EDF's experience in the field of RE in developing countries

Practical Examples and Lessons Learned

Guy MARBOEUF

EDF – e8 member

guy.marboeuf@edf.fr

Renewable Energy & Sustainable Development in Indonesia

Past Experience – Future Challenges

19-20 January 2009

Jakarta, Indonesia

Renewable Energy & Sustainable Development in Indonesia – 01 / 2009

Contents

Mid nineties, the beginning…

- **Having finished the rural electrification (RE) in France (beginning of the seventies)…**
- **Master Plan for rural electrification in Indonesia**
  - Financed with the support of the World Bank
  - With the national utility PLN
    - Socio-economic study to define the needs, village by village, for the next 20 years (bottom-up approach)
    - To design tools to plan RE investments in the whole country
    - To work-out a master plan for RE until 2019
    - To develop a software (Replasys) based on geographical information system (GIS) to follow-up the implementation of RE in the country
- **Promotion of single phase MV networks**
- **Designing of planning tools: Laper and Elvira**

Renewable Energy & Sustainable Development in Indonesia – 01 / 2009

Mid nineties, in Africa

- **Pilot projects in Western and Central Africa**
  - In order to learn on the context
    - The needs of the population,
    - Its capability to pay
    - To test equipment,
    - Economy of the projects,
    - The local organization to manage the systems
- **2 to 4 villages per country**
  - Communication and Activity Centers, based on PV systems
    - Merchant and non-merchant services
    - Local management
    - In 3 different countries: Mali, Benin and Burkina-Faso
  - GECO : micro grids, diesel generators and energy efficiency
    - Size adapted to the needs
    - In 2 countries: Ivory-Coast and Cameroon

Mid nineties, lessons learnt

- Successes and difficulties
- How to adapt the approach to:
  - Ensure sustainability?
  - Develop large scale programs?
- An answer in the context of countries still with low electrification rates : the RESCO concept

RESCO concept

- Local operator which sells energy based services
- In a clear and facilitating institutional framework
- Public Private Partnership
- Services to be paid by the customer at affordable tariffs
- A multi-service, multi-energy approach
- An external support through investment subsidies
- The customer pays for the recurrent costs
- To respond to all local needs: households, collective, commercial and productive uses
- Open based technologies: traditional or renewables, grid or off-grid – no dogmatism

Institutional framework - 1

- To guarantee access to essential needs for everybody
- To enable economic development
- To guarantee fairness in the whole country
- To define the applicable rules for the tariffs
- National utility or PPP?
  - Linked to the rate of electrification
  - PPP supposes a clear and facilitating institutional framework
  - RE is not a simple market

Renewable Energy & Sustainable Development in Indonesia – 01 / 2009

Institutional framework - 2

- A clear framework
  - With priorities and objectives (MDG…)
    - Socio (access to essential needs)
    - Economic development
    - Environment preservation
    - Etc.
  - Clear rules
  - Stable in the long term
  - To ensure sustainability of the programs
- A facilitating framework
  - To ensure economic viability for the State and the operators
  - A strong support through investment's subsidies or equivalent
  - Possibly including tax exemptions,
  - To enable "reasonable" profitability for the private operators

Financing

- A dedicated fund
- With the same rules whatever the donors are
- To bring investment's subsidies or equivalent to the operators:
  - To enable profitability for the operators…
  - …and affordable tariffs for the customers
- An adapted contribution of the beneficiaries to the investment
  - Adapted to their capability of payment
  - Showing their interest for electricity
- With carbon finance?
- A good allocation of the risks to enable reasonable guarantees

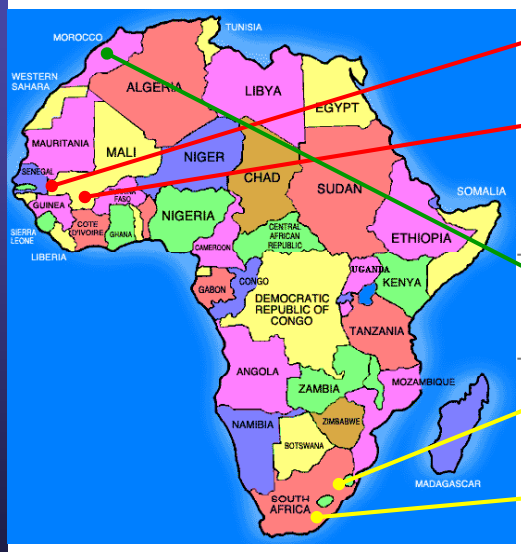
Renewable Energy & Sustainable Development in Indonesia – 01 / 2009

Carbon finance

- An additional financing tool with the objective to preserve the environment
- But…
  - There are still uncertainties: valorization of the ton of CO2, future of the Kyoto protocol…
  - Low financial interest with small projects due to transaction costs…
  - The admitted « base line » is not always favorable to the projects…
- Programmatic approach: the future?

EDF RESCOs programs

❑ Four programs in 3 countries:



– **Mali: 2 RESCOs**

- **Korayé Kurumba**: micro grids with gensets – 10,000 beneficiaries to 100,000 – start 1999 – partner Total 30 %
- **Yéelen Kura**: SHS + micro grids with gensets – 30,000 beneficiaries to 100,000 – start in 2001 - Partner(1) Nuon 50 % - Biofuels test (Jatropha) – Hybrid PV/diesel power plant (72 kWp)

– **Morocco**

- **Temasol**: SHS (26,600) – 190,000 beneficiaries to 400,000? – start in 2002 – Partners Tenesol and Total

– **South Africa**

- **KES in KwaZulu-Natal** – 50,000 beneficiaries to 90,000 – start in 2002 – Partner(2) Total 35 % - SHS (8,000) + supply of LPG
- **KES in Eastern Cape** – 700 beneficiaries to 150,000 – start end of 2008 – Partner(2) Total 35 % - SHS + 400 schools

(1) EDF sold its participation to FRES (Nuon's foundation in December 2008)
(2) A South African partner (Calulo) is entering in KES capital (15 %) in January, 2009

Renewable Energy & Sustainable Development in Indonesia – 01 / 2009

Feedback from the field

❑ Usually a good acceptation from the population

- But necessity to explain the choice of SHS
- And necessity of a strong commitment from the operator for customer management to ensure an acceptable collection rate (more than 90 or 95 %)

❑ Low reactivity of national authorities

- To adjust tariffs
- To pay subsidies

❑ Change of rules or objectives

- Programs falling
- Change of tariffs' structure

❑ Importance of a local partner

❑ Strong involvement of the donor at the beginning but not at the time

Conclusion

- PPP approach seems to be a correct way…
- …if the institutional framework is clear and facilitating
- Presence of a local partner is of prime importance
- Involvement of the State, the National Utility, the donor, useful at the time
- Technological choices opened and adapted to the context
- To bring an answer to all energy needs to fulfill the objectives of the State and respond to the demand
- Necessity of ambitious and permanent training
- A good allocation of the risks
- Ambitious programs (scale effects, MDG…)

Thank you for your attention