Mini grids and regulatory issues

EDF’s experience in Mali
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Overview of the Malian rural electrification institutional framework

- **Rural electrification in Mali**
  - The approach consists in giving a rural electrification operator the role of electrifying a territory and operating the system in the long run
  - Public Private Partnership
  - PCASER or ZEM
    - PCASER: local initiative – limited to a few villages - subsidies < 500,000 $
    - ZEM: similar to a concession area – for a large territory
  - Call for tender in the case of ZEM
  - Financial support through subsidies limited at 80% of the investment

- **The Amader: 1 entity, 2 roles**
  - Promotion of rural electrification on the whole country
  - Regulation of rural electrification
  - Senegal, Tanzania, Cameroun… : RE agency + regulator

- **Objectives of rural electrification:**
  - To supply energy (electricity or others) in order to cover all needs for all types of customers (not only domestic uses).
Quick description of EDF's Malian programs

- 2 programmes have been developed by EDF and its partners
  - Koraye Kurumba in the Kayes region – since 1999
  - Yéelen Kura in the cotton area - since 2001

- Programs launched before the new institutional framework (end of 2005) as pilot projects
Korayé Kurumba

- **Objective**: 5,000 customers – 100,000 people
- **Technical choices**: mini grids and gensets
- **First phase**: 1999 – 2005
  - 4 villages – 500 customers
- **Second phase**: 2006 – present
  - 22 villages (potential customers: around 10,000)
  - Initially, mini grids and diesel gensets
  - Moving to hybrid Solar PV / Diesel powerplants
Yéelen Kura

- **Objective:** 6,000 customers – 120,000 people
- **Technical choices:** SHS + mini grids and gensets
- **First phase:** 2001 – 2005
  - Several villages – 1,500 customers
  - Only SHS
- **Second phase:** 2006 – present
  - Around 22 villages
  - Mini grids and gensets
  - 1 hybrid Solar PV / Diesel powerplant in 2008
  - 7 new hybrid Solar PV / Diesel powerplants in 2011
  - Biofuels (Jatropha) in its developing phase
Services and tariffs structure

- **4 types of services**
  - 3 services based on monthly fixed fees (50 to 300 W)
  - 1 service "per kWh" plus a monthly fixed fee (1 to 18 kVA)

- **Duration of service:**
  - 10 to 12 hours per day usually in 2 periods – 1 during the day time, the other one in the evening

- **Connection fee and advance payment**
  - Connection fee: depending on the power supplied
  - Advance payment: equivalent to 1 month consumption

- **The "per kWh" service:**
  - Connection fee + advance payment
  - Monthly flat rate (depending on the subscribed power) + cost per kWh
Tariffs structure

Costs in Euros excl VAT
Only kWh over 100 kWh/month are subject to VAT
Public lighting partly included in monthly fixed fees
S4 consumption > 17 kWh/month
Costs per kWh = 0.30 to 0.33 €
Incidence of tariffs structure and tender's criteria

- **Effect of tariffs structure on technical choices**
  - Cost per kWh too low => no diesel
  - Incompatibility between S3 and S4 tariffs => small consumers will ask for S4 and the financial viability of the company is lost

- **Unintended effect of tender's connection criterion**
  - Example: if the main criterion is the number of customers connected after 3 years with a fixed amount of subsidies, the candidate is obliged to choose the lowest investment cost solution, which might not be the best economical solution and would favour the smaller customers instead of the larger ones
Regulation: how does it work?

- Automatic prices revision through a formula taking into account several parameters:
  - Cost of raw materials,
  - Manpower index
  - Inflation rate
  - Cost of gasoil
  - Etc.

- Links with technical choices
  - This kind of formula is linked to the technical choices (grid connection, mini grid and diesel or hybrid power plant, SHS…) and the repartition of these solutions could change in the medium and long term => revision of the formula itself

- Honouring the agreement
  - Importance of time
  - Different interests between ministries (energy and finance for example)
  - Detaxation of gasoil not really feasible…
Conclusion

- To keep the principle of free technological choices by the operator (to avoid the dogmatic choices not adapted to the context)

- Incentives to favour renewables

- Automatic price revision formula: it is not enough

- During the 5 to 10 first years of a rural electrification programme, the combination of both roles – promotion and regulation – dedicated to the same body (rural agency) seems to be more efficient.