charging facility inside the community will eventually increase the APRU for mobile operators by 10-20%.

It will also assist with creating a new subscriber base for the operator. An estimated US$9000/year will be returned to the mobile operator from this initiative, per base station. Primarily the initiative will be invested by TEF, therefore mobile operator will be free from any CAPEX requirements.

Power, like food, shelter and clean water, is an essential component for social development. Social development is in the interest of all stakeholders as it builds the current market as well as fulfilling a personal and corporate desire to have a positive impact.

The Ecology Foundation, with support from GSMA and Mobile Network Operators expects to make a globally significant impact on community power delivery.

If you would like some further information about these models, please contact:
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