



**RESULTS REPORT**

**2020**

**RENEWABLE ENERGY FOR RURAL  
DEVELOPMENT PHASE 2 (RERD2) MOZAMBIQUE**



## Table of contents

TABLE OF CONTENTS .....	2
ACRONYMS .....	4
1 INTERVENTION AT A GLANCE (MAX. 2 PAGES) .....	7
1.1 INTERVENTION FORM .....	7
1.2 BUDGET EXECUTION .....	8
1.3 SELF-ASSESSMENT PERFORMANCE .....	8
1.3.1 <i>Relevance</i> .....	8
1.3.2 <i>Effectiveness</i> .....	9
1.3.3 <i>Efficiency</i> .....	9
1.3.4 <i>Potential sustainability</i> .....	10
1.4 CONCLUSIONS .....	11
2 RESULTS MONITORING .....	12
2.1 EVOLUTION OF THE CONTEXT .....	12
2.1.1 <i>General context</i> .....	12
2.1.2 <i>General and Institutional context</i> .....	12
2.1.3 <i>Management context</i> .....	17
2.2 PERFORMANCE OUTCOME.....	18
2.2.1 <i>Progress of indicators</i> .....	18
2.2.2 <i>Analysis of progress made</i> .....	18
2.2.3 <i>Potential Impact</i> .....	18
2.3 PERFORMANCE OUTPUT 1 MINI-GRIDS PROVIDE RELIABLE AND ADEQUATE ENERGY SERVICE .....	19
2.3.1 <i>Progress of indicators</i> .....	19
2.3.2 <i>Progress of main activities</i> .....	19
2.3.3 <i>Analysis of progress made</i> .....	19
2.4 PERFORMANCE OUTPUT 2: TECHNICAL AND FINANCIAL SUSTAINABILITY OF EXISTING SYSTEMS IS IMPROVED .....	24
2.4.1 <i>Progress of indicators</i> .....	24
2.4.2 <i>Progress of main activities</i> .....	25
2.4.3 <i>Analysis of progress made</i> .....	25
2.5 PERFORMANCE OUTPUT 3: THE CAPACITY OF FUNAE IN PLANNING AND PROJECT MANAGEMENT IS IMPROVED.....	28
2.5.1 <i>Progress of indicators</i> .....	28
2.5.2 <i>Progress of main activities</i> .....	28
2.5.3 <i>Analysis of progress made</i> .....	28
2.6 PERFORMANCE OUTPUT 4: PRO MEMORIA, TECHNICAL BUDGET LINE FOR IVA (VAT) .....	33
2.7 PERFORMANCE OUTPUT 5: THE NEW LEGAL FRAMEWORK IS	

INFLUENCED BY FUNAE.....	33
2.8 PERFORMANCE OUTPUT 6: SUSTAINABLE SOLAR POWERED IRRIGATION SYSTEMS ARE TAKEN UP BY SELECTED FARMERS IN 2 PROVINCES .....	34
2.9 PERFORMANCE 7: THE TECHNICAL AND FINANCIAL CAPACITIES OF FARMERS, INSTITUTIONAL PARTNERS AND MARKET ACTORS FOR A SUSTAINABLE USE OF SOLAR POWERED IRRIGATION SYSTEMS ARE ENHANCED .....	34
2.10 PERFORMANCE 8: INITIATIVES TO FOSTER AN ENABLING ENVIRONMENT FOR PRIVATE AND PUBLIC INVESTMENTS IN THE IRRIGATION SECTOR ARE SUPPORTED .....	34
2.11 TRANSVERSAL THEMES .....	34
2.11.1 Gender .....	34
2.11.2 Environment .....	35
2.11.3 Digitalization.....	36
2.12 RISK MANAGEMENT .....	37
3 STEERING AND LEARNING.....	47
3.1 STRATEGIC RE-ORIENTATIONS .....	47
3.2 RECOMMENDATIONS.....	48
3.3 LESSONS LEARNED .....	49
ANNEXES .....	50
3.4 QUALITY CRITERIA.....	50
3.5 DECISIONS TAKEN BY THE STEERING COMMITTEE AND FOLLOW-UP ....	53
3.6 UPDATED LOGICAL FRAMEWORK.....	57
3.7 MORE RESULTS AT A GLANCE.....	61
3.8 “BUDGET VERSUS CURRENT (Y – M)” REPORT .....	62
3.9 EVOLUTION OF THE BUDGET AFTER FORMULATION OF THE ADDENDUM TO THE TFF .....	63
3.10 COMMUNICATION RESOURCES.....	65

## Acronyms

ARENE	<i>Autoridade Reguladora Nacional da Energia</i> (National Energy Regulatory Authority)
BRILHO	Bringing Energy to Off-Grid Households and Businesses in Mozambique (FCDO funded project implemented by SNV)
CB	Capacity Building
CBMIREME	Capacity Building Ministry of Mineral Resources and Energy
CEO	Chief Executive Officer
CNELEC	<i>Conselho Nacional de Electricidade</i> (National Electricity Council)
DEP	<i>Divisão de Estudos e Planificação</i> (Research and Planning Division)
DMH	<i>Divisão de Mini-Hidricas</i> (Mini-Hydro Division)
DPCA	<i>Direcção Provincial para a Coordenação da Acção Ambiental</i> (Provincial Directorate for the Coordination of Environmental Action)
DPREME	Provincial Directorate of the Ministry of Mineral Resources and Energy
DSO	Distribution System Operator
DSSE	<i>Divisão de Sistemas Solares e Eolicos</i> (Solar and Wind Systems Division)
EDM	<i>Electricidade de Moçambique</i> (Mozambican Power Company)
Enabel	The Belgian development agency
ENE	The National Electrification Strategy
EPC	Engineering, Procurement and Construction
ESWG	Energy Sector Working Group
EUR	Euro
FCDO	Foreign, Commonwealth and Development Office of the United Kingdom (ex-DFID)
FUNAE	<i>Fundo de Energia</i> (National Energy Fund)
GIS	Geographical Information System
HCB	<i>Hidroeléctrica de Cahora Bassa</i>
HQ	Headquarters
HR	Human Resources

IMU	Intervention Management Unit
INIR	National Institute of Irrigation ( <i>Instituto Nacional de Irrigação</i> )
IPP	Independent Power Producer
IT	Information Technology
ITA	International Technical Assistant
JE	Junior Expert
MADER	<i>Ministerio de Agricultura e Desenvolvimento Rural</i> (Ministry of Agriculture and Rural Development)
MDG	Millennium Development Goals
MEF	<i>Ministerio de Economia e Finanças</i> (Ministry of Economy and Finance)
MIC	<i>Ministerio de Inductria e Comercio</i> (Ministry of Industry and Commerce)
MITADER	<i>Ministério da Terra , Ambiente E Desenvolvimento Rural</i> (Ministry of Land , Environment and Rural Development)
MIREME	<i>Ministério dos Recursos Minerais e Energia</i> (Ministry of Mineral Resources and Energy)
MO	Market Operator
MONOP	Operational Monitoring report of the Country
MOPRH	<i>Ministério das Obras Públicas, Habitação e Recursos Hídricos</i> (Ministry of Public Works, Housing and Water Resources)
MTR	Midterm Review
MW	Megawatt
M&E	Monitoring and Evaluation
n/a	not available
NGO	Non-governmental organization
PAYG	Pay-As-You-Go systems
PPP	Public Private Partnership
PSI	Provincial Services of Infrastructure (previously DPREME)
PV	(Solar) Photovoltaic
RE	Renewable Energy
RES	Renewable Energy Sources

RERD1	Renewable Energy for Rural Development Phase 1
RERD2	Renewable Energy for Rural Development Phase 2
SA	Specific Agreement
SC	Steering Committee
SE4All	Sustainable Energy for All
SNV	Netherlands Development Organisation
RR	Resident Representative
TA	Technical Assistant
TFF	Technical and Financial File (=Project Document)
TSO	Transmission System Operator
UGEA	Unidade Gestora Executora De Aquisições ( <i>Procurement Executing Unit</i> )
UM (O&M)	<i>Unidade de Manutenção</i> (Operations and Maintenance Unit)

# 1 Intervention at a glance (max. 2 pages)

## 1.1 Intervention form

<b>Intervention title</b>	Renewable Energy for Rural Development Phase 2 (RERD2)
<b>Intervention code</b>	MOZ 15 034 11 / DGD Code 3016524
<b>Location</b>	Mozambique
<b>Total budget</b>	22.000.000 EUR (12.000.000 EUR for RERD2 plus 10.000.000 additional EUR for RERD2+)
<b>Partner Institution</b>	Fundo de Energia (FUNAE)
<b>Start date Specific Agreement</b>	16 March 2018 (7 years)
<b>Date intervention start / Opening steering committee</b>	1 July 2018
<b>Planned end date of execution period</b>	31 December 2024 (78 months)
<b>End date Specific Agreement</b>	- Initial end date of the RERD 2 Specific Agreement: 15th of March 2024 = 6 years (72 months) - New end date of the RERD 2 Specific Agreement covering the additional component: 15th of March 2025 = 7 years (84 months)
<b>Target groups</b>	FUNAE, rural population in intervention provinces who do not have access to reliable and adequate energy services (households, institutions and small businesses)
<b>Impact<sup>1</sup></b>	Contribute to rural economic and social development by increased sustainable access to energy
<b>Outcome</b>	Increase access to energy in rural areas by investments in renewable energy systems and support mechanisms ensuring sustainability <sup>2</sup>
<b>Outputs</b>	1. Mini-grids provide reliable and adequate energy services 2. Technical and financial sustainability of existing systems is improved 3. The capacity of FUNAE in planning and project management is improved 4. <i>Pro memoria, technical budget line for iva (VAT)</i> 5. The new legal framework is influenced by FUNAE <i>Added outputs RERD2+ (addendum to the TFF formulated in Q3-Q4 2020)</i> 6. Sustainable solar powered irrigation systems are taken up by selected farmers in 2 provinces 7. The technical and financial capacities of farmers, institutional partners and market actors for a sustainable use of solar powered irrigation systems are enhanced 8. Initiatives to foster an enabling environment for private and public investments in the irrigation sector are supported
<b>Year covered by the report</b>	2020

<sup>1</sup> Impact refers to global objective, Outcome refers to specific objective, output refers to expected result

<sup>2</sup> With the extra RERD2+ component on Solar Powered Irrigation Systems (SPIS, see further below) the addition to the specific objective is in italics in the following specific objective statement "Increase access to energy - *for irrigation purposes (or productive water)* - in rural areas by investments in renewable energy systems and support mechanisms ensuring sustainability

## 1.2 Budget execution<sup>3</sup>

	Budget (Euro)	Expenditure		Balance	Disburse- ment rate at the end of 2020
		Previous years	Year covered by report (n)		
<b>Total</b>	<b>12,000,000</b>	<b>1,060,042.15</b>	<b>726,502.91</b>	<b>10,213,454.94</b>	<b>14.9%</b>
<b>Output 1</b>	6,400,000	154,831.32	196,470.78	6,048,697.90	5.5%
<b>Output 2</b>	1,260,000	17,517.29	4,248.20	1,238,234.51	1.7%
<b>Output 3</b>	2,750,000	561,201.49	367,839.32	1,820,959.19	33.8%
<i>Output 4 IVA</i>	0	3,929.67	0	3.915.67	
<b>Output 5</b>	0	0	0	0	-
<b>Contingencies</b>	326,000	-	-	326,000.00	0.0%
<b>General means</b>	1,264,000	322,566.61	157,944.61	783,489.01	38.0%

## 1.3 Self-assessment performance

### 1.3.1 Relevance

	Performance
Relevance	<b>A</b>

The Mozambican government's 2020-2024 five-year plan provides for the development of economic and social infrastructure to promote productive activity in the private and associative sectors. As energy plays a key role in the development of productive and income-generating activities, the government launched an ambitious plan for 'Energy for All' in 2030, in which renewable energy will play an important role.

With its objective of increasing access to energy in rural areas through investment in renewable energy and support for mechanisms to ensure sustainability, the RERD2 project is well aligned with public policies and responds to the needs of beneficiaries.

The partner institution, FUNAE, is engaging in a new strategy (2020-2030). In November 2020 its new organic structure was gazetted. The project is firmly anchored in FUNAE and continues to support the organization in accomplishing its - partly new - mission. The project intervention logic is very appropriate. It is geared at (a) the development of mini-grids, b) improving technical and financial sustainability of systems and c) improving planning and management capacity. The context changed somewhat as regards the relevance of 'follow up' on first phase (RERD1) investments. FUNAE transferred the majority of its small solar systems to sectoral ministries. This changed the orientation of a number of RERD2 actions, as compared to the RERD2-TFF. The project remains highly relevant however. This is also true for a new project component of 10M€, approved by the Belgian Minister of Development Cooperation in December 2020. The extra component

<sup>3</sup> At the end of 2020, after the approval of an additional component on solar irrigation systems (SPIS), three SPIS related expected results were added to the logical framework of the project. Since there are no realizations to report yet for 2020, the additional budget is not yet included in this table. Suffices it to say here that the additional tRERD2+ budget is not only for SPIS, but also adds resources to the original RERD2 budget, as follows: EUR 2.370.000 extra for output 1, EUR 0 for output 2, EUR 470.000 extra for output 3 and EUR 60.000 for output 5.



of introduction of solar powered irrigation systems (SPIS) is an excellent example of productive use of renewable energy (and water). The project will now start work with a new partner, the Mozambican Irrigation Institute (INIR), but will remain firmly anchored in FUNAE. The legal context of the renewable energy domain continues to require attention from the government and FUNAE. This is further detailed in the section on sustainability. The project remains highly relevant.

### 1.3.2 Effectiveness

	<b>Performance</b>
<b>Effectiveness</b>	<b>B</b>

The institutional anchoring of Enabel staff in FUNAE HQ facilitates collaboration with the counterpart. Participation of counterpart staff is assured in all field missions.

Until March 2020 the technical team worked in FUNAE while the AdminFin support was, and still is, based in the Enabel representation. FUNAE offices have poorly ventilated small spaces. This presents on-going COVID health challenges for FUNAE employees as well donor embedded technical assistance such as the RERD2 project. As such the pandemic obliged the project to rent extra office space outside FUNAE, and outside the representation. Where face-to-face meetings are required, staff now moves between three offices. These three offices however are all relatively close to the centre of Maputo, keeping the situation manageable. Less face-to-face meetings has given a real boost to the use of MS Teams for meetings and this has proved to be very effective. FUNAE remains a compartmentalized and centrally run organization with a lot of bureaucracy. Lines of communication remain long and less important decisions are easily passed on to the CEO. As such decisions tend to take a lot of time. Moreover, RERD2 is only one out of many externally funded renewable energy projects and has, at times, to ‘compete’ for the attention of FUNAE’s leadership. As regards investments in infrastructure, a change in FUNAE’s strategy means that the project is now fully focusing on solar mini-grids while it also concentrates its sustainability-oriented actions on those systems. FUNAE indeed requested the project to shift its attention it was still giving to isolated solar power systems<sup>4</sup> to existing and newly to be developed micro- and mini-grids. This is because most small solar power systems were recently transferred to sector ministries. The results obtained in 2020 indicate progression to the achievement of the project outputs and outcomes. The chances of achieving the specific objective remain real and significant.

### 1.3.3 Efficiency

	<b>Performance</b>
<b>Efficiency</b>	<b>B</b>

The arrival of the intervention manager and the energy engineer, mid October 2018 (3.5 months after the official project start), marked the full mobilization of technical - and administrative, financial and logistics staff. The team was complemented with a junior expert (50%) in digital data management in March 2019. The contract of the capacity building expert based in Quelimane was not renewed and ended on 31 May 2020. This obliged the project to reorganize its operations in the province, pending the arrival of a

<sup>4</sup> many of which were funded by RERD1

new junior (expected to arrive early 2021). The management of the project's resources is generally satisfactory but financial execution remained low. For an implementation period at the end of 2020 of 50% of the originally planned time of 60 months budget consumption stands low at 15%. This low rate of financial execution is mainly linked to the project's logic that requires intensive study phases prior to investment decisions, but also to deferral of certain initiatives at the request of the counterpart pending feasibility study results and completion of a new corporate strategy. Added to these were in 2020 the handicaps associated with the co-management modality. Difficulties encountered by all (9) companies in preparing the administrative documents for an EPC tender, which the project had launched in co-management (Mozambican law) in 2020, and the subsequent need to cancel the tender, prompted the project to propose to the Steering Committee a €6.86 million transfer from co-management to regie. The December 7, 2020 Steering Committee approved this budget revision. This was formalised by the signing of the minutes of meeting by all members of the committee. There are no signs that the outputs will not be reached, on the contrary. The approval of the aforementioned SPIS component also added budget for mini-grids, while a quality feasibility study laid the foundation for a new EPC for 4 or 5 mini-grids (under regie), the works of which are estimated to be completed by Q3/Q4 2022, two years before the end of the - new - project end date (31 December 2024).

#### 1.3.4 Potential sustainability

	<b>Performance</b>
<b>Potential sustainability</b>	<b>B</b>

Sustainability of the project remains, among others, dependent on whether innovative approaches involving the private sector can be developed<sup>5</sup>. The legal and regulatory framework continue to be unfavourable and requires informed attention from the government so that important conditions such as (a) the adoption of the new Electricity Law, (b) a well-defined strategy for private sector participation and investment in the renewable energy sector and (c) the removal or reduction of import taxes for renewable energy equipment are achieved. In view of promoting these developments the steering committee (SC December 2019) adopted the project's proposal to add a fourth result to the project's logical framework with a dedicated budget enabling FUNAE to undertake specific actions or studies and, as such, exert influence on the - new - legal framework.

In the meantime, and in view of attracting the private sector, the project collaborates closely with sister projects funded by the FCDO (ex-DFID) and the Italian Cooperation. The approach of the FCDO funded project BRILHO, in collaboration with the Energy Ministry, resides in the drafting and ministerial approval of special derogations for private sector involvement. The project is aware that the success of this so-called 'sandbox' approach cannot be guaranteed and also embodies a certain risk due to the lack of experience with this approach. At the same time Enabel's CB-MIREME project works on similar legal context issues with MIREME and notably ARENE. The Energy Sector Working Group (ESWG), of which the project is part, will continue to try and steer and monitor developments in the above policy areas. These efforts are likely to have a positive

<sup>5</sup> RES4Africa's recent report *RE-thinking Access to Energy Business Models Ways to Walk the Water-Energy-Food Nexus Talk in Sub-Saharan Africa showed that projects 100% public financed will not / are very unlikely to be sustainable.*

impact on developments and thus on the sustainability of RERD2 project actions in the medium and longer term.

## 1.4 Conclusions

Below is a summary of the main highlights of this report:

- RERD2 continues assisting FUNAE with data collection and studies to prepare the Nintulo hydro plant's executive project (investment estimated at 23 Million EUR).
- The undertaking of 20 mini-grid pre-feasibility studies resulted in the selection of 5 sites in two provinces eligible for project investment. A call for expression of interest for building these mini-grids is about to be launched (March 2021) and will be followed by a call for proposals from the shortlisted companies. End of construction is foreseen by the end of 2022.
- The December 2020 steering committee approved a project proposed 180-degree turnaround from co-management to 100% regie to circumvent the handicaps of the co-management modality in tendering for works.
- Important steps have been taken with FUNAE's Research and Planning Department and its GIS unit so that its work evolves from "simple" geo-referencing of existing systems to real and meaningful off-grid energy planning.
- The transfer of FUNAE ownership of small isolated solar power systems - many of which were funded by the first phase project RERD1 - to sector ministries represents a reorientation of planned project actions originally aimed at increasing the sustainability of these systems to existing and to be developed - micro and mini-grids.
- Training of FUNAE staff is on track with a registered total of 1,392 'person training hours' benefitting 60 FUNAE technicians in 14 types of training, while 8 technical documents / manuals guiding their work were developed.
- With the development and approval of an additional project component, the project budget will be increased by EUR 10 million, three expected results have been added to the logical framework, the number of technical assistants (international and national) has been increased by three people and the duration of the project has been extended to December 2024.

Enabel execution official<sup>6</sup>



Mark Hoekstra

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<sup>6</sup> Name and signature

## 2 Results Monitoring<sup>7</sup>

### 2.1 Evolution of the context

#### 2.1.1 General context

Mozambique remains in debt distress and on a subdued growth trajectory. Progress has been made in debt restructuring, but the outlook remains unknown. A refugee crisis has continued to unfold following persistent violent attacks by terrorist groups in the northernmost province of Cabo Delgado. The country struggles to cope with numerous security-, economic- and social challenges. On the other hand, the signature of a Peace and National Reconciliation Agreement in 2019 (between FRELIMO and RENAMO) has brought stability and more security to the central provinces of Manica and Sofala. Manica is one of the provinces, besides Zambezia, where a new RERD2+ project component will work on renewable energy for productive use i.e. solar powered irrigation. The COVID-19 pandemic has mainly had a socio-economic impact given the measures that have been taken by the government to limit its spread. Many activities have been put on hold for a period of 8 to 9 months, and a return to normality can only be expected in, or possibly somewhat after, Q1 2021.

As to the - renewable - energy sector earlier announcements of important changes in sector policies and partner institutions were reconfirmed in 2020 but most still await concrete implementation. Approval of relevant legislation is pending parliamentary approval of proposed changes to the legal framework. 2020 did provide clarity however on the consequences of the adoption of decree 41/1 of June 2018 that lays down new rules for public institutions and funds, such as the project's counterpart organization FUNAE (see 2.1.2. below).

In a general sense the lack of progress on the electricity law remains among the main preoccupations of the intervention as it complicates the projects quest for cooperation on innovative business models for mini-grids. It remains difficult to stipulate at this stage in how far delays of adoption of the electricity law will have a negative influence on the intervention.

#### 2.1.2 General and Institutional context

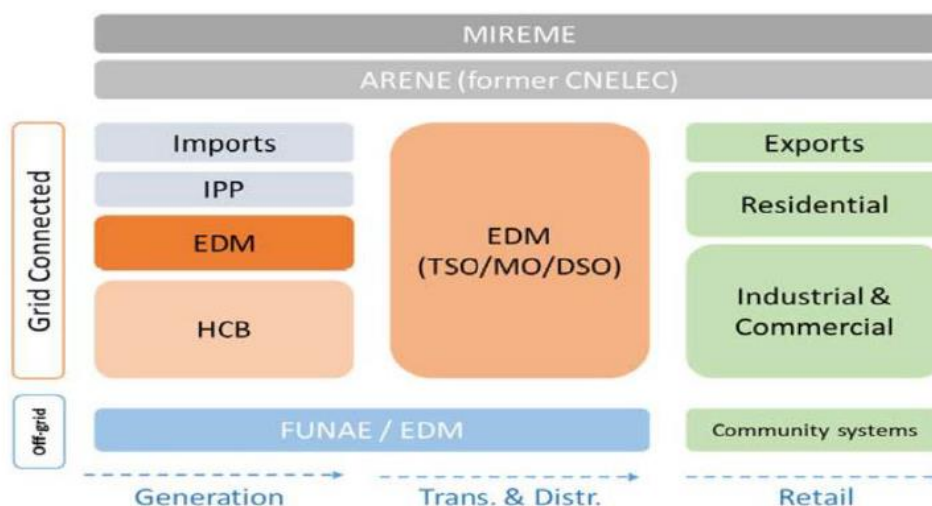
In terms of the Institutional set up<sup>8</sup> the following diagram summarizes the role and names of the key entities.

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<sup>7</sup> Impact refers to global objective, Outcome refers to specific objective, output refers to expected result

<sup>8</sup> that stems from the current regulation of the sector

### *Institutional set up of the Energy Industry and regulatory bodies*



#### *The Ministry of Mineral Resources and Energy (MIREME)*

The Ministry of Mineral Resources and Energy (MIREME) is responsible for national energy planning, policy formulation and overseeing the operation and development of the energy sector. The ministry remains committed to boost the development of renewable energies and diversification of sources in the national energy matrix, thus contributing to the achievement of the (new) Integrated Master Plan and the National Electrification Strategy objectives. One of the major objectives is to achieve the target of universal access to energy by 2030. There are signs that it is reasonable to assume that new policies and legislation developed in the last two years will evolve and become reality in the present term of government, thus paving the way for innovative solutions in mini-grids as foreseen by the project.

#### *Establishment of the National Energy Regulatory Authority (ARENE)*

ARENE (created by law in 2017) was quite inactive in 2018 and for most of 2019 due to delays in the nomination of the chairman of the board. The appointment of the CEO in November 2019 marked the real start of ARENE's operability. In 2020, 2 Technical Assistants were appointed to assist Arene's Economic Regulation and the Market Division and 1 to assist the Planning and Cooperation Department. More reinforcement, notably in the area of promotion and regulation of renewable energy, regulatory instruments and IT is foreseen for the coming year. Urgent progress needs to be made in proposing/anticipating regulatory measures for off-grid energy. This will require coordination by Arene of the various donors and stakeholders involved. In the above-mentioned areas ARENE - as well as MIREME - continue to be supported by the Belgium funded CB-MIREME project.

#### *Master Plan for Electricity*

In October 2018 government approved the Integrated Master Plan for electricity infrastructure (2018-2043). This plan aims at increasing the country's capacity to generate, consume and export electricity over the next 25 years. The plan (US\$34 million) seeks to ensure diversification of energy sources including hydropower, natural gas and coal. \$18 billion will be invested in energy generation.

### *Review of Electricity Law*

A proposal for a new Electricity Law (to replace the 1997 law) aims to promote the efficiency of the electricity sector in accordance with internal, regional and international markets and includes, among others, encouraging participation of the private sector and redefinition of the role of FUNAE. The law will include a series of specialized regulations, rules and standards on topics such as mini-grids, solar home systems, storage, self-generation and net-metering rules for incorporating isolated grids into the national grid. The public consultation process is completed. MIREME's legal team has been working on the adaptation of the text to the current legislative norms and templates and on the identification of subjects that should not be part of the law but instead of Ministerial decrees or inferior legal figures to avoid any further revision of the law in the short to medium-term. Legal advisors are also looking at the alignment of the Electricity Law with other existent laws (PPPs, Land, Water, Public companies, etc.) to avoid conflicts amongst them. After the above process is completed the law will be submitted for inter-ministerial consultation. This should be followed by the presentation of the final draft to the development partners before submission of the law to the Council of Ministers. Validation of the law by the Council of Ministers is expected during the first semester of 2021 to be followed by law approval by the National Assembly.

### *The National Energy Fund (FUNAE)*

The Energy Fund (*Fundo de Energia*, FUNAE) – the project's counterpart organization - is a public body subordinated to MIREME with the aim of promoting the development and use of different forms of low-cost energy and the sustainable management of energy resources. Initially setup as a fund, FUNAE today mostly implements off-grid access projects.

Until recently, FUNAE conformed to the rules established in the Basic Law of 2012 (Law No. 7/2012 of February 8) and Decree No. 41/2018 of July 23, which approved the rules for the allocation, autonomy, budget regulation, organization and operation of institutions, foundations and public funds. Decree No. 41/2018 of July 23 however required that the organic structure be adjusted<sup>9</sup> to ensure compliance with the objectives set by the Government for the sector in general and under the National Energy for All Program in particular. As such, on October 20, 2020, MIREME submitted the proposal for a new decree to the Council of Ministers. The proposal was approved and subsequently published on November 12, 2020 (Decree 101/2020 of 12 November).

**FUNAE** (public fund) is now a legal entity of public law, category A, with legal personality and administrative, financial and **patrimonial autonomy**. Under the previous status patrimonial autonomy was missing. The new decree now allows FUNAE to own shares in companies. In the new decree, FUNAE's competences are more broadly defined as: *Implementation and management of electrification projects based on renewable energy solutions, expansion of the rural fuel network, mobilization of funding at the level of internal and external partners (financing) and energy efficiency - and other energy - services.*

Under new decree the Board of Directors is composed of three executive directors (as opposed to one - the CEO - under the previous decree). One of the executive directors is the CEO. The CEO is appointed by the Council of Ministers upon the proposal of the

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<sup>9</sup> under the provisions of Article 11(d)

Minister overseeing the energy domain. The implementation of the decree has resulted in a new organizational chart where the O&M unit has not been made a division (as is foreseen in the RERD2 TFF). The O&M unit is now expected to become a unit under the “Electrification division”. The other - three - divisions are the “Fuels Division”, the “Financing and Private Sector Service Division” and the “Studies and Mobilization Division”.

#### *Electricidade de Moçambique*

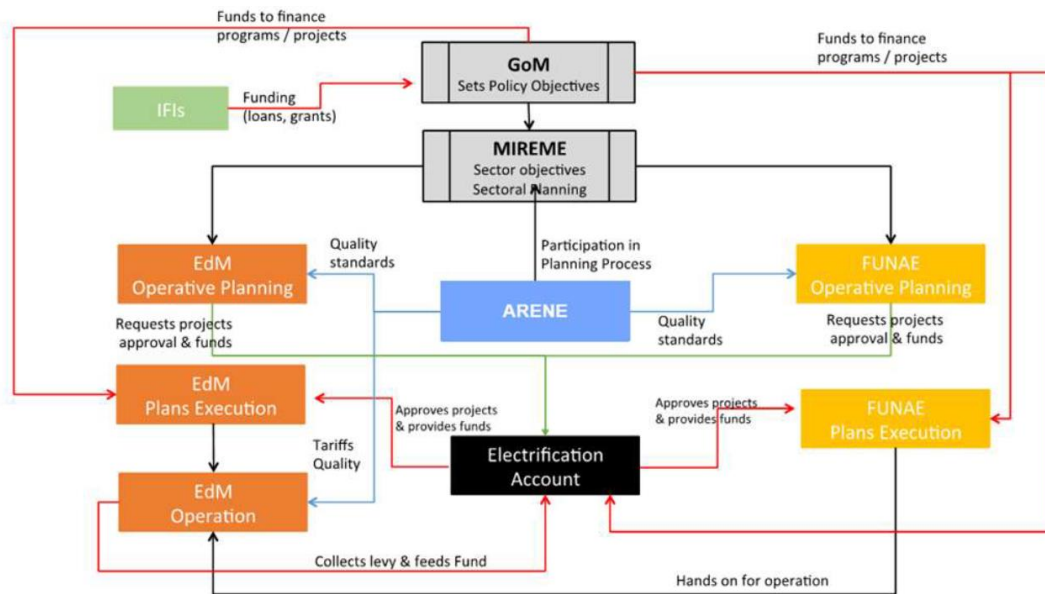
EDM is the government-owned electricity utility established in 1995 as national electrical utility, responsible for the generation, transmission, distribution and sale of electricity throughout the country. But EDM is mostly a transmission and distribution company with few generating assets. EDM has recently created a renewable energy business planning and development portfolio with a Directorate of Renewable Energy and Energy efficiency that is to address renewable energy sources (RES) investments. Doubts have however been expressed as to the feasibility of EDM pursuing such investments when it has to rely on its own corporate funding.

#### *The National Electrification Strategy 2018 (ENE)*

The National Electrification Strategy (NES) represents a key milestone in reaching all Mozambicans with electricity access by 2030. The strategy distinguishes between Expansion Areas (AEPs) and Subsidized Expansion Areas (AES). Its roadmap proposes that EDM takes the lead in identifying and implementing on-grid projects following project prioritization criteria and electrification schemes, while FUNAE focuses on the implementation of off-grid solutions. Once a system is installed, FUNAE will transfer it to EDM for operations. EDM may in turn outsource to private operators or communities. FUNAE projects will, besides other sources, be financed by an Electrification Account without the obligation to reimburse. FUNAE and EDM should coordinate efforts on specific projects where their areas may overlap. The lack of such coordination affected the project at various times during the past two years and led to it having to change course at various occasions.

A schematic representation of the institutional relationship of the above-mentioned institutions is presented below.

### Energy sector main institutions



### National Institute of Irrigation (INIR)

INIR is a proposed new project partner, the background of which is briefly explained in the box below.

In Q1, FUNAE requested support from Enabel for a feasibility study for the installation of Solar-Powered Irrigation Systems (SPIS) and subsequent funding of investments in such systems. In support of its request FUNAE handed over a feasibility study developed in partnership with the Global Green Growth Institute (GGGI) in 2018 for the installation of SPIS systems in the province of Manica, one of the target provinces of the first phase RERD1 project. FUNAE proposed Zambezia for the new study because Zambezia Province is the prime target province for the RERD2 project to date. Following the request, not only to support a study but also investments, a formal request for an additional project component was introduced to, and positively received by, Enabel's headquarters in Brussels. Enabel set aside an envelope of €10 million pending the development of a solid project document, a so-called additional technical and financial file (TFF). The extra project component is now known as RERD2+. In order to base the additional TFF on up-to-date context information of the two provinces of Manica and Zambezia the project contracted two local consultants. They collected field data and delivered their report within the established deadline, satisfactorily answering to the terms of reference. As soon as signals appeared from headquarters that the additional project document was going to be successful, the GGGI was contracted for the technical study in Zambezia, more or less similar to the abovementioned study in Manica. The Zambezia study, however, focuses more on small(er) farmers and their associations. The expected results of the study of Euro 152,120 are: a) project sites are identified and selected in collaboration with the Ministry of Lands and the Ministry of Agriculture, FUNAE and the Zambezia provincial government, b) technical assessment and design of selected sites completed and validated with government counterparts, and c) financial viability analysis of selected sites completed and submitted to FUNAE for funding.

Context analysis and stakeholder's consultation during the drafting of the additional TFF led to the decision to anchor RERD2+ in INIR that offered to host the project and second the Mozambican counterpart(s). The formulation process of the additional TFF was concluded by the end of October 2020. After its validation, also in October, the project was approved by the Belgian minister of development cooperation mid-December 2020 adding €10 million and 3 expected results to the project.



INIR was created in 2010 to ensure the efficient and sustainable planning, development and management of land and water resources for production. In line with the creation of INIR, a National irrigation strategy was defined in 2012 that plans to double the amount of land under irrigation (with a particular focus on Zambezia and Manica provinces) and a National irrigation plan was formulated in 2015 which sets the short, medium and long-term goals in the irrigation sector. INIR oversees the promotion, the rehabilitation, the construction and the maintenance of irrigation infrastructures, as well as the establishment of water users' associations. INIR is also responsible for implementing and supervising integrated water resources management plans.

### **2.1.3 Management context**

#### **2.1.3.1 Partnership modalities**

FUNAE remains the government entity responsible for the intervention. The FUNAE Chief Executive Officer (CEO) is designated as sponsor, responsible for achieving the results and the specific objective of the intervention. The CEO equally acts as Authorizing officer, who is responsible for authorizing and liquidating expenditure following the modalities as laid down in the project document. Co-managed procurement was to be used for all works involving the appropriation of results by FUNAE after the end of the project. For co-managed acquisitions, the Mozambican legislation was to be used, as it applied to acquisitions financed by the government. These specifically concerned acquisitions under the following activities; 'Development of mini-grids' (6 Mio Eur), 'Implementation of Remote Monitoring Systems (360k Eur) and 'Implementation of Payment Systems' (500k Eur). As described in section 1.3.3, the December 7, 2020 steering committee approved a project proposed 180-degree turnaround from co-management to regie to circumvent the handicaps of the co-management modality.

The new component of solar powered irrigation systems (also in regie) adds the Ministry of Agriculture and Rural Development (MADER) and the National Irrigation Institute (INIR) to FUNAE as partners institutions. A representative of the Ministry of Agriculture and Rural Development is to be invited to the steering committee whereas INIR / MADER will second an additional Mozambican counterpart and provide offices with water and electricity services, internet security, etc. in Maputo and in the provinces of Zambezia and Manica.

#### **2.1.3.2 Operational modalities**

The operational modalities of the project are now more appropriate. The practical modalities of operational management of the additional component are aligned to RERD2, including the reporting requirements.

From the point of view of contracting tools, the implementation of the project can take the following forms:

- Direct implementation by Enabel (mainly via technical assistance employment contracts);
- Subcontracting via public (services, works and supplies) contracts where Enabel maintains its contracting authority role;
- Usage of Cooperation Framework Agreements concluded between Enabel and Belgian or European public-law entities; and

- The awarding of Grants to public entities or private not-for-profit organizations in which case Enabel will have the contracting authority role.

## 2.2 Performance outcome



### 2.2.1 Progress of indicators

Monitoring matrix extracted from the Technical and Financial File.

Outcome: Access to energy in rural areas is increased by investments in renewable energy and in support mechanisms to ensure sustainability.					
Indicators	Baseline value	Value <sup>10</sup> year N-1	Value year N	Target year N	End Target
Access to electricity in rural areas	5,97% of rural population (Global Tracking framework)	na	na	na	7,97% of rural population of Zambezia province

### 2.2.2 Analysis of progress made

The first year of the project was largely devoted to pre-feasibility studies of possible locations for mini-grids. The logic of the project and in particular the (a) stringent selection criteria for sites and (b) the importance of proper sizing of mini-grids forced the project to invest considerably in studies, which logically took the necessary time. Taking this into account, it is clear that the project, so far, did not impact on the above-mentioned indicator of energy access. In addition, it has, for mainly two reasons, been decided that the project not venture into setting up costly and time-consuming research similar to the SE4ALL Global Tracking Framework study from which the above indicator was drawn. The first argument was the need to avoid an overkill of studies due to the considerable research already undertaken (site screening, pre-feasibility and feasibility studies). Secondly the Mozambican Energy Ministry and the National Institute of Statistics are in partnership with the Norwegian Water Resources and Energy Directorate (NVE) working on improving analytical capacity in the energy sector. Work is ongoing on the undertaking of a pilot survey on access to energy in Mozambique. In this context, it is also noted that this initiative has serious doubts as to whether a study of all five tiers of access to energy is possible and has suggested that only research into the first two tiers is feasible. The project is in contact with this initiative and it was decided not to duplicate efforts in this field. Verification of the above indicator will therefore continue to mainly rely on secondary sources.

### 2.2.3 Potential Impact

The potential impact of the project remains significant, not only because of the mini-grids that will be constructed, but also because of the medium-term prospects for the realization of a grid connected hydroelectric power plant of approximately 11.2 MW, for which the dossier continuous to be prepared by the project.

<sup>10</sup> These 3 value columns are maintained throughout this report even though values have not yet been assessed or projected. The quoted baseline and end target values are from the TFF.

## 2.3 Performance output 1 Mini-grids provide reliable and adequate energy service



### 2.3.1 Progress of indicators

Monitoring matrices extracted from the TFF.

Output 1: Mini-grids provide reliable and adequate energy service					
Indicators	Baseline value (from TFF)	Value year N-1 2019	Value year N 2020	Target year N 2021	End Target
Multi-tier framework (World Bank)	5,97% of rural population (Global Tracking framework)	n/a	n/a	-	7,97% of rural population of Zambezia province
Reviewed, revised and updated studies	13 existing studies on PV and hydro	1	1	1	1 to 3 studies revised and updated
Awareness and stakeholder consultations	0 campaigns	0.5 <sup>11</sup>	5	5	15 awareness campaigns on sites
Mini-grid developed with productive uses of energy	3 large existing hydro mini grids (Sembezia, Murora, Majua) and 3 large solar mini grids	0	0	0	4 to 5 solar mini-grids in 2022
Publication	0 publications	0	-	-	Minimum one publication

### 2.3.2 Progress of main activities

Progress of <u>main</u> activities <sup>12</sup>	Progress:			
	A	B	C	D
1 Review and update of existing feasibility and baseline studies and site selection in view of productive uses of energy (socio economic surveys)		X		
2 Awareness and stakeholder consultations for each site including the private sector		X		
3 Mini-grid development with productive uses of energy			X	
4 Result dissemination		X		

### 2.3.3 Analysis of progress made

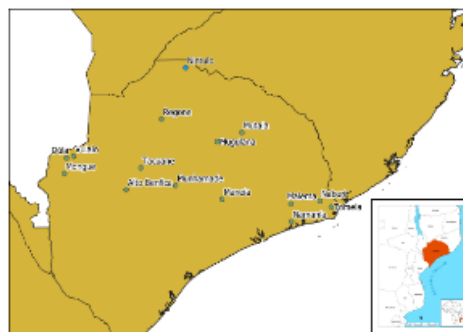
In the first year of the project, work was primarily guided by FUNAE's project pipeline, commonly referred to as the '*carteira de projectos*'. This pipeline exists since a number of years and was not established on the basis of specific - selection - criteria, and certainly not those mentioned in the RERD2 project document (such as - productive use of electricity and - innovative business models involving the private sector in ownership and / or management of mini-grids). On the contrary FUNAE, to date, is considered to be fulfilling a social role and is expected to bring electricity to - often - isolated rural regions where investment in electricity generation is unattractive for EDM and private operators. An area's economic potential is thus, as opposed to the project's criteria, not a criterium

<sup>11</sup> We mark 0.5 because important consultations took place in Nintulo but we cannot pretend it was a full campaign.

<sup>12</sup> A: The activities are ahead of schedule  
 B: The activities are on schedule  
 C: The activities are delayed, corrective measures are required.  
 D: The activities are seriously delayed (more than 6 months). Substantial corrective measures are required.

for inclusion in the FUNAE’s pipeline. Whilst FUNAE has started to understand and accept the project’s selection criteria it continued its tendency to present its project pipeline as the prime entry point for RERD2 to ‘choose’ from. With this in mind it is not surprising that this discrepancy in - selection - criteria resulted in only 20% of the sites studied being retained for - potential - project investment.

This however does not mean that 80% of the work did not contribute to the expected output. Starting from the FUNAE project pipeline has also led to the identification, technical design and financial feasibility study of an extremely attractive hydroelectric power plant, completed by the end of 2019<sup>13</sup>. It is likely that in the medium term this project work will significantly contribute to electricity supply in the north of Mozambique through a grid-connected power plant realized via a co-financing partnership between government, development agencies/banks and the private sector. Enabel is in a unique position to play a proactive role in the realization of this project.



Map of 15 of the 20 sites studied

Work on hydro and solar mini-grids is described in a bit more detail below.

The projected cost of the 11.2 MW small hydro power plant is some 25.9 Million USD. This is more than twice the original RERD2 budget and more than 3 times the amount that RERD2 budgeted for investments in mini-grids. Concerning follow up actions the project:

- continues to collect data on daily water flow with the help of a member of the Nintulo community, under the supervision of the head of the administrative post, and measure rainfall with a device installed at the residence of the same head of the post<sup>14</sup> early 2020. A technician from the FUNAE hydro division is firmly in charge of ensuring that all data collection and transmission procedures are followed;
- undertakes two monthly missions to Nintulo led by a technician from the FUNAE delegation in Quelimane for calibration of both waterflow and rainfall data at the location of the future SHPP;
- undertakes pre-rainy season road repair works with the help of the community to keep the site to the measuring weir accessible;
- plans a power evacuation / grid connection lines study via an Enabel framework contract. A meeting with the pre-selected company has taken place and a first on-site mission is planned for October 2021 (after collection of at least two years of flow- and one year of rainfall data) followed by a second mission in 2022;

<sup>13</sup> The technical and financial-economic details of the SHPP were described in the previous annual results report and are therefore not repeated here.

<sup>14</sup> The process of data collection up to processing and analysis is guided by a manual prepared by the project for the purpose. The manual (in Portuguese and English) describes the theory as well as the procedures and responsibilities of data collection, forwarding, storage and processing. Data are transmitted via a WhatsApp group of all members playing a role in the process.

- foresees final design in function of the results of full data analysis.

It's worth mentioning that the local Nintulo community was involved in these activities from the earliest stages.

The repair works on the Majaua hydroelectric power station, destroyed by the disastrous floods of 2015, were completed by the end of 2019. The rehabilitation was co-financed by the EU and the first phase of the RERD project (the Belgian contribution amounted to 462,049 euros). In 2020, the FUNAE delegation of Zambezia started installing the meters purchased by RERD1 in October 2016 (see further below).



Community consultation during feasibility study

As a final activity in the field of hydropower we mention the compilation of a master table of 59 hydro sites in Zambezia province, based on data contained in a large series of individual reports that have valuable information and cost estimates on these sites. The sites are all mentioned in FUNAE's Renewable Energy Atlas. The table holds information on 24 key parameters (geography, hydrology, costs, ...) and helps comparison of these 59 sites in view of further site selection. Respective distances to the national EDM grid remain to be (re)verified as those are likely to have changed in the mean-time. Distances from EDM can be updated thanks to the results of the methodology developed in the context of the project's second cycle site identification. Indeed, this methodology (also referred to further below) gives a tool to the FUNAE GIS unit to estimate EDM's grid extension. Exact map data on the existing and planned EDM national power grid remain confusing, inaccurate and difficult to obtain, not in the least because EDM seems not to have this data digitized in a functional GIS system. FUNAE's hydro division (DMH) is keen to work with the project and replicate the Nintulo's flow measurement experience on the most interesting site of the above-mentioned list, Mutala, in Zambezia. As such this was included in the 2021 project plan.



Kick-off meeting of feasibility study

As to solar mini-grids a total of 19 locations benefitted in 2019 from pre-feasibility studies jointly conducted by FUNAE (Maputo and delegation) and Enabel staff.

An identification / prefeasibility mission to 6 potential solar mini-grids sites in Pebane and Mocubela districts marked the finalization of detailed examination of these 19 sites (12 sites of which from FUNAE's original project pipeline. As such, early 2020 the project had

exhausted FUNAE's project pipeline in Zambezia. Three sites from FUNAE's pipeline were finally retained while two non-pipeline locations were added after having observed their potential for productive use of energy.

In order to speed up the construction of two (smaller) mini-grids in the communities of Mugulama and Alto Benfica<sup>15</sup>, in the interior of Zambezia, it was decided to carry out the technical design of these grids in-house and then call for tenders<sup>16</sup>. The EPC (Engineering, Procurement and Construction) tender, under co-management, was published on the 27<sup>th</sup> of July 2020.

The mini-grid tender for Alto Benfica (lot 1) and Mugulama (lot 2) was finally cancelled in November 2020. A first phase evaluation of 9 offers disqualified three offers while of the remaining six some administrative documentation was either missing or lacked proof of official translation (Chinese to Portuguese). The difficulties the companies encountered to abide by all the regulations imposed by the Mozambican law motivated the project to propose, and insist on, a change of modality from co-management to regie.

In light of the cancellation of the EPC for Mugulama and Alto Benfica, the tender for the supervision of these works was also cancelled (by mid- December). 14 companies had submitted an expression of interest for supervision of the works, 6 companies of which had passed to the shortlist.

Following steering committee approval (December 5<sup>th</sup> 2019), the project launched a tender (in regie) entitled "*Feasibility study for hybrid mini-grids in Zambézia and Nampula, Mozambique*" on 28 February 2020. The study targeted 3 locations in Zambezia and 2 in Nampula province. The original steering committee's approval for 5 sites actually only concerned Zambezia province. The inclusion of 2 sites (administrative posts) in the province of Nampula however was decided after the project received a request from FUNAE following an official EDM communication that Naburi (the most interesting site for a RERD2 sponsored mini-grid) was included in the EDM pipeline for connection to the national grid. FUNAE received this notification one week after the December 2019 steering committee's approval for this settlement of Naburi. Accepting locations in Nampula was logical because, as mentioned, the project had exhausted FUNAE's Zambezia pipeline locations for mini-grids following its close investigation of 19 potential locations in 2019.

The tender of the above-mentioned feasibility study resulted in 18 offers of which 8 passed the first selection phase. A joint FUNAE/Enabel evaluation committee performed the evaluation, frequently meeting remotely via MS-Teams<sup>17</sup>. The contract was awarded to the Berlin based 'Reiner Lemoine Institut gGmbH', working in consortium with EnGreen on 26 June. Despite the COVID19 imposed restrictions the study was concluded within the established deadline(s). Final reports, received on 28 November, were in time to prepare the due investment decisions of the December 2020 steering committee.

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<sup>15</sup> both approved by the Steering Committee of December 2019

<sup>16</sup> With regard to Alto Benfica, it should be mentioned that later in the year, when the locations of a second EPC were discussed with FUNAE, it was confirmed that Alto Benfica was now on the list for electrification by EDM. This had been suspected for some time but feedback from EDM was only obtained after EDM's CEO called EDM in Zambezia. This was the second of 5 sites approved by the SC that was dropped as EDM finally confirmed it would electrify the site, the first being Naburi which was cancelled just a week after the SC approval. This was yet another illustration of how poorly the two organizations coordinate with each other.

<sup>17</sup> After the COVID19 outbreak, Enabel had repatriated RERD2 staff to Europe, from where they worked from April to August..

The technical specifications - as proposed in the feasibility study - were approved by FUNAE after a series of technical discussions. The subsequent EPC tender documents, applying Belgian law<sup>18</sup> were sent to Enabel's headquarters in Brussels on 29 January 2021. The terms of reference for the call for expression of interest were concluded at the time of drafting this report and was awaiting non-objection from HQ in Brussels for publication.

In 2020, and in more general terms, the project responded to requests to investigate and brief the Research and Planning Department (DEP) on containerized solutions for small mini-grids, a new area for FUNAE. The project also submitted a full manual on application of GIS and remote sensing techniques for mini-grid site identification and selection. The proposed methodology illustrates step-by-step how the DEP GIS unit can concretely move forward in applying GIS and satellite imagery in concrete off-grid energy planning, thus constructing an updated project pipeline, a key mandate for FUNAE. This work is also part of capacity development in project planning and therefore more detailed in the section on expected result 3.

Following tendering of full design and works, the project will now have to gradually step-up preparatory work on awareness building in communities<sup>19</sup> modestly started during the 2020 field studies and community consultations. It also has to further develop ideas on how to promote productive use of energy. In the context the expected arrival of a junior expert early 2021 is opportune.



Potential area identified for installation of mini-grid solar panels

Given the stage of the project there are no activities or results to be reported on in the section on 'result dissemination'.

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<sup>18</sup> after the December 2020 steering committee's approval of the budget revision and change of modality

<sup>19</sup> Within the framework of some 20 (pre)feasibility studies and 5 feasibility studies, hundreds of individual and small group interviews were held, but these are not considered here as full 'stakeholder consultations'

## 2.4 Performance output 2: Technical and financial sustainability of existing systems is improved

### 2.4.1 Progress of indicators

Monitoring matrix extracted from the TFF.

Output 2: Technical and financial sustainability of existing systems is improved					
Indicators	Baseline value (from TFF)	Value year N-1 2019	Value year N 2020	Target year N 2021	End Target
Revenues from the systems	Fee collection at 50%	Zambezia Survey on RERD1 systems indicate 0% <sup>21</sup>	24%	-	Fee collection raised to 80%
Percentage of systems working	Working systems: 50%	Zambezia Survey on RERD1 indicates 61% working <sup>20</sup>	64%	-	80% of working systems
GIS implemented beyond a static database and used for planning and asset management purpose	GIS currently not used = 0%	0%	20%	35%	GIS interconnected with other databases and used for planning purpose 100%
The existing maintenance strategy for PV is implemented	PV maintenance strategy implemented at 25%	25%	25%	-	PV maintenance strategy implemented at 80%
Level of functionality of maintenance unit	Half functional 50%	50%	-	-	Maintenance unit strengthened 90%
Degree of connectivity / sharing GIS database with other departments	0% sharing with other departments	0%	10%	40%	GIS and data base connected and used for asset management, site identification and planning
Number of installed remote monitoring systems and technologies	8 systems installed, 3 different technologies	20	20	-	Number of systems installed One technology
Number of meters and pre-payment systems purchased and operational	1000*) meters and pré-payment systems purchased but not operational yet 0% of systems operational	119 are operational (against 726 purchased)	440	590	Pre-payment (for domestic users) and meters systematic on the mini-grids financed by RERD2 100% of mini-grids equipped with pre-payment systems
*) Actually, a total of 726 meters (incl. 3 payment system computers) were purchased in October 2016. All meters were intended for use in 3 hydro mini-grids funded by RERD1. The details are as follows: 60 meters + 1 payment system computer was installed to administer Sembezeia & 58 meters + 1 payment system computer were installed to administer Muoha. 605 meters + 1 payment system computer were sent to Majaua. 2020. 440 pre-paid meters are now installed and registered in the three villages of Majua-Maia, Gurgunha and Dachudua. In the first week of March 2021 150 will be installed and registered in the two still 'missing' villages of Topola and Barua.					

<sup>20</sup> Zambezia survey indicates that 0% of public institutions pay and that 61% of systems working, 23% is not working and 16% is problematic.



## 2.4.2 Progress of main activities

Progress of <u>main</u> activities <sup>21</sup>	Progress:			
	A	B	C	D
1 Planning, operation and maintenance processes are strengthened			X	
2 Strengthening of Information systems		X		
3 Remote metering and monitoring systems allow for more efficient maintenance of the systems.		X		
4 Implementation of payment systems (metering, fee collection, pre-payment)		X		

## 2.4.3 Analysis of progress made

A second study of revenues from systems in 10 provinces revealed an overall 24,2% effective payment of the total due amount when excluding RERD2 and World Bank projects that had financed individual systems for public institutions. For the systems funded by Enabel and World Bank the value is still 0%. This is in line with the results of the RERD2 field survey in Zambezia in 2019<sup>22</sup>, reported in more detail in the 2019 Results Report. This 'country wide' analysis, indeed clearly depicts Zambezia as a low paying province with 9%. Manica, Nampula, Sofala and Inhambane do much better. The reasons behind the significant differences are more difficult to investigate, but it is clear that public institutions are generally not willing to pay, most likely because of budget limitations.

In the context of improving sustainability of systems the project worked with the operations and maintenance unit, the solar and hydro divisions, the Zambezia delegation, the ICT unit and the administration and finance division on matters such as monitoring of operational status of systems, the status of revenue collection, strengthening of information systems and methods for work planning. This collaboration resulted among others in the drafting of a technical document entitled “*Análise de consumo das mini-redes existentes geridas pelo FUNAE, (mini-redes de Muhoa, Mecula, Mavago e Mueembe)*”, 56 pag<sup>23</sup>. Studies such as these not only provide indications of payment rates, but are also very useful input for feasibility studies for new mini-grids, as they give a good indication for the sizing of such systems.

The project also worked intensively with the GIS unit of DEP to arrive at a GIS unit improvement plan. The above-mentioned field survey in Zambezia, apart from providing interesting insights, also served as an excellent starting point for this exercise. The plan was considered final by Q3 2020. It outlines a detailed set of concrete actions and responsibilities. Its elaboration and early stages of implementation were accompanied by the junior digital data management before he shifted his attention / assistance to the operations and maintenance unit in Q3 and Q4<sup>24</sup>. The project now considers the

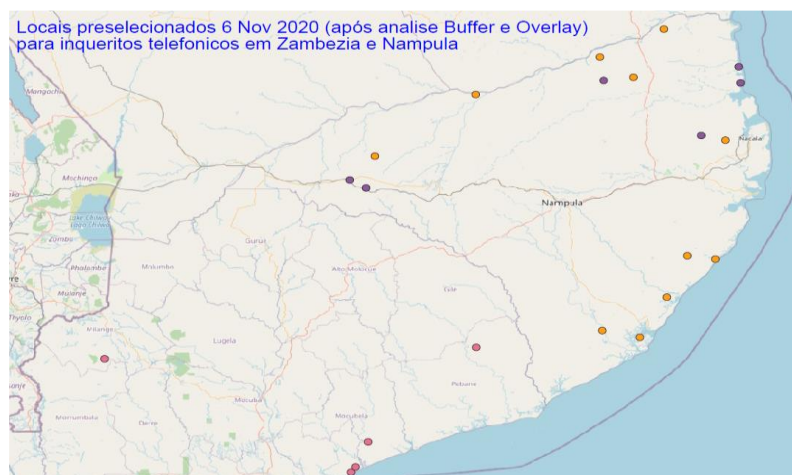
<sup>21</sup> A: The activities are ahead of schedule  
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<sup>22</sup> Relatório da missão 024 - Avaliação e monitoria dos sistemas RERD1 na Zambézia”, 38pp., December 2019, Prepared by the project's Junior Expert in digital data management.

<sup>23</sup> "Analysis of consumption of existing mini-grids managed by FUNAE in the mini-grids of Muhoa, Mecula, Mavago and Mueembe"

<sup>24</sup> Working with those still present in the FUNAE headquarters as most HQ O&M technicians had been requisitioned by government for months to build power grids in new settlements in Cabo Delgado.

monitoring of implementation of the GIS plan the prime responsibility of the head of the research department<sup>25</sup>, assisted by the head of the GIS unit, whereas evidently the ITAs remain available for assistance.



Sites identified through buffer and overlay analysis further researched in-depth through (second step) telephone surveys

Also related to GIS, early 2020 the project purchased an ArcGIS online subscription for the second consecutive year. It is encouraging to note that unlike in 2019, when no online activity was recorded for more than 10 months, the GIS unit has put a number of in-house developed maps online. Despite this significant achievement, the project still believes that stricter data quality control is necessary before information is made available online. Implementation of the actions included in the aforementioned GIS improvement plan will significantly contribute to this.



Surveying a community with a drone

In connection with GIS, it is also worth mentioning that the project purchased the software package Agisoft Metashape. This software was added to the set of software packages already purchased in 2019. Agisoft Metashape is photogrammetric software able to process drone images to elaborate georeferenced 2D or 3D models of a specific area. The 2D models are used to map areas such as villages. This will help further data collection for electrifying remote areas by allowing FUNAE to quickly know the number and locations of houses in a village or calculate the distances and areas for the future electrical grid. 3D models help

geographical surveys by calculating, with more accuracy and precision, elevation, slope, contours lines, etc. All these products are also necessary to evaluate, for example, the hydro-electrical potential of an area. Both these 2D and 3D models help to increase the

<sup>25</sup> Who is also the counterpart's RERD2 change manager.

quality of the pre-feasibility studies that FUNAE is undertaking before electrifying a village or calling for interest from investors.

The project also bought a second drone and transferred it to FUNAE for its exclusive use, independent of RERD2 project activities. Given the drone's ability to efficiently collect detailed data several divisions quickly adopted use of the drone. As such the project JE and energy engineer stepped up related training (see chapter on capacity building).

Introductions on the use of software (Kobotoolbox) and tablets for mobile data collection continued - initially and at times remotely - with the DEP and the O&M unit. A last - partly refresher - training session by the junior was being administered at the time of drafting this report. The challenge remains to turn tablet-based data collection and transmission standard routine, notably for the O&M unit, but going forward also for the DEP. The purchase of more tablets is pending progress of work notably with the DEP and the O&M unit. Field pilot test surveys in 2020 were postponed to 2021, mainly due to restrictions linked to the COVID19 outbreak.

After discussions with the operations and maintenance unit and the administration and finance division on necessary improvements in inventory and stock management, the project facilitated a visit for a group of FUNAE technicians to the National Centre for Drug Management. This visit was to learn about performing stock management software. Further exchange of ideas on the subject was hindered by the COVID19 induced physical separation from FUNAE. The subject will be taken up again in 2021.

FUNAE's O&M unit was supported in a market research undertaken with the energy engineer on the introduction of a remote monitoring system for mini-grids and a centralized vending system that can receive remittances from mobile money accounts. Four companies (AMPP, Elum, Higecco and Ferntech) specialized in remote monitoring systems for mini-grids shared a document with their technical proposal and an approximate budget to monitor 20+ FUNAE's hybrid mini-grids. The technical document proposing a number of options was discussed with FUNAE in November and conditions are now reunited to launch a formal tender for acquisition of a system, foreseen for 2021.

Contacts with PAYG companies were put on hold because it is not clear what kind of solution (cloud or on a local server) FUNAE is willing to implement. There are indications that FUNAE intends to test and possibly take over the system used by EDM. The project can be of assistance in the testing the EDM system.

Investigations in 2019 had already revealed that remote monitoring equipment (Victron, EMS, Belgian Campus) installed in isolated small solar systems had clearly not worked. Additionally, the investigation also showed that the originally promising 'Belgian Campus system'<sup>26</sup> had not evolved any further. This was explained in more detail in the previous result report. Discussions with FUNAE's CEO, the solar division and the maintenance unit led to the conclusion that it makes little sense to continue work on remote monitoring systems for isolated / individual solar installations. FUNAE is progressively transferring the ownership of most of the systems, notably to the Ministry of Health and the Ministry of Education. As such these systems are not a priority anymore. The focus is now on micro and mini-grids and it makes less sense to invest important resources in georeferencing

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<sup>26</sup>A school in South Africa founded by a Belgian engineer

the small isolated systems to support maintenance or to collect payments. Further work should rather concentrate on remote monitoring and payment systems on existing RERD1 funded hydro mini-grids (Muoha, Sembezeia, Majaua) and existing and to be developed RERD2 (and other) solar mini-grids.

Lastly it needs mention that remote metering in, and monitoring of, mini-grids are in their early infancy in Mozambique. The project therefore, apart from continuing work on these systems, intends to be inspired by experiences in the southern and eastern Africa region through exchange visits in 2021.

## 2.5 Performance output 3: The capacity of FUNAE in planning and project management is improved

### 2.5.1 Progress of indicators

Monitoring matrix extracted from the TFF.

Output 3: The capacity of FUNAE in planning and project management is improved					
Indicators	Baseline value (from TFF)	Value year N-1 2019	Value year N 2020	Target year N 2021	End Target
Capacity building plan	No plan for capacity building	0	0	1	Agreed plan for capacity building
Quality of tender documents	n/a	n/a	Improved	Improved	Na
Quality of socio-economic survey methodology	No standard method for socio-economic surveys	No standard method	Standard method developed and agreed	Standard method consolidated	Standard template for surveys
Processes and working procedures	Not updated	-	Improved somewhat	Improved somewhat	Clear processes and tools for project management
Planning process with DPREME (now SPI)	unclear	unclear	Still fairly unclear	-	Clear working processes and structure; technicians better trained
Quality of working procedures	Incomplete procedures	-	Improved in specific areas	Improved in specific areas	Working procedures are operational

### 2.5.2 Progress of main activities

Progress of <u>main</u> activities <sup>27</sup>	Progress:			
	A	B	C	D
1 Project management is improved at FUNAE central level		X		
2 Capacity of selected delegations of FUNAE are strengthened in sector planning and coordination			X	
3 Technical assistance		X		
4 Surveys, field trips workshops and seminars, study tours		X		

### 2.5.3 Analysis of progress made

Until recently, FUNAE considered a project proposal for contracting consultancy services for the preparation of a capacity development plan not opportune, i.e. not well-timed.

<sup>27</sup> A: The activities are ahead of schedule  
 B: The activities are on schedule  
 C: The activities are delayed, corrective measures are required.  
 D: The activities are seriously delayed (more than 6 months). Substantial corrective measures are required.

Following the gazeting of FUNAE's new organic status in November 2020, this activity was included in the 2021 plan.

Intensive cooperation between FUNAE's procurement unit (UGEA) and Enabel in the preparation of EPC tenders and the tender for supervision of the EPC contract execution has led to visible improvements in the quality of FUNAE tender documents. We specifically mention; a) better structured evaluation criteria, b) inclusion of a summary table with important information, c) the opening for container solutions for mini-grids, d) the opening for solutions with Lithium batteries, e) the incorporation of (drone) aerial photos & links to 3D models of communities (generated by Metashape from drone images) and f) clearer descriptions of systems and their operation and last but not least increased flexibility of technical specifications to respond to markets products.

A group of DEP technicians and the Enabel energy engineer analyzed FUNAE's methodology for socio-economic surveys and suggested a number of improvements. The new (baseline) survey is based on FUNAE's original surveys that merely needed some improvements. Improvements imply, among others, working in three distinct phases of a project process: (i) remote assessment via telephone for follow up site identification; (ii) a 1-day on field survey and (iii) an extensive energy need assessment campaign. The improved survey questionnaires were transferred to tablets. Actual field surveys - normally carried out by the "area social" of DEP - were put on hold in the course of the year because of travel restrictions imposed by the COVID19 pandemic.



Feasibility survey team on its way to Idugo Island

The analysis of existing management and support processes at the provincial level (Zambezia) by the Quelimane based capacity building expert have always (and thus until now) remained at a very modest level. The final departure of the expert in May 2020 has only underlined the gap in this work.

The 6th ARE, Energy Access Investment Forum (18-19 March 202) and the MGA (Micro Grid Academy of Res4Africa) training, (16-20 March) in Lusaka, to which two FUNAE Division heads were planned to assist, have not taken place due to precautionary measures related to the COVID-19 outbreak. ARE and MGA initially adjourned the conference and training to 14 September 2020 to later adjourn them again to 2021.

The project supported eleven FUNAE staff (5 from Nampula, 2 from Zambezia, 2 from Manica and 2 from Maputo) to attend a ten days (17-27 March) training course in Pemba.

The course was co-organized with the AVSI People for Development foundation and covered a wide array of topics related to generation, distribution, and renewable energy Management.

Seven (7) FUNAE staff members completed the ERRA Online Training course on 'Introduction to Energy Regulation'. The trainees 'returned to work' with; - familiarity with the advantages and disadvantages of the various wholesale market designs and the role of regulation (and regulators) under various models, - understanding the principles of calculating prices and tariffs in the energy sector, - awareness of regulatory roles in increasing competition levels in wholesale energy markets, - information on the global trends in natural gas markets, including LNG markets, - knowledge of the main types of support schemes applied globally for promoting renewable energy, including auction designs and - information on the drivers in providing flexibility in the DSO (Distribution system operators) networks and the role of demand response in electricity markets.

Through observations and discussions in FUNAE revealing widespread manual data processing, it became clear that there was a need for MS Excel training. 27 technicians followed a course in advanced data analysis with MS Excel. The course was extremely useful and highly appreciated, such that it was decided to offer this course again for additional staff in 2021.

DEP (planning division) and DSSE (solar division) staff were trained in automatic and manual drone piloting. Unfortunately, the training was interrupted due to COVID19. It has been encouraging to note however that FUNAE staff has still undertaken drone operations without RERD2 assistance (repatriated to Belgium from April to September). These missions could be undertaken thanks to the skills acquired from their earlier trainings. On the other hand, the lack of routine in working with the drone over the past months will probably require refresher courses once conditions permit. In an early stage Enabel drew attention to the possible need for official licensing of FUNAE drone operations. Indeed, the Mozambican law appeared not to allow piloting a drone without a license and a specific authorization. The licensing process however is not very clear, and a specific authorization to survey an area may need more than 3 months to be released. FUNAE has approached the National Disaster Institute to benefit from their licensing training and a simplified process to get specific authorizations to survey areas countrywide.

In view of capacity development in off-grid energy planning, and associated project development, the project established contacts with 4 renowned international institutes: VITO in Belgium, the Reiner Lemoine Institute in Berlin<sup>28</sup>, Spottitt in the United Kingdom and Waya Energy Inc. (a spin off from MIT) in the USA to investigate how these institutes could assist in training and use of satellite imagery and geo-spatial tools for off-grid energy planning. In particular contacts with VITO and Spottitt may be resumed when the FUNAE's GIS unit makes progress (in the work explained further below) and indicates that support from VITO or Spottitt is likely to be fruitful<sup>29</sup>.

Early in the year the project was in contact with GIZ (the German Agency for International Cooperation) and the EU programme Get-invest to explore possibilities of an online

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<sup>28</sup> Coincidentally the institute that was awarded the RERD2 contract for the feasibility study in 5 locations

<sup>29</sup> VITO and Spottitt are more focused on detailed analysis of already identified area while the Reiner Lemoine Institute and Waya Energy re more on area identification at the macro level and subsequent detailed analysis of identified sites.

platform for off-grid electrification planning in Mozambique. A workshop consulted different energy sector stakeholders, notably EDM, FUNAE, ARENE on this topic. The course of the workshop revealed that FUNAE was clearly more advanced in the use of GIS than the Ministry of Energy and EDM. This was later in the year confirmed by a GIS consultancy organized by Enabel's project CBMIREME. Enquiries made to GIZ in the second half of the year revealed that GIZ would not go much further than putting online, at a date yet to be determined, maps of Mozambique showing population centers, the estimated national EDM network and an on-screen buffer analysis module to identify/show potential off-grid areas. Exactly the kind of work the project was already doing in Zambezia and Nampula and for which the GIS unit's staff was being trained.

Indeed, a meeting on the methodology of the project's second cycle site identification for mini-grids led to FUNAE's increased understanding of the possibilities provided by GIS and remote sensing techniques. Consequently, the RERD2 junior was requested to write a manual on the procedure he had applied in mini-grid site identification in Zambezia province. The complete and detailed final version of the manual, destined for the FUNAE GIS unit, was finalized in February 2021. The DEP head of division specifically underlined the importance of this manual and urged his staff to work on the subject. The step-by-step approach was explained in specific training sessions in December 2020. The project, and the DEP head of division, underlined that the best way to retain knowledge on the proposed procedure is to put it into practice without delay. A first step of the procedure is to, using different techniques and sources, try and identify the location of the existing national electricity grid. This is not as straightforward as it may sound. EDM itself does not have complete digitized map files of its national distribution networks that (obviously) is in constant expansion. The project encourages the GIS unit to apply the proposed methodology and to produce a database and pipeline for the development of mini-grid projects in the provinces where this analysis has not yet taken place i.e., all except the provinces of Zambezia and Nampula. Over the past few months Zambezia has been subjected to an in-depth analysis. The more recent analysis undertaken for Nampula indicates a total of 27-potentially interesting mini-grid sites in both provinces. The '*area social*' of the DEP is now following up and researching these 27 locations with the help of telephone interviews (already referred to above). In function of the results of the telephone interviews further in-depth surveys (as also referred to further above) can be undertaken. The transfer of knowledge through the mentioned manual and its imminent application in practice is of prime importance, notably given the end of the junior contract at the end of February.

In November, an in-house training on the use of GIS software for watershed identification was completed. This training was aimed at the staff of the Hydro Division of FUNAE (DMH). Also, here the best way to retain knowledge about the proposed procedure is to apply it in practice. Therefore, the project is now working on the organization of a training course for carrying out pre-feasibility studies of hydroelectric sites. A first part consists of applying GIS for the identification of catchment areas in Mozambique.

Practical training of FUNAE and PSI staff (DPREME was recently replaced by PSI) also continues, notably during field mission in preparation of the Nintulo SHPP.

The project developed a 'training database' where it registers all project in-house and outsourced training activities. From project start to date it registered a total of 1,392

‘person training hours’ for 60 technicians of which 82 hours were administered in 2019 and 1,310 in 2020. 60% of the total number of hours were to the benefit of male staff and 40% for female staff.

Below a short overview of trainings so far:

**Principal trainings:**

- Advanced data analysis with MS Excel (Maputo, 27 technicians)
- ‘Micro Grid Academy’ Res4Africa (Pemba, 11 technicians),
- Use of the Drone (flight planning, piloting, image processing, 9 technicians)
- Introduction to the Energy Regulation, ERRA Training online (7 technicians)

**Other trainings:**

- Identification of the surface area of river basins with QGIS,
- Use of the flowmeter,
- Google Earth Pro,
- Introduction to Homer Pro,
- Introduction to PV Sol,
- Introduction to PVsyst,
- Rain gauge installation,
- Mini-grids Engineering, Components and System Design
- GIS methodology for sites identification
- Kobotoolbox and the use of tablets

In reality, the figure of training hours can be considered significantly higher as it does not include the time invested by FUNAE staff in studying and using the technical documents/manuals prepared in the framework of the project.

Lastly, we provide a list of technical documents / manuals - all in Portuguese - produced so far.

1. *Análise de consumo das mini-redes geridas pelo FUNAE, 2020, 56 pag.*
2. *Manual para coleta de dados do caudal e precipitação em Nintulo, 2020, 43 pag.*
3. *Plano GIS, Recomendações para a estratégia GIS no âmbito da FUNAE e feedback sobre o plano GIS da FUNAE, 2020, 9 pag.*
4. *Manual do Drone. Documento com a informação necessária para a utilização de drone para a produção de mapas. 2020, 12 páginas.*
5. *Manual Kobotoolbox. Utilização básica de kobotoolbox para recolha de dados de campo. Adaptado da documentação oficial. 72 slides, 2020.*
6. *Fluxo de trabalho da Kobotoolbox. Documento que descreve o fluxo de trabalho recomendado para a utilização da kobotoolbox dentro da Dep. de Estudos e Planeamento (DEP/FUNAE), 4 pag.*
7. *Metodologia de pré-selecção de locais com teledeteccção, 2020.*
8. *Templates inquéritos socio-economicos readaptadas em colaboração com DEP, 2020*



Training in advanced data analysis with Excel



As to the international technical assistance we limit ourselves to the following observations. The Maputo based RERD2 Enabel technical team<sup>30</sup> is essentially embedded in FUNAE. The Quelimane based capacity building expert working 50% for RERD2 and 50% for the CB-MIREME project was based in the DPREME office in Quelimane. The March 2019 steering committee encouraged the project to benefit from the possibility provided by the Enabel headquarters to contract additional junior experts. A proposal for a second junior expert<sup>31</sup> was drafted and accepted at HQ. The junior was expected to arrive in January 2021 but his entry visa was still not granted at the time of drafting this report. The approved extra component on solar powered irrigation systems will add one international and two national technical assistants. They will work with the National Irrigation Institute (INIR) to the project and provincial stakeholders in Manica and Zambezia.

Lastly in this chapter we mention the funding of a few internal FUNAE senior staff retreats to discuss FUNAE's new organizational set up.

## **2.6 Performance output 4: pro memoria, technical budget line for IVA (VAT)**

This additional technical budget line was created to keep track of VAT movements in the former Enabel accounting system.

An addendum to the specific agreement (SA) was proposed to the Mozambican Government to take account of the Ministry of Economy and Finance. Indeed, this Ministry has been in charge of VAT refund issues for several years and it is therefore essential that it has official knowledge of the project. Addendum 1 to the SA should be validated by the two parties through an exchange of letters in the first quarter of 2021.

## **2.7 Performance output 5: The new legal framework is influenced by FUNAE**

An important observation made by the participants of the baseline workshop was that without a solid, favorable legal framework the project would have difficulties attaining its objectives and guaranteeing sustainable impact, especially with regards to Public Private Partnerships and private sector involvement. Therefore, an additional results area was deemed necessary. It was formulated as “5. *New legal framework is influenced by FUNAE*”. This result area was approved by the steering committee of 5 December 2019. The assignment to prepare an additional project component (see box in section 2.1.2) provided an excellent opportunity to allocate additional resources for activities related to this output. The in the meantime approved RERD2+ addendum sets aside EUR 60,000 for this result Nr.5. In 2020 FUNAE did not yet make use of these additional resources, but ideas were developed for 2021.

The legal framework for private investments in the off-grid sector, to which the project aspires, has so far indeed remained unfavorable. FUNAE and Enabel are in contact with other donor initiatives that also seek to circumvent these difficulties. The RERD2

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<sup>30</sup> Intervention manager (100%), energy engineer (100%) and a Junior Expert digital data management (50%)

<sup>31</sup> for digital surveying and promotion of productive use via introduction of new technologies in collaboration with the private sector

intervention manager is member of the investment committee of an FCDO funded project (BRILHO) that includes a ‘Market Development Fund’ for private sector initiatives developing off-grid energy products. The BRILHO project is managed by SNV, the Netherlands Development Organization. It is noted in this context that, compared to FCDO, Enabel has few, if any, instruments for financial support/subsidization of the private sector. This lack of instruments significantly reduces the scope for project assistance to private actors willing to take risks in investing in mini-grids. It’s also worth noting in this context that simulations indicate that, with the present tariffs in Mozambique, the private sector can invest no more than 30% of the Capex to have an IRR >12% in 20 years. Another safety providing condition would be that the public sector assures investments in the not-detachable assets (distribution lines). To date the project has remained open to this option but with a tender for mini-grids about to be published there it is now unlikely that - significant - funds will remain for such alternatives.

The above issues were also object of a webinar organized by the Mozambican Association of Renewable Energy (AMER) with the title “*Private sector perspectives on renewable energy in Mozambique. Edition: mini grids*”, to which the RERD2 intervention manager was invited as member of the panel. The proceedings of the webinar were published on YouTube<sup>32</sup>. The webinar extensively discussed the problematic areas of the Mozambican legal framework and the - potential - role of the private sector.

## **2.8 Performance output 6: Sustainable solar powered irrigation systems are taken up by selected farmers in 2 provinces**

This is a recently added result in the mentioned new project component, as explained in section 2.1.2. Progress in this area will be reported in future results reports.

## **2.9 Performance 7: The technical and financial capacities of farmers, institutional partners and market actors for a sustainable use of solar powered irrigation systems are enhanced**

This is a recently added result in the new project component, as explained in section 2.1.2. Progress in this area will be reported in future results reports.

## **2.10 Performance 8: Initiatives to foster an enabling environment for private and public investments in the irrigation sector are supported**

This is a recently added result in the new project component, as explained in section 2.1.2. Progress in this area will be reported in future results reports.

## **2.11 Transversal Themes**

### **2.11.1 Gender**

Subsequent to the study of international literature focusing on identification of differential gender impacts of electricity access reported in 2019, the project worked with

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<sup>32</sup> <https://www.youtube.com/watch?v=Ggu4DWBELyg&t=4003s>

the FUNAE gender group<sup>33</sup>, that had presented a rather general sketchy plan of FUNAE based gender related activities. In work with this group the project makes a distinction between;

- 1) FUNAE's own actions that are not necessarily connected to the RERD2 project, and
- 2) gender actions that fit "firmly" within logic and plan of the project e.g., those implemented in communities where RERD2 will fund the building of mini-grids.

Themes in the plan, commented and discussed included:

- community sensitization on energy - not just electricity - and gender issues. This theme is highly relevant to the RERD2 project.
- ensuring that FUNAE project beneficiary surveys explicitly disaggregate by gender.
- FUNAE technicians general training on gender equality.
- promotion of gender mainstreaming in all ToRs of studies and trainings in order to keep a perspective on the needs and interests of different target groups, and
- exchange of experiences with other institutions on gender issues.



Family that owns a mill in which the energy source can be converted from diesel to renewable energy

A planned support mission by a gender specialist from Brussels to further assist RERD2 (and CB-MIREME) on "how -to- continue working on gender issues" had to be postponed due to travel restrictions imposed by COVID19.

### 2.11.2 Environment

Environmental impact studies are mandatory by law.

Regarding the hydropower component of the project, it was reported in the previous annual report that the terms of reference of the feasibility study on the Nintulo hydropower plant included collecting and systematizing the necessary information for the preparation of the hydropower project's environmental impact study<sup>34</sup> and conducting a preliminary environmental impact assessment. The final report listed the positive and negative environmental impacts and mitigation measures of the project.

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<sup>33</sup> a group of female technicians

<sup>34</sup> In accordance with Decree 45/2004 of 29 September.

Similar to the hydro feasibility study, the 5 solar mini-grid feasibility studies included a preliminary environmental (& social) impact assessment to assess risks arising during plant construction and operations. According to the World Bank and FUNAE guidelines, solar mini-grids fall under category “B”, meaning only local impacts are expected, with minor negative effects on the surrounding areas and easy to prevent. Indeed, according to the Decree 45/2004, regulating the Environmental Impact Assessment procedures in Mozambique, all solar/hybrid mini-grids projects fall under category “B”, requiring only a Simplified Impact Assessment outlining main project features, to be submitted to the DPCA (*Direcção Provincial para a Coordenação da Acção Ambiental*) for authorization. Whereas all the technical features to be highlighted (according to article N° 13 of the Decree 45/2004) are dealt with in the technical chapters of the feasibility reports the section on preliminary environmental impact assessment highlights the mitigation measures for the environmental (and social) aspects. The documents also include a section on environmental monitoring during the preconstruction period and construction.

### 2.11.3 Digitalization

Work related to digitalization is mainly described in chapter 2.4.3. of this report so there is no need to repeat it here.

Worth underlining though is that from March 2019 to the end of February 2021, the project benefitted from the services of a Junior Expert in digital data management. His mission was coming to an end at the time of drafting this report. His skills have been highly relevant for the project notably in 'Strengthening of information systems', 'Implementation of remote monitoring systems', 'Implementation of [mobile] payment systems' and 'capacity building' in these areas. The Junior Expert not only contributed to innovative digital data collection in the field, but was also a driving force in improving the functioning of FUNAE's GIS unit and the implementation of measures to pave the way for a future link between the current stand-alone databases in the organisation such as those of the GIS - and the Operations and Maintenance Unit.

His last document '*Metodologia para a identificação de locais adaptados para a construção de mini-redes*'<sup>35</sup> is worth mentioning again in this context because it laid the foundation for FUNAE's capacities in what is undoubtedly one of the most important future tasks of FUNAE's new “Studies and Mobilization Division” i.e. the identification of locations for off-grid electrification projects.

Both the project Energy Engineer and the Junior Expert continue to be active and appreciated members of Enabel's 'Digital Believers' group. The objective of this group is to be a community of practice of colleagues interested in digitalization / digital for development and to co-create the operational approach of Enabel in Digital Development.

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<sup>35</sup> Methodology for the identification of suitable sites for the construction of mini-grids

## 2.12 Risk management

Risk Identification			Risk analysis			Risk Treatment			Follow-up of risk	
Description of Risk	Period of identification	Risk category	Probability	Potential Impact	Total	Action(s)	Resp.	Deadline	Progress	Status
Instability due to presidential elections in 2019 leads to insecurity in the provinces, which would hamper the implementation of activities and project quality	TFF	OPS	Medium	Medium	Medium Risk	The geographical concentration will be adapted to the security situation. The focus will be on two provinces.	FUNAE	Nov19	Four provinces were initially chosen: Zambezia, Niassa, Nampula and Manica. The Steering committee of May 2018 assigned Zambezia as the project only target province.	closed
						Close monitoring of events in provinces in the run-up to the elections	RR, PMT	Throughout the project period	-	Closed
Difficult access to sites due to natural occurrences (heavy rains) which block roads	TFF	OPS	Medium	Medium	Medium Risk	In the planning of activities, consider the period from December – February as months not suitable for works/rehabilitations but for other activities (procurement/acquisition of goods, trainings, etc.)	PMT	Throughout the project period	Late arrival of annual rains have enabled 3 important field missions in Zambezia end 2018. The 2019 missions of the project team as well as external consultants have been undertaken according to plan thus avoiding the rainy period. Despite the COVID-19 outbreak the hybrid mini-grids feasibility study (award of 26 June 2020) in Zambezia and Nampula started with only small delay because RLI / Engreen hired a qualified Mozambique based consultant for the field work. The assignment completed with deadline.	In progress
Slow pace of intervention due to	TFF	OPS	Medium	Medium	Medium Risk	Optimized implementation modalities based on	Enabel / FUNAE	Throughout the	The steering committee of December 2019 adopted a RERD2 proposal to transfer	In progress

procurement procedures						lessons learned from RERD1		project period	funds to a co-management budget line to a regie line to speed up (hydro and solar) feasibility studies	
Idem as above	Idem	Idem	Idem	Idem	Idem	Projects will build on existing studies developed by RERD1	Enabel /FUNAE	Through-out project period	(done but because of choices made by FUNAE the number of locations so far was limited to only one location studied by RERD1.	In progress
Idem as above	Idem	Idem	Idem	Idem	Idem	All travel, study tours and surveys in Enabel management mode.	Enabel	Through-out project period	Done so far and will continue.	In progress
Idem as above	Idem	Idem	Idem	Idem	Idem	Vehicles purchased on RERD1 must be made available to the project staff when needed	Enabel	Through-out project period	Available / in progress	In progress
Idem as above	Idem	Idem	Idem	Idem	Idem	Within the IMU: Procurement expert for the program	Enabel	Through-out project period	Available / in progress	In progress
Idem as above	idem	idem	idem	idem	idem	Within the IMU: Support from international RAFi	Enabel	Through-out project period	Available / in progress	In progress
Resistance to change in FUNAE	TFF	OPS	Medium	Medium	Medium Risk	Full-time long term technical assistance with adequate profile regarding capacity reinforcement and change management (see budget line A03 05)	Enabel	Through-out project period	Project recruited 2 ITAs in October 2018 in addition to the one already based in Zambezia province since July 2018. Contract of the Quelimane (province) based capacity building expert, ended on 30 May 2020, was not renewed.	In progress (the baseline workshop suggested to delete this statement on resistance from this risk management table
Idem as above	idem	idem	idem	idem	Budget for activities and support devoted to sustain change processes (see Z03 04 Missions cost)	Enable	Through-out project period	Available		
Idem as above	idem	idem	idem	idem	idem	Involve FUNAE staff on change processes and build on the high degree of openness showed by	Enabel	Through-out project period	In progress	

						the management of FUNAE.				
Low private sector interest for operating mini-grids	TFF	DEV	High	High	Very High Risk	The intervention works on several axes, including with other actors than the private sector.	Enabel / FUNAE	Through-out project period	Being undertaken.	In progress
Idem as above	idem	idem	idem	idem	idem	Create enabling conditions for private sector interest in mini-grids, including receptiveness of FUNAE (activity R1.A2 , R3.A4)	Enabel / FUNAE	Through-out project period	A fourth result with a budget line of Eur 60.000 was included in the project log-frame facilitating FUNAE's influence on the legal reform.	In progress
Idem as above	idem	idem	idem	idem	idem	Start with outsourcing only operation and maintenance (O&M)	Enabel /FUNAE	Through-out project period	To date there is no outsourcing of O&M -	In progress
Idem as above	idem	idem	idem	idem	idem	Make a thorough economic feasibility study and attract private sector with interesting business models	Enabel / FUNAE	Through-out project period	All feasibility studies undertaken so far (for hydro and solar based mini-grids) contain advice on business models.	In progress
Idem as above	idem	idem	idem	idem	idem	Involve private sector from the start and build a sustainable model for public-private partnership for the operation of grids.	Enabel / FUNAE	Through-out project period	Pending approval, a new legal framework (notably adoption of the new electricity law) and in order to -already attract the private sector the project collaborates with other donor initiatives aimed at the preparation and ministerial approval of special exemptions for the private sector in close cooperation with the Ministry of Energy.	In progress
Idem as above	idem	idem	idem	idem	<u>idem</u>	Envisage other management modes than the private sector	Enabel / FUNAE	Through-out project period	More traditional management models are likely to be applied in the RERD2-funded mini-grids, as Enabel does not have instruments such as catalytic grants or results-based financing (RBF).	In progress

Idem as above	idem	idem	idem	idem	idem	Small mini-grids can be clustered for operation & maintenance to form an attractive package	Enabel / FUNAE	Through-out project period	Clustering of mini-grids has effectively been proposed to FUNAE (to date one inland / agriculture area cluster and one coastal / fishing area cluster).	In progress
Idem as above	idem	idem	idem	idem	idem	Make a careful selection of sites and target large sites with economic potential	Enabel / FUNAE	Through-out project period	Sites have been rigorously screened in 2019 resulting in selection of 25% of the FUNAE proposed Zambezia project pipeline. Exhaustion of the Zambezia project pipeline and requests from the partner (FUNAE) have led to inclusion of 2 sites in the neighboring Nampula province in a feasibility study completed in November 2020. A new GIS/satellite imagery assisted methodology and a concrete identification of 27 areas for further study were proposed in September 2020. FUNAE is works on follow-up.	In progress
Idem as above	idem	idem	idem	idem	idem	Better estimation and budgeting of OM costs   Feasibility studies	Enabel / FUNAE	Through-out project period	Estimation of OM costs are included in all ToR for mini-grid feasibility studies.	In progress
Idem as above	idem	idem	idem	idem	idem	Continue implementation of preventive maintenance (reducing OM Costs)	Enabel / FUNAE	Through-out project period	This action is handicapped by limited operational budget of FUNAE imposing travel restrictions of OM staff	In progress
Financial sustainability of the systems is problematic	TFF	DEV	High	High	Very High Risk	Make a strong users awareness campaign on correct use of systems (PV) to lower OM costs (reducing OM Costs)	Enabel / FUNAE	Through-out project period	A Junior expert proposal to work - among others - on this aspect - has been positively received in HQ Brussels. A new junior (the 2nd) was selected early July 2020 and was expected to start in January 2020. A the time of drafting this report he was still	In progress



									waiting for entry via to Mozambique.		
Idem as above	idem	idem	idem	idem	idem	idem	Inform the authorities on real OM costs of mini grids and advocate for government subsidies (increasing OM resources)	Enabel / FUNAE	Through-out project period	Indicative (high) OM cost have been demonstrated through some field missions to selected mini-grids in the provinces of Manica and Niassa. Reports were distributed among division heads in FUNAE.	In progress
Idem as above	idem	idem	idem	idem	idem	idem	Propose a well-studied adapted tariff structure (increasing OM resources)	Enabel / FUNAE	Through-out project period	This subject is included in the ToR of all mini-grid feasibility studies.	In progress
Idem as above	idem	idem	idem	idem	idem	idem	Increase revenue collection by generalizing use of pre-payment systems (R2 A3) (increasing OM resources)	Enabel / FUNAE	Through-out project period	Different prepayment systems are being studied by the project in collaboration with FUNAE's operations and maintenance unit.	In progress
Idem as above	idem	idem	idem	idem	idem	idem	Involve local authorities at the planning stage and define their role in the project to increase willingness to pay (increasing OM resources)	Enabel / FUNAE	Through-out project period	Local authorities of 5 communities were consulted in August / Sept 2020 in the context of feasibility studies. Involvement of authorities in Nintulo (fydro site) were reported in the 2019 annual report.	In progress
Idem as above	idem	idem	idem	idem	idem	idem	Design the project in a rural development perspective that promotes economic uses of energy to increase ability to pay (thus increasing OM resources)	Enabel / FUNAE	Through-out project period	Economic use is at the core of all discussions on site selection and decision and the reason why 80% of the pipeline sites were rejected	In progress
Lack of policy and regulation for mini-grids hampers private sector interest. No operational	TFF	DEV	Medium	Medium	Medium Risk		Planned establishment of ARENE as independent regulator	ARENE	Through-out project period	ARENE's CEO was (finally) nominated in November 2019.	In progress

independent regulator.										
Idem as above	idem	idem	idem	idem	idem	Support from CBMIREME to ARENE on regulatory functions	Enabel	Through-out project period	Conducted HR consultancy for ARENE and reinforced staffing of ARENE to work on regulatory issues.	In progress
Idem as above	idem	idem	idem	idem	idem	Undertake seminars targeted at the private sector on regulatory issues	Enabel / FUNAE / ARENE	throughout project period	This is an activity that is being undertaken by different donor funded projects. The IM of RERD2 acted as member of a private sector seminar panel in 2020. Another seminar with the IM as panel member id foreseen for March 2021.	In progress
High numbers of non-functioning RERD1 installations	TFF	REP	High	High	Very High Risk	Capacity building, monitoring systems and reinforcement of FUNAE Delegations (R2; R3)	Enabel / FUNAE	Through-out project period	A project report on a Sept. 2019 sample survey of 377 RERD1 systems indicates 61.7% as functional - against 50% as indicated in the project document, 22.6% out of service and 15.7% as problematic. Approximately 70 % of the breakdowns are due to problems with the batteries (38%) and/or the inverter (32%). In the meantime, FUNAE is phasing out maintenance of small systems after transfer of systems to sectoral ministries (education and health)	In progress
Technical failure or low quality of mini-grid construction	TFF	REP	Medium	High	High Risk	Strong ITA; review of feasibility studies (R1 A1)	Enabel	Through-out project period.	The feasibility study on 5 solar mini-grids was carried out by a reputable company with a wealth of international experience. The EPC tender will also have to result in the selection of (a) renowned Engineering, Procurement and Construction company (companies).	In progress

Import taxes exemption not granted	TFF	FIN	High	Low	Medium Risk	Request (import and VAT) tax exemption for the importation of quality PV systems	Enabel	Through-out project period	VAT and tax exemption is on the agenda of every steering committee and an exchange of letters (with a solution) has been initiated between Mozambique and Belgium. (see also further below)	In progress
Idem as above	idem	idem	idem	idem	idem	Cooperation with other donors to put reduction of fiscal barriers as a priority	Enabel	throughout project period	Actions are coordinated within the Energy Sector Wide Group (ESWG) of donors.	In progress
Idem as above	idem	idem	idem	idem	idem	Use locally produced TUV certified PV panels	Enabel / FUNAE	Through-out project period	-	In progress
Idem as above	idem	idem	idem	idem	idem	Publish tenders in English; publish internationally	Enabel / FUNAE	Through-out project period	First tender for 'Engineering, Construction and Design' (EPC) published in July 2020 in Portuguese and English and nationally and internationally. The same will apply for the second / major tender to be launched shortly.	In progress
Low value for money of bids for construction contracts	TFF	FIN	High	High	Very High Risk	Make feasibility studies of high quality (R1.A1)	Enabel	Through-out project period	The project's first feasibility study on a hydro installation in Nintulo, Zambezia province is of high quality while representing very good value for money. The first PV hybrid feasibility study tender resulted in 18 offers of which 8 passed the selection stage resulting in the evaluation of 8 quality offers of which the best (value for money) proposal was selected. The resulting study of 5 sites was of high quality.	In progress
Idem as above	idem	idem	idem	idem	idem	Tender in euros	Enabel	Through-out project period	Tender documents state that all prices must be given in EUR (euros) or MZN (Mozambican	In progress

Idem as above	idem	idem	idem	idem	idem	Split tenders for power plant and for distribution network	Enabel / FUNAE	Through-out project period	Meticais) while 'similar services' are to be given in EUR equivalent(s). Splitting tenders for power plant and for distribution network makes sense in the case of hydro plants but not in the case of solar/hybrid mini-grids under 400-500 kW. Splitting the tenders increases costs and management problems (delays) because the project would need to coordinate 2 companies on the field, manage 2 contracts, etc. Since the project will only invest in hybrid solar mini-grids and not anymore in hydro plants splitting tenders has become irrelevant	In progress
Establishment of capital controls on foreign currency accounts in Mozambique	TFF	FIN	Low	High	Medium Risk	Derogation to have a DB EURO account in co-management	Enabel	Through-out project period	See status	Closed
Forced conversion of foreign currency accounts into local currency	TFF	FIN	Low	High	Medium Risk	Derogation to have a DB EURO account in co-management	Enabel	Through-out project period	See status	Closed
Devaluation of the local currency	TFF	FIN	Medium	High	High Risk	Derogation to have a DB EURO account in co-management	Enabel	Through-out project period		In progress
Delayed refund of VAT	TFF	FIN	High	High	Very High Risk	Continue with the existing set up for VAT compensation as in RERD1	Enabel / FUNAE	Through-out project period	Is on the agenda of each Steering Committee to date. Awaiting conclusive action from government.	In progress

Idem as above	idem	idem	idem	idem	Idem	After the first two years of project execution, make an assessment of VAT refund.	Enabel	Through-out project period		In progress
Idem as above	idem	idem	idem	idem	idem	Exchange of letters ongoing with the support of the diplomatic office so that the MEF is involved as a signatory to the Specific Convention (not the case only MAE which gave the mandate to the technical Ministry to sign the Specific agreement. The MEF is responsible for the reimbursement of VAT since 2015.	Enabel	Through-out project period	Exchange of Letters ongoing, MAE BE gave the mandate to the ambassador in SAF to sign and then to ask the Mozambican part (MAE and MEF) to endorse it. Renewed correspondence ongoing.	In progress
Poor public contract and action plan execution performance owing to the COVID Pandemic	Q1 2020	OPS	High	Medium	High Risk	Extend deadline of submission of tender offers.	Enabel	Through-out project period	Deadline of submission of offers on the "Feasibility study for hybrid mini-grids in Zambézia and Nampula, Mozambique" was extended.	In progress
Idem as above	idem	idem	idem	idem	idem	Extension of the period the tender is open.	Enabel	Through-out project period	Tender period was extended with two weeks because of the COVID19 outbreak.	In progress
Idem as above	idem	idem	idem	idem	idem	Foresee addenda of the contract if COVID19 (travel) restrictions hamper implementation of the feasibility study.	Enabel	Through-out project period	Addenda was not necessary. Study was completed within deadline.	In progress
Idem as above	idem	idem	idem	idem	idem	Postpone (training) activities	Enabel	Through-out project period	6th ARE, Energy Access Investment Forum (18-19 March) postponed	In progress
10002/10003 Late award of contract for the EPC (co-management)	Q2 2020	OPS	Medium	Medium	Medium Risk	Contact FUNAE CEO as soon as advice is obtained from the Deloitte auditors.	CEO FUNAE	Q2/3 2020	Deloitte has been approached to provide advice on legality of FUNAE selection and exclusion criteria. Deloitte's advice was extremely useful	Closed

of the mini-grids of Alto Benfica and Mungalama due to a slow negotiation process with FUNAE on selection and exclusion criteria.									and project 'won' on all fronts in negotiations with the partner on potentially) problematic issues in tender text. In the meantime, the SC of 7 Dec 2020 decided to implement all EPCs under regie. This risk is closed and not anymore classified as PRIORITY.	
10002/10003 Late start of contract execution of the EPC (co-management) of the minigrids of Alto Benfica and Mungalama due to delays in the advice from the public prosecutor office and/or the administrative court's position.	Q1	OPS	Medium	Medium	Medium Risk	If after 54 days the administrative court has not answered FUNAE concerning the submitted contract the RERD2 intervention manager will ask the FUNAE project co-Director and UGEA/FUNAE to send a letter to the administrative court stating that the legal period of 54 days has passed and that FUNAE will proceed with the execution of the contract.	FUNAE Change Manager	Q2/3 2020	In the meantime, the SC of 7 Dec 2020 decided to implement all EPCs under regie	Closed
Limited access to the field and/or limited availability of national and international expertise due to Covid19 restriction	Q1	OPS	Medium	Medium	Medium Risk	<ul style="list-style-type: none"> <li>• Boost use of digital communication means</li> <li>• Pay special attention to Terms of reference for assignments</li> <li>• Foresee additional NTA at provincial levels additionally to ITA</li> </ul>	Enabel	Through-out project period		In progress

## 3 Steering and Learning

### 3.1 Strategic re-orientations

The partner's initial strategy prioritizing the development of one particular hydro based mini-grid in Nintulo and the outcome of the feasibility study in this location (referred to in Chapter 2.3.3) led on the one hand to the identification of a highly attractive hydro project but at the same time excluded the realization of this or any other hydro mini-grid within the timeframe of the project. Work on hydro energy continues at the request of the steering committee but only as preparation of the dossier for the construction of a grid connected hydro power plant of approximately 11 Megawatt. The provisional timetable for implementation indicates that this plant could be completed by 2027.

Regarding solar mini-grids, the project was initially guided by FUNAE's renewable energy atlas and the organization's project pipeline. This pipeline indicated the sites to be further explored through pre-feasibility and feasibility studies. More than twenty locations were investigated on site. On the basis of the criteria listed in the TFF the project selected the most interesting locations for further investigation. Some locations were removed from the list, sometimes at quite an advanced stage (after approval of the steering committee), because it became clear at some point that EDM was going to electrify the sites. This was the case for Naburi and Alto Benfica. Others were dropped because after the feasibility study it was clear that the location no longer met the selection criteria. This was the case for Namanla. The process led to the project exhausting all potential locations in Zambezia, reason why the project opened up for another province<sup>36</sup>. This extra province became Nampula. Indeed, now after finalization of elaborate technical and financial feasibility studies the project foresees construction of mini-grids in two clustered inland locations in the North of Nampula, two clustered coastal locations in Zambezia, and depending on negotiations and final prices(s) and (hopefully) VAT reimbursement a fifth location inland in Zambezia.

The difficulties experienced by companies in bidding for public contracts under the co-management regime, i.e., application of the Mozambican law, led the project to propose a radical change of modality and consequent budget revision. The proposal was approved by the Steering Committee in December 2020 and officially confirmed with the signature of all committee members on the minutes of the SC meeting in February 2021.

The transfer of small solar energy systems, 698 of which were financed by RERD1, to sector ministries (notably of education and health) means that FUNAE can no longer claim income from these systems and refrains from maintaining them. This has led to a reorientation of project work with the operations and maintenance unit and the GIS unit. The O&M unit is now more oriented towards micro- and mini-grids and the GIS unit idem dito, while the latter will now also focus more on off-grid energy planning.

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<sup>36</sup> It is worth recalling that the project document (TFF) proposes to focus geographically on a maximum of two provinces, to be chosen from Zambezia, Nampula, Niassa and Manica. The first steering committee of May 2018 however had chosen only one province, namely Zambezia.

No doubt, the recent change in FUNAE's organizational chart will also have implications for the future.

Last but not least, the addition of an extra component (SPIS), extra partners (MADER and INIR), more staff and a doubling of the budget will also have its effects on the functioning of the project going forward.

### 3.2 Recommendations

Recommendations	Actor	Deadline
Include Nampula and Manica as beneficiary provinces of the RERD2 project <sup>37</sup>	JCLB	Q1 2021
Continue with preparations for the construction of solar-hybrid mini-grids in the Administrative Posts of Muite and Milhana in the province of Nampula and in the Island of Idugo, Alto Maganha and Mugulama in Zambezia province	JCLB / PM RERD2	2021
For the coming years y+1 (2021, 2022...) include in the FUNAE budget the equivalent total VAT amount for the construction of mini-grids and the purchase of associated equipment (meters, prepaid system, remote monitoring system);	FUNAE	2021, 2022, 2023, 2024
Approval of budget transfers from the following Co-management lines: A0103 (Mini-Grid Development) of EUR 6,000,000.00 (actually EUR 5,999,950.00), line A0203 (Implementation of Remote Monitoring Systems) EUR 360,000.00 and line A0204 (Implementation Of Payment Systems) of EUR 500,000.00 to Regie in order to accelerate the construction of mini-grids and the acquisition of associated equipment.	JCLB	Q1 2021
The agreement between the Ministry of Foreign Affairs (MINEC) and MIREME on VAT to be sent to the Diplomatic Bureau of Belgium so that the Ministry of Finance acknowledges VAT refunds, under its responsibility since 2015.	FUNAE / MIREME	Q1 2021
Formal invitation of a representative of the Ministry of Agriculture and Rural Development (MADER) to the RERD2(+) steering committee after having shared the RERD2+ document with all institutions involved and after having obtained all necessary Mozambican and Belgian approvals. (MADER) in the Steering Committee RERD2 (+).	MIREME	Q1 2021
Start-up RERD2+ component including recruitment of international and national staff, purchase vehicles, organize for MoU between INIR and FUNAE, ...	PM/RERD2	Q1 & Q2 2021
Launch a tender for the building of 4 to 5 mini-grids	PM/RERD2	Q1 2021
Launch tender for the supervision of the building of 4 to 5 mini-grids	PM/RERD2	Q1 2021
Sign contract(s) for the building of 4 to 5 mini-grids	PM/RERD2	Q3 2021
Sign contract(s) for the building of 4 to 5 mini-grids	PM/RERD2	Q3 2021
Undertake a project Mid-Term Review	PM/RERD2	Q3 2021

<sup>37</sup> It was agreed that in response to FUNAE's request the project would explore possibilities of limited SPIS actions in the locations of the two mini-grids in Nampula (Muite and Milhana).



### 3.3 Lessons Learned

The project cannot pretend, at this stage, to have generated many significant lessons learned. Hereunder we list four for the time being.

- The development of a rural off-grid electrification project requires continuous contact with the national on-grid utility, especially before launching a tender for mini-grids.
- The co-management modality in Mozambique discourages international companies from bidding on public tenders for relatively important infrastructural works as all documentation must be submitted in Portuguese, stamped by a sworn translator, while, in addition, some of the documentation to be submitted is of a distinctly Mozambican administrative nature and not necessarily in possession of the tenderer.
- Enabel lacks instruments that provides scope for project assistance to private actors willing to take risks in investing in mini-grids. If Enabel wants to work on innovative ways for private sector development in this, or another field, it must equip itself with tools such as catalytic grants and/or results-based financing.
- In line with the above it is important that Enabel develops capacity in supporting partners for blended finance for large infrastructural works financed through a combination of grants, loans and private capital.

# Annexes

## 3.4 Quality criteria

<b>1. RELEVANCE: The degree to which the intervention is in line with local and national policies and priorities as well as with the expectations of the beneficiaries</b>				
<i>In order to calculate the total score for this quality criterion, proceed as follows: 'At least one 'A', no 'C' or 'D' = A; Two times 'B' = B; At least one 'C', no 'D' = C; at least one 'D' = D</i>				
Assessment RELEVANCE: total score	A	B	C	D
	<b>X</b>			
<b>1.1 What is the present level of relevance of the intervention?</b>				
X	A	Clearly still embedded in national policies and Belgian strategy, responds to aid effectiveness commitments, highly relevant to needs of target group.		
	B	Still fits well in national policies and Belgian strategy (without always being explicit), reasonably compatible with aid effectiveness commitments, relevant to target group's needs.		
	C	Some issues regarding consistency with national policies and Belgian strategy, aid effectiveness or relevance.		
	D	Contradictions with national policies and Belgian strategy, aid efficiency commitments; relevance to needs is questionable. Major adaptations needed.		
<b>1.2 As presently designed, is the intervention logic still holding true?</b>				
	A	Clear and well-structured intervention logic; feasible and consistent vertical logic of objectives; adequate indicators; Risks and Assumptions clearly identified and managed; exit strategy in place (if applicable).		
X	B	Adequate intervention logic although it might need some improvements regarding hierarchy of objectives, indicators, Risk and Assumptions.		
	C	Problems with intervention logic may affect performance of intervention and capacity to monitor and evaluate progress; improvements necessary.		
	D	Intervention logic is faulty and requires major revision for the intervention to have a chance of success.		

<b>2. EFFICIENCY OF IMPLEMENTATION TO DATE: Degree to which the resources of the intervention (funds, expertise, time, etc.) have been converted into results in an economical way</b>				
<i>In order to calculate the total score for this quality criterion, proceed as follows: 'At least two 'A', no 'C' or 'D' = A; Two times 'B', no 'C' or 'D' = B; at least one 'C', no 'D' = C; at least one 'D' = D</i>				
Assessment EFFICIENCY : total score	A	B	C	D
		<b>X</b>		
<b>2.1 How well are inputs (financial, HR, goods &amp; equipment) managed?</b>				
X	A	All inputs are available on time and within budget.		
	B	Most inputs are available in reasonable time and do not require substantial budget adjustments. However, there is room for improvement.		
	C	Availability and usage of inputs face problems, which need to be addressed; otherwise results may be at risk.		
	D	Availability and management of inputs have serious deficiencies, which threaten the achievement of results. Substantial change is needed.		

<b>2.2 How well is the implementation of activities managed?</b>	
	<b>A</b> Activities implemented on schedule
X	<b>B</b> Most activities are on schedule. Delays exist, but do not harm the delivery of outputs
	<b>C</b> Activities are delayed. Corrections are necessary to deliver without too much delay.
	<b>D</b> Serious delay. Outputs will not be delivered unless major changes in planning.
<b>2.3 How well are outputs achieved?</b>	
	<b>A</b> All outputs have been and most likely will be delivered as scheduled with good quality contributing to outcomes as planned.
X	<b>B</b> Output delivery is and will most likely be according to plan, but there is room for improvement in terms of quality, coverage and timing.
	<b>C</b> Some output are/will be not delivered on time or with good quality. Adjustments are necessary.
	<b>D</b> Quality and delivery of outputs has and most likely will have serious deficiencies. Major adjustments are needed to ensure that at least the key outputs are delivered on time.

<b>3. EFFECTIVENESS TO DATE: Degree to which the outcome (Specific Objective) is achieved as planned at the end of year N</b>				
<i>In order to calculate the total score for this quality criterion, proceed as follows: 'At least one 'A', no 'C' or 'D' = A; Two times 'B' = B; At least one 'C', no 'D' = C; at least one 'D' = D</i>				
<b>Assessment EFFECTIVENESS: total score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		X		
<b>3.1 As presently implemented what is the likelihood of the outcome to be achieved?</b>				
	<b>A</b> Full achievement of the outcome is likely in terms of quality and coverage. Negative effects (if any) have been mitigated.			
X	<b>B</b> Outcome will be achieved with minor limitations; negative effects (if any) have not caused much harm.			
	<b>C</b> Outcome will be achieved only partially among others because of negative effects to which management was not able to fully adapt. Corrective measures have to be taken to improve ability to achieve outcome.			
	<b>D</b> The intervention will not achieve its outcome unless major, fundamental measures are taken.			
<b>3.2 Are activities and outputs adapted (when needed), in order to achieve the outcome?</b>				
	<b>A</b> The intervention is successful in adapting its strategies / activities and outputs to changing external conditions in order to achieve the outcome. Risks and assumptions are managed in a proactive manner.			
X	<b>B</b> The intervention is relatively successful in adapting its strategies to changing external conditions in order to achieve its outcome. Risks management is rather passive.			
	<b>C</b> The intervention has not entirely succeeded in adapting its strategies to changing external conditions in a timely or adequate manner. Risk management has been rather static. An important change in strategies is necessary in order to ensure the intervention can achieve its outcome.			
	<b>D</b> The intervention has failed to respond to changing external conditions, risks were insufficiently managed. Major changes are needed to attain the outcome.			

<b>4. POTENTIAL SUSTAINABILITY: The degree of likelihood to maintain and reproduce the benefits of an intervention in the long run (beyond the implementation period of the intervention).</b>				
<i>In order to calculate the total score for this quality criterion, proceed as follows: At least 3 'A's, no 'C' or 'D' = A ; Maximum two 'C's, no 'D' = B; At least three 'C's, no 'D' = C ; At least one 'D' = D</i>				
<b>Assessment POTENTIAL SUSTAINABILITY : total score</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
		<b>X</b>		
<b>4.1 Financial/economic viability?</b>				
	<b>A</b>	Financial/economic sustainability is potentially very good: costs for services and maintenance are covered or affordable; external factors will not change that.		
	<b>B</b>	Financial/economic sustainability is likely to be good, but problems might arise namely from changing external economic factors.		
X	<b>C</b>	Problems need to be addressed regarding financial sustainability either in terms of institutional or target groups costs or changing economic context.		
	<b>D</b>	Financial/economic sustainability is very questionable unless major changes are made.		
<b>4.2 What is the level of ownership of the intervention by target groups and will it continue after the end of external support?</b>				
	<b>A</b>	The steering committee and other relevant local structures are strongly involved in all stages of implementation and are committed to continue producing and using results.		
X	<b>B</b>	Implementation is based in a good part on the steering committee and other relevant local structures, which are also somewhat involved in decision-making. Likelihood of sustainability is good, but there is room for improvement.		
	<b>C</b>	The intervention uses mainly ad-hoc arrangements and the steering committee and other relevant local structures to ensure sustainability. Continued results are not guaranteed. Corrective measures are needed.		
	<b>D</b>	The intervention depends completely on ad-hoc structures with no prospect of sustainability. Fundamental changes are needed to enable sustainability.		
<b>4.3 What is the level of policy support provided and the degree of interaction between intervention and policy level?</b>				
	<b>A</b>	Policy and institutions have been highly supportive of intervention and will continue to be so.		
X	<b>B</b>	Policy and policy enforcing institutions have been generally supportive, or at least have not hindered the intervention, and are likely to continue to be so.		
	<b>C</b>	Intervention sustainability is limited due to lack of policy support. Corrective measures are needed.		
	<b>D</b>	Policies have been and likely will be in contradiction with the intervention. Fundamental changes needed to make intervention sustainable.		
<b>4.4 How well is the intervention contributing to institutional and management capacity?</b>				
	<b>A</b>	Intervention is embedded in institutional structures and has contributed to improve the institutional and management capacity (even if this is not an explicit goal).		
X	<b>B</b>	Intervention management is well embedded in institutional structures and has somewhat contributed to capacity building. Additional expertise might be required. Improvements in order to guarantee sustainability are possible.		
	<b>C</b>	Intervention relies too much on ad-hoc structures instead of institutions; capacity building has not been sufficient to fully ensure sustainability. Corrective measures are needed.		
	<b>D</b>	Intervention is relying on ad hoc and capacity transfer to existing institutions, which could guarantee sustainability, is unlikely unless fundamental changes are undertaken.		

### 3.5 Decisions taken by the steering committee and follow-up

Decision					Action			Follow-up	
Decision	Period of identification	Timing	Source	Actor	Action(s)	Resp.	Deadline	Progress	Status
Composition and management of Joint Steering Committee	Q2 2018	Immediate	JLCB		Directors of <i>Direcção de Planificação e Cooperação</i> and of <i>Direcção Nacional de Energias Novas e Renováveis</i> will be invited members of the Steering Committee on a permanent basis	JLCB	Next steering committee	Noted	ONGOING
					Joint Steering Committees of CB MIREME and RERD2 will be held jointly; additional Steering Committees may be held for each project individually if need be	JLCB	Next steering committee	Noted	ONGOING
TFF's reference to CNELEC applies to ARENE	Q2 2018	Immediate	JLCB		-	-	-	Noted	CLOSED
CB MIREME and FUNAE to provide more detailed activity planning until end of 2018	Q2 2018	Immediate	JLCB		After planning sessions formulate more detailed planning	PM	-	FUNAE provided a plan for 2018 which was integrated in the 2019 operational plan.	CLOSED
RERD2 result report 2018 and operational plan and budget 2019 are approved.	Q1 2019	Immediate	JLCB		N.A.	N.A.	N.A.	Noted	CLOSED

On the basis of a list of RERD2 pre-selected sites decide on those that merit further studies in view of project investment.	Q1 2019		JLBC		Proposed by the project in the JLCB of 4 December 2019	PM / JLBC	Dec. 2019	Sites to advance with EPCs and in-depth feasibility studies.	CLOSED
Approval of the following sites for building solar mini-grids: 1. Naburi, 2. Alto Maganha and 3. Namanla in Pebane district; 4. Mungulama in Ile district and 5. Alto Benfica in Mocuba	Q4 2019	Immediate	PM/JLBC		Organize complete technical and economic feasibility studies of selected / approved locations	OM	Q2-Q4	Full mini-grid feasibility studies of 5 locations completed by Q4 2020	CLOSED
Financial reinforcement of the direct management budget line R1A1 "Review and update of existing studies", to speed up the process of contracting solar feasibility studies.	Q4 2019	Immediate	PM/JLBC		Proposed by the project in the JLCB of 4 December 2019	PM	Q1 2020	JLCB approved. Budget line increased by the additional RERD2+ budget.	CLOSED
Include a 4th result in the project logical framework denominated "The new legal framework is influenced by FUNAE" with a budget line "R4A1 Carrying out specialized studies to strengthen the legal framework".	Q4 2019	Immediate	PM/JLBC		Proposed by the project in the JLCB of 4 December 2019	PM	Q1 2020	4 <sup>th</sup> result added to logical framework. Budget line funded from the extra RERD2+.	CLOSED
The 2020 Results Report is adopted	Q4 2020	Immediate	JLCB		Submit to Enabel	PM	Q1	Report submitted	CLOSED
Nampula and Manica are included as beneficiary provinces of the RERD2(+) project.	Q4 2020	Immediate	JLCB		Recruit ATI and national staff and start up project activities	PM	Q1/Q2	ATI identified and selected. INIR briefed and mobilized to prepare for ATI arrival	ONGOING

Continue with the construction of solar-hybrid mini-grids in the Administrative Posts of Muite and Milhana in the province of Nampula and in the Island of Idugo, Alto Maganha and Mugalama in Zambezia province	Q4 2020	Immediate	JLCB		Prepare EOI, EPC and supervision tenders for construction of 4 to 5 mini-grids	PM	Q1	Tender documents submitted to HQ Brussels in Jan 2021	ONGOING
For the coming years y+1 (2021, 2022...) the inclusion in the FUNAE budget of the equivalent total VAT amount for the construction of mini-grids and the purchase of associated equipment (meters, prepaid system, remote monitoring system)	Q4 2020	Immediate	JLCB		FUNAE	CEO	Q2-Q3 / 2021, 2022, 2023, 2023	Register mini-grid works at the Procuradoria da Republica and insert VAT values in yearly FUNAE budget	ONGOING
5. Approval of budget transfers from the following Co-management lines: A0103 (Mini-Grid Development) of EUR 6,000,000.00 (actually EUR 5,999,950.00), line A0203 (Implementation of Remote Monitoring Systems) EUR 360,000.00 and line A0204 (Implementation Of Payment Systems) of EUR 500,000.00 to Regie in order to accelerate the construction of mini-grids and the acquisition of associated equipment.	Q4 2020	Immediate	JLCB		Request approval budget revision at Enabel HQ in Brussels	RAFI / Enabel	Q1	Budget revision request submitted to Enabel HQ	ONGOING
The agreement between the Ministry of Foreign Affairs (MINEC) and MIREME on VAT to be sent to the Diplomatic Bureau of Belgium so that the Ministry	Q4 2020	ASAP	JLCB		Send agreement between the Ministry of Foreign Affairs (MINEC) and MIREME on VAT to Diplomatic Bureau of Belgium	MIREME	Q1	Pending	ONGOING

of Finance can acknowledge VAT refunds, under its responsibility since 2015.									
Formal invitation of a representative of the Ministry of Agriculture and Rural Development (MADER) to the RERD2(+) steering committee after having shared the RERD2+ document with all institutions involved and after having obtained all necessary Mozambican and Belgian approvals. (MADER) in the Steering Committee RERD2 (+).	Q4 2020	Timely before next JLCB meeting	JLCB		Send invitation	Permanent Secretary MIREME	Q1 and / or Q4	Pending	ONGOING



### 3.6 Updated Logical framework

General Objective	Indicators	Means of verification	Base values	Target	Assumptions
<i>Rural Economic and Social Development is promoted by increased sustainable access to energy</i>	Poverty indicators of target area	<ul style="list-style-type: none"> <li>Government statistics (INE - Instituto Nacional de Estatística)</li> <li>UNDP</li> </ul>	<ul style="list-style-type: none"> <li>Zambezia: 70.5%</li> <li>Nampula 54.7%</li> <li>Niassa 31.9%</li> <li>Manica 55.1%</li> <li>Nat. average 54.7%</li> <li>(UNDP 2019 Report on MDGs)</li> </ul>		Successful integration of the RERD2 intervention with other interventions promoting productive uses of energy
<i>Specific Objective</i>	Indicators	Means of verification			Assumptions
<i>Access to energy in rural areas is increased by investments in renewable energy and in support mechanisms to ensure sustainability</i>	Access to electricity in rural areas	<ul style="list-style-type: none"> <li>Existing multi-tier framework surveys (SE4All)</li> <li>Household surveys</li> </ul>	5,97% of rural populations (Global Tracking framework)	7,97% of rural population of one province	Target based on Zambezia population data

Result 1	Indicators	Means of verification	Base values	Target	Assumptions
Mini-grids provide reliable and adequate energy service	<ul style="list-style-type: none"> <li>Multi-tier framework (World Bank)</li> </ul>	<ul style="list-style-type: none"> <li>Household surveys</li> </ul>	5,97% of rural population (Global Tracking framework)	7,97% of rural population of one province	Suitable operator models can be found
<b>Activities for R1</b>	<b>Actors involved</b>	<b>Estimated Budget</b>			<b>assumptions</b>
R1.A1: Review and update of existing feasibility and baseline studies and site selection in view of productive uses of energy (socio economic surveys)	Consultancy, NGOs, FUNAE, business associations, businesses, other donors, local authorities	€200.000	13 existing studies on PV and hydro	1 to 3 studies revised and updated	<ul style="list-style-type: none"> <li>Quality consultants are found</li> <li>The existing FUNAE pipeline for mini-grids is relevant to the objective</li> <li>Existing studies are of good quality</li> </ul>
R1.A2 : Awareness and stakeholder consultations for each site including the private sector	NGOs, FUNAE, business associations, businesses, local authorities	€50.000	0 campaigns	1 a 3 awareness campaigns performed on future sites	NGOs and actors with sufficient knowledge of local conditions can be found
R1.A3: Mini-grid development with productive uses of energy	Private sector, FUNAE, consultants, NGOs, communities, local authorities	€ 6.120.000	3 large existing hydro mini grids (Sembezia, Murora, Majaua) and 3 large solar mini grids	1 to 3 additional large hydro mini-grids	<ul style="list-style-type: none"> <li>A financially sustainable management system for mini grid is agreed upon</li> <li>Enforcement of payment for services</li> <li>Sufficient ability to pay</li> </ul>
R1.A4 Result dissemination	FUNAE	€ 50.000	0 publications	Minimum one publication	

Result 2	Indicators	Means of verification	Base values	Target	Assumptions
Technical and financial sustainability of existing systems is improved	<ul style="list-style-type: none"> <li>Revenues from the systems</li> </ul>	<ul style="list-style-type: none"> <li>Baseline for systems and for payments</li> <li>Systems database</li> <li>FUNAE accounts</li> </ul>	Fee collection at 50%	Fee collection raised to 80%	<ul style="list-style-type: none"> <li>Continuity in management and continued openness to other stakeholders</li> <li>Users are willing and able to pay for the energy services</li> <li>FUNAE is open to a level of decentralization process giving more autonomy to the Delegations, including financial.</li> <li>Agreement can be found on tariffs and subsidies</li> </ul>
	<ul style="list-style-type: none"> <li>Percentage of systems working</li> </ul>	<ul style="list-style-type: none"> <li>Baseline for systems and for payments</li> <li>Systems database</li> </ul>	Working systems: 50%	80 % of working systems	
	<ul style="list-style-type: none"> <li>GIS implemented beyond a static database and used for planning and asset management purpose</li> </ul>	<ul style="list-style-type: none"> <li>GIS system</li> <li>Activity reports</li> </ul>	GIS currently not used = 0%	<ul style="list-style-type: none"> <li>GIS interconnected with other data bases and used for planning purposes 100%</li> </ul>	
	<ul style="list-style-type: none"> <li>The existing maintenance strategy for PV is implemented</li> </ul>	<ul style="list-style-type: none"> <li>Satisfaction surveys about FUNAE</li> <li>Operation and maintenance report</li> </ul>	PV maintenance strategy implemented at 25%	PV maintenance strategy implemented at 80%	
Activities for R2	Actors involved	Estimated Budget			assumptions
R2.A1 Planning, Operation and maintenance	FUNAE with focus on maintenance unit, and other relevant divisions (solar, mini-hydro)	€ 200.000	Maintenance unit half functional 50%	Maintenance unit strengthened 90%	Integration with other departments is simulated Qualified human resources are kept in FUNAE
R2. A2 Strengthening of Information systems	FUNAE maintenance unit and delegations	€ 200.000	Data base and GIS not connected Information not shared between departments 0%	GIS and data base connected and used for asset management, site identification and planning 100%	Integration with other departments is simulated Qualified human resources are kept in FUNAE

R2 A3 Implementation of monitoring remote monitoring systems	FUNAE delegations in the provinces and relevant divisions	€ 360.000	8 systems installed; 3 different technologies	One technology chosen. Number of systems installed according to budget	Monitoring systems are adequate for the targeted systems.
R2 A4 Implementation of payment systems (metering, fee collection, pre-payment)	FUNAE maintenance unit and Delegations in the provinces	€500.000	1000 Meters and pre-payment systems purchased but not operational yet 0 % of systems operational 1000	Pre- payment (for domestic users) and meters systematic on the mini-grids financed by RERD2 100% of mini-grids equipped with pre-payment systems	Users are willing and able to pay for services

Result 3	Indicators	Means of verification	Base values	Target	Assumptions
The capacity of FUNAE in planning and project management is improved	<ul style="list-style-type: none"> <li>Capacity building plan</li> <li>Quality of tender documents</li> <li>Quality of socio-economic survey methodology</li> <li>Quality of working procedures</li> </ul>	<ul style="list-style-type: none"> <li>Surveys</li> <li>Activity reports</li> <li>Coordination reports</li> </ul>	No plan for capacity building No standard method for socio-economic surveys Incomplete procedures	Agreed plan for capacity building Standard template for surveys Working procedures are operational	<ul style="list-style-type: none"> <li>Continuity in management</li> <li>Cooperation between divisions</li> <li>FUNAE retains qualified human resources</li> </ul>
Activities for R3	Actors involved	Estimated budget			Assumptions
R3.A1 Project management is improved at HQ level	<ul style="list-style-type: none"> <li>FUNAE relevant divisions in HQ</li> </ul>	€ 100.000	Processes and working procedures not updated	Clear processes and tools for project management	<ul style="list-style-type: none"> <li>Integration with other departments is simulated</li> <li>Qualified human resources are kept in FUNAE</li> </ul>
R3.A2. Capacity building of Delegations in sector planning and coordination	FUNAE maintenance unit and delegations	€ 200.000	Planning process with DIPREME unclear	Clear working processes and structure; Technicians better trained	<ul style="list-style-type: none"> <li>Qualified human resources are kept in FUNAE</li> <li>More autonomy for FUNAE Delegation</li> </ul>
R3 A3 Technical assistance	Enabel	€2.250.000			<ul style="list-style-type: none"> <li>Experts with adequate profiles are found</li> </ul>
R3 A4 Surveys, field trips workshops and seminars, study tours	FUNAE and Enabel staff	€200.000			

### 3.7 MoRe Results at a glance

Logical framework's results or indicators modified in last 12 months?	<ul style="list-style-type: none"> <li>- The December 2019 steering committee agreed with a change in the Logical Framework (i.e. addition of a fourth result) while.</li> <li>- the December 2020 agreed with an extra component on Solar Powered Irrigation studies.</li> <li>- For the RERD2 results a new monitoring matrix with partly new indicators was submitted to the partner and is awaiting agreement.</li> <li>- The RERD2+ SPIS component will have to review its additional TFF logical framework and set of indicators.</li> </ul>
Baseline Report registered on PIT?	No (see above)
Planning MTR (registration of report)	MTR currently planned for September 2021 (registration of report in Q4 2021)
Planning ETR (registration of report)	Not yet determined
Backstopping missions since 01/01/2018	0

### 3.8 "Budget versus current (y – m)" Report

Enabel				Budget versus actuals (Year to month) of MOZ1503411				
MOZ1503411 RERD 2				Start to 2019	Expenses 2020	Total expenses	Budget remaining	Execution rate
Budget Execution/Activities				(a)	(b)	(a) + (b) = (c)	(d) - (c)	(c) / (d)
	Modality	Budget (d)						
<b>A</b>	<b>Increase access to energy</b>	<b>10,410,000</b>		<b>737,475.77</b>	<b>568,558.30</b>	<b>1,306,034.07</b>	<b>9,103,965.93</b>	<b>12.55%</b>
A 01	Mini-grids provide reliable and adequate energy services	6,400,000		154,831.32	196,470.78	351,302.10	6,048,697.90	5.49%
A 01 01	Review and update of existing studies	200,000		154,831.32	196,458.49	351,289.81	-151,289.81	175.64%
A 01 02	Awareness and stakeholder consultations	150,000		-	-	-	150,000.00	0.00%
A 01 03	Mini grid development	6,000,000		-	12.29	12.29	5,999,987.71	0.00%
A 01 04	Result dissemination	50,000		-	-	-	50,000.00	0.00%
A 02	Technical and financial sustainability of existing systems is improved	1,260,000		17,517.29	4,248.20	21,765.49	1,238,234.51	1.73%
A 02 01	Planning, operation and maintenance	200,000		6,614.35	-	6,614.35	206,614.35	-3.31%
A 02 02	Strengthening of information systems	200,000		24,131.64	4,243.36	28,375.00	171,625.00	14.19%
A 02 03	Implementation of remote monitoring systems	360,000		-	4.84	4.84	359,995.16	0.00%
A 02 04	Implementation of payment systems	500,000		-	-	-	500,000.00	0.00%
A 03	Capacity building of FUNAE in planning and project management	2,750,000		561,201.49	367,839.32	929,040.81	1,820,959.19	33.78%
A 03 01	Project management at HQ level	100,000		458.69	11,970.81	12,429.50	87,570.50	12.43%
A 03 02	Capacity building of Delegations	200,000		770.69	12,608.49	13,379.18	186,620.82	6.69%
A 03 03	Technical assistance	2,250,000		557,426.66	339,027.00	896,453.66	1,353,546.34	39.84%
A 03 04	Surveys, field trips, workshops and seminars, study tours	200,000		2,545.45	4,233.02	6,778.47	193,221.53	3.39%
A 04	IVA	-		3,925.67	-	3,925.67	-3,925.67	#DIV/0!
A 04 01	IVA	-		3,925.67	-	3,925.67	-3,925.67	#DIV/0!
A 04 02	IVA	-		-	-	-	0.00	#DIV/0!
A 05	New legal framework influenced by FUNAE	-		-	-	-	0.00	#DIV/0!
A 05 01	Carrying out specialised studies to strengthen the legal framework".	-		-	-	-	0.00	#DIV/0!
<b>X</b>	<b>Contingencies</b>	<b>326,000</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>326,000.00</b>	<b>0.00%</b>
X 01	Contingencies	326,000		-	-	-	326,000.00	0.00%
X 01 01	Contingencies	163,000		-	-	-	163,000.00	0.00%
X 01 02	Contingencies	163,000		-	-	-	163,000.00	0.00%
<b>Z</b>	<b>General Means</b>	<b>1,264,000</b>		<b>322,566.38</b>	<b>157,944.61</b>	<b>480,510.99</b>	<b>783,489.01</b>	<b>38.02%</b>
Z 01	Personnel Costs	690,000		265,337.86	134,571.68	399,909.54	290,090.46	57.96%
Z 01 01	Regional Administration & Finance	450,000		224,043.53	99,810.25	323,853.78	126,146.22	71.97%
Z 01 02	Finance/admin/procurement staff	120,000		41,294.33	34,761.43	76,055.76	43,944.24	63.38%
Z 01 03	Driver	120,000		-	-	-	120,000.00	0.00%
Z 02	Investment costs	40,000		13,729.22	2,196.59	15,925.81	24,074.19	39.81%
Z 02 01	IT equipment	40,000		13,729.22	2,196.59	15,925.81	24,074.19	39.81%
Z 03	Operating Costs	372,000		37,722.44	21,666.92	59,389.36	312,610.64	15.96%
Z 03 01	Office consumable	12,000		1,329.48	332.08	1,661.56	10,338.44	13.85%
Z 03 02	Communication costs	30,000		3,776.28	1,909.38	5,685.66	24,314.34	18.95%
Z 03 03	Fuel and maintenance	60,000		13,481.81	4,055.06	17,536.87	42,463.13	29.23%
Z 03 04	Mission costs	105,000		6,062.15	350.77	6,412.92	98,587.08	6.11%
Z 03 05	Other operation costs	5,000		1,989.77	1,863.53	3,853.30	1,146.70	77.07%
Z 03 06	Office rental	150,000		11,003.88	13,156.10	24,159.98	125,840.02	16.11%
Z 03 07	Office renovation and maintenance	10,000		79.07	-	79.07	9,920.93	0.79%
Z 04	Audit, Follow-up and Evaluations	162,000		5,776.86	490.58	5,286.28	156,713.72	3.26%
Z 04 01	Audit	50,000		-	-	-	50,000.00	0.00%
Z 04 02	Mid-term and final evaluation	80,000		-	-	-	80,000.00	0.00%
Z 04 03	Follow-up and backstopping	32,000		4,964.94	-	4,964.94	27,035.06	15.52%
Z 99 98	Conversion rate adjustment	-		811.92	490.58	321.34	-321.34	#DIV/0!
	<b>Total:</b>	<b>12,000,000</b>		<b>1,060,042.15</b>	<b>726,502.91</b>	<b>1,786,545.06</b>	<b>10,213,454.94</b>	<b>14.89%</b>
	COGEST	7,023,000		0	17	17	7,022,983	0.00%
	REGIE	4,977,000		1,060,042.15	726,486	1,786,527.93	3,190,472	35.90%
	<b>Total:</b>	<b>12,000,000.00</b>		<b>1,060,042.15</b>	<b>726,502.91</b>	<b>1,786,545.06</b>	<b>10,213,454.94</b>	<b>14.89%</b>

### 3.9 Evolution of the budget after formulation of the addendum to the TFF

Enabel							
		MOZ1503411 RERD 2	Budget evolution				
	Budget Execution/Activities	Modality	Budget (d)	Budget extension (e)	Budget total (d) + (e) = (f)	Total expenses to 31 / 12 / 2020 (c)	Budget remaining (f) - (c)
<b>A</b>	<b>Increase access to energy</b>		<b>10,410,000</b>	<b>8,696,500</b>	<b>19,106,500</b>	<b>1,306,034.07</b>	<b>17,800,465.93</b>
A 01	Mini-grids provide reliable and adequate energy services		6,400,000	2,370,000	8,770,000	351,302.10	8,418,697.90
A 01 01	Review and update of existing studies	REGIE	200,000	510,000	710,000	351,289.81	358,710.19
A 01 02	Awareness and stakeholder consultations	REGIE	150,000	-	150,000	-	150,000.00
A 01 03	Mini grid development	COGEST	6,000,000	6,000,000	-	12.29	-12.29
A 01 04	Result dissemination	REGIE	50,000	10,000	60,000	-	60,000.00
A 01 05	Mini grid development	REGIE	-	7,800,000	7,800,000	-	7,800,000.00
A 01 06	Short term expertise envelope	REGIE	-	50,000	50,000	-	50,000.00
A 02	Technical and financial sustainability of existing systems is improved		1,260,000	-	1,260,000	21,765.49	1,238,234.51
A 02 01	Planning, operation and maintenance	REGIE	200,000	-	200,000	6,614.35	206,614.35
A 02 02	Strengthening of information systems	REGIE	200,000	-	200,000	28,375.00	171,625.00
A 02 03	Implementation of remote monitoring systems	COGEST	360,000	360,000	-	4.84	-4.84
A 02 04	Implementation of payment systems	COGEST	500,000	500,000	-	-	0.00
A 02 05	Implementation of remote monitoring systems	REGIE	-	360,000	360,000	-	360,000.00
A 02 06	Implementation of payment systems	REGIE	-	500,000	500,000	-	500,000.00
A 03	Capacity building of FUNAE in planning and project management		2,750,000	470,000	3,220,000	929,040.81	2,290,959.19
A 03 01	Project management at HQ level	REGIE	100,000	-	100,000	12,429.50	87,570.50
A 03 02	Capacity building of Delegations	REGIE	200,000	-	200,000	13,379.18	186,620.82
A 03 03	Technical assistance	REGIE	2,250,000	270,000	2,520,000	896,453.66	1,623,546.34
A 03 04	Surveys, field trips, workshops and seminars, study tours	REGIE	200,000	200,000	400,000	6,778.47	393,221.53
A 04	IVA		-	-	-	3,925.67	-3,925.67
A 04 01	IVA	REGIE	-	-	-	3,925.67	-3,925.67
A 04 02	IVA	COGEST	-	-	-	-	0.00
A 05	New legal framework influenced by FUNAE		-	60,000	60,000	-	60,000.00
A 05 01	Carrying out specialised studies to strengthen the legal framework".	REGIE	-	60,000	60,000	-	60,000.00
A 06	R6 Sustainable solar powered irrigation systems are taken up by selected farmers in 2 provinces		-	3,802,000	3,802,000	-	3,802,000.00
A 06 01	Sites selection and preparatory actions	REGIE	-	220,000	220,000	-	220,000.00
A 06 02	IEC of beneficiaries and partners on SPIS	REGIE	-	60,000	60,000	-	60,000.00
A 06 03	Technical participatory analysis and identification	REGIE	-	200,000	200,000	-	200,000.00
A 06 04	Support acquisition and implementation of	REGIE	-	2,220,000	2,220,000	-	2,220,000.00
A 06 05	Continuous learning and adjustment & dissemination	REGIE	-	20,000	20,000	-	20,000.00
A 06 06	Technical Assistance (ITA and NTA)	REGIE	-	1,008,000	1,008,000	-	1,008,000.00
A 06 07	Training costs and short term expertise envelope	REGIE	-	74,000	74,000	-	74,000.00
A 07	R7 The technical and financial capacities of farmers, institutional partners and market actors for a sustainable use of solar powered irrigation systems are enhanced		-	1,732,500	1,732,500	-	1,732,500.00
A 07 01	Support for implementation and use of SPIS and strengthening maintenance	REGIE	-	200,000	200,000	-	200,000.00
A 07 02	Improving sustainable irrigation and agronomic practices linked with SPIS's use	REGIE	-	420,000	420,000	-	420,000.00
A 07 03	Strengthening suppliers distributors and service suppliers of SPIS	REGIE	-	70,000	70,000	-	70,000.00
A 07 04	Build local expertise on SPIS through collaboration with Research centres and learning centres	REGIE	-	667,500	667,500	-	667,500.00
A 07 05	Capacity building of institutional partners with a focus on the provincial and local level	REGIE	-	60,000	60,000	-	60,000.00
A 07 06	National Technical Assistance	REGIE	-	240,000	240,000	-	240,000.00
A 07 07	Training costs and short term expertise envelope	REGIE	-	75,000	75,000	-	75,000.00

Enabel									
		MOZ1503411 RERD 2		Budget evolution					
		Budget Execution/Activities	Modality	Budget (d)	Budget extension (e)	Budget total (d) + (e) = (f)	Total expenses to 31 / 12 / 2020 (c)	Budget remaining (f) - (c)	
A	08	R8 Initiatives to support an enabling environment for private and public investments in the irrigation sector are supported		-	262,000	262,000	-	262,000.00	
A	08	01 Supporting platforms to exchange and coordinate the actions of different actors	REGIE	-	32,000	32,000	-	32,000.00	
A	08	02 Support institutional actors in creating an enabling environment for SPIS uptake and dissemination	REGIE	-	130,000	130,000	-	130,000.00	
A	08	03 Short term expertise envelope	REGIE	-	100,000	100,000	-	100,000.00	
X		<b>Contingencies</b>		<b>326,000</b>	<b>48,520</b>	<b>374,520</b>	<b>-</b>	<b>374,520.00</b>	
X	01	Contingencies		326,000	48,520	374,520	-	374,520.00	
X	01	01 Contingencies	COGEST	163,000	-	163,000	-	163,000.00	
X	01	02 Contingencies	REGIE	163,000	48,520	211,520	-	211,520.00	
Z		<b>General Means</b>		<b>1,264,000</b>	<b>1,254,980</b>	<b>2,518,980</b>	<b>480,510.99</b>	<b>2,038,469.01</b>	
Z	01	Personnel Costs		690,000	594,600	1,284,600	399,909.54	884,690.46	
Z	01	01 Regional Administration & Finance	REGIE	450,000	123,460	326,540	323,853.78	2,686.69	
Z	01	02 Finance/admin/procurement staff	REGIE	120,000	838,060	958,060	76,055.76	882,003.77	
Z	01	03 Driver	REGIE	120,000	120,000	-	-	0.00	
Z	02	Investment costs		40,000	155,000	195,000	15,925.81	179,074.19	
Z	02	01 IT equipment	REGIE	40,000	20,000	60,000	15,925.81	44,074.19	
Z	02	02 Office refurbishing	REGIE	-	15,000	15,000	-	15,000.00	
Z	02	03 Furniture and equipment	REGIE	-	15,000	15,000	-	15,000.00	
Z	02	04 Vehicles	REGIE	-	105,000	105,000	-	105,000.00	
Z	03	Operating Costs		372,000	354,380	726,380	59,389.36	666,990.64	
Z	03	01 Office consumable	REGIE	12,000	38,400	50,400	1,661.56	48,738.44	
Z	03	02 Communication costs	REGIE	30,000	24,000	54,000	5,685.66	48,314.34	
Z	03	03 Fuel and maintenance	REGIE	60,000	72,000	132,000	17,536.87	114,463.13	
Z	03	04 Mission costs	REGIE	105,000	21,000	126,000	6,412.92	119,587.08	
Z	03	05 Other operation costs	REGIE	5,000	-	5,000	3,853.30	1,146.70	
Z	03	06 Office rental	REGIE	150,000	120,000	270,000	24,159.98	245,840.02	
Z	03	07 Office renovation and maintenance	REGIE	10,000	12,000	22,000	79.07	21,920.93	
Z	03	08 Marketing and representation costs	REGIE	-	32,000	32,000	-	32,000.00	
Z	03	09 Training administrative staff	REGIE	-	20,000	20,000	-	20,000.00	
Z	03	10 ICT Maintenance and UBW Costs	REGIE	-	10,980	10,980	-	10,980.00	
Z	03	11 Financial transaction costs	REGIE	-	4,000	4,000	-	4,000.00	
Z	04	Audit, Follow-up and Evaluations		162,000	151,000	313,000	5,286.28	307,713.72	
Z	04	01 Audit	REGIE	50,000	45,000	95,000	-	95,000.00	
Z	04	02 Mid-term and final evaluation	REGIE	80,000	60,000	140,000	-	140,000.00	
Z	04	03 Follow-up and backstopping	REGIE	32,000	36,000	68,000	4,964.94	63,035.06	
Z	04	04 Monitoring	REGIE	-	10,000	10,000	-	10,000.00	
Z	99	98 Conversion rate adjustment	REGIE	-	-	-	321.34	-321.34	
		<b>Total:</b>		<b>12,000,000</b>	<b>10,000,000</b>	<b>22,000,000</b>	<b>1,786,545.06</b>	<b>20,213,454.94</b>	
		COGEST		7,023,000	-6,860,000	163,000	17	162,983	
		REGIE		4,977,000	16,860,000	21,837,000	1,786,527.93	20,050,472	
		<b>Total:</b>		<b>12,000,000.00</b>	<b>10,000,000.00</b>	<b>22,000,000.00</b>	<b>1,786,545.06</b>	<b>20,213,454.94</b>	



### 3.10 Communication resources

One article on the “**Open Enabel**” website a second article in final draft <sup>38</sup>.

The proceedings of a webinar organized by the Mozambican Association of Renewable Energy (AMER) with the title "Private sector perspectives on renewable energy in Mozambique. Edition: mini grids", to which the RERD2 intervention manager was panel member, was published on **YouTube**<sup>39</sup>. The webinar extensively discussed the issue of the Mozambican legal framework and the role of the private sector.

Completion of 5 RERD2 feasibility studies by RLI/ENGREEN published on **LinkedIn**<sup>40</sup>.

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<sup>38</sup> <https://open.enabel.be/en/MOZ/2188/p/renewable-energy-for-rural-development-phase-2-rerd2.html>

A second article in final draft is entitled: *Rural electrification: how to find the right villages?*

<sup>39</sup> <https://www.youtube.com/watch?v=Ggu4DWBELyq&t=4003s>

<sup>40</sup> <https://www.linkedin.com/feed/update/urn:li:activity:6767723728768917504/>