# **ANNUAL REPORT 2011**

RENEWABLE ENERGY FOR RURAL DEVELOPMENT (MOZ 0901811)



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## **Acronyms**

BTC	Belgian Technical Cooperation
EDAP	Energy Sector Development Assistance Programme (WB)
FUNAE	Fundo de Energia
GIS	Global Information System
GIZ	German International Assistance
ICT	Information and Communication Technology
JLCB	Joint Local Committee Meeting
M&E	Monitoring and Evaluation
MF	Micro Finance
MFI	Micro Finance Institute
R&D	Research and Development
RERD	Renewable Energy for Rural Development
SC	Steering Committee
SPV	Solar Photo-Voltaic
TA	Technical Assistance
YTD	Year To Date

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## 1 Project Form

Project name	Renewable Energy for Rural Development (RERD)		
Project Code	MOZ 0901811		
Location	Mozambique		
Budget	€15m (to be increased to €23.43m)		
Key persons	Mrs. Miquelina Menezes (Director FUNAE) Mrs. Nilsa Abdul Carimo (Project manager FUNAE) Mrs. Irene Novotny (technical adviser, socio economist) Mr. Jan Cloin (technical adviser renewable energy)		
Partner Institution	Fundo de Energia (FUNAE)		
Date of implementation Agreement	14 September 2010		
Duration (months)	48 months (to be extended based on the specific agreement signed on 28 Dec 2011 for the additional funding from The Netherlands)		
Target groups	Rural areas with no access to electricity in Manica, Sofala, Zambézia and Niassa Provinces		
Global Objective	To promote rural development by providing access to energy		
Specific Objective	To increase access to hydro, solar and wind energy for use in off- grid applications in rural areas, by investments in renewable energy systems, stimulation of micro-finance initiatives and institutional capacity building		
Results	Access to energy is increased by the implementation of solar, wind and hydro projects     Financial accessibility to energy is improved     Technical and administrative capacity of FUNAE is increased		

**Note**: Targets and indicators in this document are based on the original RERD project document with €15 m funding only and do not take into account the budget increase coming into force with the signature of the Specific Agreement of the Dutch contribution on 28 December 2011, except when noted otherwise.

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## 2 Summary

Notwithstanding the energy generated by the Cahora Bassa power plant and some other minor hydro power plants, energy consumption in Mozambique relies still heavily on wood and petroleum products.

In rural areas most of the energy is obtained from fuel, wood and charcoal, which are costly, inefficient and environmentally damaging.

By the end of the year 2008, around 615.000 households, mostly in urban areas, had access to the electricity grid, giving an electricity access rate of 12%, significantly below the SADC Regional average of 27%.

The electricity access rate in rural areas, where the population is very scattered, is less than 5%. Grid extensions towards rural areas remain very expensive and are not economically viable.

In order to increase the access to energy in rural areas, this program will focus on off-grid energy systems, based on renewable energy resources (hydraulic, solar and wind), in remote rural areas where no grid connection is foreseen within the next five years.

- The program will finance, on grant basis, electrification systems for community infrastructures such as administrative buildings, schools, health centres, water pumping devices and public lighting.
- Renewable energy installations for private use (household, shops or small enterprises) will be stimulated by subsidies (investment funds) and soft loans through micro-finance systems. This will make the investment more economically feasible for rural people.

In order to increase the sustainability of the renewable energy installations, the program will also provide a computerized asset management system and technical assistance focussed on capacity building through training initiatives, research and development. Two long-term international experts (one with technical and one with a socio-economical profile) have been recruited to compliment the FUNAE staff during the implementation of the project.

The total budget of the program has been established at 18.000.000 EUR, composed of a

15.000.000 EUR contribution of the Belgian Government and an additional contribution of the Mozambican Government estimated at 120.000.000 MTN (equivalent to 3.000.000

EUR) for payment of all taxes and duties, personnel, staff and office space provided by FUNAE and Dutch funds amounting to €23.34M. The duration of implementation has also been increased to 5 years.

During the project Inception phase consideration has been made given the large area of the country and the dispersed population in the rural areas, for a geographical concentration and/or clustering of the activities in order for the follow-up and the cost-effectiveness of the activities. During the inception phase the Project management unit has finished the preparatory activities for implementation in 2011, such as data surveys, preparation of strategies and tenders. This will see the project getting into full-throttle implementation in 2012.

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## 2.1 Analysis of the intervention

Intervention logic	Efficiency	Effectiveness	Sustainability
Specific Objective			
To increase access to hydro, solar and wind energy for			
use in off-grid applications in rural areas, by	В	В	X
investments in renewable energy systems, stimulation			
of micro-finance initiatives and institutional capacity	,		
building			
Result 1:			
Access to energy is increased by the implementation of	В	В	X
solar, wind and hydro projects			
Result 2:			
Financial accessibility to energy is improved	Х	X	X
Result 3:			
Technical and administrative capacity of FUNAE is	X	X	X
increased			

**NOTE**: As the project has just finished the preparatory activities for implementation in its first year, such as data surveys, preparation of strategies and tenders, no tangible results are available; the analysis of outputs will be done in the 2012 annual reporting.

Budget	Expenditure per year	Total expenditure year N (31/12/2011)	Balance of the budget	Execution rate
€23.340.000,00	€26.402,51	€2.930.370,53	€20.383.226,96	13%

**NOTE**: In December 2011, a budget increase of €8.34 m was agreed for the RERD project including Dutch funds, as well as considering one (1) year extension to the agreed period to the end of 2015.

## 2.2 Key elements

Solar systems are acquired to be installed in social infrastructure such as schools, hospitals, administrative centres and water provision points. Hydro systems are developed and financed for provision of electricity of social infrastructure and households. Microfinance is provided for investments in renewable energy systems for use households and provision of energy services (village) entrepreneurs. by Training, coaching and technical support is provided to increase the capacity by FUNAE to implement rural energy as well as provide support for a system of long-term maintenance of renewable energy systems.

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## 2.3 Key Risks

- There is a risk that insufficient hydro projects can be identified within the project period; which will be mitigated by developing a comprehensive strategy to identify hydro power resources in target areas.
- There is a risk that there is few demand for existing wind energy technology by private sector without receiving subsidies.
- There is a risk that insufficient demand exists for consumer products financed by the microfinance mechanism; which will be mitigated by engaging suppliers in the target areas and promotion activities.

## 2.4 Key lessons learned and recommendations

- 1) A hydro investment plan should be written including thorough planning to ensure sufficient and tangible results during the lifetime of the project.
- A promotion plan for small scale solar systems should be developed with the aim of elaborating a marketing strategy of the renewable energy sector for small scale renewable energy products at a later stage. This will require support by an external party with experience on marketing consumer products in rural areas as well as coordination with other stakeholders in the country.
- 3) Establishment of a database for impact assessment data as well as a database for asset management based on GIS technology
- 4) Strengthen maintenance capacity of FUNAE and line Ministries (Health and Education)

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## 3 Analysis of the intervention

#### 3.1 Context

Mozambique is a vast country with less than 20% of the households having access to modern forms of energy. RERD aims to invest in energy infrastructure through its partner Fundo de Energia (FUNAE) by providing schools, hospitals, water pumps, administration buildings with electricity through solar energy and hydro power in selected areas. Even though FUNAE already exists 15 years, and is building a network of delegations throughout the country, it is still a challenge to keep all the systems working in a sustainable way.

#### 3.1.1 Evolution of the Context

The original TFF described the investment of €15m in the energy sector in Mozambique, however due to the contribution of the Netherlands of net €8.4m, most budget lines have increased and additional activities need to be included. There will be additional solar systems for social infrastructure, as well as additional villages to be powered by hydro power and investment funds. Also, additional investment in the new delegations will be part of the new activities.

#### 3.1.2 Institutional Anchoring

The institutional anchoring is very appropriate for most activities in the programme. The TAs have obtained all room to develop proposals, ensure quality control and link with other ongoing activities as part of the FUNAE programme, also materials developed by the project (e.g. baseline survey) will be used as a standard

for

future

programmes.

#### 3.1.3 Execution Modalities

The execution modality of co-management for most of the activities is very appropriate as FUNAE is taking responsibility for the activities while at the same time TAs have the opportunity to ensure certain level of quality control. The limited amount planned as direct management entails all activities that are within the scope of BTC and therefore also appropriate.

#### 3.1.4 Harmo-dynamics

The BTC Resident Representative as well as the Attachée on Energy of the Belgium Mission are members of the Energy Working Group as well as a sub-group on off-grid energy. The platform works well to share information, plans, reviews and critical insights on how to work more effectively with the Mozambican partners.

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The RERD programme has been able to link up with most activities taking place in the off-grid energy sector in Mozambique, such as GIZ "Energising Development programme", the World Bank EDAP sector programme, the Norwegian programme to assist with capacity building at FUNAE. It has taken note of less-harmonised interventions by Korea, Japan and Portugal and is seeking to establish links at least at information sharing level. For the implementation of water pumps the RERD is establishing links with water sector programmes.

A concrete example of harmonised approach is that the technical requirements for solar systems installed by FUNAE has been standardised between the World Bank and BTC as per the 'FUNAE Standard" of systems aimed at electrification of social infrastructure (schools, hospitals, water pumps, administrative buildings, staff houses, etc.).

## 3.2 Specific Objective

#### 3.2.1 Indicators

## **Specific Objective**

To increase access to hydro-electric, solar and wind energy for use in off-grid applications in rural areas, by investments in renewable energy systems, stimulation of micro-finance initiatives and institutional capacity building

Indicators	Baseline	Progress	Progress	Target	End	Comments
	value	year N-1	year N	year N	Target	
Number of beneficiaries	0%	n/a	0%	n/a	-	Baseline being established
Beneficiary Satisfaction	n/a	n/a	n/a	n/a	-	Indicators being established
Total Power Installed	0%	n/a	0%	n/a	-	Targets still being established for Solar, Hydro and Wind power, depending on identification and feasibility results of sites

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### 3.2.2 Analysis of progress made

The methodology for the baseline study has been developed. FUNAE requested standardisation of the baseline for all categories of projects. Due to this additional task as well as introduction of verification visits to the preselected infrastructures of the solar tender, the field visits have been postponed and took place in the 4<sup>th</sup> quarter. Results will be available in the 1<sup>st</sup> quarter of 2012.

### 3.2.3 Risks and Assumptions

		Potential implication	ons	Risk
Risk	Probability			Level
	(score)	Describe	Score	(score)
The development of hydro sites will take longer than expected, limiting the outputs and therefore impact of the programme		Less installed capacity and less beneficiaries through hydro power		С
The sale of consumer products for solar energy will be lower due to low demand	Medium	Less beneficiaries reached with clean energy		С
Villages targeted by the programme already have access to electricity.	Low	Additional cost but no beneficiaries	Medium	В

### 3.2.4 Quality criteria

Criteria	Score	Comments
Effectiveness	Х	The project has just started
Efficiency	Х	The project has just started
Sustainability	Х	The project has just started
Relevance	А	In the current context, most components of the project appear relevant*

<sup>\*</sup> The relevancy of the wind water pumping and micro finance for solar systems components are under investigation and more insight will be available next year.

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## 3.2.5 Potential Impact

There is no reason why the potential impact that was assumed during project formulation cannot be achieved.

## 3.2.6 Recommendations

Recommendations	Source	Actor	Deadline
Hydro site development plan including planning to be			
written by FUNAE in conjunction with TA	Internal	J Cloin	1 MAR 2012
Promotion plan concept to be developed for small scale			
solar systems	Internal	I Novotny	1 APR 2012

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### **3.3 Result 1**

#### 3.3.1 Indicators

Result 1: Access to energy is increased by the implementation of solar, wind and hydro projects

Indicators	Baseline value	Progress year N-1	Progress year N	Target year N	End Target	Comments
List of priorities is established	N	n/a	Y	Y	Y	List of priorities is under development for hydro and wind
Number of total power of hydro power plants and solar systems installed, operational and properly maintained and quantity and quality of electricity provided to the beneficiaries	-	-	-	-	-	Pipeline of hydro projects is still under development
Number of schools, hospitals and administrative posts electrified, and quantity and quality of electricity provided to the beneficiaries.	-	-	-	-	704	No systems installed yet
Number of solar water pumps installations	-	-	-	-	-	Target being identified with partners
Number of windmills for water pumping for drinking water / irrigation	-	-	-	-	-	Feasibility of wind water pumping yet to be identified

<u>NOTE</u>: The final number of infrastructures of solar installations can still slightly change, and there are no hydro power plants or solar and wind water pumps identified, therefore the End Target has not been established.

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#### 3.3.2 Evaluation of activities

Activities		Progress:			
	Α	В	С	D	
1 Needs assessment and feasibility studies		Х			
2 Hydro power project implementation				Х	Quality of pipeline projects low
3 Solar Power project implementation	Х				
4 Wind Water pumping			Х		Wind water pumping delayed: first wind resource assessment

#### 3.3.3 Analysis of Progress Made

The best progress has been achieved with the solar systems, where contracting was achieved in late 2011. The hydro component has known a few disappointments. There was the expectation that one hydro project was ready for investment but it turned out that the electricity grid had arrived close to the village, therefore the investment was not viable anymore. In addition, it has taken a very long time to commission studies to investigate the (pre-) feasibility of projects in the provinces of Manica and Niassa. A few are now underway but progress is slow and without intervention there is a risk that insufficient projects are developed before the end of the project.

#### 3.3.4 Risks and Assumptions

	Probability	Potential implications	Risk	
Risk	(score)	Describe	Score	Level (score)
Quality consultants are found Geographical dispersion	Medium	Less results through access to hydro power Insufficient projects are developed before the end of the project	High	O

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Maintenance issue Sufficient opportunities are found	Medium	Theft or vandalism of installed systems resulting in systems Medium not operational	С	
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## 3.3.5 Quality Criteria

Criteria	Score	Comments
Effectiveness	С	Need to identify hydro sites through GIS technology
Efficiency	С	Visits to areas through the Government system are not very efficient as Government officials do not always know best where hydro potential is available
Sustainability	В	Attention is required to the maintenance of solar systems as many systems in schools are not operational.

## 3.3.6 Budget execution

Refer to Annexure 7.3 below

## 3.3.7 Recommendations

Recommendations	Source	Actor	Deadline
Investment plan for hydro plants to be written	Internal	J Cloin	31 MAR '12

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#### **3.4 Result 2**

#### 3.4.1 Indicators

Result 1: Financial a	Baselin e value	Progress year N-1	Progress year N	Target year N	End Target	Comments
Presence of MFIs offering credit for RE	0	Х	Х	Х	X	Will be defined after pilot phase
Number of beneficiaries	0	X	X	х	х	Targets are being established based on strategy (results of pilot phase)
Amount of private sector projects financed	0	Х	Х	X	X	Targets are being established based on strategy
Total funding invested in Renewable Energy projects	0	n/a	n/a	n/a	€2 m	Will be result of amount of projects financed

**NOTE**: Regarding the first indicator in the TFF, presence of MFIs, this will not be changed by the project. What can be influenced is the number of MFIs that offer credit for renewable energy products. This can be identified once the letters of interest (pilot phase) are being received by FUNAE.

In the past Private Sector projects have been identified by FUNAE in the area of wind water pumps for irrigation or mini hydro plants. Currently the suitability of these technologies needs more investigation in order to promote them.

#### 3.4.2 Evaluation of activities

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Activities		Prog	ress:		Comments (only if
	Α	В	С	D	the value is C or D)
1. Set Up of Micro-Finance system			Х		Limited capacity within FUNAE
2 Promotion of Micro-Finance system	n/a	n/a	n/a	n/a	Activity did not yet start
3 Investment Funds	n/a	n/a	n/a	n/a	Activity did not yet start

## 3.4.3 Analysis of progress made

The progress with regard to the microfinance activities has been data survey of existing microfinance institutions, analysis of documentation and stakeholders, existing market, purchase and testing of low cost consumer products for renewable energies, and preparatory work. Given the fact that there are no existing projects for providing funds through microfinance institutions in Mozambique, FUNAE is opting for a step by step approach.

## 3.4.4 Risks and Assumptions

	Probability	Potential implications	Risk		
Risk (describe)	(score)	Describe	Score	Level (score)	
Affordability, willingness to pay, cooperation of Micro-finance		Insufficient demand for low cost solar systems			
institutions Demand exceeds subsidies	Medium	exists Impact limited through low penetration rate	High	С	

## 3.4.5 Quality criteria

Criteria	Score	Comments
Effectiveness	Х	The project has just started
Efficiency	Х	The project has just started
Sustainability	Х	The project has just started

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## 3.4.6 Budget execution

Refer to Annexure 7.3 below.

## 3.4.7 Recommendations

Recommendations	Source	Actor	Deadline
Promotion plan concept to be developed	Internal	I Novotny	30 APR 2012
Start up of pilot phase	Internal	I Novotny	30 APR 2012

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#### **3.5 Result 3**

#### 3.5.1 Indicators

Result: Technical and Administrative capacity of FUNAE is increased						
Indicators	Baseline value	Progress year N-1	Progress year N	Target year N	End Target	Comments
Number of trained people	0	n/a	6	12	х	No specific end-target as this is not an aim in itself; more focus on quality and appropriateness of training
Number of trainings given	0	n/a	2	3	x	One training did not materialise due to cancellation by the training institute
Number development & research projects	0	n/a	Х	х	Х	Two research projects are in preparation
Number of entries in GIS Asset management database	0	n/a	n/a	n/a	all	All systems should be in a the GIS asset management database by the end of the project

<u>NOTE</u>: To set a baseline for these indicators is not taking into account the dynamics of the training needs during the project period, quality and offers of training institutions in the market, as FUNAE is a growing institution. In case of trainings organized in Mozambique a higher number of persons can participate for the same cost compared to training abroad. The planning is on a yearly basis and depends on the needs assessments and evaluation of the received trainings as well as on the budget available.

#### 3.5.2 Evaluation of activities

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Activities	_			Comments (only if the value is C or D)	
	Α	В	С	D	
1. Training		Х			
2. Research and Development			Х		Has not started yet, but plans have developed
3. GIS System			Х		No clear strategy for development of GIS
4. Technical Assistance	Х				
5. Set up of new delegations	n/a				Has not started yet.

## 3.5.3 Analysis of progress made

Two training programmes have been finalised in 2011. These have been well-received by the FUNAE staff concerned. It is however unclear to what degree they do fulfil the needs and remain relevant. Therefore, a follow-up procedure has been elaborated with the Human Resource department of FUNAE to investigate the effectiveness of trainings.

The GIS system is a very high priority within FUNAE. Under pressure to produce quick results, the danger exists that the GIS system is not properly designed to provide support for asset management and planning, but instead is just BE producing nice overview maps with FUNAE systems. Therefore, a consultancy is suggested to have an external expert with experience in designing such systems to assist early 2012 with the design of the GIS database and interface with the people who work with it.

#### 3.5.4 Risks and Assumptions

Risk	Probability	Potential implications	Risk	Level	
	(score)	Describe	Score	(score)	
Training not relevant	Low	Waste of resources from training fund	Medium	В	
GIS system not appropriate for asset management and planning	Low	Waste of resources from GIS funds	Medium	В	

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## 3.5.5 Quality criteria

Criteria	Score	Comments
Effectiveness	В	In order for the GIS to be an effective system, it's structure must be designed properly.
Efficiency	В	The efficiency of trainings abroad is limited due to high travelling cost and language barriers (English-Portuguese)
Sustainability	В	It is unclear whether the trained staff can be retained within FUNAE

## 3.5.6 Budget execution

Refer to Annexure 7.3 below

## 3.5.7 Recommendations

Recommendations	Source	Actor	Deadline
A standard training follow-up evaluation has been established within FUNAE to investigate the relevancy and the effectiveness of the training components	Internal	I Novotny	Evaluation is carried out after each training session with 6 months follow up periods.
Consultancy services to be recruited to assist with the design of GIS database	Internal	I Novotny and J Cloin	31 MAR 2012

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## 4 Transversal Themes

#### 4.1 Environment

Recycling of batteries must be included when new batteries are purchased to replace existing ones.

Impact of hydro on environment will be limited as there will be no dams retaining water, only overflowing walls to lift the water.

#### 4.2 Gender

Gender data gathering has been included in the baseline surveys.

FUNAE has gender focal points in all divisions as well as a gender activity plan.

## 4.3 Social economy

The impact on social economy will be measured during the monitoring visits and evaluations once the systems have been installed.

## 4.4 Children's rights

The impact on children's rights will be measured during the monitoring visits and evaluations once the systems have been installed.

#### 4.5 HIV /AIDS

There is no discrimination within the activities regarding people with HIV/Aids. Better conditions for awareness campaigns exist in the electrified health centres, However the activities depend on the initiatives of the Ministry of Health.

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## 5 Decisions taken by the JLCB and follow-up

Decisions	Source	Actor	Time of decision	Status
Approval of training plan for 2011	minutes	I Novotny	Feb 2011	executed
Development of Hydro Power plant guidelines	News bulletin	J Cloin	July 2011	Final Draft at Ministry of Energy
Draft a comparison between solar water pumping and wind water pumping	News	J Cloin	July 2011	Final Version presented at JLCB
Microfinance plan of approach	minutes	I Novotny	July 2011	Final version presented at JLCB
Approval of training plan for 2012	minutes	I Novotny	July 2011	Identification of training institutions
Approval of activity plan and budget for 2012	minutes	Project Management Team	July 2011	In execution
Delay wind water pumping and develop strategy to measure wind resource	minutes	J Cloin	Nov 2011	Draft of plan being developed
Approval of start of Microfinance pilot phase	minutes	I Novotny	Nov 2011	In execution
Approval of Baseline Study	minutes	I Novotny	Nov 2011	Field missions for sample infrastructures concluded

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## **6 Lessons Learned**

	Lessons learned	Target audience
1	Providing a microfinance fund for the purchase of a product based on a new technology (use of solar energy) is not sufficient to create demand for this type of products; there have to be efforts to promote access to and knowledge about the advantages and limitations of this technology on basis of renewable energy products; at the same time availability of these products have to be ensured in the rural areas, as well as a reliable structure to enforce repayment of loans without collateral; this needs to involve all relevant stakeholders, from policy level to private sector, training and awareness raising.	BTC HQ, BTC Mozambique, FUNAE
2	An integrated approach between FUNAE and the line Ministries is required to ensure proper repair and maintenance and hence sustainable operation of solar systems placed in public infrastructure	•

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## 7 Annexes

- 7.1 Logical framework
- 7.2 M&E activities
- 7.3 "Budget versus current (y m)" Report
- 7.4 Beneficiaries
- 7.5 Operational planning Q1-2011

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## 7.1 LOGICAL FRAMEWORK

This logical framework is valid for the total project (merging all contributions).

Indicators	Means of Verification	Risks and assumptions
<ul> <li>alphabetisation degree/number of students (in evening classes)</li> <li>vaccination ratios and health care quality</li> <li>water chore time</li> <li>crop yields</li> </ul>	<ul> <li>surveys from line ministries</li> <li>site visits</li> <li>vaccine quantities</li> <li>agriculture statistics</li> </ul>	<ul> <li>energy systems are properly designed, installed and maintained</li> <li>population is motivated to profit from the energy systems provided</li> </ul>
Indicators	Means of Verification	Risks and assumptions
- Number of beneficiaries - Beneficiary satisfaction - Total power installed	<ul> <li>Surveys/impact evaluations</li> <li>project reports</li> <li>audits</li> </ul>	Systems are well designed, installed and maintained     Projects are implemented on time and on budget
	- alphabetisation degree/number of students (in evening classes) - vaccination ratios and health care quality - water chore time - crop yields  Indicators - Number of beneficiaries - Beneficiary satisfaction	- alphabetisation degree/number of students (in evening classes) - vaccination ratios and health care quality - water chore time - crop yields  Indicators  Means of Verification  - Number of beneficiaries - Beneficiary satisfaction  - surveys from line ministries - vaccine quantities - agriculture statistics  - site visits - vaccine quantities - agriculture statistics  - Surveys/impact evaluations - project reports

Intermediate Result 1	Indicators	Means of Verification	Risks and assumptions
Access to energy is increased by the implementation of solar, wind and hydro projects.	- the list of priorities is established  - number and total power of hydro-electric power plants and solar systems installed, operational and properly maintained and quantity and quality of electricity provided to the beneficiaries  - number of schools, hospitals and postos administrativos electrified and quantity and quality of electricity provided to the beneficiaries  - number of solar water pumping installations  - number of windmills for water pumping for drinking water/irrigation	- project reports - surveys - GIS-system	
Activities for R1	Actors involved	Estimated Budget	Risks and assumptions
R1.A1 Needs assessment and feasibility studies	Consultancy, Min Education, Min Health, Min Energy	450.000 €	Quality consultants are found Geographical dispersion
R1.A2 Hydropower project implementation	Consultancy (supervision), Companies	6.000.000 €	Maintenance issue Sufficient opportunities are found
R1.A3 Solar power project implementation	Consultancy (supervision), Companies	9.700.000 €	Maintenance issue
R1.A4 Wind water pumping	Consultancy (supervision), Companies	500.000 €	Maintenance issue

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Intermediate Result 2	Indicators	Means of Verification	Risks and assumptions
Financial accessibility to energy is improved	<ul> <li>Presence of MFI's</li> <li>Number of beneficiaries</li> <li>Amount of private sector projects financed</li> </ul>	<ul> <li>progress reports</li> <li>reports from Micro-Finance institutions</li> </ul>	Affordability, willingness to pay, cooperation of Micro-finance institutions
Activities for R2	Actors involved	Estimated Budget	Risks and assumptions
R2.A1. Set-up of micro- finance system	Consultancy, Micro-finance institutions	100.000 €	
R2.A2 Promotion of MF system	Media	100.000 €	Beneficiaries have access to media
R2.A3 Investment funds	Micro-finance institutions	2.000.000 €	Demand exceeds subsidies

Intermediate Result 3	Indicators	Means of Verification	Risks and assumptions
Technical and administrative capacity of FUNAE is increased	<ul> <li>number of trained people</li> <li>number of trainings given</li> <li>number of document research projects</li> <li>presence of a GIS-system</li> </ul>	- reports, audits	- trained people stay at FUNAE (no brain-drain) - GIS-system is kept up to date - Staffing is kept sufficient for implementation and research
Activities for R3	Actors involved	Estimated Budget	Risks and assumptions
R3.A1. Training	FUNAE staff	300.000 €	
R3.A2. R&D		300.000 €	
R3.A3. GIS-system	Consultancy, software provider, GPS suppliers	150.000 €	
R3.A4. Technical assistance	втс	1.725.000 €	Recruitment delay
R3.A5. Set-up of new delegations	FUNAE	1.000.000 €	

Renewable Energy (MOZ 10 022 01) – Version after QCC of the 27/06/2011 and after JLBC of the 13/07/2011

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## 7.2 MONITORING & EVALUATION ACTIVITIES

 Evaluation of earlier implemented wind water pumping systems in Gaza and Inhambane Provinces (June 2011) by FUNAE and Technical Assistants

Baseline study for impact measurement (November and December 2011)FUNAE and Technical Assistant

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## 7.3 BUDGET VERSUS CURRENT (Y - M)

#### Budget vs Actuals (Year to Date, Last 5 years) of MOZ0901811 Project Title: Expansion de systèmes d'énergie renouvelable pour la promotion du développement rural Budget Version : D1 Currency : EUR. YID: Report includes all valid transactions, registered up to today Expenses Start to 2008 2009 2011 2012 Status Fin Mode Amount Total Balance 22,325,000,00 26.016.82 2.843,685,80 2.869.702.62 19.455.297.38 2236 A INCREASE ACCESS TO ENERGY 16 650 000 00 21,401,40 2 481 520 40 2.503.021,80 14 145 978 20 15% 01 Access to energy is increased by 01 Needs assessments, feasibility studies COGES 450,000.00 21,401,40 54,456,35 75.857,75 374,142,25 17% 02 Hydroprojects COGES 6.000.000.00 -1.498,46 0.00 -1.498,46 6.001,498,46 096 03 Solar electrification COGES9.700.000.00 2,428,662,51 0.00 2,428,662,51 7.271.337,49 04 Wind water pumping COGES 500.000.00 0.00 0.00 500.000.00 811,44 02 Micro financing mecanisms are developed 2,200,000,00 811,44 0% 0.00 2.199.188.56 COGES 100,000.00 99 188 55 01 Set-up of MF mechanism 811.44 0.00 811.44 196 02 Communication COGES 100.000.00 0,00 0,00 100.000,00 0% 03 Investment funds COGES2.000.000,00 0,00 0.00 2,000,000,00 096 3.475.000,00 4.615,42 361.253,96 11156 03 Capacity of co-management is increased 0.00 365.869.38 3.109.130,62 COGES 300.000.00 26.860.71 25,860,71 273.139.29 01 Training 0.00 02 Research and Development COGES 300.000.00 0.00 0.00 300,000,00 1796 03 Implement GIS asset management system 19 470 10 19,470,10 13% COGES 150:000.00 130,529,90 0,00 4.615,42 04 Technical Assistance REGIE 1.200.000,00 314.923,15 0.00 319.538,57 880.461,43 27% 05 Set-up of new delegations/offices COGES 1.000,000,00 0.00 1.000,000,00 096 0,00 06 Technical Assistance - MOZ1002211 REGIE 525.000.00 525.000,00 0.00 0.00 385,69 139.500.00 507,27 892.96 138 507.04 1756 X RESERVE 139,500,00 385,69 507.27 0.00 01 Reserve 892.96 138,607,04 196 01 co-managed Reserve COGES 139.500.00 385,69 507,27 0.00 892.96 138.607,04 1% 86,177,46 Z GENERAL MEANS 875.500,00 86,177,45 789.322,54 01 Personnel Costs 48.000,00 6.106,95 0.00 6.106,95 41.893,05 13% 2,600,500,00 4.615.42 401,100.61 405.716,03 2.194.783.97 1656 0.00 COGEST 20.739.500.00 21.787,09 2.529.269.93 0.00 2.551.057.01 18.188.442,99 12% TOTAL 23.340.000.00 25,402,51 2.930.370.53 2.956.773,04 20.383,226,96 13% Budget vs Actions (Year to Date, Last 5 Years) of MOZD901811 Printed on 1/02/2012

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### Budget vs Actuals (Year to Date, Last 5 years) of MOZ0901811

Project Title: Expansion de systèmes d'énergie renouvelable pour la promotion du développement rural

Budget Version : D1
Currency : EUR

YtD: Report includes all valid transactions, registered up to today

			Start to				Expenses			
	Status Fin M	ode Amount	2008	2009	2010	2011	2012	Total	Balance	% Exec
01 Accoutnant and Administrative officer	REGIE	48.000,00				6.106,95	0,00	6.106,95	41,893,05	13%
02 Investments		145.000,00				56.832,21	0,00	56.832,21	88.167,79	38%
01 Vehicles	REGIE	120,000,00				53.965,48	0,00	53.965,48	66.034,52	45%
02 ICT	REGIE	25.000,00				2.866,73	0,00	2.866,73	22.133,27	1196
63 Operating costs		492,500,00				11,403,01	0,00	11,403,01	481.096,99	2%
01 Vehicles operation and maintenance	REGIE	103.000,00				5.212,20	0,00	5.212,20	97.787,80	5%
02 Communication costs	REGIE	34.500,00				421,83	0,00	421,83	34.078,17	196
03 Mission costs	REGIE	313,000,00				3.296,52	0,00	3.296,52	309.703,48	1%
04 Other operating costs	REGIE	42,000,00				2.472,46	0,00	2.472,46	39.527,54	5%
04 Audits, Follow-up and Evaluations		190,000,00				11.835,28	0,00	11,835,29	178.164,71	6%
01 Audit	REGIE	40,000,00				8.889,95	0,00	8.889,95	31,110,05	22%
02 Internal control and risks asssessment	REGIE	50.000,00					0,00	0,00	50.000,00	D96
03 Mid term and Final evaluation	REGIE	50,000,00					0,00	0,00	\$0,000,00	D%
04 Baseline study	REGIE	20,000,00				2.145,27	0,00	2.145,27	17.854,73	11%
05 Follow-up and backstopping	REGIE	30,000,00				800,07	0,00	900,07	29, 199,93	3%
	REGIE	2.600.500,00			4.615,42	401.100,51	0,00	405.716,03	2.194.783,97	16%
		20.739.500,00			21.787,09	2.529.269,93	0,00	2.551.057,01	18.188.442,99	
	TOTAL	23.340.000,00			25.402,51	2.930,370,53	0,00	2.956,773,04	20.383.226,96	13%

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## **BUDGET TFF**

MO	<b>)Z</b> 09	0181	1 - Renewable Energy for Rural Development	N°	Unit price	Budget (€)	%
A			Increase access to energy		1	14.200.000 €	94,7%
$\overline{A}$	01		Access to energy is increased by implementation			11.300.000 €	75%
Α	01	01	Needs assessments, feasibility studies			300.000 €	
Α	01	02	Hydroprojects			4.000.000 €	
Α	01	03	Solar electrification			6.500.000 €	
Α	01	04	Wind water pumping			500.000 €	
$\mathcal{A}$	02		Micro financing mecanisms are developed and subsidised			1.150.000 €	8%
Α	02	01	Set-up of MF mechanism			100.000 €	
Α	02	02	Communication			50.000 €	
Α	02	03	Investment funds			1.000.000 €	
$\mathcal{A}$	03		Capacity of co-management is increased			1.750.000 €	12%
Α	03	01	Training			200.000 €	
Α	03	02	Research and Development			200.000 €	
Α	03	03	Implement GIS asset management system			150.000 €	
A	03	04	Technical Assistance	2	12.500	1.200.000 €	
Χ			Reserve			79.000 €	0,5%
X	01		Reserve			79.000 €	
X	01	01	co-managed Reserve			79.000 €	
Z			General Means			721.000 €	4,8%
7.	01		Personnel Costs			48.000 €	
Z	01	01	Accoutnant and Administrative officer	1	1.000	48.000 €	
Z	02		Investments			95.000 €	
Z	02	01	Vehicles	2	40.000	80.000 €	
Z	02	02	ICT	1	15.000	15.000 €	
Z	03		Operating costs			388.000 €	
Z	03	01	Vehicles operation and maintenance	96	750	72.000 €	
Z	03	02	Communication costs	48	500	24.000 €	
Z	03	03	Mission costs	100	2.500	250.000 €	
Z	03	04	Other operating costs		1 1	42.000 €	
Z	04		Audits, Follow-up and Evaluations			190.000 €	
Z	04	01	Audit	2	20.000	40.000 €	
Z	04	02	Internal control and risks asssessment	1	50.000	50.000 €	
Z	04	03	Mid term and Final evaluation			50.000 €	
Z	04	04	Baseline study	1	20.000	20.000 €	
Z	04	05	Follow-up and backstopping		1	30.000 €	
			Total			15,000,000 €	100,0%

co-management	13.079.000
direct-management	1.921.000

Mode	Y1	<b>Y</b> 2	Y3	<b>Y</b> 4
	850.000 €	2.425.000 €	5.750.000 €	5.175.000 €
	400.000 €	1.750.000 €	4.750.000 €	4.400.000 €
co-management	100.000 €	150.000 €	50.000 €	0€
co-management	150.000 €	500.000 €	1.500.000 €	1.850.000 €
co-management	100.000 €	1.000.000 €	3.000.000 €	2.400.000 €
co-management	50.000 €	100.000 €	200.000 €	150.000€
.,	50.000 €	175.000 €	525.000 €	400.000 €
co-management	50.000 €	50.000 €	0 €	0€
co-management	0 €	25.000 €	25.000 €	0€
co-management	0 €	100.000 €	500.000 €	400.000 €
	400.000 €	500.000 €	475.000 €	375.000 €
o-management	25.000 €	75.000 €	75.000 €	25.000€
co-management	25.000 €	75.000 €	75.000 €	25.000€
co-management	50.000 €	50.000 €	25.000 €	25.000€
lirect-management	300.000 €	300.000 €	300.000 €	300.000 €
co-management	0 €	0 €	0 €	79.000 €
	0€	0 €	0 €	79.000 €
o-management	0€	0 €	0 €	79.000€
own-management	299.000 €	142.000 €	142.000 €	138.000 €
	12.000 €	12.000 €	12.000 €	12.000 €
direct-management	12.000 €	12.000 €	12.000 €	12.000 €
	90.000 €	0 €	5.000 €	0€
lirect-management	80.000 €	0 €	0 €	0€
lirect-management	10.000 €	0 €	5.000 €	0€
	97.000 €	97.000 €	97.000 €	97.000 €
lirect-management	18.000 €	18.000 €	18.000 €	18.000€
lirect-management	6.000€	6.000 €	6.000 €	6.000€
lirect-management	62.500 €	62.500 €	62.500 €	62.500 €
direct-management	10.500 €	10.500 €	10.500 €	10.500 €
	100.000 €	33.000 €	28.000 €	29.000 €
lirect-management	20.000 €	0 €	20.000 €	0€
direct-management	50.000 €	0 €	0 €	0€
direct-management	0€	25.000 €	0 €	25.000 €
direct-management	20.000 €	0 €	0 €	0€
direct-management	10.000 €	8.000 €	8.000 €	4.000 €
	1.149.000 €	2,567,000 €	5,892,000 €	5.392.000 €

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### 7.4 BENEFICIARIES

There is no final number of beneficiaries e identified in the field as no systems have been installed.

Within FUNAE, staffs have been trained using project resources and therefore, they are benefitting from the project.

After establishment of the baseline in the field, the number of beneficiaries will be elaborated upon in more detail.

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## 7.5. OPERATIONAL PLANNING Q1 - 2011

#### R1: Access to energy is increased by the implementation of solar, wind and hydro projects

Activities	Sub activities	J	F	М	A	М	J	J	A	s	0	N	D	Person in charge	Remarks - Difficulties – Points of attention
R1.A1 Needs assessment and feasibility studies	1-Needs Assessment on SPV Electrification: 50 Schools and 50 health Centre; 2-Feasability Study on Mini-hydro in Manica (Sembezeia & Mavonde), Zambezia (Nitulo) and Niassa (Mbau, Messinge, Malanga, Cungerere, Ndirima and Nungo)	х	x	х		х	х	x	x	x	X	х	x	DEP/DSSE/DMH	
R1.A2 : Hydropower project implementation	1-Implemention of the Nhamuzarara mini hydro project					х	х	х	х	х	Х	Х	Х	Mini-Hydro department	
R1.A3 : Solar power project implementation	1- Zambezia: Electrification of 50 Schools, 50 Heath Centre, 17 Adm.Building and 50 Water Pumping systems 2- Manica: Electrification of 25 Schools and 14 Adm.Building 3- Sofala: Electrification of 50 Schools, 50 Heath Centre, 8 Adm.Building and 50 Water Pumping systems					х	х	х	х	х	х	х	х	DSSE	
R1.A4 :Wind Water pumping	Finalizing the Wind Atlas with FUNAE Support					Х								DSSE	The activities for 2011 depend on the findings of the "Wind Atlas" that is being developed.

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Activities	Sub activities	J	F	М	A	М	J	J	А	s	0	N	D	Person in charge	Remarks - Difficulties – Points of attention
R2.A1 : Set up of Micro-finance mechanism	1-Preparation for the Sofala assessment visit;     2-Desig the precise list of products to be financed     3-Assessment to Sofala Province	х	х	х	Х	х	x	х	х	x	x	x	x	Finance Department	
R2.A2 : Promotion of micro-finance mechanisms								х	х	х	х	х	х	Finance Department	
R2.A3 : Investment funds														Finance Department	

### R3: The technical and administrative capacity of FUNAE is improved

Activities	Sub activities	J	F	М	Α	М	J	J	Α	s	0	N	D	Person in charge	Remarks - Difficulties - Points of attention
<b>R3. A.1</b> : Training	1-Selection of the institution to offer the short courses to FUNAE Staff 2-Training Programme			x	х	х	х	x	x	x	х	х	х	FUNAE	Ongoing activities according to the internal training plan of FUNAE
R3. A.2: Research and development				х	х	х	х	х	х	х	х	х	х	DEP	Identification of research topics during
R3. A.3: Implement a GIS asset management system	1-Design of the specification of the GIS Software 2-Aquisition and Installation of the System 3-Traning to FUNAE Staff				x	х	x	x	x	х	х	x	x	IT Department	Preparation of data base and development of monitoring tool using GIS

### Z. General Means

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#### Personnel

Activities	Sub activities	J	F	М	Α	М	J	J	Α	s	0	N	D	Person in charge	Remarks - Difficulties – Points of attention
Recruitment (started up or in case of resignation)	Recruitment of Finance and Administration Officer													BTC/FUNAE	Recruitment process and signing of contract took place in 2010.
	Socio economic TA	Х												ВТС	Start of work in project February 1 <sup>st</sup> , 2011
	Renewable Energy Engineer	х	х											BTC	Contract by March 1 <sup>st</sup> , 2011, Start of work at project April, 2011;
	Prior notice (in closing phase)														
Training of project staff	Energy efficiency (BTC Brussels)				х									втс	

#### Investments

Activities	Sub activities	J	F	М	Α	М	J	J	Α	s	0	N	D	Person in charge	Remarks - Difficulties – Points of attention
Vehicles	Procurement				x	х	х	х	х					BTC /HQ	Each of the two vehicles will be at purchased separately;
	Import and registration						х			х				BTC/FUNAE	
IT equipment	Purchase of two laptops and one Computer		х	Х										втс	completed
Office supplies and	Office chairs and set of drawers					Х								BTC	
equipment	Others													BTC	

## **Quality (Monitoring & Evaluation)**

			_							_	_		_	Person in	Remarks - Difficulties -
Activities	Sub activities	J	F	М	Α	М	J	J	Α	S	0	N	D	charge	Points of attention

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	Monitoring of technical activities	х	х	х	х	х	x	x	х	х	х	x	x	FUNAE /BTC	These are on-going activities on a permanent
Backstopping	Monitoring of financial aspects	х	х	х	х	х	х	х	х	х	х	х	х	FUNAE /BTC	basis according to the internal rules and
	Monitoring of socio economic development	х	х	х	х	х	х	х	х	х	х	х	х	FUNAE /BTC	regulations of the implementing national partner and BTC
	Monitoring of institutional development	х	х	x	x	х	х	х	х	х	х	х	х	FUNAE /BTC	
	Elaboration Terms of Reference														Mid Year 3 (2013)
Mid-term Evaluation	Tender of consultant/company														
iviid-term Evaluation	Supervision of evaluation process														
	Analysis and approval of final report														
	Elaboration Terms of Reference														End Year 4 (2014)
Final Evaluation	Tender of consultant/company														
Tindi Evaluation	Supervision of evaluation process														
	Analysis and approval of final report														
Audit	Elaboration of Terms of Reference, tender,					Х									Public Tender to select the
Audit	audit activities, analysis, final report														Audit Company