

Project RESOUTH Madagascar



First Seminar for the Second Energy Facility Projects - April, 27th 2012

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Objectives

- **Reduce poverty of rural populations in the South of Madagascar by sustainable access to electricity**
- **Rural decentralised electrification in:**
 - **Ambondro – Region Androy**
 - **Analapatsy – Region Anosy.**



General features

Contractor

- Fondation Energies pour le Monde

Local partner

- WWF Madagascar, partner for economic uses of electricity

Local institution involved

- Ministry of Energy

Beneficiaries:

- Population of the 2 target localities (5 500 people): domestic use, social services, economic activities

Technologies:

Wind at Ambondro

Solar PV at Analapatsy



Duration:

2008 - 2012

Chosen technology for Ambondro

Feasibility study achieved before the launch of project:

- Favourable wind source
- Economic uses of electricity
- Density of dwellings

Tender in June 2009 for:

- Production of electricity
- Tech. building and grid

Equipment:

- 2 * 6 kW PROVEN wind generators
- SMA controls and inverters
- 4 100 Ah / 48 V battery
- **In service since October 2010**



The production and distribution equipment



2 6 kW PROVEN generators



4 100 Ah / 48 V battery



3 Windy Boy and Sunny Island AC system



3 km 3 phases grid

Implementation to date

Subscribers:

- 58 (*1st year*)
- Approx. 100 (*at the end*)

Direct and indirect beneficiaries:

- 3 000 people

Actual production:

- Total annual production for 1st year: 10 MWh
- Mean production: 27 kWh/day
- Flexible duration of operation around the year

Month	Duration	Hours of operation
June and July	5 h/day	9 - 12 am & 6 - 8 pm
March to October	8 h/day	7 - 13 am & 6 - 8 pm
November to February	15 h/day	7 am - 10 pm

Technical scheme for sustainability (I)

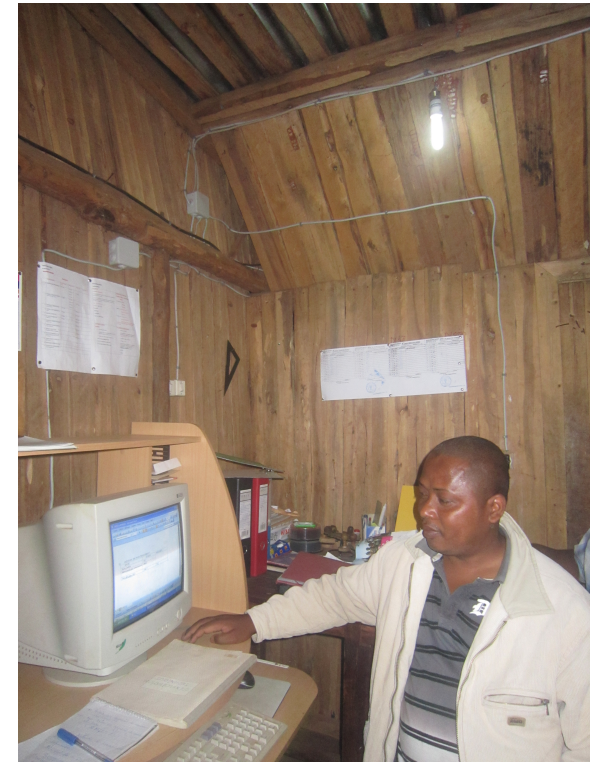
A - LOCAL OPERATOR

Association Angovo Soan'Androy (ASA), with approved licence for production and distribution of electricity, managed by

- a local entrepreneur,
- with 2 technicians

B- TWO NATIONAL SUPPLIERS with LOCAL BRANCH

- Fast answers and interventions
- Good technical knowledge



Technical scheme for sustainability (2)

A - LOCAL OPERATOR

daily turn on and off
the system

regular system maintenance

troubleshooting

Phone
assistance

MANUFACTURER

B - TWO NATIONAL SUPPLIERS with LOCAL BRANCH

Equipment warranty -
Maintenance contract

annual





Technical scheme for sustainability (3)

Requirements

Initial trainings of local operator

- Technical aspects during implementation and practical courses by suppliers
- General control of knowledge by officer in charge of on-site commissioning

Follow-up for improvements of local operator

- Monthly visit by a supplier technician during the first year, for control and further training of local technicians on regular system maintenance
- Assistance on phone of supplier team in case of trouble
- **Challenge:** Further training of local technicians for troubleshooting

Efficient assistance chain

- Local supplier branch
- Set up procedures for a rapid intervention chain in case of breakdown

Financial scheme for sustainability (I)

- Initial investment subsidized
- Operating costs covered by electricity fees

TARIFF STRUCTURE

- **Connection fee:**

- 2 bulbs + 1 plug : 80 000 Ar (29 €)
- Bigger uses : 95 000 Ar (34,5 €)

- **Monthly fix fee :**

- Consumption < 6 kWh/month: 4 000 Ar (1,5 €)
- Consumption 6 to 13 kWh/month: 8 000 Ar (3 €)
- Consumption > 13 kWh/month: 15 000 Ar (5.5 €)

- **Monthly variable fee :**

- 850 Ar / kWh (0,3 €)

Financial scheme for sustainability (2)

Requirements

Efficient project design

- Tariff suited to local payment capacity
- Sanctions for non-payment users

Reduce cost of maintenance for the operator

- Robust equipment, Good O&M, Availability of spare parts
- Design suited to external incidents (lightning, storm, etc.)
- **Challenge** : Transfer the most skills to local operator
- **Outlook** : Economy of scale with group of electrified localities

Initial trainings and follow-up of local operator

- All financial, commercial management, organisational and legal aspects, long before implementation of equipment
- Further training during the first years of operation
- Weekly follow-up **by phone** on payment and accounting
- Support of the operator in the first management difficulties

Encountered difficulties in the project implementation

General Context

- Higher equipment costs than provisional budget
- Unavailability of distribution treated poles
- National supplier unused with wind generator and rural electrification
- PROVEN manufacturer financial difficulties

Local Context

- Malagasy political crisis
- Schools not electrified due to difficulties to get financing for connection and regular fees, from the supervisory Ministry



Assets and strenghts

in the project implementation (I)

Approval of the population and subscribers for:

- Type of local operator
- Tariff structure
- Flexible operation hours

Institutional support for:

- On-time tax exemption
- Frequent presence on site
- Facilitation with local stakeholders

Availability of operator:

- Acceptance of innovations with associated risks
- Readiness for training
- Gradual increasing of technical and management skills

Assets and strenghts in the project implementation (2)

High quality Production equipment

- Well-know equipment manufacturers : SMA, PROVEN, etc.
- Equipement warranty service
- Performance monitoring

Flexibility

- Possible remote control through telecom.
- Foreseen extension of production sources



Lessons learned on project operation

Challenges

- Learn from the production capacities to optimize the system use (increase number of subscribers and operating hours)
- Reduce the production capacity gap between seasons
- Handle required level of local technical expertise
- Reduce maintenance cost

Learning by doing

Successes

- Local acceptance of renewable energies constraints
- Accountance capacity of the manager
- Basic technical capacity reached by technicians
- Suitable partnership between local stakeholders (head of village and operator, operator and suppliers and Ministry of Energy, etc.)



Thank you for your attention !

