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:	Increased energy access for productive use through small hydropower development in rural areas		
Country(ies):	Madagascar	GEF Project ID:[1]	
GEF Agency(ies):	UNIDO	GEF Agency Project ID:	120094
Other Executing Partner(s):	Ministry of Energy (ME); Ministry of Environment and Forestry (MEF); Rural Electrification Development Agency (ADER)	Submission Date: Resubmission Date:	22.02.2013 11.04.2013
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Name of parent program (if applicable):		Agency Fee ($):	271,225

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK[2]:

Focal Area Objectives	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
CCM-3 Renewable Energy: Promote Investments in Renewable Energy Technologies	GEF TF	2,720,000	13,470,000
Project Management Cost	GEF TF	135,000	675,000
Total Project Cost		2,855,000	14,145,000

B. INDICATIVE PROJECT FRAMEWORK

Project Objective: Stimulate the use of small hydropower (SHP) to reduce Greenhouse Gas (GHG) emissions and trigger productive use for income generation, in line with priorities of the Government of Madagascar, as outlined in the National Policy for the Environment, with the overall aim to increase the competitiveness of its SME sector and reduce dependency on fossil fuels.

Project Component	Grant Type[3]	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Cofinancing ($)
1. National Low-Carbon Energy Development Plan as a framework to support the development of renewable energy (RE) - with focus on small hydropower projects (SHP) – developed and agreed	TA	National Low-Carbon Energy Development Plan and secondary legislation for the support of SHP in place	1.1 Policy framework for an increased use of RE for productive use reviewed 1.2 Recommendations to streamline the policy framework towards a greater installation and use of SHP, especially for rural areas, including possible incentive schemes, proposed and adopted as part of the National Low-Carbon Energy Development Plan. 1.3 Standardised reference emission level established	GEF TF	200,000	1,000,000

[1] Project ID number will be assigned by GEFSEC.
[2] Refer to the reference attached on the Focal Area Results Framework when completing Table A.
[3] TA includes capacity building, and research and development.

2. SHP Projects operational	TA	Construction of SHP based mini grid for productive use	2.1 Detailed technical specifications for the target SHPs developed and co-financing secured. 2.2 Training to assess and develop, build and manage, operate and maintain SHP provided to targeted institutions and projects developers	GEF TF	400,000	2,000,000
	INV		2.3 An indicative 1 to 3 SHP plants (in the capacity range of 100 to 1500kW) constructed		1,400,000	7,000,000
3. Sustainable model for replication in place	TA	Appropriate financial measures to create conditions for SHP project replication developed and operational	3.1 A mechanism to facilitate sustained securing of finance set up; appropriate business models between public entities and private and financial sector developed	GEF TF	320,000	1,600,000
4. Targeted capacity strengthening carried out and knowledge management in place	TA	Technical capacity of system designers, project developers on technical and financial viability of SHP, as well as the appropriate use of electricity for productive use, enhanced Local capacity to manufacture SHP strengthened	4.1 SME sectors made aware and strengthened in their management capacity, their competitiveness and the appropriate use of electricity for income generating activities. 4.2 Policy makers, project developers, financing institutions familiarized with the specifics of SHP 4.3 Best practices and lessons learned disseminated, and a platform to promote cooperation between local actors and international centres and technology suppliers created	GEF TF	350,000	1,750,000
5. Monitoring and evaluation and dissemination carried out	TA	Project's progress towards goals confirmed and/or necessary adjustments made Evaluation system for the GHG emission reductions from the project in place	5.1 Mid-term and final evaluation carried out; project's progress assessed, documented and recommended actions formulated; 5.2 GHG emission reductions from the project monitored and evaluated 5.3 Carbon registry for the project in place	GEF TF	50,000	120,000
Subtotal				GEF TF	2,720,000	13,470,000
Project Management Cost (PMC)[4]				GEF TF	135,000	675,000
Total Project Cost				GEF TF	2,855,000	14,145,000

[4] To be calculated as percent of subtotal.

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, ($)

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount ($)
Government	ADER (Rural electrification Development Agency) REF (Rural Electrification Fund)	Cash	1,300,000
		In kind	500,000
Private sector	To be defined	Cash	1,400,000
		In kind	1,000,000
Finance sector	Multi- and bilateral Financing Institutions (e.g. BAD, EC EDF, KfW)	Cash/Loan	7,000,000
Finance sector	Local / regional bank	Loan	2,175,000
Development partner	GIZ	Cash	650,000
GEF Agency	UNIDO	Cash	60,000
GEF Agency	UNIDO	In-kind	60,000
Total Cofinancing			14,145,000

D. INDICATIVE TRUST FUND RESOURCES ($) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY[1]

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount ($) (a)	Agency Fee ($) (b)[2]	Total ($) c=a+b
(select)	(select)	(select)				0
Total Grant Resources						

[1] In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

[2] Indicate fees related to this project.

E. PROJECT PREPARATION GRANT (PPG)[5]

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant:

	Amount Requested ($)	Agency Fee for PPG ($)[6]
• No PPG required.		
• (upto) $50k for projects up to & including $1 million		
• (upto)$100k for projects up to & including $3 million	85,000	8,075
• (upto)$150k for projects up to & including $6 million		
• (upto)$200k for projects up to & including $10 million		
• (upto)$300k for projects above $10 million		

PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF ROJECT ONLY

Trust Fund	GEF Agency	Focal Area	Country Name/ Global	(in $)		
				PPG (a)	**Agency Fee** (b)	**Total** c = a + b
Total PPG Amount						

MFA: Multi-focal area projects; MTF: Multi-Trust Fund projects.

[5] On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

[6] PPG fee percentage follows the percentage of the GEF Project Grant amount requested.

PART II: PROJECT JUSTIFICATION[7]

Project Overview

A.1. Project Description. Briefly describe the project, including ; 1) the global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects, 3) the proposed alternative scenario, with a brief description of expected outcomes and components of the project, 4) incremental cost reasoning and expected contributions from the baseline , the GEFTF, LDCF/SCCF and co-financing; 5) global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF); 6) innovativeness, sustainability and potential for scaling up

1) The global environmental problems, root causes and barriers that need to be addressed; 2) the baseline scenario and any associated baseline projects

Madagascar has a population of about 20 million, with 30% living in urban and the remaining 70% in rural areas (EI 2011). In 2010, 66% of the total population was deemed to be living in poverty (EI 2011). Access to electricity remains low with about 20% of the total population having access to modern energy services. In the rural areas, only about 6% have access to electricity (ISCHEBECK 2008). In 2008 1292 GWh of electricity was produced, with 592 GWh (45.8%) produced from thermal stations (mainly through diesel generators), 700 GWh (54.2%) from (large) hydro electric power stations (UNdata 2011). It is estimated that since 2010 the contribution of hydropower to electricity generation has proportionally decreased from 60% (UNdata 2011) to 45% in early 2012 (Ministry of Energy 2011) because of an increase of production through thermal stations used to meet the increasing demand for electricity. The energy consumption per head is around 0,2 tons oil equivalent, which is one of the lowest in the world, primarily due to the very low access to energy.

Madagascar imports around 675 kt of oil products per annum, even though Madagascar has a considerable land area (587,040 km^2) and heavy annual rainfall (up to 3600 mm) (World Energy 2010) mainly concentrated in the middle, north and north west of the country. Therefore, the potential for hydropower is correspondingly large: estimated at 7,800 MW (Ravina & Bolgar 2009), which is the fifth largest hydro potential in the African continent. Yet just 250 MW is exploited so far which represent only 3% of the potential (ADER). Although in principle several conditions are present to reverse the trend in favor of small hydropower over the fossil-fuel based alternative (i.e. the political awareness, initial steps in incentive schemes), a number of barriers still prevent an increased uptake of small hydropower (SHP) as viable economic solutions. The excess electricity could be fed into the existing grid (when nearby) or alternatively can supply isolated mini grids, and thus constitute the basis for various forms of productive use of electricity, including small industrial applications (Gaul et al. 2010).

In spite of many studies on hydroelectricity potential, the GoM has been forced to resort to thermal production to face the immediate demand for electricity. To meet the demand for electricity, which between 2003 and 2009 has been increasing at an average 7% per year (Ravina & Bolgar 2009), JIRAMA decided to install a large number of diesel based power plants as a short-term intervention to address this demand. Currently there are as many as 100 diesel-based power plants operated by JIRAMA, totaling approximately 282 MW installed capacity and another 20 MW licensed by ADER to various private operators. In addition the JIRAMA imported diesel generators to produce 48 MW of electricity (January 2012). Altogether, these power plants represent the majority of the country's oil imports as well as the major source of CO_2 emissions. Thus, import of diesel generators, while potentially effective in solving the shortage in electricity supply in the short term, increases the energetic dependency (including price volatility, loss of competitiveness etc.), and increases GHG emissions.

Development of the SHP potential could substitute firewood and reduce deforestation. Madagascar's energy balance shows that about 80% of its overall energy consumption is based on biomass (mainly firewood 68%, charcoal 10% and other biomass 2%), 17% on petrol (transport), 2% on electricity (hydropower and diesel power plants) and 1% on coal (Ferguson 2009). This high rate of biomass based

[7] Part II should not be longer than 5 pages.

energy consumption contributes to deforestation, with Madagascar's rainforests being deforested at between 0.53% (Ferguson 2009) and 1.3% (UNEP 2010) yearly. A recent report presented during COP 17 in Durban highlighted that Madagascar is the third country in the world where "Climate Change Impacts and Environment Risks" are most critical, (Maplecroft 2011), and in the case of Madagascar, deforestation is at the core of these risks.

Apart from UNIDO's past work in the field of site identification for small-hydropower plants, especially GIZ has been active in strengthening the institutional capacity of ADER and promoting the private sector in the implementation of projects, albeit with a focus on the small capacity range (80 – 150 kW). The coordination of this GEF project proposal with GIZ's activities is described in section A4.

The major barriers include the lack of affordable financing and limited technical capacity on the ground, as well as a lack of a demonstrated approach for implementation of small hydro projects through a public-private partnership, even though the positive experience with the lower capacity range is promising and will be built upon.

3) Proposed alternative scenario, with a brief description of expected outcomes and components of the project; 4) Incremental cost reasoning and expected contributions from the baseline, the GEFTF, LDCF/SCCF and co-financing;

Without the GEF intervention the "business as usual" scenario is expected to lead to an annual increase of 8% in the use of diesel based power generation. Current barriers relating to the implementation of RE projects in the country imply that financial support from the international donor community are required to help the country in successfully moving away from its reliance on imported fuels.

On October 6, 2011, the GEF Operational Focal Point for Madagascar endorsed UNIDO's project "Increased Energy Access for productive use through small hydropower development in rural areas". The ADER has developed a strategic plan for rural electrification with renewable energy, including hydro power in 22 regions. Furthermore, potential production of hydro power in the country was mapped and a list of 22 sites has been drawn up. The Ministry of Industry is eager to launch Private Public Partnerships to create competitive industrial clusters that could be supplied with hydroelectric energy.

The project will thus aim to tap into Madagascar's hydropower potential in order to supply SMEs with clean and affordable energy, thereby promoting production and development, increase competitiveness and substantially reduce GHG emissions. The present project aims to reverse the trend of thermal use by supporting the large clean and renewable hydroelectricity potential of Madagascar (Energetic Switch). Moreover, this project will contribute to meeting the rural energetic demand.

Therefore, the proposed project supports the energy strategy by demonstrating the commercial viability of investments in small hydropower pilot projects for productive uses. In addition, the project will build and reinforce the national capacities and capabilities to locally produce turbines and to plan, build and manage small SHPs throughout the country. With respect to energy demand, the project will support productive activities and ensure either a replacement of fire wood (as a source of domestic energy) by hydropower that will reduce deforestation or the replacement of diesel-based power generation with a view to reduce GHG emissions. Current industries on the island that may benefit from the project include: rice in Sofia region and vanilla in Sava region. However, a feasibility assessment for conservation of onion, tobacco and fruits (e.g. banana, mango, litchi) processing, crafts and conservation of cash crop products (ADER 2011) will be carried out to identify and refine most likely target industries. Accompanying benefits of the project include strengthened competitiveness and quality of hotels and restaurants with a positive effect on the tourism industry, and electricity can also be used for water-pumping, crop irrigation or refrigeration for food and medicines. With local productive activities mainly carried out by women, the project will also have a positive gender impact.

The planned project activities can be broken down into four components:

COMPONENT 1: POLICY: Strengthen the policy framework to support small hydropower projects (SHP) for productive use

Building on the existing framework, the recent regulatory initiatives and current support instruments by the Ministry of Environment and Forestry, and the Ministry of Energy, this component will strengthen the policy and institutional framework to enhance penetration and scaling up of SHP for applications in industries. The government demonstrated its will to create a legal framework conducive to private public partnerships in the energy sector, and the law to support the initiative "build operate and transfer" is in place. However insecurity about the electricity price as well as cumbersome authorization processes have been hampering a smooth implementation.

The present promotional mechanisms and policies will be analyzed to identify the technical & financial gaps and constraints with regard to tapping more effectively into the industrial potential. From support perspectives, the Rural Electrification Fund subsidy schemes are accessible but can be made more encouraging for industries. This component is critical to the project as policy is the main driving force for development of SHP technology in Madagascar. This component would recommend favorable financial and promotional policies and strategies that will promote increased use of hydro power technologies. The installation and the exploitation of SHP is expected to be taken forward as a public private partnership. This government prefers such approach as a way to guarantee long-term electricity provision of the systems.

In addition the supporting policies for SHP will also be assessed for their applicability for other RE sources and technologies, and according proposals will be prepared as input to the National Low-Carbon Energy Development Plan, the development and agreement of which will be the overarching objective of this component.

COMPONENT 2: TECHNOLOGY DEMONSTRATION: SHP projects in place and operational

This component will consist of preparing detailed technical specifications, performance benchmarks and guidelines for the most relevant technology option for the selected site(s). Industrial sectors with significant potential for adopting SHP applications to meet their process energy requirements in a commercially viable manner will be identified. Then, pilot plants will be realized for the most promising technologies in selected sectors, demonstrating technical and financial viability of the technology through favourable business models. The development of an appropriate business model will be particularly relevant since the lack of a viable economic model has been one of the main issues hindering the increased take-up of SHP technologies in Madagascar. Many past SHP projects in rural areas have failed because of a missing viable economic model. Indeed, the advancement of the grid to rural areas does not systematically lead to better access to electricity for the poor.

Based on ADER's experience and analysis from CNRIT, target projects will be developed in the capacity range between 100kW and 1.5 MW. On this basis, ADER and UNIDO selected 4 potential sites from the ADER portfolio, which fit with the ambition to match the potential supply of small hydro electricity with the potential consumption of the electricity for productive activities. The Alaotra Mangoro region and especially the area around the Alaotra Lake (which is the primary rice production region of Madagascar) seems to be the most promising candidate. This area has been preselected by UNIDO and ADER as a potential site considering its huge potential for productive use: Around 270 entities are concentrated around the Alaotra lake (37 dehusker; 163 shops and groceries; 10 woodwork shops) and consume around 2528 KWh/day.

The current list of potential sites are a 1.5 MW and a 500 kW SHP plant around Alaotra Lake, and two other sites of 300 kW capacity in Sava region (in the vanilla region, towards the north of Madagascar), as a list of project sites that would boost the economic situation of the region sites. From this total of 2.6 MW (1.5+0.5+0.3+0.3) SHP capacity an indicative number of 1-3 will be selected for prioritized construction; the detailed selection will be carried out during PPG phase based on additional feasibility assessments. The investment needs are estimated at 4 MUSD per MW, and slightly higher for the 300 kW systems (i.e. 1.5 MUSD for 300 kW or approx. 5 MUSD / MW). Also grid infrastructure and roads will need to be

constructed. Based on the estimated costs per MW the indicative investment cost for all 4 systems amounts to 11 MUSD [4 MUSD / MW * (1.5+0.5) MW + 5 MUSD / MW * (0.3+0.3)].

The PPG will define the most appropriate pilot demonstration projects (primarily from the list mentioned above but possibly including additional target projects), taking into account the preferred scenario which is to co-locate several sites in the same region with most promising potential for the productive use of the electricity, rather than developing "isolated" sites in different regions. The PPG phase will also develop an allocation mechanism (set of criteria) based on which to grant a certain amount or percentage of the investment cost, and an approach to structure the different sources of finance (ADER, REF, GEF, private sector, financial sector, other donors).

COMPONENT 3: SCALE-UP: Sustainable model for replication in place:

Appropriate mechanisms will be developed and put in place in order to ensure sustained securing of finance, thus creating the necessary conditions for sustainable SHP project replication. It is anticipated that such mechanism will include non-grant instruments such as a revolving fund or required guarantees. The experience of the pilot system will feed into the design of this mechanism. The work is expected to be primarily be in the form of technical assistance, including through support in securing or structuring finance, and the provision of smart subsidies.

In collaboration with a local finance institution a public private partnership will be established according to the model used by the ADER: The ADER will partner in the project with a financial contribution of 30% of the investment. A call for proposals will be published to identify the partner of the private sector willing to invest 70% of the equipment, while the project will secure the capacity building and the legal framework.

COMPONENT 4: CAPACITY BUILDING: Targeted capacity strengthening and knowledge management

This component will enhance the capacity of key players in the target industries by promoting research, networking and international cooperation for promoting technology transfer, information sharing and dissemination of best practices in the area of SHP technology. As part of this component, awareness programs will be carried out amongst industry, policy makers, academicians, industries, financial institutions, entrepreneurs, industry associations through workshops/conferences, training programs, media campaigns etc. This would also solve the existing problem of limited interface between industry and R&D institutions.

The local SHP manufacturing capacity will be enhanced from the current existing yet limited national manufacturing capacity of SHP turbines; so far, Francis and Pelton turbine have been the main type of turbines produced in Madagascar, but has been limited to 30kw capacity. Moreover, Aider and Vitasoa (which are the two mains leaders in turbine manufacture capacity) as well as other potential new players, will need to be strengthened in their technical and managerial capabilities. South-South cooperation with countries with significant experience in turbine production (e.g. China, India, Sri Lanka or Thailand) will be considered; for instance Thai actors are already present in Madagascar in the SHP field. Technical support for UNIDO's SHP projects will be provided by the International Centre for Small Hydropower (ICSHP) at Hangzhou in China, which facilitates the execution of activities in the field of small hydropower and fosters cooperation worldwide. The exact needs at the level of manufacturing capacity and according project activities will be developed during the PPG.

5) Global environmental benefits (GEFTF, NPIF) and adaptation benefits (LDCF/SCCF);

The project will assist the country in delinking its economic growth from an increased use of thermal power plants that otherwise would have to be built to meet the increasing energy demand. Instead the economic growth will be sustained with reduced GHG emissions, encouraging the private sector to adopt low carbon technologies. Thanks to the environmental approach of the SHP implementations on targeted sites, the local population would directly benefit from a preserved environment. The reduction in GHG emissions will be a direct result of replacing fossil fuels use with SHP.

It is estimated that the project through the use of SHP will result in direct GHG emission reductions of approximately 262,800 tCO_2 over the life time of the installations (30 years). Assuming a replication factor of 4 an estimated indirect emissions of 1,000,000 tCO_2 can be avoided. The emission reductions will be estimated in further detail during project preparation phase.

6) Innovativeness, sustainability and potential for scaling up

The innovativeness of the project will lie in the adoption of both public and private finance to build SHPs for productive use in rural areas in Madagascar. The concrete investment projects will educate the financial sector on the emerging role of SHP and provide them with the skills to financially evaluate such proposals in the future.

The training and dissemination activities will increase the awareness and will allow for a sustainable replication in areas across the country. Component 3 will specifically focus on putting in place appropriate measures to create the conditions allowing for SHP project replication, both through a set of financial measures to facilitate a secured financing, and an appropriate business model demonstrated between public entities and private and financial sector.

The sustainability strategy of the project is thus embedded in the creation of an enabling policy framework (component 1), scale-up (component3) and capacity building (component 4), which have the ultimate aim to put Madagascar on track for sustainable replication of SHPs and activiate its full potential. What exactly the activities at policy and capacity level will be, as well as which finance instrument(s) will be most appropriate to guide this shift, is not entirely clear at this stage, and will be discussed with key stakeholders during PPG phase.

A.2. Stakeholders. Identify key stakeholders (including civil society organizations, indigenous people, gender groups, and others as relevant) and describe how they will be engaged in project preparation:

The main partners for the project implementation include:

Organisation	***Role***
Rural electrification development agency **(ADER)**	Support rural development initiatives, will act as the main government partner
The association **ECOMAD** and its technical partner the National Center for Industrial research and Technology **(CNRIT)**	Provide technical support to SHP developers
Ministry of Energy (ME) / Ministry of Environment and Forestry (MEF)	National policy supporting SHP development
Private developers	May build the pilot SHPs
Financing sector such as **WB, AfDB** and local financing institutions such as **NEF** (National Electricity Fund) and **REF** (Rural Electrification Fund)	Cofinancing
Development partners such as **GIZ** and **GRET**	Reinforce the project and maximise the development impact

A.3 Risk. Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable):

The results of an initial risk assessment are presented below:

Risk	Risk level:	Risk Mitigation
Political risk	Medium	After the military coup in Madagascar in 2009 the international community condemned the unconstitutional change and imposed economic and individual sanctions against Madagascar. In September

		2011 a road map paving the way to the organization of free elections was signed by 10 political groupings, and as of 5 October 2011 UN agencies were allowed to resume all activities in the country. Though the process still remains volatile, the way towards the conduction of free elections is deemed credible. The political situation and its potential impact on the project will constantly be monitored.
Investment risk	Medium	The investment risk will be mitigated through bringing in international and private finance. In addition, a public private partnership will be established according to the model used by the ADER: The ADER will partner in the project with a financial contribution of 30% of the investment. A call for proposals will be published to identify the partner of the private sector willing to invest 70% of the equipment, while the project will secure the capacity building and the legal framework.
Technology risk	Low	The technology risk will be mitigated through involvement of technical experts and UNIDO's expertise
Policy risk	Low/medium	The policy risk will be mitigated through strong involvement of lead ministries and governmental organisations throughout the implementation
Private sector risk	Low/medium	The willingness of local SMEs to shift to modern technologies: will be mitigated through continuous involvement of the target SME sectors
Climate Change and Water Supply risks	Medium	Pre-feasibility study to show that hydropower supplies are sufficient to justify investments; Other studies show uncertainty as Malagasy rainfall has not been studied sufficiently (rainfall during wet season supposed to increase by 5-20%; rainfall during dry season to decrease by 10-30% though unclear whether referring to Madagascar or areas affected by ENSO in general (WWF n.d.) Rainfall in the north is expected to increase but to occur as more sporadic and intense periods (USAID 2008)

A.4. Coordination. Outline the coordination with other relevant GEF financed and other initiatives:

As for SHP technology, there are currently two local turbine manufacturers, "AIDER " and "Vitasoa", which produce Banki and Pelton turbines with a capacity up to 30 kW. Larger turbines and all generators need to be imported.

A number of projects in the field of SHP are currently ongoing, notably by GIZ and GRET, as well as by the World Bank:

1. GIZ

GIZ has been running the project "**PERER**", which consists of the following components:

Institutional strengthening of ADER:

Since 2009, GIZ has been working on strengthening the capacities of ADER in the field of project proposal formulation for hydro-power stations. The result thus far is a data base with:

- A rough mapping of potential hydro sites
- Some preliminary studies including power supply and consumption potentials
- Some detailed feasibility studies
- Some feasibility studies including an economic and financial business plan in order to convince investors
- ADER has now the capacity to identify new sites to increase its pipelines of project proposals.

Promoting the private sector and supporting the implementation of projects

Thus far three projects have been implemented, i.e. each between 80 to 120 KW capacity, thus enabling the private sector to gain initial experience in partnering with ADER and GIZ; overall the PPP model approach has been positive. It is exactly based on this initial positive experience that ADER has asked UNIDO to support the implementation of larger projects, i.e. in the range of 100 to 1000 kW.

Both UNIDO and GIZ have identified hydropower sites in the capacity range of 100 to 1000 kW (possibly up to 2000 kW), the most suitable of which will be implemented as part of the GEF project. GIZ is considering a USD 650,000 (EUR 500,000) contribution to the development of some of these hydropower site(s) provided other partners such as UNIDO can join the effort. It is envisaged that GIZ will finance the detailed project formulation, and UNIDO will support the private sector development, through policy streamlining, capacity building, and the development and activation of the replication strategy). This will be aligned in further detail during ongoing consultations and the PPG phase.

For the actual investment part (hardware) it is anticipated that private sector, financing institutions (e.g. AfDB), other donors (e.g. EU) and ADER itself shall contribute to the hardware investment. UNIDO will guide and support the securing of this cofinancing.

GIZ has been very open and positive to partner with UNIDO and it should be clear from the above that both interventions could be complementary and mutually reinforce and increase the development objective. The GIZ project is expected to start in 2014, a timeline which can smoothly be brought in line with the activities under this planned GEF project.

2. GRET

The GRET, (a French NGO) developed a project called "rHYvière" which plans to build SHP for rural electrification with a targeted capacity production up to 50 kW. Moreover "rHYviere" aims to strengthen SHP turbine manufacturing capacities for the lower capacity range (up to 30kW).

Thus far this project has carried out the following activities:

- Setting up technical norms to define rural energy networks
- Assistance to putting in place the administrative procedure within ADER to assess the best private sector partner/investor;
- Establishment of the observatory of renewable energy potential and supply in the country;
- Establishment of necessary steps for building of small hydro power
- Training of a consultancy on the design of detailed project;
- Development of software to manage electricity supply

Discussions between UNIDO and the mentioned actors are ongoing in order to maximize potential synergies between the different initiatives.

3. World Bank (WB)

An initiative called "Projet Pôles Intégrés de Croissance" (PIC) is being financed by the World Bank with a view to, in a first phase, install a 4 MW thermal plant at Nosy-Be and, in a second phase, to assist an Independent Power Producer (IPP) in providing electricity based on (a mix of) renewable energy sources, with 2-3 hydropower sites currently topping the list. The second phase will be initiated in 2013, with installation planned by 2015. WB will finance the feasibility study and due diligence. The African Development Bank (AfDB), through its Sustainable Energy Fund for Africa (SEFA), is expected to join this project.

The envisaged power capacities of PIC are significantly larger than the focus of the UNIDO-GEF project, yet the possibility to obtain cofinancing will be investigated further.

Description of the consistency of the project with:

B.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSAs, NIPs, PRSPs, NPFE, Biennial Update Reports, etc.:

The proposed project supports the **National Policy for the Environment** (NPE) adopted in 2010. As electricity is one of the key factors for development, the NPE encourages the use of clean energy through the development of locally available energy resources to increase access to electricity. In addition the National Climate Change Policy prioritizes the need to implement mitigation measures that contribute to the economic development of the country. The proposed project is being considered by the Government of Madagascar (GoM) as one of the major actions contributing to the national Climate Change Policy.

Second National Communication under the UNFCCC (2011): The major contributor to GHG emissions is the energy sector (i.e. through the use of fossil fuels for the production of electricity and heat), accounting for 34.1% of the emissions. The transport sector ranks second, with 32.1%. Consequently efforts to produce electricity from small hydropower can greatly contribute to the reduction of GHG emissions, as well as increase the energy security and reduce the cost of energy to the national economy.

The new government has retained most of the Malagasy Energy Policy established in 2004, which ties in to the larger macro-economic policy to obtain a substantial of economic growth and consequently reduce poverty. The objective for the energy sector in this respect is to ensure a secured supply of reliable and affordable energy, as per the following three guiding principles:

Economic: to rationalize the conditions of provision, production, distribution and consumption of energy;
Social: to allow the population, both in rural and urban areas, to have access to a minimum of energy services; thus far two programmes have been launched to implement this policy component, i.e. one to increase the access to electricity and one on the rationalization of the domestic use of energy;
Environmental: to respect the natural balance of ecosystems and to encourage a rational and sustainable management of forests and their role in the provision of energy (i.e. biomass);

Laws in favor of renewable energy implementation

Article 01.01.04 "Companies investing in the production and supply of renewable energy can benefit from a tax reduction equal to the tax corresponding to 50% of the investment. The tax benefit applied under a given tax year may not exceed 50% of the tax actually due. The remainder can be carried forward as a reduction in taxes due for the following year(s)."

N° 0210 001 Section III 8410-11-00: Customs Duties and VAT harmonization and exemption for import of renewable energy technologies (capacity ≤ 10 MW): In the past the electricity market in Madagascar was dominated through the monopoly of the integrated national utility company JIRAMA. A World Bank initiative dating back to 1995, together with several donors, have assisted the GoM to unbundle and ultimately privatize the activities of JIRAMA and at the same time reform the energy sector. With the adoption of the new **law n° 98-032** on energy in 1999 and following decrees the sector had been formally liberalized. The objectives of the energy sector reform are the following:

- Development of independent power producers (IPPs)
- Promotion of competition and private-public-partnerships (PPPs)
- Restructuring of the national power utility JIRAMA
- Providing 10% of the rural population with reliable and sustainable electricity supply by 2012
- Increasing the share of renewable energies (excluding traditional biomass) to at least 3% of the total energy consumption by 2012

Even though the reform process has partly failed with regards to the restructuring of JIRAMA, there are now about 20 private operators active in rural electrification. The reform and restructuring was accompanied by the creation of two new regulatory entities, i.e. the Electricity Regulation Office (ORE) and the Rural Electrification Development Agency (ADER) (for description of their respective role see section B5).

Technology Needs Assessment (TNA) for Madagascar

The TNA report (2007) covered nine sectors (agriculture and cattle farming, health, water resources, coastal zones, forestry, construction, energy, industry and transport) and identified a number of cross-sectoral barriers, including:

- Lack of education, information, communication and awareness raising;
- Lack of available financing
- Weak purchasing power of the local population
- Insufficient skilled and qualified human resources
- Non-existence of research and development programmes in terms of modern and new technologies

As for the energy sector the increasing use of fossil-based energy plants to address rising demand is recognized as a problem both in terms of rising GHG emissions, increasing cost for industry and households, and decreasing energy security. The Ministry of Energy has therefore been charged with the promotion of renewable energy technologies (RETs), yet the high initial cost for these technologies is singled out as the critical barrier. It is therefore suggested to increase the local manufacturing capacity for the most relevant technologies.

The proposed project is synchronized with the analysis and outcomes of the TNA report and will contribute to addressing key barriers, including the development of the National Low-Carbon Energy Development Plan, the promotion of RETs through improved promotional measures and financing instruments, strengthening local capacities and increase communication and awareness levels.

B.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities:

This project contributes to GEF in the focal area of climate change, specifically CCM-SP 3: "Promote investment in renewable energy technologies" – through streamlining the policy and regulatory framework, developing the capacities to implement SHP in the country, demonstrate the economic viability of the SHP for productive activities and develop local manufacturing capacity and industry.

B.3 The GEF Agency's comparative advantage for implementing this project:

Micro and small hydropower schemes have little or no environmental impact and can provide a range of valuable energy services especially in rural areas. In regions with hydropower potential, this form of renewable energy is the most cost-effective opportunity to energize on/off-grid areas. Micro and small hydropower can be applied to satisfy low to medium voltage electric needs such as lighting or telecommunication and to provide motive power for small industry. UNIDO emphasizes small-scale hydropower (SHP) and is currently implementing projects in China, Ghana, India, Indonesia, Kenya, Mali, Nigeria, Rwanda, Sri Lanka, Uganda, the United Republic of Tanzania and Zambia. For example, in December 2012, a 1 MW SHP in rural Zambia was commissioned, which will supply a mini-grid to benefit over 25,000 people.

Within UNIDO, potential synergies with relevant programmes, such as the Environmental Management, Business, Investment and Technology, Trade Capacity-Building and Agri-Business Development, will be established. UNIDO gives special attention to mainstream gender equality throughout its technical cooperation project portfolio, and with local productive activities in Madagascar mainly carried out by women, this is expected to prove a very important aspect of this project.

The GEF Council document GEF/C.31/5 gives UNIDO comparative advantage for such projects. UNIDO's mandate is to assist industries in enhancing their productivity and competitiveness. UNIDO is especially well placed to implement this project because of its experience and expertise in renewable energy projects, and its history of cooperation with key stakeholders in the field of SHP. South-south cooperation has also been supported through UNIDO's technology centres and partner institutions.

Technical support for UNIDO's SHP projects is provided by the International Centre for Small Hydropower (ICSHP) at Hangzhou in China, which facilitates the execution of activities in the field of small hydropower and fosters cooperation worldwide. UNIDO's Regional SHP Centres in Trivendrum (India) and Abuja (Nigeria) provide technical assistance at the regional level.

UNIDO has a country office in Antananarivo which has been instrumental in the preparation of the project and gather support from key government and other stakeholders. It is clear that this office will be crucial in the further preparation and implementation of the project.

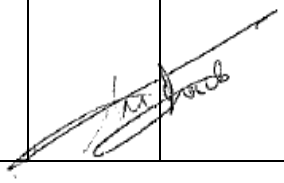
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

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 OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE (MM/DD/YYYY)
MRS RALALAHARISOA CHRISTINE EDMEE	GENERAL DIRECTOR FOR ENVIRONMENT AND GEF OPERATIONAL FOCAL POINT	MINISTRY OF ENVIRONMENT AND FORESTRY	10/06/2011

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.

AGENCY COORDINATOR, AGENCY NAME	SIGNATURE	DATE (MM/DD/YYYY)	PROJECT CONTACT PERSON	TELEPHONE	EMAIL ADDRESS
Philippe Scholtès Officer-in-Charge Programme Development and Technical Cooperation Division		11.04.2013	Mr. Mark Draeck, Industrial Development Officer, Rural and Renewable Energy Unit, Climate Change Branch UNIDO	+43 (1) 26026-5317 	m.draeck@unido.org