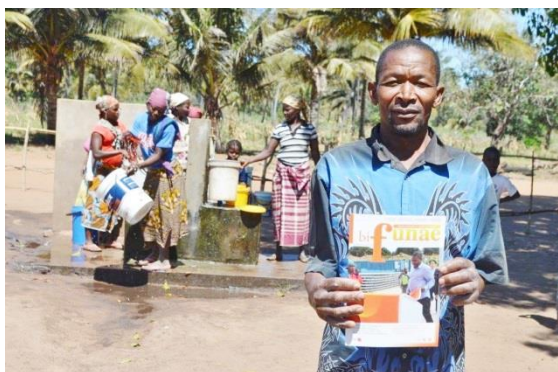




# FINAL REPORT RERD 2011 - 2017

## RENEWABLE ENERGY FOR RURAL DEVELOPMENT

(MOZ 0901811 & MOZ1002211)



## Table of Contents

<b>TABLE OF CONTENTS.....</b>	<b>2</b>
<b>INTERVENTION FORM.....</b>	<b>4</b>
<b>GLOBAL APPRECIATION .....</b>	<b>5</b>
<b>PART 1: RESULTS ACHIEVED AND LESSONS LEARNED.....</b>	<b>6</b>
<b>1 ASSESSING THE INTERVENTION STRATEGY .....</b>	<b>6</b>
1.1 CONTEXT	6
1.2 IMPORTANT CHANGES IN INTERVENTION STRATEGY	8
<b>2 RESULTS ACHIEVED .....</b>	<b>13</b>
2.1 MONITORING MATRIX	13
2.2 ANALYSIS OF RESULTS 15	
<b>3 SUSTAINABILITY.....</b>	<b>28</b>
<b>4. LEARNING .....</b>	<b>32</b>
4.1 LESSONS LEARNED	32
RECOMMENDATIONS	34
<b>PART 2: SYNTHESIS OF (OPERATIONAL) MONITORING .....</b>	<b>37</b>
<b>1 FOLLOW-UP OF DECISIONS BY THE JLCB .....</b>	<b>37</b>
<b>2 EXPENSES .....</b>	<b>38</b>
<b>3 DISBURSEMENT RATE OF THE INTERVENTION .....</b>	<b>39</b>
<b>4 PERSONNEL OF THE INTERVENTION .....</b>	<b>40</b>
<b>5 PUBLIC PROCUREMENT .....</b>	<b>42</b>
<b>6 PUBLIC AGREEMENTS .....</b>	<b>54</b>
<b>7 EQUIPMENT.....</b>	<b>55</b>
<b>8 ORIGINAL LOGICAL FRAMEWORK FROM TFF : .....</b>	<b>56</b>
<b>9 FINAL LOGICAL FRAMEWORK.....</b>	<b>58</b>
<b>10 COMPLETE MONITORING MATRIX .....</b>	<b>60</b>
<b>11 TOOLS AND PRODUCTS.....</b>	<b>64</b>

## Acronyms

ADB	African Development Bank
AFD	Agence Française de Développement
BTC	Belgian Technical Cooperation
CB	Capacity Building
CDM	Clean Development Mechanism
CEO	Chief Executing Officer
DGDC	Directorate for Development Cooperation
DIPREME	Direcção Provincial de Recursos Minerais e Energia
EDM	Electricidade de Moçambique
EIA	Environmental Impact Assessment
ESMAP	Energy Sector Management Assistance Program
ETR	End Term Review
EU	European Union
FUNAE	Fundo de Energia
GIS	Geographical Information System
GIZ	“Deutsche Gesellschaft fuer Internationale Zusammenarbeit”
ICP	Indicative Cooperation Program
kW	kiloWatt
kWh	kiloWatt hour
kWp	kiloWatt peak
MDG	Millennium Development Goals
MIFs	Micro Finance Institutions
MIREME	Ministry of Mineral Resources and Energy
MTR	Mid Term Review
MZN	Mozambican Metical, about €0.022 (Jan 2016)
PARP	Plano de Acção para a Redução da Pobreza (=PRSP)
PPP	Public Private Partnership
R&D	Research and Development
RERD	Renewable Energy for Rural Development
RR	Resident Representative of BTC
SC	Steering Committee
SME	Small and Medium-sized Enterprises
TA	Technical Assistant
TFF	Technical and Financial File
UGEA	Unidade Gestora Executora das Aquisições (Procurement Unit at FUNAE)
WB	World Bank

## Intervention form

Intervention name	Renewable Energy for Rural Development (RERD)
Intervention Code	MOZ 0901811 and MOZ1002211
Location	Mozambique
Budget	€23.34m
Partner Institution	Fundo de Energia (FUNAE)
Start Date Specific Agreement	20 July 2010 / 28 Dec 2011
Date intervention start /Opening steering committee	14 September 2010
End date Specific Agreement	31 December 2016
Target groups	Mozambicans in rural areas with no access to electricity in Manica, Sofala, Zambézia and Niassa Provinces
Impact <sup>1</sup>	To promote rural development by providing access to energy
Outcome	To increase access to hydro, solar and wind energy for use in off-grid applications in rural areas
Outputs	1. Solar, wind and hydro systems in rural areas installed and operational.
	2. Increased access of rural households to renewable energy products.
	3. Technical and administrative capacity of FUNAE is increased.
Total budget of the intervention	€23.34m
Period covered by the report	2011 – Mid of 2017

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<sup>1</sup> Impact is a synonym for global objective, Outcome is a synonym for specific objective, output is a synonym for result

## Global appreciation

<b>Describe</b> your global appreciation of the intervention (max 200 words):	<b>Describe</b> your global appreciation of the intervention (max 200 words):
<p>The appreciation of FUNAE is very positive. The interventions allowed increasing access to renewable energy by electrification of small rural villages focussing on public infrastructures such as health centres, schools, staff houses and administrative buildings, for an estimated number of 550 000 beneficiaries.</p> <p>The project also contributed to Institutional development with training courses, setting up new delegations, purchase of informatics equipment and the use of GIS tool.</p> <p>The project started slowly because of complex internal institutional procedures and lengthy local procurement processes. However, the situation improved by introducing a team work approach (FUNAE and BTC) and the development and application of improved coordination and communication mechanisms.</p> <p>Other obstacles encountered were the high expectations for Private Sector to engage actively, which was not the case, difficult access to the sites especially during rainy season and political – military tensions in the centre of the country, that difficult timely implementation and monitoring.</p> <p>However, regarding Private Sector involvement, the project eventually successfully conducted a study for FUNAE how to engage with Private sector and looking for finance modalities, in order to promote the development of the solar home system market. This engagement is on-going as pilot options are being implemented and will continue even after the project has ended.</p>	<p>After a slow start registering low disbursement rates, the project improved considerably by implementing MTR recommendations (2013).</p> <p>The project contributed to increase access to energy by electrifying more than 600 public infrastructures and installing 74 solar water pumping systems, 2 mini hydro plants with isolated mini grids (162 kW), 40 km grid extension of a mini hydro with 595 kw capacity (Majaua); 17 hydro feasibility studies are ready for further (private) investments.</p> <p>A maintenance unit and GIS database have been created, monitoring systems and pre-payment metring implemented, new delegations in the provinces supported. FUNAE staff is regularly conducting standardized baseline and impact studies.</p> <p>Ownership of the benefitting line ministries (Health and Education) regarding (financial) contributions to operation &amp; maintenance still needs to be strengthened. Improved management models with private sector participation are needed to guarantee the investments' sustainability.</p> <p>The project contributed to raise awareness within FUNAE that it needs to transform from being an implementing agency to become also a facilitator of market development in the renewable energy sector. It has been recognized that energy services have to be paid for by end consumers (obligatory installation of pre-payment meters) as well as the importance of facilitating Private Sector participation.</p> <p>It is recommended to continue to support FUNAE to consolidate and accompany its transformation towards an important facilitator and promoter of the renewable energy sector in Mozambique.</p>
<b>Score</b> your global appreciation of the intervention <sup>2</sup> :	<b>Score</b> your global appreciation of the intervention <sup>3</sup> :
Satisfactory	Satisfactory
National execution official	BTC execution official
Mario Batsana	Erik Van Malderen

<sup>2</sup> Very satisfactory - Satisfactory - Non satisfactory, in spite of some positive elements - Non satisfactory

<sup>3</sup> Very satisfactory - Satisfactory - Non satisfactory, in spite of some positive elements - Non satisfactory

# PART 1: Results achieved and lessons learned

## 1 Assessing the intervention strategy

### 1.1 Context

#### General context

The intervention “Renewable Energy for Rural Development” (RERD) is part of the Indicative Cooperation Program (ICP 2009 – 2012) between Belgium and Mozambique. The project represents over 30% of the ICP budget. It was formulated in 2009 and started implementation in 2011. Its official completion date was December 2016, but the project continued to run until mid-2017 in order to implement commitments for a proper closure.

During the project implementation period, a new Government was elected in October 2014, resulting in a change of the President, Filipe Nyusi (FRELIMO), starting governing in 2015. Changes in Ministries affected the Energy sector, as the Ministry of Energy merged with the Ministry of Mineral Resources into the Ministry of Mineral Resources and Energy (MIREME). The Renewable Energy Directorate was merged with the Energy Directorate, thus becoming now a sub division. So far there are no negative effects noted in relation to the coordination with MIREME.

Financially, the strong devaluation of the Metical against the EURO have affected the closing planning of the project as the remaining project budget amount became slightly higher than the initially planned. At the start of the project implementation, the exchange rate was about 45 MZN against 1 Euro, this remained up to mid-2015. By then, the political and financial environment changed drastically. In mid-2016, the exchange rate doubled, at more than 80 MZN per Euro. Further, Mozambique didn't maintain in 2016 its economic growth of near 7% as projected in 2015. It is expected for 2017 a slightly improving as was foreseen an economic growth of about 5.5%<sup>1</sup>.

Violent conflicts in the central Provinces of the country where the project has activities (Sofala, Manica, Zambezia) contributed for a delaying in the project implementation in these provinces during 2015 and 2016. Due the provisional period of peace now extended for indefinite period, agreed between the Government and the opposition party RENAMO, in the beginning of 2017, some activities in these provinces have restarted.

Significant investments in energy infrastructure are continuing, due to Mozambique's natural resources potential i.e. natural gas, coal, large hydro power, the backbone electricity line from north to south. EDM, the main electricity utility aimed at electrifying all district capitals. However, the rural areas are still deprived from access to clean energy sources, which is the focus of FUNAE and the need of support by the RERD project.

#### Institutional context

The project is anchored on the local partner institution FUNAE (Energy Fund) that is the only institution in Mozambique mandated by the Government with responsibility for developing off-grid renewable energy solutions in the rural areas. The Fundo Nacional de Energia (FUNAE) was established in 1997 as a public institution to promote rural electrification and rural access to modern energy services, in a sustainable manner, and as a contributor to economic and social development in the country. FUNAE operates exclusively in areas not covered and served by EDM and can be considered as the public institution mandated with the responsibility to develop, finance, build or install energy and electrification systems and solutions in the off-grid areas of the country.

The project alignment with the strategic plan (2010-2014) of the partner institution FUNAE, which took rural electrification as a booster for the fight against poverty and for the socio-economic development, had positive impact in the achievement of results for the selection of priority sites for electrification and in terms of capacity building and openness to change of new FUNAE leadership.



In September 2015 there was a change of the CEO of FUNAE, which was done smoothly and did not affect on-going activities. In 2015 FUNAE has also finalized its new Strategic Plan for the period of 2015-2019. Main aspects are increasing the number of beneficiaries, maintaining a high level of quality of activities, strengthening the sustainability of the institution and looking for Private Sector engagement as well as guaranteeing proper maintenance of the existing investments.

Since 2014 FUNAE is operating a solar panel assembling factory. This state-owned Government facility intends to serve the upcoming local demand for solar modules.

A Renewable Energy Atlas issued by FUNAE is a reference document for identifying interesting opportunities in the area of wind energy, hydro power, solar, geothermal and biomass.

## Management context: execution modalities

The legal and administrative framework defined in the TFF provided for co-management and Regie modality (BTC own management) for a limited number of project activities.

However, due to the Partner institution's understanding, the co-management modality was not well understood and seen not to be executable exactly as described in the TFF. Implementation was more done as a national execution modality. For example, BTC had to wait for the monthly bank statements to proceed with No Objection of the transfers, additionally to the No objections procedures applied for the procurement process. Consequently, the project was overburden by the "No Objection" procedure, which resulted into some delays. Another element was that BTC staff was at the start of the project not well informed about, trained and followed up. The co-management procedure, with as lead the partner's manager in cooperation with a co-manager has never been implemented as it could be, every Technical Assistant was confined in his division, without real management and strategic input for the whole institution.

The MTR recommended improving the management structure by nominating a local project manager responsible to guide the implementation and daily management of the project. The formal appointment of a FUNAE staff member as Project Director in 2013 has enabled the functioning of an effective PMT (Project Management Team) as foreseen in the TFF, which was composed of the Technical Assistants (TAs) and FUNAE heads of divisions and led by FUNAE project Director along with one TA acting as project co-Director. The creation of a harmonious team (both FUNAE staff members and TAs), with regular Project Management Team meetings, is improving communication and facilitating daily management of the project and has finally allowed the project to make efficiency gains compared with the previous period.

By 2013 the application of Belgian procurement rules for short term consultancies through REGIE modality have brought some gains in time and flexibility thus shortening the long procurement procedures in two phases brought about by the Mozambique Procurement Law (applied within the co-management procedure).

The project had various visits of the BTC Regional Controller who analysed the process and had a positive opinion about the financial control put in place. It was recommended on keeping track of the controls done and proposed to the project to keep certain documentation every month which has been followed by then. Further a Financial and Systems Audit by MOORE STEPHENS has been conducted to assess:

- (1) the general management of the project and its compliance with the rules and regulations applicable (sometimes the Mozambican rules, sometimes the Belgian rules);
- (2) the completeness, the reliability and the timeliness of the financial information of the project. Specifically, to perform an assessment of the level of maturity of the internal controls of FUNAE with regard to the funds co-managed by FUNAE and BTC, with a clear identification of the risk incurred.

Besides, with support of the TA Project Co-Director, the project has however been maintaining a number of project management tools in accordance with BTC guidelines and standards, as well as

developing state-of-the-art tools for planning and controlling specific project activities (quarterly narrative and financial reporting of execution of activities, operational planning and follow up of recommendations of audits and Steering committees; monthly operational planning meetings (PMT) - discussion, updating and improvements of operational planning tables; project lifecycle tools for socio economic monitoring such as approval of indicators to be used (by FUNAE Board decision), elaboration of standardized questionnaires and (EXCEL) data bases for baseline, monitoring and impact assessment of projects; standardized measurement of beneficiaries' satisfaction).

These tools are properly maintained, which significantly contribute to increasing project efficiency. The issue remains though the level of appropriation by the partner institution of the PM tools designed and used by RERD project<sup>8</sup> 4.

## Harmo context: donor coordination

A number of donors support rural electrification through FUNAE, among them are EU, Norway, the World Bank and Belgium/Holland. Others, like GIZ, have opted to support rural electrification outside FUNAE with direct linkage to the Ministry of Mineral Resources and Energy.

The Energy Sector Working Group (ESWG) was led by the Head of Development Cooperation of the Embassy of Belgium until 2015, which created conditions of improved information sharing, coordination and cooperation. Donor coordination within the field of rural energy is based on the exchange of information, a common framework has not yet been established. Relevant information on (Renewable) Energy subjects is being shared regularly with the group, which had positive impact for the creation of synergies and exchange of experiences. Cooperation with partners like GIZ, DFID and EU is ongoing and studies are coordinated, enhancing the achievement of common results. The EU together with 12 partners, under which also the Belgian Cooperation has signed a joint declaration on Renewable Energies in Mozambique, on initiative of UK aid (DFID) and USAid an Energy Compact off-grid is proposed mid-2017.

The ESWG is now under the lead of DFID and Norway, half 2017 it will go to World Bank as lead donor and Norwegian Embassy as co- lead. The ESWG is working with 3 subgroups, in which RERD TAs can participate: the subgroup of Electricidade de Mocambique (EDM), Ministry of Energy and Mineral resources and ARENE (MIREME - ARENE) and FUNAE taskforces. BTC was supposed to chair the MIREME-ARENE sub group, also due to late start of implementing the MIREME CB project from BTC side it was proposed to other partners to assist in it. At this stage, some subgroups are not yet in place or active, perhaps also because some Strategic studies and Master Plans are ongoing and some partners have still to determine their strategic field of intervention.

## 1.2 Important changes in intervention strategy

In order to promote rural development by increasing access to renewable energy services (G.O.), the project formulation document (original TFF of 2009 and the amended TFF of 2011 for the inclusion of the Dutch contribution – cf. annex 1 – Initial Log-frame) comprised three major components: investments in solar, wind and hydro energy systems (Result 1), stimulation of micro-finance initiatives (Result 2) and institutional capacity building of FUNAE (Result 3).

Based on the findings of the Mid-term review (made in 2013) some elements of the initial log-frame were reformulated into the RERD Action Plan 2013-2015:

- ✓ a budget line 'maintenance, with its own intervention logic and indicators, was included within the solar energy activity;
- ✓ wind water pumping was cancelled and replaced by wind measuring activities;
- ✓ financial accessibility ('Microfinance') activities, which were initially the only approach for market development, was broadened;
- ✓ the capacity building component was slightly adapted to FUNAE and project needs.

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<sup>4</sup> Final report, 11/2015



Since 2013, the project has therefore been operating based on the following three (reformulated) components:

- ✓ R1. Implementation of solar, wind and hydro projects
- ✓ R2. Support for promotion of small solar products
- ✓ R3. Capacity Building Support for increasing the technical and administrative capacity of FUNAE.

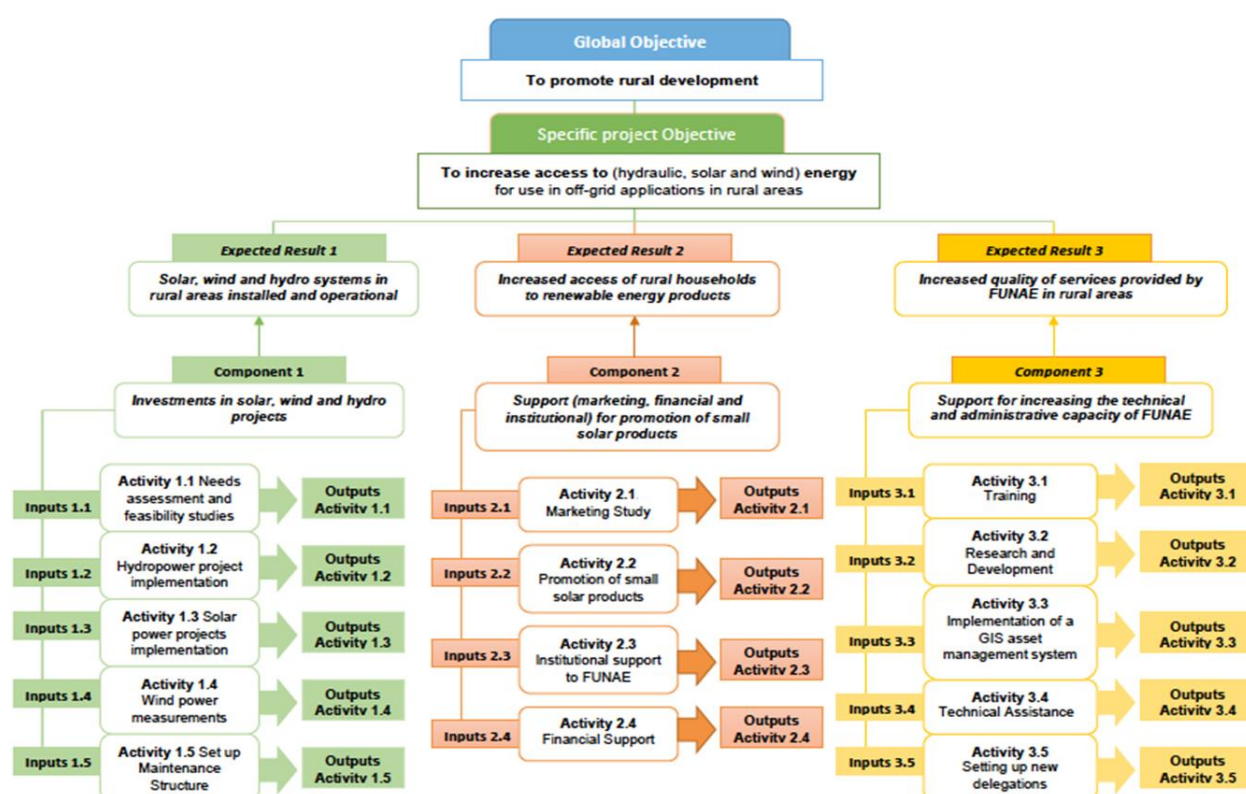
The project budget breakdown per main components is given below.

**Table 2. RERD Project Budget**

Component	Budget (thousands Euros)	
1. Investments	17,061	73%
2. Promotion of RE products market	177	1%
3. Capacity Building	5,167	22%
Other (Contingencies, general means, audit and evaluation etc.)	935	4%
<b>Total</b>	<b>23, 340</b>	<b>100%</b>

*Source: RERD Updated Overall Budget as scheduled in the Action Plan 2013-2015*

The expected project results and their links with the planned activities under each component are succinctly given in the diagram below that refers to the revised Logical Framework following the MTR recommendations.



**Figure 1. RERD Project Structure Diagram**

## **Reasoning for the changes in the intervention logic after the MTR:**

The MTR assessment of the intervention logic showed that a re-orientation of the project in some aspects was needed in order to ensure maximum contribution towards project objectives.

### **Result area 1: Access to Renewable Energy Increased**

The activities in the Result area 1 Access to Renewable Energy were tuned more towards increasing impact. This was done to increase focus on the concept of energy services as opposed to energy provision.

#### **Needs assessments and feasibility studies, Hydro power**

The TFF assumed that sites for developing and constructing hydropower systems would be readily available. However, RERD found that no potential sites were available. Thus there was a need for training and knowledge transfer, learning by doing, tendering out additional surveys for identification of suitable sites and feasibility and executional studies, this slowed down the implementation process. The availability of the Renewable Energy Atlas with its data was from end 2013 on.

#### **Solar systems**

To increase the impact of PV systems in schools and health centres electrification it was seen necessary to focus more on carrying out

- ✓ In-depth investigations into the actual use of the pilot systems in the field using monitoring systems. These measurements are expected to result in changes / improvement of the systems
- ✓ Early impact analysis in buildings that are electrified during the pilot phase to propose measures to increase impact

#### **Wind water pumping**

Wind water pumping was included under Result 1, recent developments and better technology and a preliminary study as well as evaluation by the MTR Team was of the opinion that this was not relevant due to the high cost of this in relation to available alternatives. In the revised logical framework this has been taken out. It was decided to go for PV water pumping instead as PV water pumping besides lower cost has less operational, maintenance and location problems, the Solar energy resource is available anywhere and is not site dependent, so can be implemented all over the country, while the wind energy resource is site dependent, not reliable, and intermittent.

#### **Maintenance**

The logical framework explicitly assumed that energy systems will be maintained, which in the opinion of the MTR Team unfortunately was a so-called killer assumption (an assumption not likely to hold). In the revised logical framework this assumption has therefore been taken out and the establishment of maintenance systems has been included under Result 1.

Belgian Campus developed pilot monitoring systems and were installed on 10 Solar PV sites, a tender was launched and 100 monitoring systems installed on PV systems of schools, health centres, mini-grids and local administrations. Monitoring and evaluation is done in FUNAE.

### **Result area 2: Increased access of rural households to renewable energy products**

This component of the programme was based on the assumption that there is a lack of financing options. This has not been proved entirely correct, as in Mozambique there are various financial options provided by MFIs, where solar lamps credit could be provided without any involvement of FUNAE. It must be said that at start of the project, solutions like Pay as you go, mobile payment didn't exist yet.

Besides, since project formulation the price of good quality LED solar lanterns had dropped dramatically and good products (lanterns) could be found on the market for around € 25 - 50. Experience world-wide, confirmed by a number of Mozambican MFIs, showed that the so-called transaction costs of providing so little amounts of credit can be as high as the value of the loan.

Another obstacle was collateral. MFIs usually ask for collateral that most poor people in rural areas do not have, not even land use (DUAT) titles. Unfortunately, a solar lantern will not be accepted as collateral. Therefore, one will need a guarantee fund, but bona fide MFIs did not like this option. The reason was that as soon as people realize that there is government money involved in any financial operation, they will stop paying. Although an MFI would not have a risk because it could claim the money from the guarantee fund (depends on how the fund is set up), the MFIs feared the "contamination" of their other lending portfolio, because this would lower the payment moral of other loan takers.

Concluding, financial accessibility to energy was based on the assumption that micro-finance institutions were willing to cooperate. The attempts so far demonstrated that the plans are not feasible because the micro-finance institutions are no risk takers and not willing enough to cooperate. It was therefore seen more relevant for FUNAE to promote market for small solar products, and to analyse how to attract suppliers. This component had consequently been reformulated in the revised logical framework.

Unclear policies and strategies and lack of insight in the market, interrupted market studies were burdens to better development and results in this area. A second marked study, with results and pilot sites for demonstration, first time in Mozambique Pay as you go systems and pre-payment metering were implemented in later stage.

The choice for appointment of a BTC Team leader without real Renewable Energy insight and knowledge, without BTC administrative and procedural experience was probably a strategic error that lead to lack of results, especially in the field under its umbrella, as socio-economist and team leader, for a program of this importance, as well financial as impact resulted.

To create more engagement with Private Sector it was also decided that FUNAE would finance hydro pre-feasibility or executional studies for interested Private sector market parties.

### **Result area 3: Increased capacity of FUNAE**

#### **Training**

In order to continue and improve the capacity building efforts, RERD introduced a focus on strengthening staff on institutional level and organised team building exercises of the project management team to ensure better understanding of the roles and responsibilities and improve internal coordination mechanisms

It was recommended to continue to support FUNAE staff in specialized trainings and seminars based on the yearly training plans elaborated on the needs analysis for each department as well as financing local and international post-graduate courses and master studies according to the criteria of FUNAE. These trainings/courses were set also as an incentive to retain key staff working at the partner institution (less turnover). Some due diligence mission were carried out, in order to get better understanding, knowledge and possibilities of partners. Regional and national Renewable energy conferences could be attended, increasing general and specific knowledge in the Renewable Energy

fields, market and presentation of new products. Networking, communication and dialogue are necessary and lift up the technical and organisational capacities.

### **GIS Asset Management System**

No GIS department was existing before the start of the project, Georeferencing of infrastructures, with about 7.000 sites was (partly) carried out during the project, this is gradually improving with site visits , maintenance visits and planning purpose visits in the field.

It was observed that the implementation of this component was still at an initial stage of focussing only on preparing a data base of electrified infrastructures. In order to advance the transformation of the GIS component as planning and monitoring tool, a consultant was hired to support the GIS team. More GIS devices have been acquired to train and better equip the delegations.

Recently the GIS division was taken under the umbrella of the Planning division of FUNAE, with scope to improve planning, identification of new infrastructure, It still has to be organised to add or integrate the maintenance and monitoring and pre-payment into a global IT package, that has to be accessible by all delegations, divisions.

### **Setting up of new delegations**

The importance of decentralization was highlighted, to be closer to the rural population to respond timely to the needs related to energy services, requests of maintenance and repair. The administrative constraints of requesting travel funds from HQ had been identified as an obstacle. In order to improve this situation, a travel fund for the delegations was created, received quarterly as advance and being replenished once expenses have been justified. This allowed more flexibility for permitting presence in the field.

## 2 Results achieved

### 2.1 Monitoring matrix

Results / indicators	Baseline Value	End Target	End Value obtained	Comments
<b>IMPACT:</b> To promote rural development by providing access to energy				
Number of electrified schools with evening classes	0	10	07	Lack of funds/ financial planning to pay teachers at evening are one of the reasons for not reaching the end target.
Number of institutional births/month with access to quality illumination in electrified Health Centres	0	2370	5910 <sup>5</sup>	With illumination, the Health Centres can attend 24 hours/day, which led to facilitate institutional births
Number electrified infrastructures that use IT/AV appliances	0	500	272 <sup>6</sup>	
<b>OUTCOME:</b> Increased access to hydro, solar and wind energy for use in off-grid applications in rural areas				
Number of beneficiaries	0	600.000	550.000	Mini hydro Majaua not included <sup>7</sup>
Beneficiary satisfaction (0-100%)	n/a	85%	86.8 %	
Total power installed (kW)	0	1600 kW	1105,85 kW	Hydro capacity including Majaua
<b>OUTPUT 1:</b> Solar, wind and hydro systems in rural areas installed and operational.				
Priority locations for solar systems are established	0	700	681	
Number of total power of hydro power plants and solar systems installed, operational and properly maintained	0	PV: 300kWp  Hydro 1200kW	PV 390 kWp,  hydro: 162 kW	Mini hydro Sembezeia and Muoha
Number of schools, health centres, administrative posts and residences electrified	0	625	681	
Number of solar water pumps installed	0	45	57	The end value obtained could reach 71 solar water pumps but a tender was cancelled due to low performance by the winner company
Number of hybrid systems	0	1	0	

<sup>5</sup> FUNAE Survey done in October 2016

<sup>6</sup> FUNAE Survey done in October 2016

<sup>7</sup> Mini hydro Majaua (595kW) in rehabilitation, finalization 2017/18

Results / indicators	Baseline Value	End Target	End Value obtained	Comments
<b>OUTPUT 2:</b> Increased access of rural households to renewable energy products.				
Market Development Study	0	1	2	
Number of promotional activities for renewable energy products	0	2	0	Currently implementing 3 pilots: 3 companies did feasibility studies in the selected sites for the pilot; a MoU signed between the three, and FUNAE. Business plan has been elaborated and it is expected that the pilot will show results by December 2017
<b>OUTPUT 3:</b> Technical and administrative capacity of FUNAE is increased.				
Number of trained people <sup>8</sup>	0	30	124 <sup>9</sup>	
Number of trainings	0	22	43	
Number of documents for research projects	0	2	3	
GIS- tool for planning and asset management in place	0	70%	100%	

<sup>8</sup> No specific end target as this is not an aim in itself; focus each year on quality and appropriateness of training; accumulative numbers do not reflect type and content of training (e.g. long term such as languages, different levels of one type of technical training for one person)

<sup>9</sup> Is total of 2011 -2016, target of 30 was on a yearly basis



## 2.2 Analysis of results

### 2.2.1 Synthesis

#### Component 1: Investments in solar, wind and hydro projects

(Overall budget weight 73%)

Access to Energy for the rural population has been increased due to investments in hydro and solar installations. The wind water pumping component had to be cancelled after analysis of the wind potential which was considered insufficient for this purpose. However 57 solar water pumping systems installed instead proved to have huge impact. The water pumping systems were built in the provinces of Inhambane, Manica, Niassa and Cabo Delgado, benefitting about 17100 people.

Hydro power investments have been concluded in Manica Province, namely Muoha (100 kW) and Sembezeia (62kW). The existing hydro plant Majaua in Zambezia province (595kW) received 42 km isolated grid extension. Identification on 56 potential hydro sites was performed, 17 pre-feasibility studies finalised, what resulted in 9 EPC tenders from which 2 were successful (Muoha and Sembezeia), and 4 potential hydro sites that ended with the executional study and who are ready for implementation. Feasibility, environmental impact assessment and executional studies for 3 more potential sites (Berua, Luaice and Zizi) have been performed.. For Zizi site, due to lack of access to it was not possible to finalise the executional study, therefore the contract was not fulfilled.

With the purpose of studying sites with hydroelectric potential for future renewable energy projects, with a view to increasing access to electricity in rural areas in Mozambique, in the scope of the project, pre-feasibility studies were carried out during the first half year of 2017 in 4 provinces, namely Manica, Niassa, Nampula and Zambézia. In the Province of Manica, it was possible to survey 8 sites with potential, with some difficulty of access but possible to find alternatives to easily access the site. Of the 8 sites, 2 have great potential for installation of a large capacity dam, so in future works it will not be considered by FUNAE.

In Niassa Province, in the 3 districts visited, access to the sites is very difficult and were recommended that in the next visits, other places would be indicated.

In Nampula Province, a visit was planned for 3 sites; however, only 2 were visited for safety reasons (maintenance of opposition soldiers), and these sites have great hydroelectric potential combined with the fact that they are areas with great agricultural potential (need for watering).

In Zambézia Province, 4 sites were visited, including 3 hydroelectric potential and 1 local (Nintulo) with serious access problems, and also with a very scarce population.

Keeping in mind the recommendations of the Value for Money Audit, tenders of the Nintulo and Murralelo micro hydro plant have been cancelled because of extremely high prices.

Significant progress was achieved in the solar PV system implementation. Per end 2016 it is at about 95% completion. The final systems to be accepted, located in Sofala Province had a delay on its implementation due to armed conflict. The schools electrified obtained appliances such as TV, DVD player, computer and a multifunctional printer to increase impact. The health centres received also vaccine fridges.

To improve the functionality of the existing (solar) systems, the maintenance unit, created as recommendation of the MTR, was consolidated. The purchase of spare parts should give a certain level of sustainability in the coming years. The installation of 100 remote monitoring systems at (larger) solar systems shall improve a timely response in case of technical problems. As technicians still going regularly to field for assistance, the systems should be improved to become fully efficient; system still not contributing for a significant reduce of logistic costs. RERD project also adapted and implemented anti-theft systems.

Responding to the challenge of maintaining photovoltaic systems after its installation, FUNAE trained for 3 days young entrepreneurs in maintenance matters, coming from technical schools in 10 Provinces of Mozambique (Maputo, Gaza, Inhambane, Sofala, Manica, Tete, Zambézia, Nampula, Niassa and Cabo Delgado) with the aim of ensuring the full functionality of solar systems. In the same training, the question of the disposal of harmful materials was also considered for the benefit of the environment. At the end of this training FUNAE offered 5 complete kits of the electrician to the 5 best formed per province.

Satisfaction of beneficiaries is about 86% which is considerably high given the fact that the capacity installed is Tier 1-2 and not comparable to 24h access of grid electrification.

## **Component 2: Support (marketing, financial and institutional) for promotion of small solar products**

(Overall budget weight 1%)

In 2013 a market study was launched, but implementation was unsuccessful and the contract interrupted.

A new study for market analysis was successfully finalized by mid-2016, focusing on different ways in which FUNAE could engage with private sector stakeholders in the renewable energy sector.

A follow up study for the implementation of 3 pilot projects for solar systems (PAYG, Repair & Maintenance and shop for spare parts, Battery charging system) is being implemented to gain experience and further improve market development.

In this context, 3 companies namely Mocitaly, Solar Works and RVEsol were already selected for the pilot (2 for mini-grid and 1 for PAYGO) and carried out baseline survey in the pilot sites, namely Porto Enrique and Chigubuta Village in order to elaborate a business plan. Before the companies start on connecting clients, putting in place a payment system, and start supplying electricity, FUNAE rehabilitated the mini grid, upgraded the batteries, and improved the control room in the pilot sites to facilitate the pilot implementation.

A MoU between the companies and FUNAE was signed in May 2017, and describes intentions and proposed responsibilities among the signatories. Each company have developed a business plan and it is expected that the pilot will present results by end of -2017.

## **Component 3: Capacity Building Support for increasing the technical and administrative capacity of FUNAE**

(Overall budget weight 22%)

The final review stated that the capacity building part of the RERD programme demonstrates satisfactory results in providing technical trainings, language courses and local Vs international post graduates courses creating further a positive effect on the retention of qualified staff within the institution.

The FUNAE Human Resources Unit concluded that the trainings have a positive impact on the technical knowledge and motivation of staff. It led to significant improvement of their performance.

Further there was continuous support to the GIS unit (consultant for diagnostic of needs and 12 months on the job training), hiring of a Procurement Officer (was taken over by FUNAE as Legal advisor to the Board), permanent Technical Assistance in management, socio economic, solar and hydro areas and investments in delegations of FUNAE (office rehabilitations, supply of 42 computers and related ICT equipments, supply of furniture, acquisition of 11 cars, hiring of additional technicians and trainings to staff,). An operation & maintenance unit in FUNAE was created, as well as acquisition of tools and spare parts for the unit functioning.

## 2.2.2 To what extent will the intervention contribute to the impact (potential impact)?

### Economic and social improvements thanks to provision of “energy service” equipment<sup>10</sup>

RERD Project considered to provide not only access to energy but also “energy service”, energy powered equipment such as: computers, TV monitor, DVD players (in 195 schools), lamps, vaccine refrigerators (in 79 health centres), etc. Just access to energy is not enough to enable changes in a rural context where people or institutions have limited resources to fully reap the benefits that access to energy can offer: access to information, educational and cultural programmes, communication, social networking, better teaching tools and educational environment, introduction of evening classes, better healthcare services with possibly 24/7 service availability, better quality administrative services for communities.

Especially mobile phone charging in the electrified institutional buildings can be considered as a positive impact as it improves communication and therefore contributes to better social and professional life. In impact surveys done by FUNAE it was observed that people working in the electrified public infrastructures invested in electrical equipment such as (small) television, laptops, radio. At the moment of the report about 270 additional small IT appliances used by the beneficiaries have been counted. Satisfaction of beneficiaries is an average of 86% (FUNAE standardized impact surveys).

The introduction of participatory developed indicators in FUNAE for socio economic impact analyses created awareness of staff on the changes expected induced by access to energy. The importance of payment for services as well as customer care was highlighted for both FUNAE staff as well as clients.

The improvement of questionnaires and data bases with the results of the surveys will assure that data is being made available also to other FUNAE units and the data base further developed for ex post analysis of changes occurred.

However, for changes to occur, more time must be considered as these involve changes in local practices and the way institutions have organized their work. Effecting cultural changes is a longer process than a project cycle.

With regards to payment for services FUNAE is going to introduce pre-payment meters as pre requisite for future installations. The awareness of the importance of payment of services for all which also prepares conditions for the engagement for Private sector in operation and management can be considered as success of the project intervention.

With the renewed definition of access to energy and electricity by ESMAP, considering energy services in TIER framework. as a time and power related service, it is proposed to FUNAE to use the renewed definition in order to get international standardised data. More info can be found on New Multi-Tier Approach to Measuring Energy Access

This renewed approach will considerably influence the old statements and give a much less “pink” view on energy and electricity access by rural population, for example, in before street lights, electrification of schools and other community infrastructure were taken into account for electricity access, in the new definition it says it improves energy access for community users but is taken out for electricity access of the individual population.

### Overall economic and social development of rural areas

The intervention is contributing to the partner countries objectives of promoting rural development insofar access to energy is a prerequisite for development. The project enabled educational

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<sup>10</sup> Has the flexibility shown by the project in providing “energy service” equipment contributed to creation of an enabling environment for rural development?

(electrification of schools) and social (electrification of health centres with vaccine fridges) development and improved service delivery of local administrations through the installation of solar systems on rural administrative buildings, improving communication via cell phone charging as well as illumination in evening hours. In cases of mini hydro plants with electrification services 16-24 hours and higher capacity, it can bring in medium term economic development. Households can use fridges for storage of food and shops can offer a wider range of perishable goods. Small entrepreneurs can use electronic equipment (carpenters, tailors) or offer milling services.

Women interviewed at the newly installed water pumps praised especially the significant reduction of time for queuing while waiting for water compared to the manual pumps and shortening of the distances to have access to water in cases when they had to fetch river water.

However access to energy alone is not sufficient for achieving rural development. It has to be part of an integrated rural development approach translated into Integrated Rural Development Plans coordinated under the auspices of the Government.

The establishment of MITADER (Ministério da Terra, Ambiente e Desenvolvimento Rural) in 2015 and the contacts between this ministry and FUNAE could improve the outcomes of actions undertaken, mixed irrigation, drinking water and energy projects could boost income and rural development. Better coordination and regular workshops are needed to improve this coordination.

### 2.2.3 To what extent has the outcome been achieved? Explain

The envisaged outcome of the programme is: To increase access to hydro, solar and wind energy for use in off-grid applications in rural areas.

As stated in the final review report, the project makes a contribution, although modest due to its size, to increasing energy access in rural area which is a pre-requisite for rural development.

The focus of the RERD project was community infrastructures (solar component) and village electrification (mini hydro) which includes private households or small commercial activities within the range of the mini grid. These include: administrative buildings, health centres, schools, water pumping systems and public lighting. These types of infrastructures were subject of direct investment actions financed by the project, improving community based electrification.

The contribution the RERD project has given to increasing access to energy in rural areas is evident, as shows the table below. The project baseline in terms of number of users was not for all considered categories whereas currently (by the end of the project), the change status would be:

<b>Energy Users</b>	<b><i>“Access to energy” Indicator (electricity connections thanks to RERD Project)</i></b>
Institutional users (schools, health centres, administrative posts)	– 698 connections (PV systems) – 9 connections from three mini-grids powered by mini HPP
Community users	– 57 connections (PV systems) to power water pumping systems
Households / commercial users	– About 150: 40-50 household/commercial connections for each of the three mini-grids powered by mini HPP

The project electrified 698 institutional buildings. It also built two hydro power projects which have associated mini-grids and connections to institutional buildings as well as privately owned rural households and commercial activities. Another hydro power project (Majaua) to which the project had contributed to grid extension contributes to increase access once it is rehabilitated (2017). Through these systems there is significant evidence to demonstrate that the rural communities in areas where the project had operated have indeed increased their access to renewable energy.

One can always calculate from the above indicator values the number of potential beneficiaries according to FUNAE's methodology, which is an estimated 550 000 people.

Further to provision of access to energy, RERD has also supplied energy-based equipment, mainly for schools, but also health centres, in order to make the benefits that energy can bring a reality in the rural areas. Access to energy service and products that RERD project has facilitated has a great potential to make a change in forming a better educated and skilled new generation, but visible only in the long term.

The rural population benefitted by the provision of 57 solar water pumping systems which increased availability of safe drinking water and reduced the work load and time spent at the pumps for women who are the main responsible for water supply in the families.

Potential to improve is in sustainability, maintenance, end user training and security of the systems to avoid theft and vandalism of components

The Capacity building component supported FUNAE at the overall organisational level with a number of activities implemented such as setting up a maintenance structure, setting up new delegations and improving the existing ones, thus contributing to improved planning data and being closer to the rural population to improve service delivery.

For instance, RERD intervention helped FUNAE in implementing a monitoring of changes through the application of regular baseline and impact studies that did not exist before and that contributes to enhance the energy services delivered by FUNAE.

## 2.2.4 To what extent have outputs been achieved? Explain

### Output 1

Activities	Planned Outputs/Deliverables	Outputs/Deliverables production status
Activity 1.1 Needs assessment and feasibility studies	<ul style="list-style-type: none"> <li>→ Solar Energy Baseline Study Report</li> <li>→ Hydropower Baseline Study Report</li> <li>→ Priority Projects List of solar systems</li> <li>→ Pipeline for hydro power projects</li> <li>→ Impact Assessment Reports for selected sites</li> </ul>	<ul style="list-style-type: none"> <li>→ Completed</li> <li>→ Completed</li> <li>→ Completed</li> <li>→ Completed</li> <li>→ Completed</li> </ul>
Activity 1.2 Hydropower project implementation	<ul style="list-style-type: none"> <li>→ Hydropower plants and mini grids</li> <li>→ MHP Majaua grid extension</li> </ul>	<ul style="list-style-type: none"> <li>→ 2 completed (MHP Muoha and Sembezeia), in operation; studies on potential hydro sites</li> <li>→ Completed</li> </ul>
Activity 1.3 Solar power projects implementation	<ul style="list-style-type: none"> <li>→ 704 Solar systems in 625 buildings</li> <li>→ Contractors' Training Reports on Users training (to be included in Works Completion Reports)</li> <li>→ Progress Status Briefs on provision of energy service equipment (to be included in RERD Activity / Results Reports)</li> <li>→ 45 solar water pumps</li> <li>→ 1 hybrid system (solar/biofuel) for electricity generation</li> </ul>	<ul style="list-style-type: none"> <li>→ Not Completed</li> <li>→ Completed</li> <li>→ On-going</li> <li>→ 57 completed</li> <li>→ Completed up to feasibility study and tender documents.</li> </ul>

Activity 1.4 Wind power resources assessment	<ul style="list-style-type: none"> <li>→ Wind power resource assessment Report</li> <li>→ Feasibility Study on hybrid systems (wind/solar or wind/diesel)</li> </ul>	<ul style="list-style-type: none"> <li>→ Completed</li> <li>→ Completed and suitable for 2 of the 5 studied sites.</li> </ul>
Activity 1.5 Set up Maintenance Structure	<ul style="list-style-type: none"> <li>→ FUNAE Maintenance Database</li> <li>→ Report on overall Maintenance Activity (included in FUNAE Activity Report)</li> <li>→ 600 Installation of monitoring devices for solar system</li> </ul>	<ul style="list-style-type: none"> <li>→ On-going</li> <li>→ Activity Reports</li> <li>→ 100 installed (10 pilot), 2<sup>nd</sup> phase (500) cancelled.</li> </ul>

### Remarks:

Schools received TV/ a DVD, table lamps and most of them also a computer with a multifunctional printer/scanner., Health centres received a vaccine fridge and lamps for examinations.

The micro-hydro plant of Majaua (595 kW) was operational from July 2014 until January 2015 when it was destroyed by heavy flooding. In the same year, an extension of the 40km isolated mini grid was finalised and Connections to households and public infrastructure have been made. Rehabilitation with funds made available by EU and the RERD project is expected to finalize in 2017. RERD project contributed to a risk assessment and risk mitigation works as well as the supervisory engineering. Mechanical and electric equipment will also be installed in the mini-grid for a proper functioning. These includes the installation of pre-payment systems to enable charging communities for energy use., .

The micro hydro plants of Sembezeia (62 kW) and Muoha (100kW) are functioning since August and December 2015, 159 new connections were done during 2016.

In Manica Province, works in the mini-hydro of Chiuraure were finished at the end of June 2017 and these were related to rehabilitations which consisted of repositioning of the lateral support of the adduction channel and rebuilding of channel walls sections destroyed by floods in 2013. Heavy rains in February and March led to a slight delay in this construction, extending the works until June.

Pre-feasibility studies were carried out during the first semester of 2017 in the Provinces of Manica, Niassa, Nampula and Zambézia to study the hydroelectric potential for FUNAE future energy projects.

Three studies on potential hydro-sites have been performed in 2016 (Berua, Luaice, Zizi). For Zizi site, due lack of access to it, was not possible to finalise the contract/executional study, only finished the feasibility and the environmental impact assessment studies. Implementation of pre-payment metering will be finalized end of 2017 by installing the system in the mini-hydros of Muoha, Sembezeia and Majaua. 100 monitoring systems for remote monitoring of renewable energy systems have been installed and the GIS division is operational due to the intervention of RERD project.

Five wind masts were installed in small communities along the coast of Cabo Delgado, Nampula, Zambézia, and Niassa. These masts collected wind potential data to determine the feasibility of wind/solar wind/diesel hybrid systems to power village mini-grids. The results are good for 2 of the 5 wind measuring sites, in combination with PV solar or Hybrid diesel generator system. The availability of wind power can cover about 25 % of the time, the rest has to be covered by other resource.



Figure 1 : Overview of systems installed

	RERD assets solar PV/hydro/water pumps/Monitoring Systems			
PROVÍNCIA		PREVISION	DONE	SALDO
Manica	primary school	25	25	0
	local administration office	10	10	0
	Staff Home	23	23	0
	Monitoring systems	50	50	0
	PV water pumps	10	8	2
	Micro hydro of Muoha	1	1	0
	Micro hydro of Chiurairue	1	1	0
	Micro hydro of Sembezeia	1	1	0
Sofala	primary school	80	80	0
	Health Center	20	20	0
	Staff Home	106	106	0
	Vaccine fridge	20	14	6
	local administration office	29	29	0
Zambézia	primary school	90	90	0
	Health Center	59	59	0
	Staff Home	145	145	0
	Vaccine fridge	59	59	0
	local administration office	38	38	0
	Monitoring systems	50	50	0
	Mini hydro of Majaua	1	0	1
	PV water pumps	18	14	4
Inhambane	PV water pumps	20	20	0
	PV water pumps	0	4	-4
Cabo Delgado	PV water pumps	0	6	-6
Niassa	PV water pumps	0	5	-5
Small solar systems		704	698	6
Water pumping systems		48	57	-9
Micro hydro's		4	3	1
Monitoring Systems		100	100	0
Total infrastructures		856	857	-1

## Output 2

The focus of this component is to support development of a renewable energy market and to engage with private sector stakeholders. However, the Legal Framework of Mozambique and internal regulations of the Public Partner institution are considered limiting factors to fully engage in private sector development.

Activities	Expected Outputs/Deliverables	Outputs/Deliverables production status
Activity 2.1. Marketing Study	→ Market Development Study	→ 1 <sup>st</sup> study cancelled due to insufficient quality ; 2 <sup>nd</sup> study completed successfully; follow up study on 3 pilot initiatives on-going. Results will be presented by end of 2017
Activity 2.2 Promotion of small solar products	→ Promotion activities (Progress status included in RERD Activity / Results Reports)	→ Promotion of small solar systems an multifunctional platform powered by biodiesel through FUNAE - EEP funded projects
Activity 2.3 Institutional support to FUNAE	→ FUNAE position (paper) on its role for promotion of small solar products	→ Study completed
Activity 2.4 Financial Support	→ Project Development Study Reports (on pico HPPs or large solar systems/plants) with potential for private financing	→ Dropped

In 2014 a consultancy contract was concluded for the market development study for two lots: Lot 1 Small Solar Systems; and Lot 2 Pico and Micro-Hydropower Plants. The Consultants did not present satisfactory results in the first reports. The contract was cancelled, a new tender launched and the study completed successfully.

The recommendations for testing 3 follow up options have been agreed with FUNAE and will be implemented starting end 2016 and finalizing in 2017B :

### 1. Pay as you go

Test Pay as You Go (PAYG) mechanism in one or two areas of the country

- Invite selected PAYG companies to submit short proposals to participate in the pilot operation
- Link the PAYG company with existing and operational entrepreneurs in 1-2 areas
- FUNAE to discuss, design, follow up and monitor with PAYG company

### 2. Repair and maintenance of institutional PV systems

Maintain & repair institutional PV systems in a single district and at the same time establish a shop to sell PV equipment including FUNAE panels

### 3. Battery charging stations

Set up battery charging centres, such centres use solar energy to charge mainly high quality and durable batteries.

There are two general approaches that can be tested:

- The batteries are rented from the centre by households and replaced with a new one when the charge is down
- Households bring their own batteries to the charging station for charging, which acts as an energy store, where equipment is also for sale.

Each business proposal will be realized by a private company (SolarWorks company on PAYGO and Moçitaly and RVE.Sol on mini-grids), which received some financial assistance for willing to start this as a pilot operation. The financial assistance was given after the companies present a business plan and a MoU was signed between them and FUNAE describing the role and responsibility of each actor. Later on, is expected that the pilot will be implemented at a commercial scale, and this will also bring lessons to FUNAE on private engagement.

### Output 3

Activities	Expected Outputs/Deliverables	Outputs/Deliverables production status
Activity 3.1 Training and Institutional Development	→ Report on the overall training activities → Team Building Report → FUNAE Institutional and Organisational Capacity Building Plan	→ Completed → Completed → Not initiated; will be done by DFID
Activity 3.2 Research and Development	→ R&D Projects Report	→ Completed
Activity 3.3 Implementation of a GIS asset management system	→ Progress Status Brief (included in RERD Activity / Results Reports) → Report on GIS Database performance (to be included in FUNAE Activity Reports)	→ On-going → On-going
Activity 3.4 Technical Assistance	→ Activity Progress Reports (included in RERD Activity / Results Reports) and Final Project Report	→ Completed
Activity 3.5 Setting up new delegations	→ Activity Progress Reports (included in RERD Activity / Results Reports)	→ Completed

### Remarks:

With regards to trainings, individual short term courses as well as long term local post-graduate degree of FUNAE staff have been supported based on yearly training plans discussed and approved by the SC. Apart from training for the mini hydro and wind team, maintenance for the delegations staff and financial and administrative area, strong focus has been given on English languages courses which had been proved useful. In 2014 a full time procurement officer was hired who was later taken over by FUNAE due to good performance.

The final review concluded that there is good progress towards the achievement of the output, as the capacity building activities lead to increased capacity of the partner organisation. It can be assessed that resources have been used in an efficient way. Training courses have been carefully selected with respect to the duration, location, subjects and costs as to optimize the use of available resources

In 2015 the GIS unit was further strengthened with a 12 months long term consultancy, to consolidate the knowledge acquired during the initial assessment made the year before.

The implementation of a GIS asset management system is regarded as an imperative instrument for controlling and managing the large number of renewable energy systems that FUNAE has installed across the country. FUNAE had over 3677 project mapped on its GIS database, which are unevenly

distributed across the country. This represents approximately 58 % of the total of installations built. The majority of the mapped projects are electrified systems (school, residences, and health facilities).

Although there are clear gains in efficiency regarding the technical capabilities of the GIS unit employees, which have increased their knowledge of the ArcGIS software and can now effortlessly operate the system and manage the data, there is still lack of effectively using the GIS software and its capabilities for planning of future projects as well as maintenance of existing ones.

Under the budget line “Set up of new delegations”, the delegations have been further strengthened with the acquisition of all terrain cars, furniture and ICT equipment, offices benefited from rehabilitation, new staff hired and trained and continuation of providing working budget for field visits. This support led to give some autonomy to the delegations work. There is still need for close follow up on the administration of the working fund by FUNAE headquarter and the project administrator.

### **2.2.5 To what extent did outputs contribute to the achievement of the outcome**

Health centres benefit to a great extent from electrification as emergencies or birth can be attended at night with quality illumination. Cell phones are being charged regularly, thus communication is possible 24 hours.

Schools have not yet been able to make full use of the provided services due to planning and financing constraints for implementing the additional activities (such as evening courses), which they seem committed to resolve by the coming school years. Close follow up of FUNAE on this component is recommended in order to maximise outcome and impact.

Residences of schools are not occupied to the full extent. This is partly because of long school breaks, weekends, reasonable distances to EDM electrified villages that allow daily travel of teachers to and from school and little capacity installed, that does not allow to use much appliances apart from illumination, cell phone charging and black and white TV.

For the training department of FUNAE the individual capacity building support improved the technical knowledge of the trained staff, also personal and interpersonal capacities. The department observed change in the motivation and less staff fluctuation due to the offer of benefits such as the financial support to (local) post graduate courses.

The Final review observed that the PM tools developed by the project are of high quality and to the international standards. However, the level of appropriation (and replicability) by FUNAE needs follow up and be integrated into FUNAE management systems.

### **2.2.6 Assess the most important influencing factors. What were major issues encountered? How were they addressed by the intervention?**

Influencing factors and how they have been addressed:

- Pre-selected sites not suitable for implementation → obligatory verification and needs assessment for new sites
- Delays in implementation due to long local procurement processes → allow use of Belgium Procurement rules for service contracts, hire procurement officer
- Delays due to floods and difficult access to sites → consider risks in contracts and planning
- Low Value for Money of bids → retendering or cancellation of activity
- Low payment rate for energy service → introduction of pre-payment meters
- Insufficient capacity and funds for maintenance by systems at public buildings → setting up of maintenance unit at FUNAE that also trains local staff
- Private Sector not motivated in engaging with public sector → study promote role of FUNAE as facilitator of market development and also implementation of a pilot initiative
- Violent tensions starting in the central Provinces in 2013 → implementation of projects in other provinces whenever possible

For the training department of FUNAE various aspects have been considered as bottlenecks:

- The lack of other and more resources for capacity development was an obstacle.
  - Training needs had to be postponed or the number of participants reduced.
- Renowned training Institutes only offering courses abroad often lead to un-proportional high travel cost.
  - The project aimed at organizing trainings in Mozambique in order to permit the participation of more technicians at the same cost.
- Language often limited the number of qualified participants in case of Non Portuguese courses.
  - The project organized and prioritized trainings in Portuguese language to allow a better assimilation of the contents and course material.
  - The project funded English courses for the technicians

## **2.2.7 Assess the unexpected results, both negative and positive ones**

The provision of a Television and DVD player for the 195 schools was supposed to increase quality of teaching and therefore improve the academic progress. However, schools have not yet been able to make full use of the provided appliances as the Ministry of Education does not provide material such as DVDs with educational content. Therefore the appliances are either not used and stored or used with privately available DVDs such as music or films. A school for example uses the presentation of films in the classrooms on weekends as income generation, charging a small amount for watching. This unsatisfying situation has been discussed and brought to the attention of the representative of the Ministry of Education at various Steering committees, however without further actions from the Ministry of Education.

Another income generating activity encountered at a school was the charging of cell phones for a small fee. The income was used for the salary of a guard for the school to avoid theft and vandalism.

The human resources department of FUNAE observed that the opportunity of funds for trainings and other individual capacity building lead to frustration of some staff in the case they expected to benefit but have been rejected. This is partly due to insufficient transparency of the selection criteria applied by FUNAE. In these cases the project only followed the recommendations of FUNAE, however did not participate in the selection process.

## **2.2.8 Assess the Integration of Transversal Themes in the intervention strategy**

### **Gender**

FUNAE has a multidisciplinary Gender team responsible to develop gender activities. It is composed by one coordinator and representatives of technical departments. They prepare annual gender activity plans and coordinate gender activities with the focal points of the divisions as well as with other public institutions.

The activities of the project have a direct effect on gender issues, focusing on female beneficiaries. These include provision of quality illumination for institutional births in electrified health centres and reduction of water chore time that is an activity typically carried out by women in the rural areas.

Evening classes can be attended by female student which have dropped out due to early marriage or need of presence at home for household chores including taking care of younger siblings.

In both baseline and impact assessments, recording and monitoring of behaviour of female and male beneficiaries have taken place, as gender disaggregated data is included in the questionnaires wherever feasible. The results so far confirm that the main beneficiaries of electrified health centres and water pumps are female due to their traditional roles within the family such taking care of the children as well as fetching water.

## Environment

FUNAE is a certified ISO 14001 institution thus having an environmental management system in place. The Quality and Environmental Division within FUNAE handles all environment related matters, from licensing which includes the contracting of environmental impact assessment studies, to monitoring of contractors so as to ensure the implementation of Environmental Management Plans and the maintenance of its internal environmental management system which allows FUNAE to maintain its ISO certification.

Having the environmental framework already set up, the RERD project has benefited by ensuring that all of its projects, specifically the hydro power plants, have undergone the necessary studies and carry the necessary licenses to operate. Impact of hydro plants on environment will be limited as there will be no dams retaining water, only overflowing walls to lift the water.

The installation of PV systems for public infrastructure and staff houses are expected to lead to a decrease in the use of batteries and kerosene as energy sources, thus producing less toxic waste and reduce the use of fossil energy sources.

FUNAE is ensuring that its sub-contractors are contractually obligated to ensure collection facilities for systems components once these have reached the end-of-life.

## HIV Aids

There is no discrimination within the activities regarding people with HIV/AIDS. FUNAE has a HIV / Aids focal point. Regular annual meetings for awareness rising are organized within the partner organisation and partly funded out of the project for all staff of FUNAE To the project makes condoms available at no cost to the staff.

### 2.2.9 To what extent have M&E, backstopping activities and/or audits contributed to the attainment of results? How were recommendations dealt with?

The Final review stated that the RERD project with support of the TA has been maintaining a number of project management tools in accordance with BTC guidelines and standards, as well as developing state-of-the-art tools<sup>11</sup> for planning and controlling specific project activities. These tools are properly maintained, which significantly contribute to increasing project efficiency. The issue remains though the level of appropriation by the partner institution of the PM tools designed and used by RERD project.

The project has been assessed by various audits and reviews:

- 2011 – 2015 FUNAE external audits by Ernst & Young
- 2013 Mid Term Review
- 2013 Audit Belgian Government Cour des Comptes
- 2014 Value For Money Audit
- 2015 Mixed Audit (Moore Stephens)
- 2015 Final review

Various Backstopping and missions have been done by Frederik Van Herzeele (BTC infrastructure expert), Ravi Reddy (LAF BTC South Africa), Fanny Bervoets (6 months stay in Maputo and Sammy Auwerx (BTC Regional controlling)

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<sup>11</sup> quarterly narrative and financial reporting of execution of activities, operational planning and follow up of recommendations of audits and Steering committees; monthly operational planning meetings (PMT) - discussion , updating and improvements of operational planning tables; project lifecycle tools for socio economic monitoring such as approval of indicators to be used (Board decision), elaboration of standardized questionnaires and (EXCEL) data bases for baseline, monitoring and impact assessment of projects; standardized measurement of beneficiaries' satisfaction).



After each review and audit an action plan was prepared together with the partner to follow the recommendations.

The Reviews and audits have been helpful to reorient the interventions strategy (MTR) and improve the administrative and financial management.

## 3 Sustainability

### 3.1.1 What is the economic and financial viability of the results of the intervention? What are potential risks? What measures were taken?

The sustainability of the intervention is mainly determined by how well the installations will be maintained. In the first years for the solar installations this happens through technician training and maintenance contracts, additionally through the maintenance department of FUNAE, set up and with spare parts in stock purchased by the project. Partly FUNAE, partly Line Ministries, but also beneficiaries will be responsible for the management and maintenance for the renewable energy systems. In each electrified infrastructure two persons are being trained in basic maintenance tasks. During the project implementation, in the contracts with companies which provided services and supplies, there was foreseen trainings of technicians for the proper use and manage of the materials/spares, contributing for more durability of the infrastructures/spares and to ensure that internally there are capacities to assist in the maintenance activities. Manuals for the technicians were also provided by the companies for a proper consolidation of the practice by the users/technicians. They have a hotline number of FUNAE (Linha Verde) in case there are issues they cannot resolve. On other hand, FUNAE trained young people/entrepreneurs in maintenance matters in all provinces of Mozambique in order to assure that human resources capable of responding to the challenges of solar systems maintenance are available.

The pre-payment metering and monitoring of the systems, introduced by the project in order to have better data, improves the rational use of the systems, and make it more possible to get payments done by the communities and or beneficiaries.

RERD also invested in a remote monitoring system for the larger solar systems which aims to reduce theft and vandalism as well as facilitate preventative and curative maintenance.

For the management of the concluded mini hydro plants by the project (Muhoa and Sembezeia) as well as the mini hydro of Majaua (RERD financed a grid extension) FUNAE is currently taking full responsibility and needs to provide funds for administration, operation and Human resources, thus increasing the dependency on external financing by development partners, but implementation of pre-payment metering is underway and will provide easier cash generation, and prepares the systems to be taken over by a private partner and or community.

All the solar systems, with electricity storage capacity however cannot avoid that in 5-8 years the batteries of the systems will have to be replaced and maintenance of civil works will be required at significant cost, for which there are currently not enough financial provisions. This is an issue that has been highlighted to FUNAE to assure the availability of funds in the future.

### 3.1.2 What is the level of ownership of the intervention by target groups and will it continue after the end of external support? What are potential risks? What measures were taken?

With regards to local beneficiary institutions, (Ministry of Health and Ministry of Education), there is a clear understanding that the partnership created between these institutions and FUNAE assumed that once the energy systems have been installed these become the responsibility of the receiving institution. However, in practice this remains a weak point as there is still the low ownership of the benefitting line ministries (Health and Education) regarding (financial) contributions to operation, maintenance and provision of technical electrical appliances for health centres, schools, staff residences).

It is of general understanding of the involved parties that ownership and accountability contribute significantly to reduce the risks of theft and vandalism. Sensitisation of communities by FUNAE and coordination with the focal points of line ministries have to continue even after the project closure.

Measures have involved the following dimensions :

- **Institutional users such as schools, healthcare centres, staff residence houses, and local administrative units.**

During the SC meetings, representatives of Ministry of Health and Ministry of Education have verbally indicated their commitment to take over ownership and responsibility for management and maintenance for the solar installation done with the support of RERD project as it has been stipulated in the MoU with FUNAE at the beginning of the project. It also appears that these Ministries have availability of funds to ensure maintenance that is currently done with either their in-house maintenance staff or outsourced to maintenance contractors. It can be logically assumed that the concerned Ministries may be willing and ready to take over any other solar installations made on their buildings and currently managed by FUNAE after the project has ended.

- **Private household and commercial infrastructure (shops, restaurants) users**

A scheme of selling the solar installations to private households, based on instalments or even for a modest price will have to be considered. The older installations can eventually even be donated.

In the case of the mini grids powered by hydro plants, finding a private operator is being aimed at, once pre-payment meters have been installed.

- **Solar water pumps**

It is important to find a balanced solution between costs and likely revenue. Discussion between FUNAE and local community representatives try to clarify the ownership of water pumps and how to share its costs and benefits.

If a cost recovery solution cannot be found, consideration should be given to the option of transferring ownership and responsibility to local communities. For the time being, FUNAE will take care of the systems and maintenance, however for the extraordinary maintenance a system of tariff collection has to be put in place for a reserve. Whether FUNAE will have a share in that tariff collection for emergency fund is still being discussed. At the time of the report no final solution has been negotiated.

### **3.1.3 What was the level of policy support provided and the degree of interaction between intervention and policy level? What are potential risks? What measures were taken?**

The project did not work directly on policy level, as the partner FUNAE is part of the Ministry of Mineral resources and Energy (MIREME), the competent authority for policy decisions. However, awareness has been created regarding the need for revising and improving the legal framework in order to facilitate and promote the participation of Private Sector in rural energy market development.

### **3.1.4 How well has the intervention contributed to institutional and management capacity? What are potential risks? What measures were taken?**

#### **Institutional capacity**

The expected end result of all capacity building actions, including training of individuals, is to strengthen the institutional capacity of FUNAE to deliver better and more sustainable services to its users/beneficiaries, namely rural population.

Capacity building activities have been undertaken under RERD project with the aim to institutional strengthening in a sustainable manner.

The axes that need to be stressed are the followings :

### **Setting up new delegations**

Increased support by the project to establish new delegations across the country did not only bring FUNAE services closer to its end user but have effectively increased FUNAE quality of service in terms of response ability. Both institutional beneficiaries and local communities demonstrate an increased satisfaction with the now local presence of FUNAE

### **Setting up a maintenance unit with technicians also at the delegations**

These activities can be summarised in firstly the setting up of maintenance division with technicians both at central level of FUNAE and represented in delegations. Having such a division in place has allowed FUNAE improve its planning for required maintenance of its vast universe of systems as well as to guarantee maintenance services at decentralized levels, throughout the country.

Risks exist when there will not be enough funds to operate delegations and maintenance unit satisfactory. FUNAE is aware of this risk and will include enough budget to maintain these services.

### **Improve the internal processes of local procurement procedures**

A Procurement Officer has been hired to support the FUNAE Procurement team.

### **Define the role (and eventually strengthen the capacity) of FUNAE for promotion of solar energy products in rural areas**

A study has been successfully concluded, presented proposals for further implementation of pilot activities. Risk is that once the TA Technical support is ending, further development of the results (analyses and roll out) will not continue as planned.

### **Strengthen the GIS implementation unit**

A clear need has been identified for FUNAE to have a full inventory of existing installations be these solar or hydro, located on public or private infrastructure. The RERD project initiated the steps to address this need by contributing to building an asset management system based on GIS system within FUNAE. This has enabled FUNAE to start the exercise of mapping and geo-referencing its current assets.

Risks are that the information collected is not updated and used for planning and monitoring purposes to the full intent. The integration of the GIS unit into the planning department is an important step to mitigate this risk.

### **Management capacity**

At individual level special training courses for staff have not only been on technical level but also program - and funds management, planning, administration, languages etc, important contributions to enhance the competencies and skills of the beneficiary staff since it is supposed that the knowledge acquired finds a direct application in their daily job.

The organization of team building exercises on leadership and improvement of coordination mechanism contribute to corporate identity sensitivity and better cooperation.

The contributions of the TA by training on the job and acting with due diligence and in timely fashion throughout the project have been recognized to respond to changes in circumstances and challenges arising during the project. Most of the project management activities have been carried out or driven

by the TA, including planning, budgeting, reporting and monitoring as well as assessing performance of the external consultants and contractors hired for specific project activities.

Risks exist when increase of trained staff turnover will cause brain drain from the institution. As mitigation measures it has been recommended to create professional development perspectives.

## 4. Learning

### 4.1 Lessons Learned

#### **Microfinance**

Providing a microfinance fund for a product is not sufficient to create demand for a product; there have to be efforts to promote access to the technology of renewable energy products, ensure availability of the products in the rural areas, as well as a reliable structure to ensure repayment of loans; this needs to involve all relevant stakeholders, from policy level to private sector.

There could have been more inventive and pro-active initiative to tackle the burden of micro-finance issues, by choosing for voucher or other similar systems in order to boost pico solar and small solar systems for rural populations.

#### **Coordination / Ownership**

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.

There are still discussions on ownership, and related to it also management and maintenance of Renewable Energy systems. In the current position, FUNAE stays with the ownership, as public entity, but was not yet able to assume management and maintenance of the systems, reason why the project invested a lot in trainings on management and maintenance, especially in the second half of the program, in order to respond to FUNAE Capacity Building needs in this area.

#### **Importation procedures**

Important delays are caused by the importation procedures regarding duty exemption; it is therefore needed to make sure beforehand that partner institution has budgeted for payment of tax and import duties.

In future projects it is foreseen that the budgets for IVA and import duties are available at the start of the project.

#### **Engagement with private sector, to develop better access to renewable energy products and/or increase investment in renewable energy generation:**

- It is crucial to investigate since the earliest project cycle stage possible (formulation or start-up phase) whether the proposed activities are feasible within the project implementation period and legal framework. In the case of the micro finance component this could have led to a slightly different design.
- For the Private sector participation, regulatory and legal framework has to be adapted, put in place, this can be possible within an enabling environment and by executing a public private project, where constraints will merge and can be tackled with common effort. Indeed, the legal status of FUNAE do not provide any room for engaging in with the private sector, for collateral-free lending, nor for the emission of grants.

#### **Security aspects of infrastructures**

- The first identification surveys for infrastructures to be electrified must always include the verification of the security aspects for the solar and electronic equipment to be installed to avoid thefts.
- The RERD project adapted and implemented anti-theft and monitoring systems but despite this there is still some vandalism and theft, especially in remoted schools and during holidays. Ownership and local public involvement as well as adding more beneficiaries on these systems



could diminish the risk of theft and vandalism

### **Taxes**

The project experienced difficulties related to the payment of taxes and duties which are per Agreement to be done by the Partner. The project should have been tax exempted by the Government which was not the case. Consequently, retention tax on all payments going abroad from Mozambique, amounting to 20% of the value of the payment, the 17% VAT and the 5-15% Import Duty tax on the items in the project had to be paid for each process. The partner institution FUNAE had to make special requests to the Ministry of Finance, leading to delays in payment and delay in results.

At the beginning of a project, the procedures for tax and duty payments and necessary preparations for timely exemptions or other procedures to be in place have to be clear and taken care of by the Partner.

### **Separate PV systems or streamline installations**

According to each reality, it can be more effective to revise the need for installation of a separate PV system in the houses of nurses and teachers, and rather extend a line from the health Centre/ school as the capacity need is minor. The health centre usually is not used at night; on the contrary the teachers residences are often not occupied at all due to long holiday periods and weekends with no school.

### **Procurement procedures**

Local procurement procedures, especially for services that require procurement in two stages and publications, with an expression of interest and a tendering process, are a lengthy process, taking into account to follow all stages required by law. However, there is room to accelerating this process within FUNAE, when documents needed are prepared on time, publications well planned and evaluations done in shorter time.

Typical procurement under RERD requires the following stages:

- a) publication of expressions of interest;
- b) selection of short-listed companies;
- c) publication of terms of reference;
- d) selection of winning bid;
- e) request for no-objection;
- f) obtaining an external legal opinion;
- g) sending to Tribunal Administrativo for approval;
- h) contracting of company.

This leads to through put periods of 10-12 months for consultancies.

## **Lesson learned from the End Term Review**

With respect to the sustainability of the investments, a lesson learned is to give due consideration to the partner country absorption capacity, both human and most importantly financial, before embarking

on ambitious investment projects. Although the funding for investment projects may come as a grant, the infrastructures built under the development partners' projects, as any other infrastructure, leave the partner country with the obligation and the financial burden to operate and maintain it.

At the formulation stage, it must be taken into account the partner country financial capacity to properly maintain the proposed new infrastructures as well as full life costing of investment projects must be made at the planning/feasibility stage in order to prove the financial feasibility of the investment before it is approved for funding.

Many public infrastructures are developed for social purposes or have a social aspect, which limits the application of full cost recovery tariffs for users. This was an inheritance of the past and was changed throughout the project, with installation of monitoring and metering systems, applying tariffs even on flat fee rates, but there is still a long way to go. There is no regulatory framework, regulation on off-grid tariffs, so the fees applied are the same for FUNAE and EDM. With a changed attitude of paying for service and support of pay as you go principles and pre-payment metering, a lot has been done, but also still to do. The government may often have to intervene with (direct or indirect) subsidy schemes in order to sustain the operation and maintenance costs of the infrastructure. The result is that the more the investments done by development partners, the higher the need for government subsidy schemes. This leads to a paradox situation that needs to be duly resolved before further investment can be made.

A program like RERD with a big financial and programmatic weight needed a more efficient management, preferable with BTC background and more Renewable Energy knowledge. The support of the Representation could have been more efficient, especially in the beginning of the project, on the management modalities.

## Recommendations

Dimensions :	Source	Target audience
<b>Policies and Legal framework</b>		
MIREME to issue instructions to FUNAE concerning the tariff setting mechanism for users of off-grid electricity, possibly in line with those applicable to national grid users.	Final review	FUNAE, operators and end users
MIREME to include FUNAE in the same subsidy mechanism as it is currently done for the main national grid in order to obtain funding for operation and maintenance of off-grid energy systems.	Final review	FUNAE
The Energy Sector Working Group (ESWG) with its task forces can play a role in recommend and support the changes in legal and regulatory issues. Partners as BTC have a role in this and could be more active in this field.	ESWG meetings ITA experience	BTC / FUNAE/ MIREME
<b>Sustainability</b>		
Facilitate the decision for transferring the facilities (individual solar systems) installed by RERD to the Ministry of Health and Ministry of Education for benefit of their users according to the agreements (MoUs) made at the beginning of the project	Final review	Line Ministries and End users
Ownership has to be discussed and clearly consigned. A financial constraint must be put in place in order to get change in attitude possible. Experience shows that people move, take action, if subject to financial obligations.	ITA experience	
Discuss possible transfer of systems or maintenance funding for the electrified Administration buildings with the Ministry of Public Administration (MPA).	Final review	MPA and End users

Communication with the partner institution has to be further exploited in order to enable more cooperation and common understanding. Partners need to make funds available and to take action for the payment of services and maintenance.	ITA experience	
Ensure installation of prepaid meters, specifically for mini-grid users, where the cost can easily be absorbed, as to ensure a fair and reliable tariff collection system.	Final review	Operators and end consumers
De-personalisation of fee collection by installing pre-payment metering eases the task of the management committees and avoids politico-administrative interactions.	ITA experience	
<b>Technology</b>		
In order to avoid oversizing and to ensure appropriateness of technology, undertake a needs assessment to get feedback from future users with regards to their energy demands and financial capabilities	MTR,  Final review	End users
NB. "Oversizing "of a solar PV system is relative: comparison of several donor systems shows a broad difference in sizing and we see that a compromise has to be discussed. The dynamics with "new" solar PV energy systems are high and often over consumption appear in an early stage. Energy efficient appliances could be provided or recommended.	ITA experience	
Set the criterion that sites developed for micro/mini-hydropower connected to a small local grid not exceed € 10,000/kW,	MTR	FUNAE
Incorporate a criterion of productive use of energy in the hydropower projects when possible	MTR	FUNAE
<b>Planning</b>		
Support project investments by comprehensive feasibility studies, not only technical but also financial/economic feasibility, in addition to social and environmental impact assessments.	Final review	End users
A participative workshop at start of the project needs to be performed.  A qualitative baseline and needs assessments have to be done in an early stage of the project implementation, or even initiated at the formulation. Some guidance of the representation and or Program officer is needed to facilitate this task.	ITA experience	
If grid-connection of a community (high hydro power potential) is the least-cost option and there are no other sources to finance it, the project should be allowed to finance it based on clear previously defined criteria.  This optimal least cost sizing of isolated grids is a challenge, if Anker loads, Businesses and Costumers are available and a cost reflective tariff can be applied, even private companies could be interested in investment. The political and financial situation together with the high risk related to it isn't the right environment to operate in. There is still a lot to do on regulation and legal side in order to have a market ready for investment. Step by step and with assistance of pilot projects work can be made of it and barriers removed.	MTR / PMT internal assessment  ITA experience	BTC
<b>Capacity building</b>		
For the Capacity building component a Capacity needs assessment	FUNAE internal	FUNAE staff

<p>is essential as basis for planning and monitoring; definition of selection criteria and transparent selection process with monitoring of implementation and follow up of the acquired knowledge transfer.</p> <p>Since the appointment of the new PCA in the partner institution there is a willingness to move forward, an organisational reform is ongoing with capacity needs assessments, organisational structure change, management and even proposal of change in statutes of the partner institution. BTC is involved in this process and has an active role.</p>	<p>assessment</p> <p>ITA experience</p>	
<p>An organisational capacity building plan shall be prepared at the beginning to guide the planning, monitoring and evaluation of capacity building activities</p> <p>The organisation of planning workshops at the beginning of the project has to include the CB aspects.</p>	<p>MTR, FUNAE internal assessment</p> <p>ITA experience</p>	FUNAE / PMT
<p>Introduce regular Team building events for both FUNAE and BTC staff for motivation and improved working relations.</p> <p>It is important to improve communication, presentations, discussions. Visual presentations with discussions strengthen ownership and commitment.</p>	<p>FUNAE internal assessment</p> <p>ITA comment</p>	FUNAE/ BTC project staff
<b>Procurement</b>		
Announce local tenders in Portuguese and English language in order to increase the participation of more international companies	MTR	FUNAE
<b>Private Sector engagement</b>		
Reinforcement of small retailers and cooperation with big actors of pico-PV market – need to facilitate the involvement of Private sector actors in market development.	MTR	
<p>The new government and new FUNAE management show willingness to promote private participation in the Renewable Energy sector. Some laws were changed in 2016 and regulation will follow.</p> <p>FUNAE can play a more proactive role to boost the private sector, create conditions to enable private sector engagement, and pave the way to a better environment.</p>	ITA comment	FUNAE
In terms of micro-finance, it is recommended to choose vouchers or other similar systems in order to boost pico-solar and small solar systems for rural populations.	ITA comment	

## PART 2: Synthesis of (operational) monitoring

### 1 Follow-up of decisions by the JLCB

Decision SC	Action	Follow-up
Decisions	Action(s)	Progress
Approval Action Plans 2011 - 2016	Implementation of annual action plans 2014, including recommendation of MTR, Audits	Annual plans implemented
Approval Annual Results reports 2011 - 2015	Implementation of recommendations and Lessons learned	Annual reports finalized on time
Approval project extensions (2015 and 2016)	Adaptation of annual Action Plans and budget	Project extension approved
Approval Reports: MTR, Audit BE High Court, Value for Money Audit, Mixed Audit, Final review	Preparation and implementation of Action Plans regarding recommendations	Action plans being implemented
MTR recommendations	Adapted Logframe	Done
	Improvement maintenance efforts	Ongoing, maintenance unit created
	Improvement coordination efforts with Ministries of Health and Education	Still need for improvement
Reorientation of Wind component	Wind Energy Monitoring being contracted	Wind measurement contract finalized
Focus on Market Development of small solar products	Market Development Studies	One study finalized, follow up study for implementation of pilot projects in progress
	Promotion activities of Renewable Energy	Promotion of small solar home systems
Pre-payment of taxes and repayment modalities	Approve temporarily pre-payment of taxes (tax payment is partner responsibility) and agree on repayment modalities in tranches	During the first quarter of 2017, the Partner totally reimbursed the debt amount of VAT regarding the Co-management Modality; Concerning the VAT on Régie modality, at the final payments made to commitments in June, BTC deducted the respective amount
Application of Belgian Tender rules for contracts below EUR 85.000	Tender processes under Regie Management speed up activities implementation	Applications continued until the end of the project
Approval project closing planning	Implementation project closing planning	Commitments finished/paid by second week of June 2017; only two commitment will go beyond this closure, both foreseen to finish in December, (1) commitment in partnership with EU for the risk mitigation works of Majaua Mini-hydro and (2) implementation of pilot project regarding renewable energy solutions for off-grid communities

## 2 Expenses

See financial report

### 3 Disbursement rate of the intervention

See financial report

## 4 Personnel of the intervention

Personnel (title and name)	Gender (M/F)	Duration of recruitment (start and end dates)
<b>National personnel put at disposal by the Partner Country:</b>		
Mario Batsana, Project Director	M	FUNAE permanent staff
Mirza Lalgy, Administrative Assistant	F	FUNAE permanent staff
Edson Uamusse, Head of Planning and Studies Department	M	FUNAE permanent staff
Jornal Rodrigues, Head of Solar Department	M	FUNAE permanent staff
Constantino Cachela, Head of Mini hydro Department	M	FUNAE permanent staff
Mussa Mane, Head of Finance Department	M	FUNAE permanent staff
Geraldo Mateus, Finance and Administrative Assistant	M	01.02.2011 – 31 03 2015
Other technicians according to needs		
<b>Support personnel, locally recruited by BTC:</b>		
Boaventura Muvale, Administrative Assistant	M	May 2013 – May 2015
Nelson Macume, Administrative Assistant	M	May – November 2015
Teresa da Cruz, Administrative and Finance Assistant	F	1 <sup>st</sup> Jan to 30 06 2017
		1.9.2014 -31.8.2015
Paulo Machava, Procurement Officer	M	7.12.2014 – 6.12.2015
Armando da Silva, GIS consultant	M	
<b>International Personnel (outside BTC):</b>		
Sylvain Penouilh, Solar expert for closing project	M	1.4. 2016 - 06 04 2017
<b>International experts (BTC):</b>		
Irene Novotny, Co-manager, Socio Economist	F	1.2.2011 – 31 12 2016
Erik Van Malderen, Hydro Expert	M	06 2012 – 30 06 2017
		1.3.2011 – 31 12 2015
Jan Cloin, Solar expert	M	





5 Public procurement

Winner Tenderer	Reference of the Tender	Sequen ber - New HQ (MOZ- Number)	Object of the tender	Budget Line	Date of No Objection	Date of Publication	Authorise responsible (Leading official)	Manager In charge of the Dossier (File controller)	Partner Country	Navision code	Type of contract (Works, supplies or services)	Procur ment Law (Belgia n/ Local)	Date and time of Tender closure	Date of No Objection - Awarding	Date of contract signature	Estimated budget(€)	Amount of the final contract (MZN)	Amount of the final contract (€)	Date of No objection for last payment	Amount of the last invoice (MZN)	Amount of invoice (equiva. in €)	Status Prep/Tender ongoing/ Awarding /Executio d of contract /Canceled )
Eduinter	045/SE-SPV/FUNAE/UGEA/11 - Lote 1	MOZ 001	Hiring contract for work trification of 25 Schools & 0 Administrative Buildings	A01 03 / A01 07	4/07/2011	7/07/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	7/09/11 at 13h00	19/12/11	30/12/11	€ 600,000.00	MZN 17,643,218.92	474,790.61 €	25/01/17	MZN 0.00	45,412.99 €	End of contract
Eduinter	045/SE-SPV/FUNAE/UGEA/11 - Lote 2	MOZ 002	Hiring contract for work trification of 80 Schools, 20 entres & 10 Administrative Buildings in Sofala	A01 03 / A01 07	4/07/2011	7/07/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	7/09/11 at 13h00	19/12/11	30/12/11	€ 2,500,000.00	MZN 68,451,698.94	1,842,080.17 €	16/01/17	MZN 0.00	64,746.83 €	End of contract
Angelique	045/SE-SPV/FUNAE/UGEA/11 - Lote 3	MOZ 003	Hiring contract for work trification of 50 Schools, 50 entres & 26 Administrative Buildings in Zambezia	A01 03 / A01 07	4/07/2011	7/07/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	7/09/11 at 13h00	19/12/11	30/12/11	€ 2,500,000.00	MZN 68,810,667.66	2,068,513.26 €	31/08/16	MZN 8,862,666.66	266,420.08 €	End of contract
Angelique	045/SE-SPV/FUNAE/UGEA/11 - Lote 4	MOZ 004	Hiring contract for work trification of 40 Schools, 9 entres & 12 Administrative delivered by photovoltaic systems in Zambezia	A01 03 / A01 07	4/07/2011	7/07/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	7/09/11 at 13h00	19/12/11	30/12/11	€ 1,500,000.00	MZN 40,638,972.80	1,137,164.76 €	31/08/16	MZN 5,367,113.44	150,183.23 €	End of contract
Aqualogus	028/FUNAE/UGEA/11	MOZ 005A	Pre-feasibility studies of and Mavonde hydro sites	A01 01	3/30/12	28/Nov/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	01/12/11 at 10h00	16/08/12	28/06/12	€ 40,000.00	MZN 1,631,252.81	42,927.71 €	28/05/14	MZN 489,375.84	12,234.40 €	End of contract
Aqualogus	027/FUNAE/UGEA/11	MOZ 005B	Pre-feasibility study of Sembezeia hydro sites	A01 01	30/03/12	28/Nov/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	01/12/11 at 10h00	16/08/12	28/06/12	€ 40,000.00	MZN 1,631,252.81	42,927.71 €	28/05/14	MZN 489,375.84	12,234.40 €	End of contract
Aqualogus	029/FUNAE/UGEA/11	MOZ 005C	Pre-feasibility of Mavonde hydro site	A01 01	30/03/12	28/11/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	01/12/11 at 10h00	16/08/12	28/06/12	€ 40,000.00	MZN 2,120,606.09	55,805.42 €	28/05/14	MZN 636,181.82	16,741.63 €	End of contract
Practical Action	121/FUNAE/UGEA/11	MOZ 006	Pre-feasibility studies of apa, Mitande and Lumbiza hydro sites	A01 01	20/12/12		Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	30/01/12 at 15h30		28/06/12	€ 60,000.00	MZN 3,448,489.00	90,749.71 €	28/05/14	MZN 1,034,546.70	25,863.67 €	End of contract
Pro Consultores	051/FISC-SPV/FUNAE/UGEA/11 - Lote 2	MOZ 007	Supervision of rification by PV systems in Zambezia	A01 03	5/10/2011	28/11/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	01/12/11 at 10h00	7/05/12	28/06/12	€ 350,000.00	MZN 12,290,382.00	307,259.55 €	31/08/16	MZN 1,843,256.20	43,887.05 €	End of contract
Pro Consultores	051/FISC-SPV/FUNAE/UGEA/11 - Lote 1	MOZ 008	Supervision of rification by PV systems in Manica & Sofala	A01 03	5/10/2011	28/11/11	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	01/12/11 at 10h00	7/05/12	28/06/12	€ 350,000.00	MZN 9,942,652.80	248,566.32 €	16/01/17	MZN 1,099,093	15,701.33 €	End of contract
Canceled	022/SE-SE/FUNAE/UGEA/12	MOZ 009	Installation of wind Wind Resource Assessment in 5 locations	A 01 8/A 01 09	20/09/2012	18/10/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	CANCELED	CANCELED	Canceled	€ 100,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled

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CANAS/TAVEL	059/SE-MHD/FUNAE/UGEA/13	MOZ 009	Construction of Micro- p Plant of Nintulo in Gurue istrict, Zambezia Province	A 01 02	23/07/2013	2/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	21/09/13, at 14:45	21/03/14	18/06/14	€ 1,125,000.00	MZN 54,540,392.00	1,377,978.58 €	Canceled	MZN 0.00	0.00 €	Canceled
Canceled	073/FUNAE/UGEA/12	MOZ 010	MF Consultant - Design implement Micro-Finance for consumer RE products		13/09/2012	24/09/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	08/10/12 at 14h30	CANCELED	Canceled	€ 100,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled
Canceled	032/FUNAE/UGEA/12	MOZ 011A	GIS Consultant - Design d implement GIS database	A 03 03	11/09/2011	30/07/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	CANCELED	CANCELED	Canceled	€ 60,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled
Acol- Araujo Construções Lda	026/FUNAE/UGEA/12	MOZ 012	Rehabilitation Office for UNAE Delegation in Niassa Province.	A 03 05	5/03/2012	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	Direct Award	N/A	31/07/12	€ 35,500.00	MZN 1,451,035.64	36,275.89 €	Not Requested	MZN 1,451,035.64	34,548.47 €	End of contract
Liser Moçambique	042/MHD-EQ/FUNAE/UGEA/12	MOZ 013	Supply of measuring equipment and computer calculations for Mini-hydro projects	A 01 02	10/09/2012	10/09/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	11/10/12 at 14h00	27/02/13	20/04/13	€ 15,000.00	MZN 1,036,863.92	26,675.17 €	28/05/14	MZN 1,036,864.00	27,285.89 €	End of contract
AQUALOGUS	037/SE-MHD/FUNAE/UGEA/12	MOZ 014A	Feasibility study and object design of Mini-hydro trification of the village of elo the District of Malema, Nampula Province. Lote 1	A 01 01	8/01/2013	08/07/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	28/06/12 at 15h00	5/04/13	24/05/13	€ 120,000.00	MZN 3,435,623.10	88,387.53 €	23/05/14	MZN 616,650.30	14,682.15 €	End of contract
AQUALOGUS	037/SE-MHD/FUNAE/UGEA/12	MOZ 014B	Feasibility study and object design of Mini-hydro trification of the village of unga the District of Sanga, Niassa Province. Lote 2	A 01 01	8/01/2013	08/06/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	28/06/12 at 15h00	5/04/13	20/05/13	€ 120,000.00	MZN 3,435,623.10	88,387.53 €	23/05/14	MZN 616,650.30	14,682.15 €	End of contract
Canceled	081/FUNAE/UGEA/12	MOZ 015	MF Consultant - Design implement Micro-Finance for consumer RE products		Not requested	20/12/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	31/01/13 at 14h30	Canceled	Canceled	€ 39,473.68	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled
Canceled	081/FUNAE/UGEA/12	MOZ 015	MF Consultant - Design implement Micro-Finance e for consumer Renewable products (re tender FIT No 17)		Not requested	20/12/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	31/01/13 at 14h30	Canceled	Canceled	€ 100,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled
Tecnasol - FGE	086/SBA-SPV/FUNAE/UGEA/12 - Lot 1	MOZ 016	Geophysical study, drilling of water borehole, on of solar water pumping and hydraulic distribution network in Manica	A01 03	5/03/2012	27/12/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	31/01/13 at 9h30	3/04/14	24/07/13	€ 350,000.00	MZN 15,603,880.00	374,104.05 €	20/06/16	MZN 1,690,592.41	26,009.11 €	End of contract

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Canceled	086/SBA-SPV/FUNAE/UGEA/12 - Lot 2	MOZ 017	Geophysical study, drilling of water borehole, on of solar water pumping and hydraulic distribution network in Sofala		5/12/2012	27/12/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	31/01/13 at 9h30	Canceled	Canceled	€ 600,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 24/07/2013
CARC	086/SBA-SPV/FUNAE/UGEA/12 - Lot 3	MOZ 018	Provision of geophysical drilling of water borehole, on of solar water pumping and hydraulic distribution network in Zambezia	A01 03	5/12/2012	27/12/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	31/01/13 at 9h30	3/04/14	30/06/14	€ 650,000.00	MZN 34,339,839.58	883,453.55 €	26/07/16	MZN 2,868,115.59	44,124.86 €	End of contract
ISQ Moçambique, Lda	006/FISC-SPV/FUNAE/UGEA/13 Lote 1	MOZ 019	Supervision of work for water pumping system Manica	A01 03	8/01/2013	8/06/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	08/07/13 at 10h00	4/09/13	14/10/13	€ 60,000.00	MZN 2,264,957.00	58,270.05 €	24/05/16	MZN 290,825.37	6,924.41 €	End of contract
Canceled	006/FISC-SPV/FUNAE/UGEA/13 Lote 2	MOZ 020	Supervision of work for water pumping system Sofala	A 01 03	8/01/2013	08/01/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	08/07/13, at 10h00	4/09/13	Canceled	€ 90,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 14-Oct-2013
ISQ Moçambique, Lda	006/FISC-SPV/FUNAE/UGEA/13 Lote 3	MOZ 021	Supervision of work for water pumping system Zambezia	A01 03	8/01/2013	08/06/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	08/07/13 at 10h00	4/09/13	Canceled	€ 100,000.00	MZN 3,501,815.00	90,090.43 €	26/07/16	MZN 408,659.62	6,287.07 €	end of contract
Canceled	085/SMON-SPV/FUNAE/UGEA/13	MOZ 022	Provision of a monitoring system for remote solar systems		Not requested	23/11/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	Canceled	Canceled	Canceled	€ 1,300,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 29/10/2013
Consórcio CANAS & TAVEL	083/SE-MHD/FUNAE/UGEA/12	MOZ 023	Procurement and execution (EPC) of MHP Muohha in Manica Province	A01 02	17/12/2012	9/01/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	12/03/13 at 13h30	22/07/13	28/08/13	€ 1,000,000.00	MZN 46,470,481.42	1,195,535.93 €	13/04/16	MZN 1,540,403.00	36,676.26 €	End of contract
CENORVIA-MOZ/GESTO	010/SE-MH/FUNAE/UGEA/13 - Lot1	MOZ 024	Pre-feasibility studies for hydro in the districts of e and Lago (Luchimuo and ) in Niassa Province Lot 1 - Contract 23/2013	A 01 01	7/03/2013	19/03/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/04/13 at 15h30	29/01/14	27/02/14	€ 240,000.00	MZN 2,638,090.98	67,869.59 €	17/12/14	MZN 791,427.29	20,487.37 €	End of contract
CENORVIA-MOZ/GESTO	010/SE-MH/FUNAE/UGEA/13 - Lot2	MOZ 024	Pre feasibility studies for hydro in the districts of Majune and Lago (Luangua, Jalalo, Ntelela, Namicuinha) Province Lot 2 - Contract 21/2013	A 01 01	7/03/2013	19/03/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/04/13 at 15:30	29/01/14	27/02/14	€ 240,000.00	MZN 2,638,090.98	66,652.12 €	17/12/14	MZN 742,942.97	17,689.12 €	End of contract
CENORVIA-MOZ/GESTO	010/SE-MN/FUNAE/UGEA/13 - Lot3	MOZ 024	Pre feasibility studies for hydro in the districts of e and Lago (Litomboshi and e) Niassa Province Lot 3 - Contract 22/2013	A 01 01	7/mar/2013	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/04/13 at 15:30	29/01/14	27/02/14	€ 240,000.00	MZN 2,638,090.98	65,952.27 €	17/12/14	MZN 884,974.09	21,070.81 €	End of contract

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Global Procurement Solutions	095/GIS-UTIC/FUNAE/UGEA/14	MOZ 024	Supply for GIS equipment	A 03 03	23/07/2014	28/07/14	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	19/08/14 at 14H10	24/11/14	31/12/14	€ 33,008.46	MZN 1,298,222.64	33,399.09 €	8/04/15	MZN 1,168,400.37	27,819.06 €	End of contract
ProComputers	044/FUNAE/UGEA/13	MOZ 025	Purchase of 42 computers for FUNAE HQ	A 03 05	28/05/2013	18/06/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	18/07/13, at 14h30	23/08/13	30/09/13	€ 73,684.21	MZN 2,450,857.50	61,471.22 €	18/12/14	MZN 2,094,750.00	52,368.75 €	End of contract
3E NV	022/SE-SE/FUNAE/UGEA/13	MOZ 026	Installation of wind measurement masts (Wind Monitoring Masts)	A01 08 / A01 09	20/09/2012	15/05/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	14/06/13, 13h00	30/08/13	08/11/13	€ 260,000.00	MZN 9,076,970.70	233,521.24 €	27/09/16	MZN 969,318.00	23,079.00 €	End of contract
Armindo Filipe da Silva	021/FUNAE/UGEA/2013	MOZ 027	GIS Consultant - Design and implement GIS database	A 03 03	3/03/2013	12/04/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	23/04/13 at 14h30	10/09/13	15/10/13	€ 40,000.00	MZN 1,470,677.57	36,886.82 €	14/05/14	MZN 1,70,677.57	35,016.13 €	End of contract
Canceled	058/SE-MHD/FUNAE/UGEA/13	MOZ 029	Construction of Nkalapa Micro Hydro plant	A 01 02	26/06/2013	10/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	30/08/13 at 9H30	Canceled	Canceled	€ 505,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 05-Dec-2013
Consórcio CANAS & TAVEL	057/SE-MHD/FUNAE/UGEA/13	MOZ 030	Procurement and execution (EPC) of MHP Nintulo in Zambézia Province	A01 02	26/06/2013	05/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	06/09/13 at 14h30	21/03/14	18/06/14	€ 950,000.00	MZN 54,540,392.65	1,467,717.78 €		MZN 0.00	0.00 €	Canceled
Consórcio CANAS & TAVEL	056/SE-MHD/FUNAE/UGEA/13	MOZ 031	Procurement and Construction (EPC) of MHP Bezeia in Manica Province	A01 02	26/06/2016	10/07/2013	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	22/08/13 at 14h30	13/11/13	05/12/13	€ 350,000.00	MZN 39,464,227.90	1,062,008.29 €	25/04/16	MZN 2,650,882.00	63,116.24 €	End of contract
Canceled	057/SE-MHD/FUNAE/UGEA/13	MOZ 032	Construction of Umbiza Micro Hydro plant	A 01 02	26/06/2013	10/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	06/09/13 at 14h30	Canceled	CANCELED	€ 350,000.00	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 05/12/2013
Liser Moçambique	042/FUNAE/UGEA/13	MOZ 033	Purchase of Pico hydro equipment	A 01 02	20/06/2013	20/06/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	04/07/13 at 14h30	13/04/14	31/12/13	€ 550,000.00	MZN 1,036,863.92	24,687.24 €	28/05/14	MZN 1,036,864.00	24,687.24 €	End of contract
INGEROPE MOÇAMBIQUE	073/SE-MHD/FUNAE/UGEA/13	MOZ 034	Supervision of construction of Micro Hydro plants Lot 1	A01 02	3/10/2013	5/08/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/08/13 at 14h00	5/06/14	11/06/14	€ 789,473.68	MZN 5,137,558.00	138,255.06 €		MZN 0.00	0.00 €	Out of scope
INGEROPE MOÇAMBIQUE	073/SE-MHD/FUNAE/UGEA/13	MOZ 034	Supervision of construction of Micro Hydro plants Lot 2	A01 02	3/10/2013	5/08/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/08/13 at 14h00	5/06/14	11/06/14	€ 798,473.68	MZN 5,257,824.79	141,491.52 €		MZN 0.00	0.00 €	Out of scope
INGEROPE MOÇAMBIQUE	073/SE-MHD/FUNAE/UGEA/13	MOZ 034	Supervision of construction of Micro Hydro plants Lot 3	A01 02	3/10/2013	5/08/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	15/08/13 at 14h00	5/06/14	11/06/14	€ 798,473.68	MZN 5,280,811.97	142,110.12 €		MZN 0.00	0.00 €	Out of scope
Royal Haskoiving DHV	055/SE-MHD/FUNAE/UGEA/13	MOZ 035	Feasibility study of the mini central of Mavonde	A 01 01	26/06/2013	05/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	24/07/13 at 15h30	8/05/14	30/05/14	€ 118,421.05	MZN 4,810,210.26	114,528.82 €	24/09/15	MZN 90,613.00	2,157.45 €	End of contract

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COWI	060/FUNAE/DEP/2013 - Lot 1	MOZ 036	Market development study - Lot 1 Solar products	A 02 05	26/06/2013	18/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	28/11/13	8/05/14	30/05/14	€ 99,000.00	MZN 3,926,900.25	91,771.45 €	23/ 03/16	MZN 36,786.00	735.72 €	End of contract
COWI	060/FUNAE/DEP/2013 - Lot 2	MOZ 036	Market development study - Lot 2 Mini hydro components	A 02 05	26/06/2013	18/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	28/11/13	8/05/14	30/05/14	€ 99,000.00	MZN 4,029,578.28	94,171.03 €	23/03/16	MZN 36,786.00	735.72 €	End of contract
Copy Solution, Lda	082/SI-SPV/FUNAE/UGEA/13 - Lot 1 (Manica: 25 Computers)	MOZ 037	Supply and installation of computers in Schools in Manica Province	A 01 03	1/10/2013	22/10/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	21/11/13 at 13H30	11/04/14	24/04/14	€ 130,000.00	MZN 1,864,375.00	50,171.56 €		MZN 0.00	0.00 €	End of contract
Dataserv LDA	082/SI-SPV/FUNAE/UGEA/13 - Lot 2 (Zambézia: 90 computers)	MOZ037	Supply and installation of computers in Schools in Zambezia Province	A 01 03	1/10/2013	22/10/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Works	Local	21/11/13 at 13H30	11/04/14	24/04/14	€ 130,000.00	MZN 5,945,199.53	159,989.22 €		MZN 0.00	0.00 €	End of contract
COWI	079/FUNAE/UGEA/13	MOZ 038	Simplified mental impact assessment of the electrification by micro-hydro project of Nintulo, Gurue district, in Zambeze Province.	A 02 05	01/07/2013	14/08/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	19/09/13 at 14H30	12/06/14	29/07/14	€ 52,631.58	MZN 1,431,867.65	38,532.50 €	15/06/15	MZN 429,560.29	10,227.63 €	End of contract
Toyota de Moçambique	114/FUNAE/UGEA/13	MOZ 039	Acquisition of two vehicles for Representations of Manica and Zambezia	A 03 05	14/01/2014	29/10/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	25/11/13 at 10H00	14/02/14	20/02/14	€ 148,000.00	MZN 3,001,337.67	80,767.97 €	14/03/14	MZN 3,001,337.67	71,460.42 €	End of contract
IMPACTO	104/FUNAE/UGEA/2013	MOZ 040	Simplified mental impact assessment of the electrification by micro-hydro project of Sembezeia, Essendenga District, Manica Province	A 01 01	13/01/2014	17/10/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Services	Local	18/11/13 at 14H30	10/04/14	2/05/14	€ 52,631.58	MZN 1,434,887.85	38,613.77 €	20/11/14	MZN 430,466.36	11,143.32 €	End of contract
IMPACTO	105/FUNAE/UGEA/2013	MOZ 041	Simplified mental impact assessment of the electrification by micro-project of Mavonde, Manica District, Manica Province	A 01 01	13/01/2014	17/10/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Services	Local	18/11/13 at 14H30	3/04/14	2/05/14	€ 52,631.58	MZN 1,434,887.85	38,613.77 €	20/11/14	MZN 430,466.36	11,143.32 €	End of contract
Canceled	108/FUNAE/UGEA/13	MOZ 042	Supply of Maintenance components of photovoltaic systems	A 01 05	22/11/2013	14/11/13	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	09/12/13 at 14H00	Canceled	Canceled	€ 263,157.89	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled
TRACTEBEL Engineering	003/TA/BTCMOZ/14	MOZ 043	Public contract for services for support to FUNAE / CTC in study and design of a grid for Micro Hydro Plant on Machele - Meponda	A01 02 / A01 06	Belgium procurement rules	25/03/2014	Paul Van Impe	Tomas De Gussemacker	MOZ	MOZ0901811	Services	Belgian	14/04	N/A	N/A	€ 60,000.00	MZN 0.00	71,787.00 €	N/A	MZN 0.00	0.00 €	End of contract
Current Automation	005/R1/BTCMOZ/14	MOZ 046	Supply of components of solar PV systems		Belgium procurement rules	06/06/14	Paul Van Impe	Tomas De Gussemacker	MOZ	MOZ0901811	Services	Belgian	25/06/14, at 10h00	N/A	N/A	€ 60,000.00	MZN 0.00	48,502.00 €	N/A	MZN 0.00	0.00 €	End of contract

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Applied the procurement rules	006/R1/BTCMOZ/14	MOZ 048	Supply and installation of solar refrigerator		Belgium procurement rules		Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Belgian	N/A	N/A	N/A	€ 50,000.00	MZN 0.00	0.00 €	N/A	MZN 0.00	0.00 €	Canceled
Solar Solutions, Lda	035/FUNAE/UGEA/14	MOZ 049	Supply of maintenance toolkits for technicians of electricity			06/03/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	26/03/14 at 14H00	29/05/14	5/06/14	€ 47,619.05	MZN 1,795,328.00	42,745.90 €		MZN 0.00	0.00 €	End of contract
GeoDrill, Lda	020/SBA-SPV/FUNAE/UGEA/14	MOZ 050	Geophysical studies, of boreholes and mounting of 17 pumping systems in Inhambane Province	A01 03	3/04/2013	08/04/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	08/05/14 at 09H30	24/06/14	not yet	€ 809,523.81	MZN 22,738,251.38	545,151.08 €		MZN 0.00	0.00 €	End of contract
Time Comércio e Serviços	024/MN-SPV/FUNAE/UGEA/14	MOZ 051	Supply of lamps and installation materials - Lot 2		6/03/2014	19/03/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	14/04/14, at 14H30	22/05/14	30/05/14	€ 23,809.52	MZN 1,560,851.84	36,299.00 €	18/12/14	MZN 780,984.15	19,524.60 €	End of contract
Engco Investments	024/MN-SPV/FUNAE/UGEA/14	MOZ 051	Supply of lamps and installation materials Lot 1		6/03/2014	19/03/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	14/04/14 at 14H30	22/05/14	30/05/14	€ 23,809.52	MZN 453,083.67	10,536.00 €		MZN 0.00	0.00 €	End of contract
CRITICAL SOFTWARE	003/SMON-SPV/FUNAE/UGEA/14	MOZ 052	Supply and installation of equipment for remote monitoring of photovoltaic systems	A 01 03 / A01 07	4/02/2014	07/02/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	07/03/14 at 13H00	19/10/14	26/12/14	€ 1,250,000.00	MZN 50,750,724.86	1,282,231.55 €	26/07/16	MZN 8,382,203.85	128,956.98 €	End of contract
Yawale Investimentos & Serviços	042/FUNAE/UGEA/13	MOZ 054	Simplified environmental study of MHP Mouha in Manica Province	A 01 01		20/06/13	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	04/07/13 at 14H30	3/04/14	14/11/13	€ 46,304.76	MZN 1,944,800.00	46,304.76 €	03/11/14	MZN 583,440.00	13,891.43 €	End of contract
Consórcio CANAS & TAVEL	084/SE-MHD/FUNAE/UGEA/13	MOZ 055	Construction of isolated grid for MAJAU MHP	A01 02	1/08/2013	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	works	Local	Direct Award	7/11/13	30/09/13	€ 750,000.00	MZN 47,117,431.56	1,267,961.02 €	21/04/16	MZN 2,486,438.00	59,200.90 €	End of contract
INENSUS gmbh	001/TA/BTCMOZ/14	MOZ 056	Feasibility study and design of a hybrid solar / diesel power an electrical mini-grid	A 03 07	Belgium procurement rules	11/01/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Belgian	10/02/14 at 12H00		20/02/14	€ 30,000.00	MZN 1,455,720.00	34,660.00 €		MZN 0.00	0.00 €	End of contract
Toyota de Moçambique	084/FUNAE/UGEA/14	MOZ 057	Acquisition of a car for the delegation Inhambane	A 03 05	23/06/2014	23/06/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	14/07/14, at 14h00	1/08/14	19/08/14	€ 148,000.00	MZN 1,595,240.63	40,304.21 €	13/01/15	MZN 1,595,240.63	40,304.21 €	End of contract
SAIRAM ENTERPRISE	052/SI-SPV/FUNAE/UGEA/14	MOZ 058	Supply and installation of computers in schools in Sofala Province	A 01 03	28/04/2014	05/05/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Belgian	05/06/14, at 13h30	16/07/14	4/08/14	€ 166,866.67	MZN 4,330,314.57	103,102.73 €		MZN 0.00	0.00 €	End of contract
Cancelled	107/SE-MHD/FUNAE/UGEA/14	MOZ 066	Construction for tendering of the site MHP Marralelo in Malema District, Province Nampula	A 01 02	23/07/2014	27/08/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	10/10/14, at 14h00	31/10/14	Canceled	€ 1,515,917.13	MZN 60,000,000.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 21/11/2014



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Cancelled	108/SE-MHD/FUNAE/UGEA/14	MOZ 067	Construction for rendering of the site MHP in Mago District, Province Niassa	A 01 02	23/07/2014	27/08/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	10/10/14, at 14:00	31/10/14	Canceled	€ 1,010,611.42	MZN 40,000,000.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled 21/11/2014
NIKOTCHOLAKA LDA	073/FISC-SPV/FUNAE/UGEA/14	MOZ 068	Supervision for Solar Water Pumps Inhambane	A01 03	3/06/2014	06/07/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	6/08/14, at 15h30	08/10/14	21/10/14	€ 126,326.43	MZN 3,207,555.00	81,971.76 €	8/07/16	MZN 171,815.00	2,643.31 €	End of contract
CENORVIA-MOZ/GESTO	118/FIS-DMH/FUNAE/UGEA/14	MOZ 070	Pre-feasibility studies for hydro in the district of Mopona, in Niassa Province	A 01 01	7/03/2013	Direct Award	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	Direct Award	20/11/14	11/12/14	€ 240,000.00	MZN 2,476,476.54	61,911.91 €	17/12/14	MZN 742,942.97	17,689.12 €	End of contract
Never Taken	119/FUNAE/UGEA/2014	MOZ 071	Supply and installation of equipment of video surveillance system of photovoltaic electric in Mavango, Muembe and Mecula, Province Niassa	A 01 03	Never tendered	Never tendered	Paul Van Impe	Ravi Reddy	MOZ	MOZ0901811	Services	Local	Never taken	Never taken	Never taken	€ 126,326.43	MZN 5,000,000.00	0.00 €	Never taken	MZN 0.00	0.00 €	Never taken
WE CHANGE	121/URH-FUNAE/UGEA/2014	MOZ 072	Team Building	A 03 01	3/07/2014	10/09/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	1/10/14, at 10h15	29/10/14	8/11/14	€ 35,371.40	MZN 737,100.00	18,741.42 €	24/02/15	MZN 737,100.00	17,550.00 €	End of contract
AFRITOOL Lda - Lot 1	081/UM-FUNAE/UGEA/2014 - Lot 1	MOZ 073	Spare parts for solar systems - Lot 1	A 01 05	17/12/2014	22/12/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	23/01/15, at 14H15	12/03/15	13/04/15	€ 218,037.33	MZN 8,575,408.00	214,385.20 €	15/03/17	MZN 857,540.81	20,417.64 €	End of contract
AFRITOOL Lda - Lot 2	081/UM-FUNAE/UGEA/2014 - Lot 2	MOZ 073	Spare parts for solar systems - Lot 2	A 01 05	17/12/2014	22/12/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	23/01/15, at 14H15	12/03/15	13/04/15	€ 353,439.61	MZN 13,900,780.00	347,519.50 €	15/03/17	MZN 1,390,078.00	33,097.10 €	End of contract
MOÇITALY Lda - Lot 3	081/UM-FUNAE/UGEA/2014 - Lot 3	MOZ 073	Spare parts for solar systems - Lot 3	A 01 05	17/12/2014	22/12/2014	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	23/01/15, at 14H15	12/03/15	13/04/15	€ 516,697.97	MZN 20,321,731.00	508,043.28 €		MZN 0.00	0.00 €	End of contract
Sotux, Lda	050/FUNAE/UGEA/13	MOZ 080	Acquisition of furniture for the new Delegation (Inhambane)	A 03 05		10/06/13	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	09/08/13 at 15H00	04/09/13	4/09/13	€ 6,717.95	MZN 171,837.68	4,624.26 €	27/05/14	MZN 171,837.67	4,091.37 €	End of contract
Canceled	018/SE-SH/FUNAE/UGEA/15 - Lot 1	MOZ 081	Designing and construction of mini hydro of Mallelo in Malema district , province of Nampula -Lot 1		16/02/2015	24/02/15	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	30/04/15, at 14h15	Canceled	Canceled	€ 0.00	MZN 0.00	0.00 €		MZN 0.00	0.00 €	Canceled
Canceled	018/SE-SH/FUNAE/UGEA/15 - Lot 2	MOZ 081	Designing and construction of power grid , laying of lines of medium and voltage of transformer stations installation and connections to consumers - Lot 2		16/02/2015	25/02/15	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901812	Services	Local	30/04/15, at 14h15	Canceled	Canceled	€ 0.00	MZN 0.00	0.00 €		MZN 0.00	0.00 €	Canceled
Canceled	013/SE-SH/FUNAE/UGEA/15	MOZ 082	Contract for agency to supervise the works construction of a hybrid electric system (Solar and Diesel generator) in the village of Naburi, Pebane District, Zambézia Province, Mozambique.		CANCELED	12/02/15	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Services	Local	27/02/15, at 15:30	Canceled	Canceled	€ 0.00	MZN 0.00	0.00 €		MZN 0.00	0.00 €	Canceled

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Aqualogus	027/SE-MHD/FUNAE/UGEA/2015 - Lote 1	MOZ 083	Pre feasibility study for construction of mini hydro of erua, in District of Milange, Zambezia Province - Lot 1	A 01 01	5/03/2015	27/03/2015	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Local	17/04/15, at 15H30	09/02/16	28/03/16	€ 145,752.75	MZN 5,830,110.00	116,602.20 €	15/03/17	MZN 1,749,033.00	0.00 €	End of contract
Aqualogus	027/SE-MHD/FUNAE/UGEA/2015 - Lote 2	MOZ 083	Pre feasibility study for construction of mini hydro of e in District of Chimbunila, Niassa Province, Lot 2	A 01 01	5/03/2015	27/03/2015	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Local	17/04/15, at 15H30	09/02/16	25/05/16	€ 145,752.75	MZN 5,830,110.00	116,602.20 €	15/03/17	MZN 1,749,033.00	0.00 €	End of contract
Aqualogus	027/SE-MHD/FUNAE/UGEA/2015 - Lote 3	MOZ 083	Pre feasibility study for construction of mini hydro of i in District of Lago, Niassa Province, Lot 3	A 01 01	5/03/2015	27/03/2015	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Local	17/04/15, at 15H30	09/02/16	30/03/16	€ 145,752.75	MZN 5,830,110.00	116,602.20 €		MZN 0.00	0.00 €	End of contrat
never tendered	048/SE-SH/FUNAE/UGEA/15	MOZ 086	Construction of hybrid ic system (solar and diesel or) in the village of Naburi, Pebane distrct, Zambezia Province.				Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Works	Local				€ 0.00	MZN 0.00	0.00 €		MZN 0.00	0.00 €	never tendered
Canceled	110/FUNAE/UGEA/13	MOZ 090	Maintenance Tools	A 01 05	21/11/2013	29/10/13	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Goods	Local	22/11/13, at 14h00	24/01/14	Canceled	€ 22,738.76	MZN 1,773,500.95	47,726.08 €	Canceled	MZN 0.00	0.00 €	Canceled on 04/03/2014
Canceled	110/FUNAE/UGEA/13	MOZ 090	Supply of maintenance r technicians of electricity.		21/11/2013	29/10/13	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Goods	Local	22/11/13 at 14H00	24/01/14	Canceled	€ 23,684.21	MZN 1,773,550.95	47,727.42 €	Canceled	MZN 0.00	0.00 €	Canceled on 04/03/2014
Toyota de Moçambique	060/FUNAE/UGEA/2015	MOZ 091	Acquisition of two all terrain vehicles for FUNAE Delegations		9/04/2015	20/05/15	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Goods	Local	22/06/15, at 10H00	20/07/15	20/07/15	€ 88,183.38	MZN 3,678,128.72	88,183.38 €		MZN 0.00	0.00 €	End of contract
SHER Ongenieurs Conseils and Mhylab	092/TA/BTCMOZ/15	MOZ 092	Study of rehabilitation MHP of Majaua in Zambeze province	A 01 06	Belgium ocurement rules	01/07/15	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Belgian	27/07/15	14/09/15	14/09/15	€ 21,000.00	MZN 0.00	26,000.00 €	N/A	MZN 0.00	0.00 €	End of contract
Altel - Telecomunicações	089/UTIC-FUNAE/UGEA/15	MOZ	Adquisicao e instalacao ntrais de PABX Delegacoes Niassa, Zambezia, Manica, Inhambane	A 03 05	04/09/2015	n/a	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Local	DIRECT AWARD	n/a	10/10/15	€ 24,416.22	MZN 1,220,810.85	0.00 €	25/11/16	MZN 244,162.18		End of contract; Objectionf or the last payment
MARGE	102/DEP/BTCMOZ/15	MOZ 102	Market study ltancy Small Solar Systems	A02 09	N/A	22/01/16	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	Services	Belgian	11/02/16 at 13h00	25/02/16	25/02/16	€ 70,000.00	MZN 0.00	50,350.00 €	N/A	MZN 0.00	28,009.00 €	End of contract
SMOPS	Direct Award	MOZ 109	Topographical survey by Drone	A 01 06	11/09/2015		Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	services	Belgian			21/10/15	€ 9,000.00		6,267.00 €	N/A		0.00 €	End of contract
Sylvain Penouilh	116-DEP/BTCMOZ/16	MOZ 116	RERD expertise closing project	Z 01 04	Belgium ocurement rules	25/02/2016	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	services	Belgian	11/03/16	30/03/16	30/03/16	€ 20,000.00	n/a	21,000.00 €	22/12/16		324.38 €	End of contract
Canceled	cancelled	MOZ 117	Study design channel Chuirairue micro hydro	A 01 01	Belgium ocurement rules	N/A	Paul Van Impe	Tomas De ussemackeer	MOZ	MOZ0901811	services	Belgian										Canceled
Dataserv LDA	002/FUNAE/UGEA/12	N/A	Installation of data rk to Delegation of Sofala.	A 03 05	5/03/2012	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	Direct Award	N/A		€ 9,227.13	MZN 343,835.98	9,227.13 €	18/12/14	MZN 221,141.70	5,265.28 €	End of contract

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Solar Associates	002/TA/BTCMOZ/14	N/A	Public contract for ces for support to FUNAE / electing and implementing solar home system remote monitoring	A 01 07	Belgium procurement	21/02/201 4	Paul Van Impe	Tomas De ussemaecker	MOZ	MOZ0901811	Services	Belgian	5/03/14, at 12h00	N/A	N/A	€ 12,500.00	MZN 653,070.00	16,500.00 €	12/10/16	MZN 683,907.00	16,283.50 €	End of contract
Contact	004/TA/BTCMOZ/14	N/A	Provision of ent and selection services	Z 01 01	N/A	14/04/14	Paul Van Impe	Tomas De ussemaecker	MOZ	MOZ0901811	Services	Belgian	13/05/14, at 12h00	N/A	N/A	€ 6,000.00	MZN 63,180.00	1,504.29 €	N/A	MZN 63,180.00	1,504.29 €	End of contract
Constuções e Serviços, Lda	008/FUNAE/UGEA/2012	N/A	Rehabilitation office of FUNAE Representation in Manica.	A 03 05	5/03/2012	27/02/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	20/03/12 at 15H15		18/04/12	€ 20,000.00	MZN 284,737.05	7,325.37 €	Not Requested	MZN 284,737.05	7,325.37 €	End of contract
SEED	012/SE-SPV/FUNAE/UGEA/11	N/A	Service contract for ollecton and elaboration of ations for electrification of Mini Hydros		CANCELED	CANCELED	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	CANCELED	Canceled	Canceled	Canceled	MZN 7,382,743.00	199,533.59 €	Canceled	MZN 0.00	0.00 €	Canceled
Shiva Enterprise	019/FUNAE/UGEA/13	N/A	Acquisition of 80 batteries for UPS	A 03 05	5/03/2012	08/03/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	23/03/13 at 13h30		30/04/13	€ 1,157.91	MZN 44,000.42	1,131.99 €	18/12/14	MZN 44,000.42	1,047.63 €	End of contract
Dataserv LDA	022/FUNAE/UGEA/12	N/A	Installation of data work in the Delegations of Nica, Niassa and Zambézia.	A 03 05	7/03/2012	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	Direct Award	31/01/14	30/04/14	€ 20,000.00	MZN 940,329.60	21,500.00 €	18/12/14	MZN 535,959.33	12,760.94 €	End of contract
DCC	023/FUNAE/UGEA/11	N/A	Supply of computer equipment.		Not requested	20/04/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	07/05/12, at 10h00			€ 13,000.00	MZN 480,489.06	12,930.28 €	18/12/14	MZN 480,489.06	12,012.23 €	End of contract
Canceled	033/FUNAE/UGEA/14	N/A	Acquisition and lation of SPSS software for Division of Planification at FUNAE		Not requested	27/02/14	Paul Van Impe	Tomas De ussemaecker	MOZ	MOZ0901811	Services	Local	21/03/14 at 10H00	Canceled	Canceled	€ 6,233.52	MZN 260,000.00	6,233.52 €	Canceled	MZN 0.00	0.00 €	Canceled n 23/04/2014
Altel - Telecomunicações	033/FUNAE/UGEA/12	N/A	Provision of two telephone exchanges PBX.	A 03 05	5/03/2012	25/05/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	26/06/12, at 10h15		25/10/12	€ 20,000.00	MZN 628,794.00	16,413.31 €	18/12/14	MZN 314,397.00	7,485.64 €	End of contract
Dataserv LDA	039/FUNAE/UGEA/12	N/A	Providing a printer HPLJ Representation of Manica.	A 03 05	5/03/2012	23/05/12	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Goods	Local	07/06/12, at 10h15	N/A	19/09/12	€ 1,608.75	MZN 64,350.00	1,693.42 €	18/12/14	MZN 64,350.00	1,693.42 €	End of contract
Canceled	049/FUNAE/UGEA/13	N/A	Acquisition of IT ent for the new Delegation (Inhambane)	A 03 05	5/03/2012	17/06/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	09/08/13 at 10H00	Canceled	Canceled	€ 14,448.72	MZN 0.00	0.00 €	Canceled	MZN 0.00	0.00 €	Canceled n 05/12/2013
KPSS Construções	051/FUNAE/UGEA/13	N/A	Rehabilitation of FUNAE - Nampula Office	A 03 05	5/03/2012	23/06/13	Paul Van Impe	Tomas De ussemaecker	MOZ	MOZ0901811	Works	Local	23/07/13 at 12H00		18/11/13	€ 6,328.18	MZN 263,948.51	6,328.18 €	not received	MZN 263,948.49	6,328.18 €	End of contract
SDO Moçambique	060/FUNAE/UGEA/2013	N/A	Team Building	A 03 01	30/06/2013	10/07/13	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Services	Local	23/07/13 at 15h00	12/08/13	27/08/13	€ 6,710.53	MZN 327,951.00	8,225.51 €	not received	MZN 327,951.00	8,225.51 €	End of contract
Dataserv LDA	065/FUNAE/UGEA/11	N/A	Provides hardware and roceeds to install the data network at the Delegation of Nampula.	A 03 05	5/03/2012	Direct Award	Tom Smis	Ravi Reddy	MOZ	MOZ0901811	Works	Local	Direct Award		30/10/11	€ 13,157.89	MZN 456,715.50	12,018.83 €	18/12/14	MZN 243,360.00	5,794.29 €	End of contract

Winner Tenderer	Reference of the Tender	Sequencer - New HQ (MOZ-Number)	Object of the tender	Budget Line	Date of No Objection	Date of Publication	Authorise responsible (Leading official)	Manager In charge of the Dossier (File controller)	Partner Country	Navision code	Type of contract (Works, supplies or services)	Procurement Law (Belgian/Local)	Date and time of Tender closure	Date of No Objection - Awarding	Date of contract signature	Estimated budget(€)	Amount of the final contract (MZN)	Amount of the final contract (€)	Date of No objection for last payment	Amount of the last invoice (MZN)	Amount of invoice (equivalent in €)	Status Prep/Tender ongoing/ Awarding/ Executed/ Contract /Canceled )
Dataserv LDA	068/FUNAE/UGEA/13	N/A	Installation of network FUNAE - Representation of Inhambane	A 03 05	5/03/2012	Direct Award	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Works	Local	Direct Award		20/08/13	€ 6,235.38	MZN 260,077.59	6,788.77 €	18/12/14	MZN 104,451.45	2,486.94 €	End of contract
MEPA, Lda	107/FUNAE/UGEA/13	N/A	Supply and installation of air-condition in Inhambane Representation	A 03 05	26/09/2013	29/10/13	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	11/11/13 at 10H00		20/10/13	€ 4,000.00	MZN 133,085.16	3,581.41 €	27/05/14	MZN 133,085.16	3,581.41 €	End of contract
F. Madeira Produções, Lda	112/FUNAE/UGEA/13	N/A	Supply of IT equipment for FUNAE - Delegação de Inhambane	A 03 05	5/03/2012	29/10/13	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	13/11/13 at 10H00		5/12/13	€ 1,892.35	MZN 78,930.00	1,925.12 €	18/12/14	MZN 78,930.00	1,879.29 €	End of contract
Toyota de Moçambique	135/FUNAE/UGEA/2014	N/A	Acquisition of two all terrain vehicles for the Representations	A 03 05	Objection	27/12/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	14/01/15, 14:00	9/02/15	Objection	€ 90,000.00	MZN 3,182,251.71	83,743.47 €	BTC gave Objection	MZN 3,182,251.71	83,743.47 €	Objection awarding the contract because it did not sent letter for No objection to launch the tender.
ALIF Limitada	Direct award	N/A	Acquisition of goods for FUNAE - Representation of Zambézia Province	A 03 05	5/03/2012	19/02/14	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	Direct award		19/02/14	€ 3,026.85	MZN 126,250.00	3,026.85 €	28/05/14	MZN 126,200.00	3,004.76 €	End of contract
Dataserv LDA	Direct award	N/A	Acquisition of 06 computers to FUNAE - Delegação de Inhambane	A 03 05	N/A	Direct award	Paul Van Impe	Tomas De ussemacker	MOZ	MOZ0901811	Goods	Local	Direct award	4/06/14	4/06/14	€ 7,885.80	MZN 331,203.60	7,885.80 €		MZN 331,203.60	7,885.80 €	End of contract
	postponed	MOZ 125	GIS Study - How to make GIS tool user friendly	A 02 09	Belgium procurement	postponed	Irene Novotny	Stephan Claes	MOZ	MOZ0901811	Services	Bel				€ 30,000.00						postponed
Canceled	cancelled	n/a	Study new GREEN building design FUNAE	A 02 09	Belgium procurement		Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Services	Bel				€ 60,000.00						Canceled
GeoDrill, Lda	050/SE-SB/FUNAE/UGEA/2015	MOZ 129	Co financing WB for water pumps 3 provinces	A 01 03	N/A	FUNAE/W B Tender	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Works	Local	N/A	FUNAE/W B Tender	05/07/16	€ 370,000.00	MZN 19,471,621.48	299,563.41 €	06/06/17	MZN 670,684.96		End of contract;
Mananga Construcoes	064/FISC-SBA/FUNAE/UGEA/2015	MOZ 130	Co financing WB for water pumps 3 provinces Fiscalization	A 01 03	N/A	FUNAE/W B Tender	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Services	Local	N/A	FUNAE/W B Tender	05/07/16	€ 90,000.00	MZN 4,646,795.00	71,489.15 €	06/06/17	MZN 283,893.04		End of contract
MH Construcoes	038/SE-M/FUNAE/UGEA/2016	MOZ 127	Rehabilitation works of airue micro hydro channel	A 01 02	18/05/2016	23/05/2016	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Works	Local	07/06/16 at 15:00	5/07/16	28/07/16	€ 25,000.00	MZN 2,401,930.44	36,752.00 €	06/06/17	MZN 457,649.00		End of contract
N/A	061/FUNAE/UGEA/2016	MOZ 128	Installment of pre-tent systems for the micro-hydro isolated mini grids of Ma, Majaua and Sembezeia	A 01 02	2/06/2016		Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	goods and services	Local		N/A	N/A	€ 150,000.00						Canceled
Zaida Construcoes, Lda	057/SBA-DSSE/FUNAE/UGEA/16	MOZ 131	Empreitada de Obra de Estudo Geofísico, Abertura de Montagem de Sistema de Alimentação de Água através de Sistemas Fotovoltáicos para a província de Gaza	A 01 03	18/07/2016	4/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Obras	Local	06/09/16 at 10h00	20/12/16		€ 220,000.00	MZN 16,588,230.00	195,155.65 €				Canceled;

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Mananga Construcoes	037/SE-MHD/FUNAE/UGEA/16	MOZ 132	Supervision for pilitation of the Channel of micro-hydro in Chiurairue	A 01 02	9/05/2016	23/05/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Services	Local	07/06/16 at 15:00	5/07/16	28/07/16	€ 10,000.00	MZN 938,988.00	14,445.00 €	12/06/17	MZN 473,908.26		End of contract
Larybird Lda	092/CC-MHD/FUNAE/UGEA/2016	MOZ 133	Works to protect the hydro of Majáua, District of nge, in Zambézia Province	A 01 02	26/07/2016	16/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Obras	Local	05/10/16	20/12/16		€ 300,000.00	MZN 26,198,500.00	308,217.65 €				In execution; to be in situ by EU and FUNAE
Royal Haskoining DHV	081/FISC-SE/FUNAE/UGEA/16	MOZ 134	Consultancy for realization the rehabilitation Majaua Mini-hydro, in the tict of Milange in Zambezia Province	A 01 02	19/07/2016	8/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Serviços	Local	22/10/16	24/11/16		€ 150,000.00	MZN 8,421,056.00	112,280.75 €				In execution; to be in situ by EU and FUNAE
N/A	077/FUNAE/UGEA/2016	MOZ 135	Fornecimento de motorizadas 4*4 e peças salentes para Mini-Hídrica Majaua, Distrito de Milange, Província da Zambézia	A 01 02	5/07/2016	4/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	29/08/16 at 14h00			€ 30,000.00						Canceled
FUNAE	093/DMH/FUNAE/UGEA/16	MOZ 136	Estudo de viabilidade a electrificação através de rica do Povoado de Cotine	A 01 02	1/08/2016	26/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Serviços	Local	26/10/16			€ 43,750.00						Canceled
Merge/Greenlight	MOZ 137	MOZ 137	Seguimento do Projecto e Estudo de Mercado para Pequeno Sistemas	A 02 09	Legislação Belga	07/07/2016	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Serviços	BEL	22/07/16	22/09/16	22/09/16	€ 63,000.00	n/a	65,775.00 €				In Execution
IDEAL	058/FISC-SBA/FUNAE/UGEA/2016	MOZ 138	Contratação de empresa para prestação de serviços de consultoria para ação de estudo geofísico e ura de 13 furos de água na a de Gaza e 1 na província de Maputo	A 01 03	18/07/2016	16/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Serviços	Local	26/10/16	14/12/16		€ 80,000.00	MZN 3,370,650.00	44,942.00 €				Canceled
FUNAE	065/AJ/FUNAE/UGEA/16	MOZ 143	Contratação de Uma empresa Para Formação de entes Empreendedores na enção de Sistemas Solares Fotovoltaicos	A 03 01	1/08/2016	4/08/16	Irene Novotny	Stephan Claes	MOZ	MOZ0901811	Serviços	Local	30/09/16	8/12/16		€ 37,000.00						Canceled
Dataserv LDA	075/UTIC/FUNAE/UGEA/16	MOZ 141	CONTRATAÇÃO DE ESA PARA FORNECIMENTO IPAMENTO INFORMÁTICO	A 03 05	26/07/2016	4/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	24/08/16 at 10h00	01/09/16	13/09/16	€ 190,000.00	MZN 12,877,750.16	151,502.94 €				End of contrat
Sotux, Lda	110/DAGF/FUNAE/UGEA/16	MOZ 140	Mobiliário de torios para o Novo Edifício	A 03 05	1/08/2016	17/09/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	13/10/16	23/12/16		€ 70,000.00	MZN 4,356,016.44	58,080.22 €				In execution
Canceled	091/CC-MHD/FUNAE/UGEA/16	MOZ 139	Contratação de presa para construção de 3 ões para os operadores da mini-hídrica de Majáua	A 01 02	26/07/2016	16/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Obras	Local	14/10/16			€ 64,500.00						Canceled and Relaunched
N/A	#7182#	MOZ 150	Acquisition of a 4x4 for the mini hydro plant of Majaua	A 01 10	30/09/2016	NA	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Belgian	NA	30/09/16	30/09/16	€ 24,000.00		23,690.52 €				BTC Internal tenders (framework contract)
N/A	#7183#	MOZ 151	Acquisition of 3 motor cycles for the operadores of Majaua mini hydro and xploitation of the mini grid	A 01 10	30/09/2016	NA	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Belgian	NA	30/09/16	30/09/16	€ 12,000.00		7,326.00 €				BTC Internal tenders (framework contract)
EMETRO	131/UM/FUNAE/UGEA/2016	MOZ 153	Fornecimento de analisadores de baterias	A01 05	30/09/16	10/10/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	24/10/16	21/12/16		€ 25,000.00	MZN 3,076,520.00	41,020.27 €				End of contract

Winner Tenderer	Reference of the Tender	Sequen ber - New HQ (MOZ- Number)	Object of the tender	Budget Line	Date of No Objection	Date of Publication	Authorise responsible (Leading official)	Manager In charge of the Dossier (File controller)	Partner Country	Navision code	Type of contract (Works, supplies or services)	Procur ment Law (Belgia n/ Local)	Date and time of Tender closure	Date of No Objection - Awarding	Date of contract signature	Estimated budget(€)	Amount of the final contract (MZN)	Amount of the final contract (€)	Date of No objection for last payment	Amount of the last invoice (MZN)	Amount of invoice (equiva. in €)	Status Prep/Tender ongoing/ Awarding /Executio d of contract /Canceled )
ITD Lda	117/DMH/FUNAE/UGEA/16	MOZ 155	Contratação de empresa fornecimento e instalação stema pré-pago de energia ctrica das Mini Hidricas de embezeia, Moua e Majaua	A 01 02	19/09/2016	3/10/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	25/10/16	21/12/16		€ 150,000.00	MZN 12,012,798.00	150,159.98 €	06/06/17	MZN 12,012,798.62		End of contract
HAS ELECTRICA	118/DMH/FUNAE/UGEA/16	MOZ 152	Contratação de sa para o fornecimento de erial electrico para as Mini rca de Sembezeia, Moua e Majaua	A 01 02	19/09/2016	3/10/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Bens	Local	18/10/16	25/11/16		€ 20,000.00	MZN 823,487.64	10,293.60 €	30/03/17	MZM 963,480.45		End of contract
Sylvain Penouilh	DEP/BTCMOZ/16	MOZ 156	RERD expertise closing project	A 02 09		04/ 11/ 16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Services	Belgium curement	15/11/16	6/12/2016		€ 12,000.00		12,250.00 €	N/A		700.00 €	End of contract
PABODZI Construcoes	122/CC-MHD/FUNAE/UGEA/16	MOZ 139	Contratação de presa para construção de 3 ões para os operadores da mini-hídrica de Majáua	A 01 02	26/07/2016	16/08/16	Erik Van Malderen	Stephan Claes	MOZ	MOZ0901811	Obras	Local	14/10/16	25/11/16		€ 56,000.00	MZN 2,930,528.00	36,631.60 €				In execution; also part of Majaua works; this tender will be followed in situ by EU and FUNAE

## 6 Public agreements

Not applicable



## 7 Equipment

List equipment acquired during the intervention

Equipment type	Acquisition Cost	Remarks
All categories - consolidated	<i>Budget €</i>	
Total Vehicles	442,343.08	
Total IT Equipment	1,089,430.27	
Total Primary Materials	46,703.73	
Total Buildings	4,885,226.05	
Total Other Equipment	3,101,389.79	
<b>Grand Total</b>	<b>9,565,092.92</b>	

## 8 Original Logical Framework from TFF :

Intermediate Result 1		Indicators	Means of Verification	Risks and assumptions
Access to energy is increased by the implementation of solar, wind and hydro projects.		<ul style="list-style-type: none"> <li>- the list of priorities is established</li> <li>- 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</li> <li>- number of schools, hospitals, administrative posts electrified and quantity and quality of electricity provided to the beneficiaries</li> <li>- number of windmills for water pumping for drinking water/irrigation</li> </ul>	<ul style="list-style-type: none"> <li>- project reports</li> <li>- surveys</li> <li>- GIS-system</li> </ul>	
	Activities for R1	Actors involved	Estimated Budget	Risks and assumptions
	R1.A1 Needs assessment and feasibility studies	Consultancy, Min Education, Min Health, Min Energy	300.000 €	Quality consultants are found Geographical dispersion
	R1.A2 Hydropower project implementation	Consultancy (supervision), Companies	4.000.000 €	Maintenance issue Sufficient opportunities are found
	R1.A3 Solar power project implementation	Consultancy (supervision), Companies	6.500.000 €	Maintenance issue
	R1.A4 Wind water pumping	Consultancy (supervision), Companies	500.000 €	Maintenance issue

Intermediate Result 2		Indicators	Means of Verification	Risks and assumptions
Financial accessibility to energy is improved		<ul style="list-style-type: none"> <li>- Number of beneficiaries</li> <li>- Subsidies given</li> </ul>	<ul style="list-style-type: none"> <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	50.000 €	Beneficiaries have access to media
	R2.A3 Investment funds	Micro-finance institutions	1.000.000 €	Demand exceeds subsidies
	R3.A4. Technical assistance	BTC	1.200.000 €	

## 9 Final Logical Framework

<i>Intervention logic</i>	<i>Indicators</i>	<i>Means of Verification</i>	<i>Risks and assumptions</i>
<b>Global Objective:</b> Contribute to Rural development	<ul style="list-style-type: none"> <li>- Number of students in evening classes</li> <li>- Number of institutional births</li> <li>- Use of it in rural areas</li> <li>- Turn-over in rural business</li> </ul>	<ul style="list-style-type: none"> <li>- Surveys from line ministries</li> <li>- Baseline survey</li> <li>- FUNAE monitoring system</li> </ul>	Energy systems are used as intended
<b>Specific Project Objective:</b> Access to hydro, solar and wind energy for use in off-grid applications in rural areas	<ul style="list-style-type: none"> <li>- Number of beneficiaries</li> <li>- Beneficiary satisfaction</li> <li>- Total power installed</li> </ul>	<ul style="list-style-type: none"> <li>- Surveys/impact evaluations</li> <li>- Project reports</li> <li>- GIS data base</li> </ul>	Systems are well designed and installed Projects are implemented on time and on budget
<b>Intermediate Result 1:</b> Solar, wind and hydro systems in rural areas installed and operational	<ul style="list-style-type: none"> <li>- Potential sites are verified</li> <li>- Number and total power of hydro-electric power plants, solar and wind hybrid systems installed, operational and properly maintained</li> <li>- Number of schools, hospitals and public administration buildings electrified</li> <li>- Number of residences provided with pumped water</li> </ul>	<ul style="list-style-type: none"> <li>- Data base of planning division</li> <li>- Project reports</li> <li>- Surveys</li> <li>- GIS data base</li> </ul>	Access to sites does not deteriorate Proper maintenance by ministries
<i>For activities:</i>	<i>Actors</i>	<i>Budget</i>	<i>Risks and assumption</i>
<b>Activity 1.1:</b> Needs assessment and feasibility studies	Consultancy, Min Education, Min Health, Min Energy	€1.300.000	Quality consultants available
<b>Activity 1.2:</b> Hydropower project implementation	Consultancy (supervision), Construction Companies, ARA	€5.400.000	Functional management modality available. Sufficient viable sites are found.
<b>Activity 1.3:</b> Solar power project implementation	Consultancy (supervision), Companies, Min Education, Min Health	€9.300.000	Proper maintenance by ministries
<b>Activity 1.4:</b> Wind power	Consultancy (supervision), Companies	€500.000	Use of small scale wind is viable

<i>Intervention logic</i>	<i>Indicators</i>	<i>Means of Verification</i>	<i>Risks and assumptions</i>
<b>Activity 1.5:</b> Set up Maintenance Structure	Min Education, Min Health, Min State Administration, Companies, FUNAE delegations	€1.100.000	Institutions benefitting from systems show commitment (in actions) to ensure maintenance.
<b>Result 2:</b> Increased access of rural households to renewable energy products	<ul style="list-style-type: none"> <li>- Availability of small solar products in rural shops/markets</li> </ul>	Survey	Private companies/suppliers and FUNAE agree on smooth cooperation model
<i>For activities:</i>	<i>Actors</i>	<i>Budget</i>	<i>Risks and assumption</i>
<b>Activity 2.1:</b> Marketing study	Consultant	€100.000	Quality consultant available
<b>Activity 2.2:</b> Promotion of small solar products	Media, FUNAE, consultant, marketing companies, radio, etc.	€300.000	Rural marketing infrastructure available
<b>Activity 2.3:</b> Institutional support to FUNAE	Consultant	€200.000	Quality consultants available
<b>Activity 2.4:</b> Financial support	Private companies	€300.000	Private companies willing to cooperate with FUNAE

<b>Result 3:</b> Technical and administrative capacity of FUNAE is increased	<ul style="list-style-type: none"> <li>- Organisational capacity development plan</li> <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	TAs are provided with sufficient space to contribute to organisational capacity building. Trained people stay at FUNAE (no brain-drain)
<i>For activities:</i>	<i>Actors</i>	<i>Budget</i>	<i>Risks and assumption</i>
<b>Activity 3.1: Training</b>	FUNAE staff	500.000 €	
<b>Activity 3.2: R&amp;D</b>	FUNAE	200.000 €	
<b>Activity 3.3: GIS-system</b>	Consultancy, software provider, GPS suppliers	300.000 €	
<b>Activity 3.4: Technical assistance</b>	BTC	2.375.000 €	
<b>Activity 3.5: Set-up of new delegations</b>	FUNAE	500.000 €	

## 10 Complete Monitoring Matrix

Include the last (full) version of the monitoring matrix

Results/ Indicators			2011		2012		2013		2014		2015		2016				Source of Verificatio n	Freque ncy of collectin g	Officer Consolida ting	COMMENT
	Bas e Val ue	Fin al Targ et Vau e	Tval ue Year 1	Vach ie ved year 1	Tval ue Year 2	Vach ie ved Year 2	Tval ue Year 3	Vach ie ved Year 3	Tval ue Year 4	Vach ie ved Year 4	Tval ue Year 5	Vach ie ved Year 5	Tval ue Year 6	Vachi e Ved Year 6	Vtarg et final	Vachi e Ved final				
<b>IMPACT: Contribute to rural development through access to energy for rural households</b>																				
Number of electrified schools with evening classes [#]	0	98	0	0	0	0	0	0	10	0	10	3	10	7	98	7	Survey from line Ministries , own surveys	yearly	FUNAE PMT	More schools are expected to start evening classes, however, the organization of it is not only depending on the availability of energy
Number of institutional births/month with access to quality illumination in electrified health centres [#]	0	2370	0	0	0	0	100	0	474	500	1000	1000	2370	5910	2370	5910	Survey from line Ministries , own surveys	yearly	FUNAE PMT	Last FUNAE survey was done in October 2016
Use of IT appliances in electrified infrastructures	0	500	0	0	0	0	50	60	100	200	0	200	500	272	500	272	Estimation based on field visits and company reports	yearly	FUNAE PMT	Last FUNAE survey was done in October 2016, it is

[#]																				probably that more than 1 computer is used per institution electrified; Personal laptops of teachers/public servant are often used as well as charging of phones, TV and radio.
OUTCOME: Access to hydro, solar and wind energy for use in off-grid applications in rural areas																				
Number of beneficiari es [#]	0	600,000	0	N/A	10,000	10,000	60,000	50,000	400,000	400,000	400,000	400,000	600,000	550,000	600,000	550,000	Surveys/ impact evaluatio n; Project reports;	1/2year s	FUNAE, PMT	Mini hydro Majaua not included
Beneficiar y satisfactio n [0-100%]	N/A	85%	N/A	N/A	N/A	000	N/A	N/A	75%	86%	75%	86%	85%	86.8 %	85%	86.8 %	Surveys/ impact evaluatio n; Project reports;	yearly	FUNAE, PMT	this indicator is subjective and not realy usefull, especialy when done by the implementer (FUNAE)
Total power installed [kW]	0	1500	0	0	16	N/A	92	80	350	850	350	1076	1600	1105.85	1500	1105.85	Surveys/ impact evaluatio n; Project reports; GIS reports	1/2year s	FUNAE, PMT	Solar systems were designed following the needs, so no extra power for future appliances was provided. On hydro, 3



																				instalations were finalised
<b>OUTPUT 1: Solar, wind and hydro systems in rural areas installed and operational</b>																				
Priority locations for solar systems are established [#]	0	700	600	600	46	46	646	646	646	646	646	646	700	681	700	681	Surveys, project reports, GIS reports	1/2years	FUNAE, PMT	All locations counted, Health Centres
Solar Energy Capacity Installed [kW]	0	300	0	0	16	16	92	80	250	255	250	298	300	327.85	300	390	Surveys, project reports, GIS reports	yearly	FUNAE, PMT	Sum of all installed solar power
Hydro Energy Capacity Installed [kW]	0	1200	0	0	0	0	0	0	100	595	100	778	1200	778	1200	778	Surveys, project reports, GIS reports	yearly	FUNAE, PMT	Majaua power plant damaged by flooding, being rehabilitated
Number of schools, health centres, administrative posts and residences electrified [#]	0	626	0	0	0	0	14	50	550	526	550	606	625	606	626	681	Surveys, project reports, GIS reports	1/2years	FUNAE, PMT	All PV SHS accepted, some with a few defects, FUNAE made new installations with spare parts
Number of solar water pumping installations [#]	0	45	0	0	0	0	0	0	10	0	10	53	45	42	45	71	Project reports	1/2years	FUNAE, PMT	Projects in Gaza (13) and Maputo (1) canceled due low performance of the winner company, which led to not reach the number 71
Number of	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	Surveys,	1/2year	FUNAE,	Hybrid

wind energy systems for water pumping and/or electricity [#]																	project reports, GIS reports	s	PMT	system will not be built due to lack of funding
<b>OUTPUT 2: Increased access of rural households to renewable energy products</b>																				
Market Development Study	1	1	0	0	N/A	N/A	0	0	1	0	1	0	1	1	1	2	Study report	1/2years	FUNAE, PMT	First contract canceled due low performance; second contract finalized
Number of different types of small solar products available in rural areas	0	2	0	0	N/A	N/A	0	0	2	0	2	0	2	3	2	3	Surveys, project reports	1/2years	FUNAE, PMT	3 pilot schemes in progress
<b>OUTPUT 3: Technical and administrative capacity of FUNAE is increased</b>																				
Number of trained people [#]	0	X	6	6	19	39	90	66	30	40	30	77	30	124	X	214	Training reports	1/2years	FUNAE, PMT	No specific end target as this was not an aim in itself; definition of targets on a yearly basis; more focus on quality and appropriateness of training
Number of trainings given [#]	0	X	2	2	4	6	15	16	13	15	21	15	22	43	X	43	Training reports	1/2years	FUNAE, PMT	No specific end target as this was not an aim in itself;

																				definition of targets on a yearly basis
Number of document research projects [#]	0	5	2	2	2	3	2	2	2	3	2	3	2	3	5	3	Research reports	1/2years	FUNAE, PMT	Remote Monitoring, Water Pumping on track, introducing of Drone Topographical surveys for GIS
GIS- tool for planning and asset management in place [0-100%]	0	100 %	0	0	5%	15%	15%	15%	40%	60%	40%	65%	70%	58%	100 %	100%	GIZ asset management plan	yearly	FUNAE, PMT	Georeferencing of all FUNAE systems ongoing and now under planning division of FUNAE, The GIS tool is in place in HQ and delegations

## 11 Tools and products

Capitalisation reports: Reports from the pre-feasibility studies done to potential sites for future electrification projects by FUNAE

Audio-visual material: 2000 posters and leaflets were produced with information on the sites (samples) electrified by the project (Administrative Post,schools and health centres for project visibility

Poster of an electrified school

**CONSTRUÍDO UM  
MUNDO JUSTO**



**BTC MOZAMBIQUE**



**ENERGIA RENOVAVEL  
PARA O DESENVOLVIMENTO RURAL**

**Dados chave**

**Financiamento:** Reino da Bélgica / Reino dos Países Baixos / República de Moçambique

**Implementação:** Cooperação Técnica Belga (CTB)

**Parceiro:** FUNAE – FUNDO DE ENERGIA  
Parceria Moçambique – Bélgica

*As nossas **ESCOLAS** de Khayane, Nhanhope e mais 193 receberam um Sistema Solar. Podemos ter aulas no período nocturno e carregar os nossos telemóveis!*





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**THE BELGIAN  
DEVELOPMENT COOPERATION**



**.be**

Reino dos Países Baixos

Poster of a health center room with a fridge for vaccine conservation after electrification



*O CENTRO DE SAUDE de Malei e mais 78 receberam um sistema solar e uma geleira para vacinas. Agora, podemos cuidar melhor dos nossos pacientes.*

**ENERGIA RENOVÁVEL PARA O DESENVOLVIMENTO RURAL**



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- M&E approach/system: introduction of 100 systems for remote monitoring



- *Methods: Introduction of GIS planning, introduction of a monitoring system*