GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: FULL-SIZED PROJECT
TYPE OF TRUST FUND: GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	Towards sustainable energy for all in Mozambique: promoting market-based dissemination of integrated renewable energy systems for productive activities in rural areas		
Country(ies):	Mozambique	GEF Project ID:	9225
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	150263
Other Executing Partner(s):	Ministry of Land, Environment and Rural Development (MITADER), Ministry of Agriculture and Food Security, Ministry of Energy and Mines Resources, Environment Fund (FUNAB), Energy Fund (FUNAE), Mozambique National Cleaner Production Center (MNCPC).	Submission Date: Re-submission Date:	07-30-2015 08-14-2015
GEF Focal Area(s):	Climate Change	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of parent program:	[if applicable]	Agency Fee ($)	270,881

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	**Trust Fund**	**(in $)**	
		GEF Project Financing	**Co-financing**
CCM-1 Program 1	GEFTF	2,851,384	9,220,000
Total Project Cost		2,851,384	9,220,000

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: To promote market-based dissemination of integrated renewable energy (solar and biogas) systems for productive uses in rural areas of Mozambique

Project Components	**Financing Type**	**Project Outcomes**	**Project Outputs**	**Trust Fund**	**(in $)**	
					GEF Project Financing	**Co-financing**
1. Establishment of a conducive policy and regulatory environment	TA	Regulatory environment for integrated renewable energy systems in rural areas established	1.1 Policy framework for private sector engagement developed	GEFTF	130,000	380,000
			1.2 Guidelines on private sector involvement in RE projects in rural areas developed			
			1.3 Standards for typical integrated RE systems for rural areas developed and adopted			
2. Capacity building and knowledge management	TA	Capacities of key players strengthened and information available for market enablers and players	2.1 Five training sessions for (50) government officials at both federal and provincial levels on RE integrated systems developed and trainings conducted	GEFTF	100,000	380,000

			2.2 Ten training sessions targeting 250 participants from financial institutions, and other private sector organisations on integrated RE systems developed and trainings conducted			
3. Demonstration of technologies and scaling up	Inv	Integrated RE systems demonstrated and scaled up	3.1 Five (5) demonstration projects on integrated RE systems installed in a selected number of productive sectors with high visibility	GEFTF	800,000	2,200,000
			3.2 Financial mechanism established to support the installations of thirty (30) solar water pumping systems for irrigation and thirty (30) biogas digesters for agro-food processing in rural areas		1,565,604	5,540,000
			3.3 Demonstration and investment projects are independently evaluated and results widely disseminated		50,000	150,000
4. Monitoring and Evaluation	TA	4.Project's progress towards objectives continuously monitored and evaluated	4.1 Mid-term review and terminal evaluation carried out	GEFTF	70,000	150,000
			4.2 project's progress monitored, documented and recommended actions formulated			
			Subtotal		2,715,604	8,800,000
			Project Management Cost (PMC)	GEFTF	135,780	420,000
			Total Project Cost		2,851,384	9,220,000

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
Implementing Agency	UNIDO	Grants	60,000
Implementing Agency	UNIDO	In-Kind	140,000
Recipient Government	FUNAE (National Electrification Fund)	Loans	700,000
Recepient Government	FUNAE (National Electrification Fund)	In-Kind	300,000
Recipient Government	FUNAB (National Environment Fund)	Grants	1,000,000
Donor	Austrian Development Agency	Grants	350,000
Private sector	To be determined	Equity	2,000,000
Banks/Financial Institutions	To be determined	Loans	3,450,000
NGOs	To be determined	In-Kind	700,000
Local communities	To be determined	In-Kind	520,000
Total Co-financing			9,220,000

D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS [a)]

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing	Agency Fee (b)[b)]	Total (c)=a+b
(select)	(select)		(select)	(select as applicable)			0

Total GEF Resources	0	0	0

E. PROJECT PREPARATION GRANT (PPG)

Is Project Preparation Grant requested? Yes ☒ No ☐ If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: $82,192					PPG Agency Fee: 7,808		
GEF Agency	**Trust Fund**	**Country/ Regional/Global**	**Focal Area**	**Programming of Funds**	**(in $)**		
					PPG (a)	**Agency Fee** (b)	**Total** c = a + b
UNIDO	GEFTF	Mozambique	Climate change		82,192	7,808	90,000
Total PPG Amount					**82,192**	**7,808**	**90,000**

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS

Provide the expected project targets as appropriate.

Corporate Results	**Replenishment Targets**	**Project Targets**
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	*4,435,073 tCO2e*

PART II: PROJECT JUSTIFICATION

1. *Project Description*

1.1 The global environmental and/or adaptation problems, root causes and barriers that need to be addressed

Mozambique has land area of 801,590 km^2 and in 2013, the population was estimated at 25,833,752 inhabitants, about 68% of which lived in rural areas. With a Total Primary Energy Supply (TPES) of 408.9 Peta joules (PJ) in 2009, biomass meets 78% of the country's energy demand, followed by hydropower (13%), oil products (7%) and diverse other resources (2%). Although the country is a producer of natural gas, and has in the recent past discovered more reserves, the current use of gas in electricity generation is marginal, with coal, it accounts for about 1% of the TPES. All oil products used in power generation are imported and their cost accounts for 15% of the country's imports, making of Mozambique a country particularly vulnerable to oil prices fluctuation.

Mozambique has, over the years, been able to attract significant investment in upstream infrastructure for power generation mainly hydropower that include Cahora Bassa (2,0755MW), Lupata (612MW), Lupata (612MW). However, the country has had very limited investments in downstream infrastructure (transmission and distribution) to evacuate the power generated. In 2014, EDM was operating a network of 4874 km transmission lines and 15,275 km transmission lines, barely enough to supply the capital city Maputo and some secondary cities. Consequently, most of the power generated is fed into the regional grid. The national access to electricity for on-grid is estimated to be around 18% and for off-grid around 11% access to electricity is even lower. Rural areas in particular have electricity access levels of 5% despite of the the fact that over 68% of the population in the countru lives in these areas. Efforts to increase the electrification rates from both on and off-grid schemes face several challenges, including scattered households in rural remote areas that makes it uneconomical to extend the grid to such areas.

Small farms and agro-food processing industries, which are in most cases located in rural remote areas, continue to face serious challenges in accessing power and other forms of energy. Therefore, majority of these farms and industries has invested in decentralized diesel powered generators resulting in higher environment footprint. In addition, the reliance of these farms and industries on diesel powered generators exposes them to oil prices fluctuations at the global level. Furthermore, in periods of unreliable supply of diesel, these farms and industries rely on firewood and charcoal for their operations. This results in rampant destruction of local forests. In addition, the waste generated from these industries and farms is dumped in local and unregulated areas and rivers resulting in

ground and water pollution. In cases where organic waste from farms is dumped in local rivers, this has resulted in pollutions that affects over users downstream.

This situation obtains despite of the country being endowed with diversified natural and renewable energy resources that, if well utilized, can contribute to power generation for diverse productive sectors, including community agriculture and small agro-food processing industries, at a lower environment footprint. Those resources include: a vast potential for hydropower given the number of rivers flowing through the country into the Indian ocean; a substantial wind power potential along the Indian ocean coastline where strong wind regimes are commonly recorded; high level of solar irradiation throughout the year; and biomass.

Mozambique has significant biomass energy resources, either as standing biomass, including plantation forests, or as residues/waste from agriculture such as sugarcane waste, corn cobs, castor seed, cashew nut shells, and from livestock such as dairy farms waste, swine, poultry, and chicken waste. Forests in Mozambique were estimated to represent 49.1% of the country land area in 2013. According to IEA 2006 statistics, agricultural residues, and domestic and animal waste in Mozambique have an estimated potential energy generation of nearly 300,934 GWh per year. However, this potential largely goes unutilised as the relevant technologies for small to medium scale applications, i.e. of 100 kW to 500 kW ranges of capacity, are not readily available in the local market, and consequently there is little, if any, knowledge about their operation.Mozambique has a significant and largely untapped solar potential. Annual average solar radiation is estimated to be 5.2 kWh/m2/day and varies between 4 and 7 kWh/m2/day across the country. The potential for solar power is estimated at approximately 1.49 million GWh (IRENA, 2012).

The adoption of renewable energy technologies in farms and rural industries faces several interlinked barriers as following:

a) **Policy and regulatory frameworks not conducive to private sector investments.** The participation of private investors in off-grid electrification is hampered by the absence of a conducive policy and regulatory framework. The existing policies and regulations do not provide for the engagement and operations of independent power producers either in grid-connected or decentralized renewable energy systems. Although the country has a Master Plan for Off-grid Energy, there is no regulation or provision for private sector active involvement in the process. For instance, in the event that a farmer or an industry produces excess power from renewables stand-alone systems, there are no regulations on how such power could be sold to nearby customers. In addition, for such a new industry, there are no standards for intergtrated renewable energy systems could be developed and adopted.

b) **Lack of capacity and knowledge.** The country lacks key skills, by both market players and enablers, to support the uptake of a vibrant renewable energy market in rural areas. On the side of market enablers, there are capacity gaps in terms of planning and regulating the sector, while key market players like private investors, farmers, industrialists lack skills to translate their project ideas into bankable investment projects. Furthermore, the country does not have cadre of qualified personnel to provide services such as design of renewable energy systems, and operation and maintenance services.

c) **Lack of appreciation of technical feasibility and commercial viability of the use of renewable energy technologies in farms and industries.** Most of the solar powered systems installed in the country is in households and public buildings such as hospitals and schools. The maintenance of systems installed in public buildings has faced challenges related to lack of ownership and lack of a business approach to their opperation, hence there has been no replication. In rural Mozambique, renewable energy technologies are generally viewed as more relevant for lighting rather than providing energy for productive uses. This is due to the fact that, to date, solar photovoltaic energy has been mainly promoted for lighting purposes. As such, the potential of renewable

energy technologies applications in farms and industries is not recognized. It is, therefore, important to demonstrate the technical feasibility and commercial viability of solar energy and other renewables, especially biogas technology, in productive sectors such as agriculture and industry. Given the lack of maintenance services, it will be important that any demonstration project will be closely linked to maintenance services contract. In addition, financial services providers generally view renewable energy projects as high risk and would not provide tailor made financial mechanisms to support such projects.

The promotion of market-based dissemination of renewable energy systems in rural areas of Mozambique is contingent upon an integrated approach being adopted in addressing these interlinked above-mentioned barriers. Such an approach will require, first, establishing a conducive policy and regulatory environment that will provide the private sector with confidence to invest in those systems. Then, it will be necessary to build a critical mass of capacity among both the market enablers and market players in the business of integrated renewable energy systems in rural areas. It is also essential to demonstrate the technical feasibility and business potential of integrated renewable energy systems in productive uses, as well as, an appropriate mechanism that will reduce barriers related to financing. These interventions, seen together, will collectively provide an impetus to market-based dissemination of integrated renewable energy systems in rural areas of Mozambique.

1.2 The baseline scenario and baseline projects

The baseline scenario is most described in three (3) aspects:

- Currently, agriculture residues and livestock waste fuelled systems with capacity ranging between 100 – 500 kW do not exist in Mozambique. Consequently, there is very limited capacity and knowledge about the operation and maintenance of these systems. With regard to organic waste from farms and industries, most of it is disposed in local dumb sites or rivers, contributing to methane production and contaminating water bodies and ground water. Its is estimated that about 10 household biogas systems are currently operational in the country. Concerning solar PV, to date, approximately 1 MW total capacity has been installed mainly in schools, clinics and villages, out of a potential for generation estimated to be 1.49 million GW. Any recorded project has so far promoted integrated and hybrid renewable energy systems in farming operations and agro-food processing industries led by the private sector. Private actors do not invest in the sector as there is no incentive such as Feed-in-Tariffs or standardized set of procedures for power purchase agreement with the grid operator.
- Heavy reliance on wood fuels is resulting in unregulated cutting of trees for supply of energy services, with associated environmental challenges. In rural areas of Mozambique, wood fuels are mainly used for services such as cooking and lighting. Also, there is rampant charcoal production in these areas to supply the urban areas. Given the challenges related to diesel supply in remote areas, some of the small farmers and agro-processing industries in these areas routinely depend on firewood and charcoal for their operations when diesel supply becomes erratic.
- Given that agriculture and industry are set to become the main drivers of the country's economic growth, currently projected to be above 8%, there is bound to be a corresponding increase in energy consumption of farms and agro-processing industries. In the baseline scenario, energy demand of those sectors is met with diesel based power generation. Since the extension of the national electricity grid to rural communities is not cost-effective due to scattered settlements, there is bound to be a rapid increase in diesel use to power farms and industries in rural areas with related global environmental challenges.

Baseline project consists of the following:
At regional level, the Southern African Development Community (SADC)[1] has demonstrated its commitment to the advancement of renewables through various policies and frameworks such as the development of the SADC Energy Protocol (SEP), the Regional Infrastructure Development Master Plan (RISMP), the Regional Indicative Strategic Development (RISDP) Plan, and the soon-to-be-released SADC Renewable Energy Strategy and Action Plan (RESAP).

The SADC Regional Energy Access Strategy and Action Plan (REASAP), approved by the SADC Ministers in 2010, proposed two broad goals for energy access in the region:

- A *strategic goal*, to harness regional energy resources in order to ensure, through national and regional action, that all the people of the SADC region have access to adequate, reliable, least-cost, environmentally sustainable energy services; and
- An *operational goal*, to halve the proportion of people without such access within 10 years for each end use, and halve it again in successive 5 years periods until there is universal access to energy.

The REASAP includes a detailed discussion of possible technical and policy options for increasing access with renewables stand-alone systems and mini-grids as an alternative to grid extension.

Another regional initiative is the establishment, with support from UNIDO, of the SADC Centre for Renewable Energy and Energy Efficiency (SACREEE), which has been formally approved by the SADC ministers. The Centre's mandate is to promote market-based adoption of renewable energy and energy efficiency technologies and services in SADC member States. The centre should contribute substantially to the development of thriving regional renewable energy and energy efficiency markets through knowledge sharing and technical advice in the areas of policy and regulation, technology cooperation, capacity development, as well as, investment promotion.

At national level, as part of the 1 UN Joint Programme, UNIDO installed solar water pumping systems with a total capacity of 15 kW in the villages of Madulo, Braganca, Ndombe, Mepuzi, Chicualacuala B, Eduardo Mondlane and Mapai located in Chicualacuala district. The monitoring exercise within this project showed that systems handed over to private entities for management have continued to operate, while systems managed by local communities face a lack of resources for maintenance as those communities do not charge cost-refelctive tarrifs for services provided. Mozambique has recorded sixty nine (69) diesel-fuelled mini-grids that are managed by local communities, most of them having stopped operating because rural communities do not charge cost-reflective tariffs.

Rural electrification in Mozambique has a two-pronged approach. On one hand, the utility Electricidade de Mocambique (EDM) promotes an aggressive grid-extension programme that has significantly increased electricity access in many towns and service centers. Most of these developments has been financed through grants and soft loans. However, much is still to be done to extend the power grid from these towns to rural areas. On the other hand, the National Electricity Fund (FUNAE) was set-up to support off-grid electrification and to promote rational use of energy resources in rural areas, where the majority still depends on firewood and charcoal to meet their energy needs. FUNAE primarily provides financial support or guarantees to economically and financially viable projects. There also, much is still to be done in order to scale-up FUNAE interventions so as to adequately respond to existent challenges at scale and level that will have impact on the lives of the majority in rural areas. To date, most of FUNAE activities in promoting renewable energy has focused on providing solar systems to schools and hospitals, through grant funding. Given the limited success of this approach and the huge number of people who still do not have access to energy, FUNAE recognizes the need to

[1] Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

adopt a market-based approach which will attract private sector investments in off-grid electrification at scale and level that will sustain markets in rural areas and actually have impact.

Under the Ministry of Science and Techonology, the Boane Agrarian Institute is currently testing locally made biogas systems for households. The project will coordinate its activities with this Institute, with a view to promote the dissemination of market ready digesters.

1.3 The proposed alternative scenario

This project seeks to adopt a holistic approach in promoting market-based adoption of integrated renewable energy solutions, mainly solar PV and waste-to-energy technologies, in small to medium-scale farms and agro-food industries across Mozambique. This alternative scenario builds on interlinked interventions focusing on policy and regulatory frameworks, capacity building for market players and enablers, and demonstration with pilot systems, and scaling up. This will in effect result in more renewable energy projects that will reduce diesel consumption by industries and farmers and reduce GHG emissions. At the local level, the use of renewable energy energy systems will eliminate the reliance on charcoal and firewood and the attendant local environmental challenges that include deforestation and land and water pollution. By addressing systemic barriers related to policy and regulatory framework, the project will create an environment conducive for private sector led investment activities in renewable energy systems in farms and industries. The project will also create a critical mass of both market enablers and players, so as to support the nascent market with relevant skills. To kick start investments in the sector, the project will implement carefully selected pilot projects that would serve as model of best practices. The installation of pilots will be for demonstration of integrated renewable energy systems as a relevant soltutions to address simultaneously forest degradation, waste management, as well as, contribute to energy access in areas currently not supplied by the national grid. The pilots in public institutions identified by Ministry for Rural Development (MITADER) will showcase how integrated systems can be an alternative to woodfuel in a number of productive applications including handicraft. Wood fuel consumption in rural areas of Mozambique is a major cause of forests degradation. The dumping of waste from agriculture and industry sectors in local rivers and other open areas contribute to pollution of the water system and leaks greenhouse gases, including methane, in the atmosphere. Using these waste in biogas systems will reduce related GHG emissions. The rural areas in Mozambique have already experience with decentralized energy systems, fueled by diesel, the alternative systems using solar and biomass energy resources will further reduce GHG emissions and will contribute to climate change mitigation. To support greater replication of these pilot installations, the project will develop a financial mechanism aimed at allowing farmers and agro-food processing industries to access the initial capital to finance their installations, and to have operation and maintenance services available throughout equipment lifetime. The financial mechanism will target rural industries that produce waste from agriculture and livestock, and also have the potential to consume electricity and heat generated from that waste in their operations. The use of agriculture and livestock residues in waste-to-energy systems for agro-food industry, combined to solar PV for agriculture irrigation in rural Mozambique, is expected to lead to global environmental benefits through reduction of GHGs emissions resulting from eliminated use of diesel. It will also generate at the local level socio-economic benefits that include increased productivity and competitiveness of farms and industries, creation of local jobs for men and women and associated delivery of services. More specifically, the project has components as outlined below.

Component 1: Establishment of a conducive policy and regulatory environment

Current rural electrification efforts need to be expanded to bring in private sector involvement. To support this process, which is in line with the policy objectives of the Ministry of Energy and Mines and FUNAE's Strategic Plan, the project will: (1) assist in establishing a conducive policy and regulatory framework for private sector engagement in the market of renewable energy systems for farms and agro-food processing industries located in rural

areas; (2) develop a guide on private sector involvement in the market; and (3) support the development and adoption of typical renewable energy systems standards to be used in rural electrification projects. It is expected from the execution of component 1 that a policy and regulatory environment for integrated renewable energy systems in rural areas is established. In particular, the regulation will focus on how farms and food processing industries in rural areas can generate power for their own use, but also possibly sell to nearby areas. In addition, the regulatory framework will focus on the possibility of establishing private wire networks and feed-in-tariffs schemes to support private investment in such systems. The existence of such incentives will contribute to sustain the project pilot installations and will ensure replication based on good practices. The Ministry of Energy and Mines will be the main counterpart on execution of this component. Other stakeholders will be contributing to the activities through a coordinated mechanism to be defined during PPG phase.

Component 2: Capacity building and knowledge management

There is need for market players and enablers, to sustain a market-based dissemination of integrated renewable energy systems in the country, to have the requisite capacities and skills. Accordingly, during the inception phase, the project will conduct a detailed assessment of the key players and enablers capacity gaps, taking into account gender differentiated needs. Based on the findings of this assessment, the project will: (1) develop training programmes at various levels for finance institutions, service providers, private developers etc. In particular the project will collaborate with existent vocational training institutes to integrate modules on renewable energy into their curriculum; (2) provide relevant training programmes to institutions that will support renewable energy technology dissemination such as Government institutions, investment and trade promotion agencies, farmers' associations, industries' associations etc. The project intends to collaborate with financial service providers to develop a model of joint learning process, where financial service providers can interact with industries, farmers, and developers to discuss potential investment opportunities. This model will also help potential project developers to learn from finance institutions about business plans, criteria and conditions for accessing finance resources. Lessons and experiences from this learning model will be used in designing a mechanism for financing solar PV and biogas systems in rural areas, taking into account the need of finance institutions(FI) to secure their investments, and the willingness of industries and developers to pay for their installations. From component 2 execution, it is expected that capacity of market enablers and players is increased. Training sessions for government officials will focus on two main thematic:

- Integrated renewable energy systems and local legislation, that will target provincial officials and institutions intervening in local development;
- And the market of renewable technologies for improving energy access, with solar and PV applications as case studies, that will target the national government officials, Ministry departments, research institutes and development partners.

Three training sessions are planned for officials in selected provinces. Two sessions will target national government officials.

Ten training sessions will target finance institutions and other private stakeholders. The training sessions targeting private stakeholders should focus on the development of renewable energy projects and requirements (criteria and conditions) to make the investments bankable.

The exact title and content of each of these training sessions will be mutually agreed during preparation phase. The project targets a total of three hundred (300) public and private stakeholders to benefit from direct training seminars on integrated RE systems, their operation and maintenance.

The capacity building component will be coordinated by the Eduardo Mondlane University, and implemented in close collaboration with other key stakeholders, including the National Electricity Fund (FUNAE), the Environment Fund (FUNAB), the Ministry for Coordination of Environmental Affairs (MICOA), the Council for Development of Mozambique (CDC), Electricidade de Mozambique (EDM), National Directorate of Energy(DNE), Ministry of

Energy (ME), National Directorate of Agriculture (DINA), National Directorate of Environmental Management (DNGA), and local finance institutions (banks and MFIs), as well as, CSOs and NGOs promoting gender equality and women's empowerment. Trainings for different stakeholders will be tailor made and will be conducted by the Mozambique National Cleaner Production Centre (MNCPC). Trained female and male experts will be included by the MNCPC into a formal network of technology service supporters that will constitute local platforms for discussions and sharing of experiences on solar PV for water pumping and waste-to-energy systems for agro-food processing industries. MNCPC will ensure that knowledge from capacity building is disseminated with follow-up trainings in other rural areas to ensure replication.

Efforts will be taken to ensure that both women and men have equal opportunity to participate in and benefit from all capacity building activities. For this purpose, during the PPG phase, a gender baseline analysis will be conducted for identification of the different knowledge gaps and training needs of the target groups, in order to define concrete targets for female participation and to develop a strategy that provides equal opportunities to women, men and the youth. The goal is to ensure that women are able to participate in, benefit from, and access all activities under this project.

Component 3: Demonstration of technologies and scaling up

The project will support carefully selected five (5) demonstration pilots in rural and peri-urban areas of Mozambique to demonstrate the technical feasibility and market viability of solar PV for water pumping in farms and biogas systems for agro-food processing industries. The Government of Mozambique has established a task team, chaired by a representative of the Ministry for Rural Development (MITADER) to harmonise and synergise the development of biogas systems under this project. Accodingly, MITADER has prioritized the installation of biogas systems in some Government institutions that include Boane Agrarian Institute, Machava Prison and Nampula Prisons. These institutions have an environment of continued feedstock (food waste and human waste) supply which is critical for successful operation of biogas systems. Successful implementation of pilots in these instititutions will contribute to increase awareness on relevance of RE systems among public officials. The systems planned in these institutions will be considered among the demonstration projects with co-financing provided by the National Environment Fund (FUNAB).

Biogas technology has been piloted in the country, mainly at household level. Concerning solar PV, although the country has already experience with small stand-alone systems, it is required to showcase a private sector led approach, which is linked to the strengthening of operation and maintenance services support. Therefore, this project will focus on demonstrating technical feasibility and commercial viability of larger systems for agro-processing industries and farms that have significant waste streams. Each of the five demonstration projects will focus on the following installations:

- Installation of solar PV systems for rural water pumping to supply local farms, industries and institutions with water for agriculture and livestock production. This will offset diesel fuel hat is currently being used in diesel-run engines to pump water.
    - Replacement of diesel generators and/or boilers in dairy farm/milk processing industries, slaughter houses and other agro-processing units that are rapidly growing in the country, with anaerobic digesters combining agriculture residues and livestock manure. The project will focus on systems with sizes in the range of 100 – 500 kW which can also generate process heat. Biomass resources considered as fuel are: animal waste, agro-processing waste, dairy farm waste etc.

Table 1: Solar PV and Anaerobic digester typical investments

	Solar PV pump	**Anaerobic digester**	**Total**
System unit cost (USD/kW)	6,150	950	
Capacity to install (kW)	281.6	9,023.1	9,304.7
CAPEX (USD)	1,731,840	8,571,945	10,303,785
Average capacity of a system (kW)	9.39	300.8	
Number of systems (units)	30	30	
System load factor (%)	50	62	
Annual operating hours	3,120	3,120	
Annual electricity production (MWh)	439.3	17,454.3	17,893.6
Years of operation	25	15	
Annual emissions reduction (tCO2e)	615	17,454	
Replication factor	15	15	
Direct and indirect emissions reduction throughout lifetime (tCO2e)	246,048	4,189,024	4,435,073

To the selected pilots, this project will provide technical assistance in the design of the systems. In addition, a performance related grant will be provided to support up to 20% of the projects' capital costs. The owner of the pilots will need to mobilise the remaining capital either as equity or as debt. UNIDO will enter into a contractual agreement with each of the demonstration projects and the nature of the contracts will be such that disbursement will be subject to verified progress on the ground. National stakeholders involved in implementation of demonstration projects will be the Ministry of Energy through the National Directorate for New and Renewable Sources of Energy (DNENR-ME), FUNAE (Energy Fund), and the Centro de Estudos de Engenharia from the University Eduardo Mondlane (CEE-UP) and the Ministry of Land, Environment and Rural Development (MITADER). CEE-UP will work with NGOs at community level to provide technical expertise and will assist with the identification and setting up of conditions for efficient involvement of rural communities in the project. Partner public entities will ensure the self-sustainability of project assets beyond the implementation period, as well as the dissemination of lessons learned from pilots implementation. The selection of pilot projects will acknowledge the need for taking into account gender dimensions in energy resources supply and use, particularly in rural remote areas, as well as, foster gender equality and women's empowerment through providing equal opportunities to women and men for access and benefit from the demonstration of renewable energies and the scaling up of projects. In addition to sites selected by MITADER, other possible location identified by the Government for pilot projects are Gaza Province (South), Manica and/or Tete Province (Central), and Nampula Province (North) and Niassa. These are some of the Mozambican Provinces with significant solar resources and a substantial number of farmers rising either swine or cattle. At PPG phase, further analysis will be conducted to identify specific sites for demonstration projects in collaboration with national counterparts.

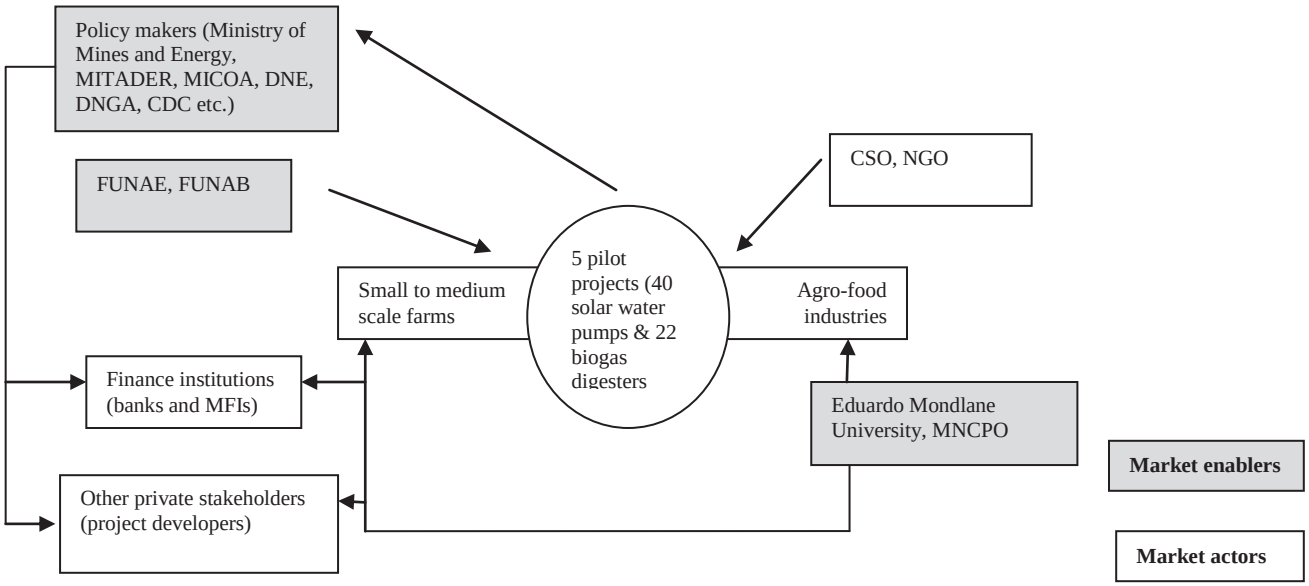
To stimulate a broader scaling up across the country, the project will provide technical assistance in the design of a financial mechanism with two complementary schemes: (1) direct loans to beneficiaries; and (2) a guarantee scheme which will involve the intervention of a third party providing operation and maintenance services to beneficiaries. Stakeholders in the financial services sector will be consulted in the design and operation of the proposed financial mechanism. The design of the financial mechanism will take into account the ability of beneficiaries to pay for the systems, and the willingness of the technology suppliers to establish partnership with local stakeholders in order to ensure that operation and maintenance services are provided to users at a local level. The availability of such services will contribute to long-term operation of the systems. In the recent past, significant improvements, mainly in waste-to-energy technologies, have been made in other developing countries, therefore, south-south cooperation for technology transfer will be considered in the mechanism to be developed. In addition to technical assistance in the design of the financial mechanism, part of GEF resources will be blended on a sliding scale into the financial

mechanism so as to reduce the cost of capital for first movers. It is estimated that 450 solar PV systems and 450 biogas systems will be able to benefit from this mechanism during its first 2 years of operation. More sytems will benefit from the mechanism in the long-term, adding to the GHG emission reductions that the project will achieve. A detailed calculation of GHG emissions reduction from these new systems will be carried out at the PPG stage using the GEF methodology. Based on lessons from the pilots, it is envisaged that business models for public-private partnerships in installing renewable energy technologies in rural areas will be developed so as to promote greater private sector investment and ensure its full contribution to adoption of these technologies in rural areas, in support of Government efforts.

Component 4: Project Monitoring and Evaluation (M&E)

The objective of this component is to facilitate a detailed and extensive M&E structure to be put in place under the project in compliance with UNIDO and GEF procedures. This will allow not only the monitoring of the project's progress but also the construction of an overall project impact assessment on a rolling periodic basis, built-up from the project's different components. The analysis of the M&E and impact assessment results of the different components will allow for periodic reviews of the project's 'Theory of Change' and subsequent implementation strategies and work plans. Beyond this tailor-made M&E and IA approach, the proposed project will also come under UNIDO's standard M&E approach for GEF funded projects, this consisting of mid-term review and terminal evaluation, as well as, definition of periodic reporting based on the GEF/UNIDO templates (MTR/PIR/final PIR).

The project value chain actors



1.4 Incremental cost reasoning and expected contributions from the baseline with GEFTF and co-financing

The activities outlined above are best catalyzed by the use of a GEFTF grant that will address existing barriers related to policy and regulation, capacity and knowledge gaps, and lack of appreciation of the technical feasibility and commercial viability of integrated renewable energy systems for productive uses. More specifically, the grant will contribute to the development of a legal and regulatory framework that will support the establishment of a market environment to catalyse private sector investments. In particular, GEF resources will be used to procure international technical assistance to anchor the development of a policy framework, guidelines and standards. In order to sustain the nascent RE market, there is need for adequate skills and capacities of market players and

enablers. Therefore, GEFTF support will also be used to provide targeted trainings to both market players and enablers in order for them to support the uptake of renewable energy systems in rural areas. GEF financing will contribute to capacity building of national stakeholders in order to ensure establishment and sustainability of platforms at local level for sharing experiences. This expertise will ensure that replication in other rural areas of Mozambique, and beyond, is based on good practices. More specifically, GEF resources will be used to bring international best practices and know-how in developing and adapting training modules, and in training the next trainers on how to use these modules. To demonstrate technical feasibility and commercial viability of these systems, GEFTF resources will be used to provide technical assistance in the design of the pilot projects. In addition, a performance based grant not exceeding 20% of the capital costs will be provided to the demonstration projects for them to overcome challenges with access to capital. The GEF resources will be used either as investment capital or as guarantee to mobilize additional resources from financing institutions. The guarantee scheme will be reinforced by the already existent mechanism with FUNAE, which will assist promoters of pilot projects in mobilizing their co-financing resources. The business models developed within each pilot will be documented and disseminated for further replication. GEF resources will also be used to catalyse the broader scaling up investments through contributing to the design of appropriate financing schemes for integrated RE systems. In sum, GEFTF will be utilized to catalyse a shift from the baseline scenario and projects towards an alternative scenario with more private sector led investments on integrated renewable energy systems for productive activities in rural areas. In the long-term, it is envisaged that the experiences from this project will also be influential in scaling up general off-grid electrification initiatives undertaken by the country.

1.5 Global environmental benefits

The project intervention will contribute to climate change mitigation by using solar resources and biomass resources available in the form of agriculture residues and livestock manure to replace diesel-fueled systems, used in a business as usual model. The alternative with renewables will contribute to reduce GHG emissions, including CO2 emissions from the burning of fossil fuels, and methane emissions from anaerobic biodegradation of unused agriculture residues and livestock manure that would otherwise be burned or dumped. The project is also a contribution to climate change adaptation with reduction of unsustainable use of forest resources that would lead primarily to deforestation and negative impacts on biodiversity. It is envisaged, using the GEF GHG Accounting methodology with a 15 replication factor, that a sum of 4,435,073 tCO2e (direct and indirect) emissions will be reduced with the operation of RE systems as alternative to diesel fueled systems. A more detailed calculation of GHG emissions reduction will be conducted at PPG stage. Other local environmental benefits of the project, including reduction of the dumping of organic waste in local water bodies, and enhancement of soil fertility by the use of the digestate from the digester as fertilizer, will be quantified at PPG phase.

1.6 Innovation, sustainability and potential for replication and scaling up

Innovation: The main innovation under this project is the promotion of a private sector driven process for introduction of integrated renewable energy systems for productive uses in rural areas of the country. By introducing renewable energy technologies in farms and agro-processing industries accross the country, the project initiates a process of continued technology innovation for these industries. The project's second innovation lays on its ability to propose that access to energy with decentralized solutions can be cost effective, if based on a business model promoting long term south-south cooperation for technology transfer and availability of operation and maintenance services. The approach proposed will also acknowledge the need for involving local stakeholders, including finance institutions, technology suppliers, services providers, to learn from each other's needs and requirements in order to agree on an effective financing mechanism that will continue to support replication beyond the implementation period. The execution of the components proposed under this project will create a framework for farmers and agro-processing industries to push for continued technology innovation in their operations.

Sustainability: The project sustainability hinges on its intervention strategy that focuses on both policy and regulatory schemes, as well as, support to pilot projects on the ground. By working on the policy and regulatory framework, the project will create and environment that will be conducive to private sector investments in renewable energy systems in rural areas well beyond its implementation period. Under its capacity building component, the project will work with an existent university, Eduardo Mondlane, to build capacity for development of training programmes on renewable energy. In addition, the project will help in integrating renewable energy into the university's curriculum. These two strategies will ensure that the university will retain such capacity and provide it continuously as part of its regular teaching activities. The pilots for demonstration under this project will be owned by private companies who will have an interest in sustaining the operations of the systems installed. The project will also leverage from the mechanism proposed by FUNAE through its two windows, namely financial support and guarantees, to scale up the pilot installations. Therefore, FUNAE will continue to operate the financial mechanism beyond the project implementation period, resulting in more renewable energy projects being supported. More importantly, the financial mechanism to be established under this project could be expanded in future to meet increased demand. In addition, social sustainability will be strengthened due to the systematic gender mainstreaming throughout the project cycle.

Scaling up: By adopting a market-based approach that initially targets the productive sectors, this project will create critical mass of market activities that will support broader replication of the systems for basic rural electrification in Mozambique, where 68% of the pupolation resides, and potentially across the Southern African region. Besides the pilot projects that will benefits from this project, the proposed financial mechanism will support many more renewable energy projects beyond the life of this project thereby having more impact. Furthermore, lessons from this project could be used for promoting renewable energy systems in urban areas and throughout the country as well.

Market transformation impact: The project will play a catalytic role in accelarating adoption of renewable energy systems in rural areas of Mozambique. The execution of its three components will result in transforming the market for renewable energy systems in rural areas with spill over benefits in other areas and sectors. The work on policy and regulation will change the market environment so as to attract private sector investments. Building capacity of both market players and enablers will effectively create conditions for the renewable energy market to operate adequately. The demonstration will show the role of renewable energy systems for productive uses, thereby creating confidence amongst all market players. Once confident about these systems, investors can then build on the proposed financing mechanism to access funding for their own projects.

2. Stakeholders. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes ☒ /no☐) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation.

UNIDO will implement this project with MITADER, FUNAB and FUNAE as principal execution partners responsible for, among others, coordination and mobilization of other national stakeholders to involve in the project. The model of promoting farms and agro-processing industries as energy producers and consumers proposed in this project will involve various stakeholders. In the areas where the pilots will be implemented, the project will take active steps to engage local communities. In particular, the design of the project will ensure that these communities will derive direct benefits from the pilots. Therefore, the project planning process will involve and consult the local communities, NGOs, and local leadership structures. In particular, the project will link up NGOs that are already active in the energy field so as to leverage on their experiences and networks. Given the relatively small size of the pilots to be supported under this project, it is not foreseen a displacement of local communities. However, in the case that displacement becomes necessary, appropriate national rules and regulations for compensation will be applied

and factored into the project planning and financing. In addition, it is not foreseen that the pilot projects will be implemented in areas where there are indigenous people as the focus is on existing industries and farms. However should that not be the case, the project will take active steps to ensure the full participation of indigenous people in all project components. In fact, under previous projects, UNIDO has worked with indigenous people where training programmes were conducted in a local language. The project will also actively promote the engagement of women and youth as service providers and beneficiaries of the pilots. In all components of this project, gender mainstreaming will be vigorously pursued to ensure at least 50% of the beneficiaries and service providers will be youth and women. The project will also actively engage farmers and industry associations in all components so as to ensure the lessons from the project reaches out to all potential interested parties. Stakeholders will also include gender experts, local and international associations and/ or agencies promoting gender equality and women's empowerment, in particular those focusing on energy needs and entrepreneurship.

3. Gender Considerations. Are gender considerations taken into account? (yes ☒ /no☐). If yes, briefly describe how gender considerations will be mainstreamed into project preparation, taken into account the differences, needs, roles and priorities of men and women.

UNIDO recognizes that gender equality and the empowerment of women have a significant positive impact on sustained economic growth and inclusive industrial development, which are key drivers for poverty alleviation and social progress. Commitment of UNIDO towards gender equality and women's empowerment is demonstrated in its policy on Gender Equality and the Empowerment of Women (2015), which provides overall guidelines for establishing a gender mainstreaming strategy, UNIDO has also developed an operational energy-gender guide to support gender mainstreaming within its sustainable energy initiatives.

The design of this project is premised on the recognition that energy interventions are expected to impact populations and are, therefore, not gender-neutral[2]. In fact, due to diverging needs and rights regarding energy consumption and production, women and men are expected to be affected differently by the project (in terms of their rights, needs, roles, opportunities, etc.) and hence, the need for differentiated interventions throughout this project. The project aims to demonstrate good practices in mainstreaming gender aspects into promoting market-based dissemination of integrated renewable energy systems for productive activities in rural areas of Mozambique, wherever possible and to avoid negative impacts on women or men due to their gender, ethnicity, social status or age. Consequently, the whole project cycle will systematically include the gender dimension.

To mainstream gender into this project, a baseline anlaysis is planned during PPG phase to identify entry points for defining gender-aware project outcomes, outputs as well as related activities. The gender analysis during the preparatory phase will identify the specific circumstances of women and youth, and will provide a basis on how the priorities and needs of these groups will be integrated in the implementation of the project. During the project development (PPG) phase, UNIDO will ensure that the relevant gender dimensions are considered, and the project log-frame will be developed to reflect key gender dimensions of the respective outputs, activities, indicators and targets. Guiding principle of the project will be to ensure that both women and men are provided equal opportunities to access, participate in, and benefit from the project, without compromising the technical quality of envisaged results.

In practical terms,

- at the onset, it is envisaged that all activities under this project will target to have at least 20% beneficiaries or service providers being women and youth;
- under its first component, the project will ensure that the regulations developed are gender sensitive;

[2] ENERGIA "Turning Information into Empowerment: Strengthening Gender and Energy Networking in Africa. Leusden, 2008; Joy Clancy "Later Developers: Gender Mainstreaming in the Energy Sector", 2009

- efforts will be made to promote participation of women in training activities, both at managerial and technical levels. For the training component, the project targets at least 20% of those to be trained will be women. Given the fact that trainings to be provided within this project will be of a technical nature, the project will also provide bridging courses so that women who may not have the requisite technical background will have an intermediary training. In addition, the project will provide training in local languages to encourage the participation of women, who may be illiterate.
- gender-sensitive recruitment will be practiced at all levels where possible, especially in selection of project staff. Gender responsive TORs will be used to mainstream gender in the activities of consultants and experts. In cases where the project does not have direct influence, gender-sensitive recruitment will be encouraged. Furthermore, whenever possible existing staff will be trained and their awareness raised regarding gender issues.
- all decision-making processes will consider gender dimensions. At project management level, Project Steering Committee meetings will invite observers to ensure that gender dimensions are fairly taken into account. Also, at the level of project activity implementation, efforts will be made to consult with stakeholders focusing on gender equality and women's empowerment issues. This is especially relevant in policy review and formulation.
- when data-collection or assessments are conducted as part of the project implementation, gender dimensions will be considered. This can include sex-disaggregated data collection, performing gender analysis as part of ESIAs, etc. For instance, during preparatory phase, it is planned to conduct a baseline assessment of the situation in pilot sites based on gender disaggregated indicators. The findings will contribute to design or adjust KPIs and capacity building modules with the necessary orientation taking into account differences of needs between women and men populations in target areas.

In sum, the project design will acknowledge the differences of energy access impacts considering distribution of economic activities and social roles between women and men in rural areas of Mozambique, in line with GEF 6 Programming Strategy.

4. Risks

Climate change risk: Drought periods, frequent in Mozambique since 1980s, may affect the availability of biomass resources, both agriculture residues and livestock manure. Rating: Low. The design of the project will include climate risk analysis and will integrate mitigation strategies. During project preparation phase, an assessment of the availability of those resources based on different scenarios will be carried out and, whenever necessary, possible alternatives will be identified.

Institutional risk: Lack of Government commitment to integrate findings, at local level, of renewable energy technologies use in rural areas into national Strategy(ies) on Energy. Rating: Low. The project objectives and planning are in line with national policies and objectives for addressing existing energy access and security challenges at an affordable cost and in a sustainable manner. The project has already identified partner public institutions, and will ensure that their representatives provide full support throughout the project implementation and beyond.

Technology risk: Technologies promoted may not be mature enough for electricity and heat self-generation in rural areas. Here, the concept of maturity is understood in two aspects: (1) full integration of the technologies into the existent environment, and (2) availability of supporting services for operation and maintenance. Rating: Low. The project will actively seek to promote systems that have been promoted by UNIDO in similar environments and countries such as Tanzania and Rwanda. The South-South cooperation model will lower this risk by making available technologies which were tested and validated in similar environments. Concerning operation and maintenance services, the project will provide appropriate training programmes and will work with existing institutions to provide the requisite skills. In addition, under component 3, operation and maintenance support will be integrated into the financial mechanism to mitigate any potential technology risk.

Market risk: The systems investment to be sustainable is high and prevent owners to afford them, particularly those with smallest farms and agro-food processing industries. Rating: Low. The project builds on creating and expanding market relationships between technology users in Mozambique and external suppliers, hence involving potential updates on technology features to meet market requirements through an optimum combination of design, capacity, production cost, and therefore sale price. The business model to be developed will integrate the willingness and ability to pay of target beneficiaries.

Sustainability risk: Demonstration systems do not survive to end of the UNIDO/GEF project implementation. Rating: Low. The capacity building component will create a critical mass of skilled personnel to provide operation and maintenance services to the pilot systems. For the scaling-up phase, the financing mechanism to be established will be linked to operation and maintenance services providers who will support the projects. In addition, the project will work with industry associations to ensure that lessons and experiences from the pilots are documented and disseminated widely.

Diesel price variability: The decision to invest in integrated RE systems by industries will be based on cost savings opportunity. In the recent past, the price of oil has continued to fall and some projections foresee a barel below 50US$. As such, some of the industries and farmers may no longer be interested to invest in renewable energy systems when the price of oil, and therefore diesel, decreases significantly. Rating: Medium. The project will ensure that the criteria to show RE systems attractiveness do not only focus on cost savings, but will include other aspects such as energy independence and reliability of supply, as well as, local and global environmental benefits.

Social and Gender Risk: There could be a resistance against, or lack of interest in the project activities from stakeholders, especially with regard to the active promotion of gender equality; There could be also low participation of female candidates to deliver support services due to lack of interest, inadequate project activity or not enough candidates to engage in planned activities. Rating: Low. To mitigate this risk the project will pursue a thorough gender responsive communication and will ensure stakeholders involvement at all levels, with special regard to involving women and men, as well as, CSOs and NGOs promoting GEEW, and a gender expert. The intervention of a gender expert at PPG phase shall assist in identification of social and gender related risks. Mitigation measures will promote gender equality, create a culture of mutual acceptance, and maximize the potential contribution of the project to improving gender mainstreaming in the energy field.

5. Coordination

UNIDO is currently implementing several projects in Mozambique that have a synergetic relationship with this project. To begin with, UNIDO established the Mozambique National Cleaner Production Center (MNCPC), whose activities seek to promote sustainable production and consumption in industry. This project will benefit from the networks and the activities of the MNCPC. In addition, capacity building activities under this project will build on already exiting activities of the MNCPC. The work on policy and regulatory framework will be linked to similar work being done by the MNCPC. UNIDO is also implementing a project on Youth and Women employment which build entrepreneurship skills amongst women and youth. Capacity building activities under the project will build on the network and tools already developed within this UNIDO's project. Accordingly, the project will build synergies with these two projects in the execution of all its activities and will draw technical expertise and experience that will be of value to achieving its results. In addition, the project will be coordinated with related activities in UNIDO under Environment Branch, Agri-business Development Branch, and Business Investment and Technology Branch. Outside UNIDO, this project will be coordinated with other national initiatives that seek to promote the dissemination of renewable energy technologies. For instance, under the Ministry of Science and Techonology, the Boane Agrarian Institute is currently testing locally made biogas systems. The project will collaborate with this Institute, with a view to promote the dissemination of market ready digesters. The institute will also be involved in

the training programmes under this project so as to ensure the know-how and skills about this technology are disseminated across the country.

6. Consistency with National Priorities. Is the project consistent with the National strategies and plans or reports and assessements under relevant conventions? (yes ☒ /no☐). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.

Energy is at the core of Mozambique's national priorities. In particular, the Agenda 2025 identifies the lack of access to energy as one of the principal challenges to the attainment of the development objectives of the country. It also recognizes the provision of electricity to industries in remote areas as key in opening up the country to more investments. The recent policy Government of Mozambique policy framework i.e. Five-Year Plan of 2015-2019 emphasizes the importance of increased access to energy to support economic transformation as well as the linkages between environment and land and rural development issues. In its Country Strategy Paper[3], Mozambique recognizes its comparative advantages in agriculture and agro-food processing, and the need to provide sustainable energy to those industries so as to bring opportunity for improving SMEs competitiveness and promote economic cooperation, FDI and technology transfer. The project is fully consistent with The Mozambique National Adaptation Programme of Action (Mz-NAPA)[4]. The second Action of the Plan for strengthening capacities of agricultural producers to cope with climate change proposes the construction of irrigation systems to reduce the loss of crops during the dry season. Mozambique's National Communication to the UNFCCC prioritises the promotion of renewable energy technologies for both climate change mitigation and adaptation, as well as, poverty reduction. In particular the report outlines that climate change will exacerbate already existing vulnerabilities, and focus on renewable energy technologies will support both mitigation and adaptation efforts. The project is consistent with the National Energy Strategy in which the Government highlights its commitment to promoting sustainable development through the adoption of renewable and environmentally friendly energy technologies throughout the country. The recently developed Sustainable Energy for All Action plan and investment strategy stresses the need for business model approach to promote the dissemination of decentralized renewable energy systems. Rural energy applications are part of the country's poverty reduction action plan (PARP). More specifically, the recent Renewable Energy Readiness Assessment[5] identifies that, for rural areas, the focus has been on providing renewable energy for social services. Given the limitation of funding, the Government is now keen to develop a more private sector led approach to mobilise further funding and ensure sustainability.

The project can find synergies and complements with the following GEF funded initiatives:

- The Energy Reform and Access Project completed in 2011, which had, among other objectives, to accelerate in a commercially viable manner the use of electricity for economic growth and improved quality of life in underserved areas through promotion of renewable energy;
- The on-going project Preparation of the National Adaptation Programme of Action (NAPA) for Mozambique, as a contribution to attainment of Objective 1: identification of priority activities that would address the vulnerable situation of Mozambique, with emphasis on highly vulnerable communities, systems and sectors;
- The project Strengthening Capacities of Agricultural Producers to Cope with Climate Change for Increased Food Security through the Farmers Field School Approach, at CEO Endorsement phase, to be executed by

[3] http://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Mozambique%20-%202011-15%20CSP.pdf
[4] National Adaptation Programme of Action, 2007, available at http://unfccc.int/resource/docs/napa/moz01.pdf
[5] http://www.irena.org/DocumentDownloads/Publications/IRENA%20Mozambique%20RRA.pdf

the Ministry of Agriculture and Food security (MASA) and the Ministry of Land, Environment and Rural Development (MITADER), one of the executing agency identified for this project

- The 4th Operational Phase of the GEF Small Grants Programme (RAF2) which promotes Global environmental benefits in biodiveristy and climate change focal areas secured through community-based initiatives and actions in Mozambique as one of the benefiting countries.

At PPG phase, it will be assessed possible collaboration with the above mentioned initiatives in areas that include provision of technical assistance, development of training modules and identification of experts for execution of the project activities. The project will also elaborate specific activities based on lessons learned from implementation of these initiatives.

7. Knowledge Management

The project will work with various stakeholders, including the newly established SADC Centre for Renewable and Energy Efficiency (SACREEE), to develop different knowledge materials that will be disseminated in Mozambique and other countries of the region. The SADC Renewable Energy and Energy Efficiency Status Report which, first edition will be released this 2015, is meant to reinforce regional and national efforts to strengthen data collection and knowledge sharing by providing a comprehensive regional review of renewable energy and energy efficiency developments, market trends and related activities, evolving policy landscapes, investments in renewable energy, and improvements in energy access. The project will take opportunity of this publication to share knowledge on the various aspects related to renewables use in rural areas of Mozambique.

Specifically, under component 1, the project will work with local institutions like FUNAE, FUNAB and Eduardo Mondlane University to develop a strategy for setting up standards and guidelines. In addition, the capacity building component will develop training manuals that will be readily available for use by different institutions on demand. The project will also assist local training institutions to adapt these training manuals into their institutions curriculum. This way, the knowledge generated from the project will be integrated into the education system. Under component 4 and once stable operating conditions are achieved, results of the pilot projects will be widely disseminated choosing the most appropriate means to reach a large number of actual and potential stakeholders. The targets of this dissemination will be potential users of the technology, and those in the private sector for whom supporting, servicing and maintaining the technology could be a business opportunity, including manufacturers of spare parts, banks, and other financers. Government officials from other provinces and districts who, through policy commitment, could encourage uptake of RE technologies in their districts/provinces will also be targeted.

To assist in the general process of knowledge dissemination, the project will make available a web-based guidance tool/manual and other decision support tools for investment in solar PV and waste-to-energy technology transfer. This will include a decision-making tool to assist farms and industries in selecting the technologies most appropriate to their business. Focus will be on encouraging further business partnerships to replicate installations in other rural areas of Mozambique. All publications developed under this project will comply with GEF and UNIDO communication policies.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this SGP OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Marilia Telma António Manjate	Director of Cooperation	Ministério da Terra, Ambiente e Desenvolvimento Rural	03/12/2015

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation under GEF-6.

Agency Coordinator, Agency name	**Signature**	**Date** *(MM/dd/yyyy)*	**Project Contact Person**	**Telephone**	**Email**
Mr. Philippe R. Scholtès, Managing Director, Programme Development and Technical Cooperation Division - PTC, UNIDO-GEF Focal Point		08-14-2015	Alois Posekufa Mhlanga, Industrial Development Officer, Energy Branch, UNIDO	+431260265169 	a.mhlanga@unido.org

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)

For newly accredited GEF Project Agencies, please download and fill up the required **GEF Project Agency Certification of Ceiling Information Template** to be attached as an annex to the PIF.