**United Nations Development Programme**

 **Country: Republic of Mauritius**

**UNDP-GEF Full Size Project (FSP)**

**PROJECT DOCUMENT**

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| **Project Title:** Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands. |
| **Country Programme (2009-2011):** To improve environmental protection by accessing and utilising environmental funds, carbon markets, payment for ecosystem services (PES) and other financing mechanisms.**CP Outcome(s):** * National capacities of key institutions to implement global environmental commitments at national and regional levels through integration of environmental concerns in national policies and programmes improved;
* Enabling policy and institutional framework for photovoltaic technology projects developed.

**Executing Agency/Implementing Partner:** Ministry of Energy and Public Utilities**Implementing Entity/Responsible Partners:** Ministry of Energy and Public Utilities. |
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**Brief Description:** The objective of this project is to accelerate sustainable on-grid PV electricity generation in Mauritius by leveraging $ 17.5 million in private sector investment over its four-year implementation period. This, in turn, is expected to generate direct global benefits of almost 13,295 tons of CO2 over the same period and almost 5,318 tons CO2/yr thereafter in avoided greenhouse gas (GHG) emissions. The project will do this by introducing a conducive regulatory framework that will facilitate private sector participation in supplying the national grid with PV-generated electricity at market-determined prices and assist the Government in closing private sector funded PV investments. It is envisaged that this project will enable Mauritius to meet (and maybe even surpass) its target of 2% of electricity generation from on-grid PV by 2025, as established in its “Long Term Energy Strategy 2009-2025”.

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## SIGNATURE PAGE

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Total resources required $ 20,993,000

Total allocated resources:

* Regular $ 50,000
* Other:
* GEF $ 2,005,000
* Govt. (MID Fund) $ 1,080,000
* Govt. $ 80,000
* Private sector $ 17,500,000

In-kind contribution:

Govt. (MEPU) $ 278,000

Programme Period: 2009-2011

Atlas Award ID: 00060842

Project ID: 00076772

PIMS # 4333

Start date: Oct. 2011

End Date Sept 2015

Management Arrangements NEX

PAC Meeting Date October 2011

***Agreed by Government****:* **Financial Secretary, Ministry of Finance & Economic Development, GEF OFP**

**Mr A M Mansoor**

NAME SIGNATURE Date/Month/Year

***Agreed by Executing Entity/Implementing Partner:* Permanent Secretary, Ministry of Energy and Public Utilities**

**Mrs N Nababsing**

NAME SIGNATURE Date/Month/Year

***Agreed by UNDP:* Officer in Charge**

**Mrs A Kannan**

NAME SIGNATURE Date/Month/Year

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## Acronyms

APR Annual Performance Report

AWP Annual Work Plan

CEB Central Electricity Board

CEO Chief Executive Officer

EU European Union

FIRR Financial Internal Rate of Return

FIT Feed in Tariff

FSP Full Size Project

GEF Global Environment Facility

GDP Gross Domestic Product

GHG Greenhouse gases

IAs Implementing Agencies

IW Inception workshop

MESD Ministry of Environment and Sustainable Development

MEPU Ministry of Energy and Public Utilities

MFED Ministry of Finance and Economic Development

MID Maurice Ile Durable

M&E Monitoring and Evaluation

MMS Mauritius Meteorological Services

MRs Mauritius Rupees (1 USD ≈ MRs 30)

MSB Mauritius Standards Bureau

NGO Non-governmental Organization

OIDC Outer Islands Development Corporation

PDD Project Design Document

PIF Project Information Form

PIN Project Idea Note

PIR Project Implementation Report

PIU Project implementation unit

PPA Power Purchase Agreement

RCU UNDP/GEF Regional Coordinating Unit in Pretoria

RE Renewable Energy

RRA Rodrigues Regional Assembly

SC Steering Committee

SSDG Small Scale Distributed Generation

Tbd To be determined

ToE Tons of oil equivalent

ToR Terms of reference

UNDP United Nations Development Programme

UNDP-CO United Nations Development Programme Country Office

## Situation Analysis

The Republic of Mauritius is an [island nation](http://en.wikipedia.org/wiki/Island_nation) off the southeast coast of the [African continent](http://en.wikipedia.org/wiki/African_continent) in the southwest Indian Ocean, approximately 900 km (560 mi) east of [Madagascar](http://en.wikipedia.org/wiki/Madagascar). In addition to the island of Mauritius, the Republic includes the islands of [Cargados Carajos](http://en.wikipedia.org/wiki/Cargados_Carajos), [Rodrigues](http://en.wikipedia.org/wiki/Rodrigues) and the [Agalega Islands](http://en.wikipedia.org/wiki/Agalega_Islands) totalling a population of 1,277,853 inhabitants (2009). With a per capita income (purchasing power parity) of US$ 12,400, the Republic of Mauritius is one of the best performing economies in Africa. The main islands of Mauritius and Rodrigues (population of 35,000) are fully connected to the Central Electricity Board electricity grid. Electricity generation in the Republic is highly dependent on fossil fuels. In 2009, 79% of the electricity generation in Mauritius was from fuel oil (diesel and heavy fuel oil), kerosene (used exclusively at the 70 MW Nicolay gas turbine plant) and coal, with the rest of the energy mix provided by hydro (5%) and bagasse (pulpy residue left after the extraction of juice from sugar cane). For the same year, Mauritius Island had a nominal installed capacity of 442 MW with a total energy production of 2,274.1 GWh. Rodrigues, on the other hand, had a nominal installed capacity of 11.5 MW that generated 31.5 GWh during 2009, with 95.9% of the electricity generated derived from fuel oil and the balance of 4.1% was provided by small wind farms. There is no electric utility on the Island of Agalega where the 300 inhabitants are supplied with electrical power using small diesel generators operating in 3 isolated mini-grids under the responsibility of the Outer Islands Development Corporation.

The Government of Mauritius has been advocating a shift from conventional fossil fuels to renewable sources for a long time. The first ever power plant built in Mauritius was a small hydro power station at Réduit in 1906. Since then, despite the construction of 7 additional hydropower stations to date, ranging in installed capacities from 900 kW to 29 MW, the share of fossil fuels has been gradually increasing and has now become the major component in the energy mix for electricity generation. Production of electricity on a large scale from biomass (bagasse) started in the late 1950’s when sugar factories came to the conclusion that rather than using bagasse for just producing process steam (heat) required for sugar crystallisation, they could first use high pressure steam to generate electricity and the resulting low pressure steam as process heat. With the continued increase in the prices of fossil fuels over the years, the Government decided to turn its attention to renewable energy sources (bagasse, hydro, solar and wind) with the adoption of the Bagasse Energy Development Plan in the 1990s. The implementation of this plan allowed for a significant increase in the share of bagasse in the generation of electricity. Consistent with this approach of promoting renewable energy sources, the Government first installed wind turbines for electricity generation in the late 1980s. Unfortunately, those turbines rapidly fell prey to cyclones (hurricanes) and were destroyed. The Government has also renewed its interest in furthering the development of renewable energy and with already 22% of its electricity generation from renewable sources (bagasse and hydro), Mauritius is an international leader in this field. However, most hydro resources have been tapped while the potential increase in the use of bagasse and efficiency improvement in its use for elecctricity generation are being pursued.

In line with the above, the Government adopted an “Outline of the Energy Policy 2007-2025” in April 2007 and followed it up in December 2008 with the adoption of a “Long Term Energy Strategy 2009-2025”. The strategy framework covers all sectors, including electricity generation, transportation, petroleum products, renewable energy and energy efficiency. In the renewable energy sector, the thrust is on the promotion of technologies, with a focus on distributed and decentralised systems, not only to increase access to modern energy services, but also to enhance energy security. In this context, the challenge under the “Long Term Energy Strategy 2009-2025” is now to increase the renewable energy share to 35% over the next fifteen years, by 2025, with the application of technologies to harness the various renewable energy resources that the country is endowed with. To achieve this objective, the Government has determined grid-connected PV for electricity generation as one of the viable componens that would enter into a renewable energy mix. Accordingly, the “Long Term Energy Strategy 2009-2025” establishes targets for PV electricity generation at 1% by 2015, and 2% by 2025. Prior to that, legislation to regulate the electricity sector was introduced in 2005 with the adoption of the Utility Regulatory Authority Act; the Regulatory Authority, as approved under the Act, is expected to be established soon. The Government hired a consultancy firm to formulate a Renewable Energy Master Plan in support of the Long Term Energy Strategy. Preliminary indications (in July 2010) from the consultants formulating the Master Plan are that solar PV has a role to play in the renewable energy mix of the country for on-grid electricity generation and that the forecasted contribution of 2% by 2025, as outlined in the Long Term Energy Strategy, can be met in the presence of a conducive environment for private sector investment. The latest information is that the study leading to the formulation of the RE Master Plan is that the contract of the Consultant ended on February 28, 2011 and was not extended by the MEPU even as the consultancy services have not been completed. In the light of this development, Government is therefore pinning high hopes that the GEF project will assist in moving forward its agenda for on-grid PV.

In addition, the Prime Minister of Mauritius enunciated, in 2007, the Maurice Ile Durable (MID – Mauritius Sustainable Island) vision with one of its objectives to make Mauritius less dependent on fossil fuels through increased utilization of renewable energy and promotion of more efficient use of energy. To date, in the energy sector, the associated MID fund, derived partially from a token levy on all imported sources of energy, has initiated and implemented a vast programme of targeted subsidies for energy efficient lighting, both in the private and public sectors, and household solar water heaters.

The Central Electricity Board, a parastatal body wholly owned by the Government and established in 1952, has responsibility under the Central Electricity Board Act of 25 January 1964 to "prepare and carry out development schemes with the general object of promoting, coordinating and improving the generation, transmission, distribution and sale of electricity"in Mauritius. It presently generates approximately 46% (Chart 1) of the country's total power requirements from its 4 thermal power stations and 9 hydroelectric plants, including the fully automated 350 kW hydropower station at La Nicolière that was recently commissioned; the remaining 54% is purchased from Independent Power Producers using a combination of bagasse and imported coal for generation.



Chart 1: Electricity generation mix in 2009 (Source: CEB Annual Report)

To facilitate small-scale grid electricity generation and in order to “democratise” the electricity sector to enable the participation of Small-scale Independent Power Producers, the Government, with the collaboration of UNDP and the Central Electricity Board, formulated in April 2009 a Grid Code aimed at simplifying regulations governing grid-connected distributed generation. In addition, limited assistance from the project management team working on the GEF funded “Removal of barriers to Energy Efficiency and Energy Conservation in Buildings” project was made available. The Grid Code allows for the integration of renewable energy generating technologies (limited to Hydro, PV and Wind) on the low voltage grid (230/410V). In addition, it puts in place a formal, transparent and non-discriminatory framework for the operation of the power sector. It also defines the rights and obligations of each party as regards to the planning, operation and management of the grid while establishing the standards of performance, safety and reliability required for the operation of the power system. The Grid Code for Small Independent Power Producers (SIPP) generating up to 50 kW is now being implemented. There is yet no Grid Code formulated for capacities higher than 50 kW or for connection to the Medium Voltage grid (6.6 kV and 22 kV) and High Voltage grid (66 kV); however, Power Purchase Agreements (PPA) have been signed with private power producers on a case by case basis. With regard to the accompanying feed-in tariffs for small-scale distributed generation less than 50 kW, these also have been developed and are available to SIPPs.

In summary, Mauritius views the expansion of its electricity generation capacity through the utilisation of renewable energy resources, including grid-connected PV, as central to its longer-term development prospects. The objective is to utilise renewable sources of energy to the maximum extent possible, taking into consideration the grid absorption capacity, thereby reducing its reliance on imported fossil fuel. Hence, this project will promote and accelerate a climate-friendly solution to the energy situation in Mauritius through harnessing its abundant solar radiation for PV-based electricity generation to supply the grid. This is also consistent with Mauritius’ First National Communication to UNFCCC in April 1999that identified solar PV electricity generation as one of the priority options for climate change mitigation (see para 17 below).

Potential for grid-connected PV: According to available data from the Mauritius Meteorological Services (MMS), Mauritius, Rodrigues and Agalega enjoy a favourable solar climate with some 2,000 – 2,250 hours of sunshine annually and an average solar radiation of 5.4 kWh/m2/day. This very good solar potential was instrumental in establishing the rationale for the Government to initiate the solar water heater programme in 2008 under MID. Encouraged by the positive response to date with solar water heaters, the next logical step has been for the Government to make the decision to harness the country’s solar potential for electricity generation from PV. However, to date, the country has had only limited experience with grid-connected PV electricity generation. The CEB has a 2 kW PV grid-connected system operating at its Rose-Hill sub-office since 2008 and has accumulated valuable experience over the past 2 years. Equipment and installation support for this system were procured from Solar Infra, Inc. (USA). In addition, International Financial Services installed a 22.4 kW grid-connected PV system (procured from Schott Solar, Germany) at its offices in Ebène a year ago and Total Mauritius Ltd. very recently installed a 4 kW off-grid PV system (later to be connected to the grid) with the support of Tenesol, Réunion/France at its petrol filling station at Mapou. In the near future, the Mauritius Commercial Bank has plans to commission a 400 kW on-grid PV system (as a component of its going “green” policy) at its new Headquarters presently under construction, again, at Ebène and the University of Mauritius is planning to install a 2.5 kW on-grid PV system (German technology) for research purposes, under an Eco-campus project, at its campus in Réduit.

As per the “Long Term Energy Strategy 2009-2025”, the target for grid-connected PV is approximately 8-10 MW and this could be exceeded if private sector interest can be sustained and the CEB “absorption” capacity is upgraded. However, as indicated in the Government’s request for the PIF, required regulatory, technical and market conditions are absent to enable implementation and operation of grid-connected PV projects. Except for the Grid Code, there is no appropriate regulatory and legal framework for the integration of grid-connected PV into the national power system and no incentives to stimulate investments. There is also a need to upgrade solar radiation data and expand the geographical coverage of instrumentation for accurate measurements to reliably estimate PV capacity and come up with sound design. Recently, there has been growing interest expressed among national investors and partners in developing grid-connected PV as a business opportunity, but prospects for this investment to materialize in full and at agreed time-frames remain low as long as measures to reduce the administrative burdens on the county’s limited regulatory capacities and to approve the required feed-in tariff and incentive schemes are not undertaken. To address these, the Government proposes to expand the mandate of the Ministry of Energy and Public Utilities, working in collaboration with the Board of Investment and Enterprise Mauritius, to support and promote investment in grid-connected PV by providing a full range of information, technical and advisory services to potential investors. For Rodrigues and Agalega, similar targeted support will be provided to the appropriate institutions in order to, likewise, enable them to provide services to potential investors. However, at the present time and as evidenced during the PPG implementation, neither TS, nor the Rodrigues Regional Assembly (RRA) nor the Outer Islands Development Corporation(OIDC)has sufficient capacity to deal with these issues.

**Note:** Henceforth, when reference is made to the Ministry of Energy and Public Utilities, it is implied that reference is also being made to appropriate and corresponding set-ups within RRA and OIDC.

## Strategy

* ***Project rationale and policy conformity***

The project’s goal is to reduce GHG emissions by creating favourable legal, regulatory and market environment and building institutional, administrative and technical capacities to promote the utilisation of the country’s favourable solar radiation potential for PV grid-connected electricity generation. The objective is to assist the Government of Mauritius in addressing the various barriers with a view to achieving at least 2% of grid-connected electricity generation from PV by 2025, as outlined in the “Long Term Energy Strategy 2009-2025”. In the business as usual scenario, the share of PV grid-connected electricity generation within the same time-frame might remain negligible, similar to what it is at the present time. The project will accomplish this by supporting the Government of Mauritius in:

* setting attractive and competitive business terms and conditions for investors, such as incentive-based feed-in tariff agreements, which give developers long-term stability and provide for sufficient investment return
* streamlining and simplifying the administrative procedures for PV-based power producers and assisting the Ministry of Energy and Public Utilities to monitor/enforce regulations;
* upgrading and expanding geographical coverage of solar radiation measurement, technical and cost data of PV systems to make informed investment decisions; and
* facilitating implementation of initial PV grid-connected projects by assisting to put in place a fair and transparent project selection process, supporting subsequent negotiation and signature of licensing and feed-in tariff agreements and providing technical support and oversight throughout the licensing and construction process;
* ***Institutional Structure***

The Ministry of Energy and Public Utilities is the central body responsible for formulating and implementing the Government’s policy in the field of energy. In the specific area of renewable energy, MEPU is entrusted with formulating policy, plans and programmes for the development and utilisation of renewable energy sources and to make proposals for appropriate legislation/regulations that would promote such activities. The Central Electricity Board, responsible for generation (in conjunction with IPPs), transmission, distribution and sale of electricity, operates under the general purview of the Ministry of Energy and Public Utilities (MEPU). MEPU is also entrusted with the formulation and implementation of energy efficiency measures in the country and, as such, is directly responsible for implementing the on-going UNDP-GEF project entitled “Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings”.

* ***Country ownership: country eligibility and country drivenness***

Development of grid-connected PV electricity generation is one of the important mitigations options that the Government of Mauritius has endorsed and wishes to pursue for reducing greenhouse gas emissions in the country. In this connection, Mauritius’ First (Initial) National Communication to UNFCCC submitted in April 1999 highlighted the Government’s requirements “for further investigation, research and analysis, as well as for technical training and transfer of environmentally friendly technologies from developed countries” in order to reduce its greenhouse gas emissions. It identified “hardware and training in photovoltaic solar energy (installation, maintenance, trouble-shooting and repair) as well as other appropriate renewable energy technologies” in a basket of measures aimed at reversing the trend in GHG emissions.

The project is also in line with national priorities as outlined in the National Environmental Policy of 2007 of the then Ministry of Environment and National Development Unit (presently, Ministry of Environment and Sustainable Development), viz.:

* The policy aims at adopting Sustainable Consumption and Production patterns to ensure efficient use of energy and environmental resources and achieve a recycling-based society and to make optimum use of renewable energy sources such as bagasse, ethanol, solar and wind energy, biomass and agricultural wastes.
* For the energy markets, the aim of the policy is to achieve significant energy conservation in all sectors of the economy in the short to medium term and to increase the share of renewable energy in the energy mix.
* The policy aims at minimizing air pollution by the introduction of sectoral air emission standards for power plants, industries and incinerators.
* ***Design principles and strategic considerations***

The project will promote a market-driven approach to encourage the participation of the private sector to supply the electricity grid in Mauritius with electricity generated from PV systems. In line with GEF requirements, “the emphasis will be upon developing policies and regulatory frameworks that provide limited incremental support to strategically important investments”, such as investment in new power generation capacity in Mauritius through on-grid PV, allowing the country to cope with its increased demand for electricity services in an environmentally and climate-friendly way. Further, the “host country willingness to adopt favourable policies and to follow through on the initiatives” was demonstrated by the Government through the adoption of the “Long Term Energy Strategy 2009-2025” which sets a target of generating at least 2% of grid-connected electricity from PV by 2025. The proposed project will assist the Government to realize the objectives of the Strategy, design and adopt regulations and feed-in tariffs which would promote on-grid PV systems.

* ***Project objective, outcomes and outputs/activities***

The project consists of five components as outlined below. It is recognised that on-the-job training will be provided by the recruited consultants, both local and international, during the normal course of their support to the relevant project activities. This will be in addition to Components 2 and 3 that, respectively, deal with capacity development on financial and technical issues required by key Government and Financial institutions. Moreover, the project will seek to achieve gender equality through the empowerment of women to fully participate in all project activities and specifically those related to capacity development under the various components.

**Component 1:** To formulate and introduce a streamlined and comprehensive market-oriented energy policy and legal/regulatory framework to promote PV grid-connected electricity generation in the country. The expected outputs under this component are:

* Comprehensive market-oriented energy policy and streamlined legal/regulatory framework to regulate PV grid-connected electricity generation formulated and operationalised.
* Overarching strategy document on grid-connected PV electricity generation sharpening the focus of the respective roles and responsibilities of MEPU and CEB developed/revised and operationalised.
* Criteria and procedures developed and implemented to govern the introduction of a transparent process in the selection of projects for grid-connected PV systems.
* One-stop shop established to facilitate issuance of permits to developers of grid-connected PV systems. The same one-stop shop will handle all on-grid PV projects, irrespective of installed capacity.
* Review of the SSDG scheme, including financial model, technical specifications towards improving the scheme and moving to the next phase.
* Standardised Power Purchase Agreements formulated and signed with selected developers/investor following transparent procedures and as per financial mechanisms developed under Component 2.

**Component 2:** To develop capacity within MEPU and other key Government/Financial institutions to evaluate the economic and financial viability of grid-connected PV systems, to formulate incentives and sustainable financing mechanisms to attract private sector investors, and to develop possible Carbon finance potential related to future on-grid PV investments outside of the project framework. The expected outputs are:

* Suitable methodology for the economic/financial evaluation of grid-connected PV systems for electricity generation developed. The existing methodology for capacities less than 50 kW is inappropriate for large systems that may involve land lease, construction of MV-HV lines to connect the PV output to the grid and complex financial engineering involving equity, debt and subsidy in the form of FIT.
* Standard financial evaluation methodology for calculating feed-in tariffs to be paid to investors for installed capacities more than 50 kW not covered under the present Grid Code, taking account of the investment recovery and operating costs of project developers. The grid code does not have to be energy-source specific; it is required to determine what “fluctuating” generating capacity the CEB grid can safely handle, be it from solar and/or wind, while maintaining a stable level of supply to consumers.
* Incentives and concessions to be provided to project investors developed and operationalised including the elaboration of an ownership model and investment scheme promote democratic access to power generation through PV technology. The Government requires the tools to evaluate the economic and financial viability of grid-connected PV systems proposed by investors, which will assist it in formulating the appropriate incentives to attract them. A Sustainable financial model and mechanisms will be developed to allow FIT scheme under component 4 to be replenished throughout the duration of the PPAs.
* Capacity developed within financial institutions to appraise PV projects for incorporation into their lending operations, including establishment of dedicated lines of credit at concessionary rates. In addition, the project will develop risk mitigation instruments such as protection afforded to lending institutions in case of default by developers, PV electricity production guarantee (in case power production targets are not met by developers) or insurance package to safeguard developers in case of non-payment for electricity already supplied to the grid. These instruments will be proposed following detailed assessment of risk profile of the pilot projects and discussions among lending institutions, Ministry of Energy and Public Utilities, Ministry of Finance and Economic Development, investors, CEB and finance/insurance entities, with the latter entrusted with responsibility to operationalise and manage the scheme(s). No GEF funds are to be used to capitalize or cover the costs of the guarantees.
* Carbon finance potential related to future on-grid PV investments outside of the project framework developed. The activities under this output would be limited to sensitising project developers in the Carbon Finance potential of their projects, viz. through workshops and seminars to help build their capacity and understanding of the various steps, procedures and methodologies, as well as how to access the necessary expertise. Any transaction-related carbon finance activities will be developed outside of the project framework and be financed by the project developers.

**Note:** In an effort to avoid the virtual compartmentalization of larger systems in sets of systems less than 50 kW, in order to benefit from the higher feed-in tariffs for smaller systems, the CEB will allow only its existing consumers to apply for a Small Scale Distributed Generation (SSDG) project.

**Component 3:** To develop capacity within MEPU/CEB/MMS/Training Institutions, as appropriate, to upgrade existing solar radiation data, expand geographical coverage for solar resource measurement, to formulate technical guidelines and standards for PV system components, to determine grid absorption capacity (this is required in order to maintain the stability and integrity of the grid at all times, in view of the fluctuating nature of the electricity input from PV) and provide oversight, monitoring and certification of PV systems, and provide installation, operation, maintenance and repair services. Proposals for viable delivery models for technology transfer will also be formulated. The expected outputs are:

* Programme formulated for updating existing solar radiation data and expanding geographical coverage for solar resource measurement followed by development and publication of a solar map for Mauritius, Rodrigues and the Outer Islands.
* Guidelines and technical standards for grid-connected PV components/systems developed and operationalised.
* Capacity within MEPU/CEB upgraded to determine grid absorption capacity and provide oversight, monitoring and certification of grid-connected PV systems and possibility of integrating the smart grid concept analyzed
* Local capacity developed/strengthened for installation, operation, maintenance and repair services.
* Proposals for technology transfer opportunities and delivery models formulated and operationalised. The main driver of technology delivery models will be the creation of an enabling environment whereby Public Private Partnership vehicles attracts international sponsors to invest in PV installations. These would consist of south-south cooperation with technology firms operating in Reunion Island, South Africa, and India/China where PV markets are mature at both small scale and utility scale; learning from projects undertaken in Namibia (GEF projects) as a means to understand the dynamics of a developing market; creating capacity in advisory bodies e.g. Board of Investment (BOI) and Enterprise Mauritius which can in turn provide assistance to local firms to acquire licenses from internationally renowned PV technology providers to commercialise PV equipment adapted to the Mauritian context; and establishing joint venture agreements between PV manufacturers and educational/ research institutions in Mauritius for R&D.

**Note:** While the available solar radiation data appear adequate for solar heating purposes, some potential on-grid PV developers have expressed frustration with the absence of accurate data at sites of interest to them. One potential developer even went to the extent of installing a pyranometer a few months ago at the site where it proposes to construct a PV farm, in order to validate extrapolated MMS data. Hence a good resolution solar map will definitely reduce uncertainty and provide more accurate resources to be used by both the government (in the determination of FITs) and private sector for all range of PV projects.

The MMS has 4 pyranometers located at Vacoas, Plaisance, Médine and Rodrigues. However none of these are in working condition at the present time and the required repairs are yet to be undertaken. In order to have a comprehensive and accurate solar map, complete radiation data needs to be gathered across the country. And the proposed installation of 15 pyranometers will cover not only Mauritius, but also Rodrigues and Agalega where the availability of solar radiation data is extremely limited.

**Component 4:** To support the Feed in Tariff scheme developed by funding part of the price differential to be offered to selected promoter connecting to the grid. The expected outputs are:

* FiT mechanism operationalized for IPP-operated PV systems with installed capacities more than 50 kW not covered under the present Grid Code and SSDG FiT scheme.
* Signed PPAs (selected according to transparent procurement procedures and established criteria) and all necessary construction permits, financing packages and other regulations in place for at least 3 MW of new installed PV capacity feeding the grid. The transfer of GEF funds to the FIT fund (and subsequently to the power producers) will be conditional and analogical to the PPAs that are signed with the project sponsors
* 11,662 MWh of electricity generated for the national grid (as a result of the 3 MW capacity brought on-line) by project completion, based on the latest technical assumptions and data recorded at pilot CEB PV installations.

**Component 5:** To formulate an outreach programme and document/disseminate project experience/best practices/lessons learned for replication within the country and in the region. The expected outputs are:

* Plan to implement outreach/promotional activities targeting domestic (and international) investors operationalised.
* MEPU’s capacity to monitor and document project experience strengthened.
* Comprehensive and reliable data/information detailing project experience/best practices and lessons learned available for future initiatives.
* Published materials on project experience/best practices and lessons learned, and project website designed and regularly updated.

During PPG phase, a co-financing letter for a 6MW plant was received. The promoter indicated his intention to install the plant in Mauritius and Rodrigues. It is estimated that the GEF funds allocated to top up the price differential for the Feed in Tariff, will cover 3MW worth of grid connected PV systems for two and a half years (see note below). Table 2 below provides a list of potential sites where the installations might be setup. These constitute a preliminary list that may be subject to change on the basis of on-going studies by the investors and the criteria established as part of the FiT scheme. Actual data recorded at the CEB PV installation demonstrate an average daily output of 4.26 kWh per kW of PV installed and this data is used in computing the annual energy outputs at the various installations in Table 2.

**Note:** The selection of the above mentioned promoter will be subject to a transparent bidding and selection process that will be put in place through the other project components. The 3MW targeted capacity was estimated using the following assumptions:

* Based on preliminary studies, a FIT of about MUR 11/kWh ($0.37/kWh) would enable the payback for utility scale investment in 10 years time.
* The retail price of electricity is about MUR 6/kWh ($0.2/kWh) and hence price differential is $0.17/kWh
* A GEF contribution of $0.11/kWh will represent 65% of the price differential
* Thus it is estimated that the $1.3m GEF allocation will be used to top up FIT to be paid to an investor for 11,765,000kWh.
* Provided the Power Purchase Agreement is signed about 1.5 years after project initiation, the GEF funds will cover part of the FIT for a period of 2.5 years.
* Since the average daily output per kW is 4.26 kWh, the GEF contribution for this component is estimated to be able to cater for an installed capacity of $\frac{11,765,000kWh}{(\frac{4.26kWh}{kW}x 365 x2.5)}≅3000 kW$or 3MW.
* This 3 MW installation will represent a capital investment of $17.5m which is represented as co-financing in the Project Framework.

The exact extent of the use of the GEF funds (percentage contribution per kWh, duration of support etc) will be determined during the project implementation phase. A number of promoters have also shown interest to install utility scale grid PV systems for a combined capacity of 16 MW and cost of $65m. The GEF funding will therefore be used to assist the Government to make up the price differential for the FIT while sustainable financial mechanisms are developed for further installed capacity which might eventually be connected on the grid.

**Table 2: List of potential grid-connected PV projects**

|  |  |  |  |
| --- | --- | --- | --- |
| **Project Site** | **Installed Capacity, kW** | **Estimated Commissioning** **Date** | **Output, kWh/yr** |
| Bel Ombre | 2700 | Jan 2013 | 4,198,230 |
| Rodrigues | 300 | Jan 2013 | 466,470 |

* ***Key indicators, assumptions and risks***

Indicators

Key indicators of the project’s success will include:

* CO2 emissions are reduced by 13,295 tons by the end of project activities.
* Post-project CO2 emissions without replication are reduced by 98,400 tons, under the assumption of a 20-year equipment projected life.
* Indirect post-project CO2 emissions with replication are reduced by over 350,000 tons, again assuming a 20-year equipment projected life and 80% GEF causality factor.
* Capacity developed within MEPU to promote private sector investment and to monitor and enforce regulations in on-grid PV development.
* Lessons learned are documented and distributed to potential investors/stakeholders through publications and project website.

Detailed indicators are provided in the Project Results Framework below.

Assumptions

The assumptions are outlined in the Project Results Framework below.

Risks

The project presents some risks which are discussed in the following Table:

|  |  |  |
| --- | --- | --- |
| Risk | Assessment | Mitigation |
| Regulatory: The putting in place of a fair and transparent project selection process, appropriate financial incentives and licensing regime for the targeted PV installations does not happen or is delayed; the establishment of an independent regulator is not established on a timely basis. | Low | In order to meet the generation target of 2% from PV by 2025, the government fully recognizes and has committed to put in place the necessary regulatory framework for MV and HV systems (including establishment of an independent regulatory authority) and the appropriate financial incentives for private investors (as noted in the co-financing letter of CEB). As evidence of their commitment to this process, the government has already developed a Grid Code for Small Independent Power Producers (SIPP) and accompanying feed-in tariffs and incentive schemes for private SIPPs. These regulations are already publicized and institutionalized. The government recognizes that to meet this target it will be necessary to provide a similar incentive and regulatory framework for PV systems above 50 kW. The project incentivizes the government to follow through on their commitment to establish an independent regulator. |
| Political: There is some risk that the final (adopted) version Renewable Energy Master plan contravene key assumptions or policy directives for this project  | Low | Owing to the cancellation of the RE Masterplan, the guiding document remains the Long Term Energy Strategy 2009-2025. Based on preliminary discussions with the consultants involved and relevant government stakeholders, it is not expected that the findings and directives of the master plan will in any way undermine the activities or targets of the project. |
| Institutional: Apprehension in some quarters in Rodrigues of the likelihood that it may not be covered under the project although mention is made in the project title and text. | Low | The Government of Mauritius is committed and strongly motivated to increase the use of renewable energy for electricity generation in Rodrigues, as the cost of generation there is higher than in Mauritius itself (fuel oil for electricity generation is first imported into Mauritius and then shipped to Rodrigues, thus adding to the cost). Hence, it will ensure that Rodrigues will be covered under the project and, thus, add substance to the measures recommended in the ARER 2007 report. |
| Financial: Lack of commitment from private and public sector to invest in RE | Low | Already during the project design stage three investors, both local and foreign, expressed their interest and commitment to invest in grid-connected PV provided a conducive and appropriate investment environment is created.  |
| Financial: The government does not agree to fund the proposed feed-in-tariffs at a level required for private sector developers to invest | Low | The government has already earmarked MID funds to meet the price differential in respect of the feed-in tariff envisioned for development under Component 4. Moreover the MID is replenished by the fuel levy and as such is constantly being replenished. It is also expected that carbon finance revenues via the CDM will provide a secondary revenue stream to developers interested in signing PPAs with the government for PV installations. Moreover, $1.3m of GEF funds has will be allocated for financing part of the price differential for the FIT and this will help galvanise both the government and the private sector. |
| Technical: Lack of technical information, knowledge and skills to design and implement on-grid PV projects | Low | Provision of technical assistance for on-grid PV capacity development in the public and private sectors will constitute one of the most important project components, which will be delivered through a combination of local and international expertise (via technology transfer models). In addition, Mauritius has a well-educated workforce with solid and reputable specialised institutions to provide technical training. |

* ***Financial modality***

The project is aimed at policy development, capacity building, technical assistance and the provision financial incentives to catalyze private sector investment in the RE sector; The majority of GEF resources will be allocated to investment purposes connected with the latter component. GEF funds will be pooled with government resources mobilized under the MID fund to fund the tariff price differential to be offered to selected promoters under a new FiT scheme developed for large-scale, commercial PV developers who supply power to the national grid. The transfer of GEF funds to the FIT fund (and subsequently to the power producers) will be conditional and analogical to the PPAs that are signed with the project sponsors so as to insure that GHG reductions are realized The project objective will be attained through technical assistance and facilitating third parties’ investment in on-grid PV projects for electricity generation. No loan or revolving-fund mechanisms are considered appropriate, and, therefore, grant-type funding is considered as the most appropriate to enable successful delivery of the project outcomes.

***Cost-effectiveness***

Promoters have expressed interest in investing in PV in Mauritius on the understanding that barriers to grid-connected PV would be removed through the implementation of the this project. For example, Outre Mer Energies Renouvelables based on Réunion Island, is interested in developing a 6 MW site at Bel Ombre, with a 2700 kW first phase coming on line in January 2013. In addition, Outre Mer plans to energise a 300 kW system in Rodrigues either at Anse Quitor or the Morouk Hotel by January 2013.

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All plants with a total installed capacity of at least 3 MW would be fully operational by January 2013. Accordingly and on the basis of expected outputs, electricity generation will be 2,332 MWh during Year 2 and 4,665 MWh during Year 3 and Year 4 (final year) of the project. Thus, by project completion, some 11,662 MWh would have been generated and an annual generation of 4,665 MWh will be sustained over an expected 20-year projected life of the equipment. All this grid-connected PV generation, if not implemented, would have otherwise been accomplished through thermal power stations burning imported coal having an emission factor of 1.14 tCO2/MWh. Consequently, during the 4-year project period, almost 13,295 tons of CO2 would have been avoided), equivalent to $150 of GEF funds per tCO2. However these PV plants will continue avoiding 5,318 tons of CO2 annually during their remaining 18-years of project life. When one looks at the 20 year lifetime of the plants earmarked for development during the project period, the combined tons of CO2 reduced is estimated at **98,400**, equivalent to $20 of GEF funds per tCO2 Moreover GEF funding should be viewed as creating the conditions to jumpstart the grid-connected PV market in the country. This implies that there would be significant potential in further “indirect” GHG reduction once the market has reached cruising speed. Additionally, if only the subsequent phases of Outre Mer Energies Renouvelables other promoters were to materialise with their estimated respective total capacities of 6 MW and 10 MW, that would make for a substantially higher reduction of CO2 emissions and a much lower cost for each ton of CO2 avoided. Finally, there are indications that Aerowatt Réunion may at some later date, under the assumption of a conducive environment for investment, join the other developers with the installation of several MW of grid-connected PV, similar to what it has already achieved on neighbouring Réunion Island (see para. 26 above). The indirect post-project emission reduction estimates related to only the additional plants mentioned above – on the basis of a conservative policy scenario and a GEF causality factor of 80% -- can be estimated at more than 350,000 tonnes of CO2 avoided, which translates into an abatement ratio of $5.7 of GEF funds per tCO2 reduced. A table summarizing the direct and indirect total CO2 emissions reduction during implementation of the project and beyond can be found in Section II of the UNDP Project Document

**Table 3: Project GHG emission reduction impacts**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time-frame** | **Up to project completion (4-year project duration).** | **Direct post-project without replication (20-year equipment projected life).** | **Indirect post-project with replication (20-year equipment projected life based on 10 MW of additional capacity[[1]](#footnote-1)).** |
| Total CO2 emissions reduced (tons) | 13,295 | 98,400 | > 350,000 |

* ***Sustainability***

From a technical point of view, the viability of grid-connected PV electricity generation has been proven in the international market, both in the context of developed and developing countries. By addressing the non-technical barriers that impede the development of PV on-grid electricity generation in Mauritius, the project will assist in creating a sustainable niche through strengthening the policy, institutional, legal, regulatory and operational capabilities of the key national institutions, supporting the development of on-grid PV through a market-driven approach, developing national capabilities and disseminating information. These efforts should ensure the long-term sustainability of PV on-grid electricity generation in the country.

With regard to the financial sustainability of MEPU, two distinctive paths will be pursued. First, it will provide its services related to oversight, monitoring and certification of on-grid PV systems on a cost-recovery basis. Second, following the proposed development of carbon finance potential for future investments outside the project framework, MEPU will act as project proponent and will receive a share of CERs based on agreement on revenue sharing with on-grid PV investors. These two sources will generate a constant source of funding to sustain MEPU operations after project completion.

From a financial point of view, the project will first help develop an appropriate feed-in tariff structure for installed capacities above 50 kW. Subsequently, it will help introduce transparency by developing a competitive institutional model for the selection/award of PV projects development. Furthermore, the project will support the integration of local industries into the PV sector. This will be achieved through the provision of focused support to local engineering firms/specialised engineering workshops for installation, operation, maintenance and repair of PV equipment. With the increase over time in on-grid PV installations, it is envisaged that such efforts will intensify with opportunities being created for additional players to provide such services.

* ***Replicability***

The Project’s potential for replicability at various other sites in Mauritius, Rodrigues and Agalega is very good since the project will adopt a bottom-up approach within the overall policy/investment framework that is envisaged to be developed to promote on-grid PV electricity generation. Technical assistance for barrier removal and institutional strengthening to be provided under the FSP will facilitate such replicability since it will create the required institutional, policy, and technical conditions to enable the mobilization of additional investor interest for the development of additional PV projects. Moreover, the lessons learned will be of great value to the neighbouring countries sharing similar resource base should they decide to tap their respective solar potential for on-grid PV electricity generation.

* ***Coordination with other related initiatives***

Coordination with other UNDP/Government initiatives: The Government is presently implementing a UNDP-GEF project entitled “Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings”. Project activities commenced in 2009 and are under the responsibility of MEPU. It is envisaged that an Energy Efficiency Management Office (EEMO) will be established once the Government enacts the Energy Efficiency Bill. The proposed PV project will also be implemented under the responsibility of MEPU and, to facilitate development of synergies between the two projects, the Government may consider re-naming EEMO as “Renewable Energy and Energy Efficiency Management Office” and maintain it under the responsibility of TS. Both projects have/will have a strong private sector focus and housing them under one “Management Office” will facilitate coordination and management in energy efficiency and renewable energy activities aimed at reducing GHG emissions at the country level that will, no doubt, continue well beyond the lifetimes of the UNDP-GEF projects. Finally, the project is in line with MID, one of the objectives of which is to make Mauritius less dependent on fossil fuels through increased utilization of renewable energy.

A broader corporate initiative which may have important linkages with this project is Deutsche Bank’s Global Energy Transfer Feed-in Tariffs (GET FiT) programme, an initiative launched in April 2010 to help facilitate the installation of Feed in Tariffs in developing countries. GET FiT looks to combine public financing with the experience of national and international partners to help address project development and remove financing barriers in developing countries. GET FiT was first conceived in January 2010 when the United Nations Secretary General's Advisory Group on Energy and Climate Change (AGECC) invited Deutsche Bank Climate Change Advisors (DBCCA) to present new concepts to drive renewable energy investment in developing regions. DBCCA responded with GET FiT, a proposal designed to catalyze the private sector investment necessary to achieve the goals of renewable energy scale-up and energy access. Since last year Deutsche Bank has expanded the GET FiT research partnership to include UNDP and Deutsche Bank and UNDP are now working on various dialogue and research platforms to explore how public sector resources might be realistically mobilized to support renewable energy scale-up, and how GET FiT might be practically implemented. The FiT-related activities in this project could serve as an excellent opportunity to apply best practices from GET FiT and mobilize additional resources and expertise.

The Government has plans to install one 5-kW PV system each at 10 educational institutions in Mauritius - a preliminary list of sites is provided in Annex I. Funding for this purpose has been earmarked under the local MID Fund. Consideration will be given to similar projects in Rodrigues and Agalega. The objective of this initiative is to sensitise the young generation of school children to the benefits of sustainable development through the provision of electricity services at these institutions to power lights, laboratory equipment, small appliances, etc. obtained from PV, thereby obviating the need, albeit to a limited extent, to resort to fossil fuel for electricity generation. The Government has solicited the support of UNDP to implement this project and activities to be implemented under the proposed UNDP-GEF on-grid PV barrier removal project will be instrumental in supporting this initiative, especially as they relate to standards in the choice and installation of PV equipment, capacity development for installers, operators and maintenance personnel. Connection of these systems to the grid with the appropriate metering systems will enable the school children to monitor their respective energy generation and export/sale to the grid, especially during times of low “in-house” electricity usage on week-ends and over school holidays. This will be combined with energy efficiency measures that the schools could implement and it is expected that the children will, in turn, be instrumental in “educating” their parents in the rational use of energy, for both the financial and environmental benefits that it provides.

Coordination with the private sector: The private sector is to play a key role in project implementation. At the PPG stage, discussions were held with three potential local companies, viz. British American Investment, PV Energy and Outre Mer Energies Renouvelables, that are prepared to invest a total of $ 65 million for on-grid PV electricity generation, on the understanding that the Government formulates and approves feed-in tariffs for capacities more than 50 kW (co-financing letter is provided in Annex G). On the basis of estimated future installation costs of grid-based PV in Mauritius, this investment will likely culminate into a total of at least 16 MW of PV installed, with the minimum installation of an estimated 3 MW completed within the 4-year timeframe of the present project. In addition, discussions are on-going with other potential investors for more grid-connected PV capacities to be installed.

Coordination with other donors: The Agence Française de Développement (AFD) has played an active role in supporting Mauritius on sustainable development issues. For example, it is participating/has participated in preparation of a new Building Control Act (including undertaking energy audits in public buildings), preparing a pre-feasibility study for the introduction of ethanol in the transportation sector and the use of electric vehicles, among others. In addition, JICA had indicated (at the PPG level) that it would coordinate with other donors to determine its level of support that would assist the Government in achieving the objectives in terms long term energy policies. However, they are yet to revert back on the type and extent of their participation.

Collaboration with Réunion Island and other countries: Réunion Island is a department of France located some 220 km to the southwest of Mauritius and has a slightly larger surface area with a lower population. Its climate is also somewhat similar to that of Mauritius, especially along the coastal areas. As of 2008, Réunion had an installed capacity of on-grid PV of 10 MW with 6.4 MW connected to the High voltage grid and 3.6 MW connected to the low voltage grid. According to Electricité de France, which manages the Réunion electricity grid, the growth of the PV industry on the island can vary between 5 MW to 15 MW/ year. Aerowatt, a French company active in Wind and PV electricity generation, has installed some 4 MW of PV grid-connected systems in Réunion (with the smallest capacity being 250 kW). It is now awaiting clearance from the authorities to proceed with a bigger 6 MW PV farm.

In addition, ARER, the Regional Energy Agency - Réunion, formulated in 2007 a document entitled “Programme for Electricity Energy Security Supply without Greenhouse Gas Emissions for Rodrigues” which proposed, among others, “an equipment programme for (on-grid) photovoltaic supply for building energy autonomy” and suggested a number of potential sites, including the airport, Government buildings, schools, etc. totalling 1 MW. This programme has not commenced implementation yet and is awaiting the setting up of a conducive environment under the present project to jumpstart the participation of the private sector.

Consequently, the proposed project will establish strong linkages with Réunion to capitalise on the valuable experience it has already accumulated to date on grid-connected PV. In addition, the project will seek the support of countries in Africa/Asia which have also developed solid experience with on-grid PV under UNDP-GEF projects.

## Project Results Framework

|  |
| --- |
| **This project will contribute to achieving the following Country Programme Outcome as defined in CPD:** To improve environmental protection by accessing and utilising environmental funds, carbon markets, payment for ecosystem services (PES) and other financing mechanisms. |
| **Country Programme Outcome Indicators:** **Key Indicator (1):** 10% improvement reflected in the environmental indicators for Mauritius by 2010 in the various State of Environment Reports prepared as part of the Conventions Obligations and framework for CDM developed and operational by end 2010.**Key Indicator (2):** National Adaptation Plan implemented. Energy efficiency regulations implemented by end 2011. |
| **Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one):** National capacities of key institutions to implement global environmental commitments at national and regional levels through integration of environmental concerns in national policies and programmes improved. |
| **Applicable GEF Strategic Objective and Program:** To promote on-grid electricity from renewable sources –CC4-SP3-RE |
| **Applicable GEF Expected Outcomes:** Total avoided GHG emissions from on-grid PV electricity generation. |
| **Applicable GEF Outcome Indicators:** Avoided GHG emissions from on-grid PV electricity generation (tons CO2/MWh); and $/t CO2. |
|  | **Indicator** | **Baseline** | **Target** | **Sources of Verification** | **Assumptions** |
| **Objective** |  |  |  |  |  |
| To assist the Government in addressing the barriers with a view to promoting PV grid-connected electricity generation.  | Direct investment in at least 3 MW of on-grid PV installations by end of project. Amount of reduced CO2 emissions compared to the projected baseline | GHG in the electricity generation sector scheduled to increase from 2.03 million tons/year (2008 figures) to almost 3.3 million tons/year by the year 2020.Negligible investments taking place in on-grid PV electricity generation. | 11,662 2 MWh of electricity generated (as a result of the 3 MW capacity brought on-line) by project completion[[2]](#footnote-2). Direct reduction of 13,295 tons of CO2 over the 4-year FSP project life cycle and 98,400 over the full lifetime of the plants.Estimated cumulative indirect GHG emission reduction of at least 350,000 tons of CO2eq by 2025 on the basis of a conservative policy scenario and a GEF causality factor of 80%. | Project’s annual reports, GHG monitoring and verification reports.Project final evaluation report. | Continued commitment of project partners, including Government agencies and investors/developers. |
| **Outcomes** |  |  |  |  |  |
| **Outcome 1:** Streamlined and comprehensive market-oriented energy policy and legal/regulatory framework to promote PV grid-connected electricity generation. Power Purchase agreements formulated and signed by selected investors | Framework finalized and available for consultation by potential investors.Standardised PPAs formulated and the SSDG scheme reviewed | None available at the present time.  | To be completed within 15 months of project initiation and approved by Government one and a half years after start of project | Published documents. Government decrees/laws. | Commitment of the various Government institutions. |
| **Output 1.1:** Report streamlining market-oriented energy policy and legal/regulatory framework to regulate on-grid PV electricity generation. | Report confirming that policy and framework arrangements are in place. | Potentially overlapping responsibilities of various Government institutions make the decision process quite cumbersome and complicated. | To be completed within 15 months of project initiation and approved by the Government 1.5 after start of project | Published documents.  | Commitment of the various Government institutions. |
| **Output 1.2:** Strategy document aimed at sharpening the focus of the respective roles and responsibilities of MEPU and CEB for on-grid PV. | Document available and procedures in place. | Not available at the present time. | To be completed within 15 months of project initiation and approved by the Government 1.5 after start of project  | Published documents. | Commitment of the respective Government institutions. |
| **Output 1.3:** Criteria and procedures for the introduction of a transparent process in the selection/award of projects for development. | Guidelines available and put into practice. | Not available at the present time.  | To be completed within 15 months of project initiation and approved by the Government 1.5 after start of project Competitive selection/award of projects completed by the end of 1.5 years after project start. | Published documents.Signed agreements. | Commitment of the various Government institutions and project developers. |
| **Output 1.4:** One-stop shop for issuance of construction licenses and permits to developers. | One-stop shop is operational.Information brochure and website are available. | Under the business-as-usual scenario, the average time to secure all required construction licenses and permits can take up to 12 months. | All construction licenses and permits are issued following completion of feasibility studies and selection of promoters | Signed documents. | Continued investor interest. |
| **Output 1.5** Review of the SSDG scheme including financial model, technical specifications towards improving the scheme and moving to the next phase | Document available on the results achieved by the scheme and options for improvement suggested for next phase | Not available at the present time. SSDG scheme expected to be over by end of 2011 | To be completed within 18 months of project initiation and applied by Government thereafter | Project report | Cooperation of Government entities and staff |
| **Output 1.6:** Standardised and signed Power Purchase Agreements with identified developers/investors  | Power Purchase agreements signed.  | Not presently available. | Completed within 15 months of project start. | Project reports. | Supportive financial regulations and feed-in tariffs in place. |
| **Outcome 2:** Capacity available within MEPU and other key Government/Financial Institutions to evaluate the economic and financial viability of grid-connected PV systems and to formulate incentives to attract investors.  |  Number of staff who participated in and successfully completed capacity development programme. | None available at the present time. | At least 2 projects evaluated by the end of year 2.Ten staff trained during first 15 months of project. | Training modules/number of staff trained.Project report. | Concerned institutions willing to release staff for training.  |
| **Output 2.1:** Suitable methodology for the economic/financial evaluation of on-grid PV systems. | Methodology applied by entities on large scale PV projects | Not available at the present time. | To be completed within 15 months of project initiation and applied by Government thereafter. | Project report. | Cooperation of concerned entities and staff. |
| **Output 2.2:** Standard financial evaluation methodology for calculating feed-in tariffs for investors with installed capacities more than 50 kW. | Methodology applied by MEPU and used in PPAs | No such evaluation methodology available. | To be completed within 15 months of project initiation and applied by Government thereafter. | Project documentation. | Cooperation of Government entities and staff. |
| **Output 2.3:** Financial and other incentives to be provided to project developers. Ownership model and investment scheme created | Document available and incentives operationalised. Financially sustainable mechanisms developed to support Feed in Tariffs | No comprehensive document available at the present time. | To be completed within 15 months of project initiation and applied by Government thereafter. | Project documentation. | Cooperation of Government entities. |
| **Output 2.4:** Capacity developed withinfinancial institutions to appraise PV projects for lending. Risk mitigation instruments developed to protect lenders and developers. | Number of financial institutions staff successfully trained.Risk mitigation instruments developed and operationalised. | None available at the present time. | Five to six financial institutions staff trained during first15 months of project.Risk mitigation instruments developed during first 15 months of project. | Number of staff trained.Project report. | Cooperation of financial institutions and developers. |
| **Output 2.5:** Carbon finance potential developed regarding future on-grid PV investments outside of the project framework. | Options assessed and potential developed to access carbon finance in future investments. | None available at the present time. | To be completed within 15 months of project initiation. | Project documentation. | Cooperation of Government entities. |
| **Outcome 3:** Capacity available to upgrade existing solar radiation data, expand geographical coverage for solar resource measurement, formulate solar map technical guidelines and standards for and provide oversight, monitoring and certification of PV systems, and provide installation, operation, maintenance and repair services. Necessary technology transfer models formulated and operationalised | Teams trained in various categories of activities. Guidelines and technical standards for on-grid PV systems. Technology delivery models put in place | No such activity being implemented. | 15 sites targeted for enhanced solar radiation assessment in year 1.Published guidelines and technical standards within 15 months of project start.Manual for installation, operation, maintenance and repair services developed by year 1.5, 40 people trained in the various categories by the end of the project. | Project reports. | Cooperation of concerned Government entities. |
| **Output 3.1:** Programme for upgrading existing solar radiation data, expand geographical coverage for solar resource measurement.Publication of a solar Map for Mauritius, Rodrigues and the Outer Islands | Instrumentation to measure solar radiation data installed.Software developed for interpretation of data.Solar map developed and published | Presently available solar radiation data insufficient to accurately design on-grid PV systems.. | Upgrade/expand coverage to 15 sites completed by the end of project.Four Meteorological Services staff trained within first 15 months of project. | Project documentation. | Cooperation of concerned Government institutions. |
| **Output 3.2:** Guidelines and technical standards for PV system components and grid-connected PV systems. | Guidelines and standards published and operationalised. | Not presently available. | Completed within first 18 months of project. Applied to sites identified for development. | Project reports. | Participation of Government institutions in drafting guidelines and standards. |
| **Output 3.3:** Capacity developed within MEPU/CEB to determine grid absorption capacity and provide oversight, monitoring and certification of on-grid PV systems. | Capacity development plan formulated and implemented. | Not presently available. | Six MEPU/CEB staff trained during first 18 months of project. | Project documentation. | Participation of Government entities in training programme. |
| **Output 3.4:** Local capacity for installation, operation, maintenance and repair services. | Availability of qualified and certified companies/individuals for installation, operation, maintenance and repair services. | None available now. | 30 people trained by the end of the project. | Project reports. | Availability of people with basic technical education. |
| **Output 3.5:** Technology transfer opportunities identified, and delivery models formulated and operationalised. | Report confirming that technology delivery models are being implemented.  | None at the present time. | Completed within 2 years of project start. | Project reports. | Commitment of equipment suppliers and project developers. |
|  | Indicator | Baseline | Target | Sources of Verification | Assumptions |
| **Outcome 4:** Promoters assisted financially through Feed in Tariffs and projects implemented and supplying electricity to the CEB grid | Funding used for toping part price differential in Feed in tariffs for a determined timed | Not presently available. | Construction of at least 3 MW of on-grid PV systems completed by the end of the project.  | Signed Power Purchase agreements and other documents | Government develops a sustainable financing mechanism. |
| **Outcome 5:** Outreach programme and dissemination of project experience/best practices/lessons learned for replication throughout the country.  | Outreach programme formulated. Project experience compiled, analyzed and disseminated. | Lack of sufficient information to pursue programme. | Increased awareness among stakeholders in place to promote and develop the market for on-grid PV | Project final report and web site. | Growth of programme will be sustained. |
| **Output 5.1:** Plan to implement outreach/promotional activities targeting domestic (and international) investors. | Plan available and operationalised. | No such plan available. | Completed within 10 months of project initiation. | Project documentation. | Expected expansion of programme. |
| **Output 5.2:** Capacity development of MEPU to monitor and document project experience. | Capacity development material prepared. | No capacity development programme. | 10 Government staff trained by the end of project. | Project reports. | Designation of staff by Government. |
| **Output 5.3:** Published materials on project experience/best practices and lessons learned. | Project experience and best practices compiled, published and available on website. | Lack of information on best practices and lessons learned. | Completed within 3 months of project end. | Project documentation and web site. | Successful completion of project. |

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## Total Budget and Work Plan[[3]](#footnote-3)

|  |  |  |
| --- | --- | --- |
| **Award ID:**  | 00060842 |  |
| **Project ID:** | 00076772 |
| **Award Title:** | PIMS 4333 CC FP: Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands |
| **Business Unit:** | MUS10  |
| **PIMS Number**  | 4333 |
| **Project Title:** | GEF 4333 CC FSP: Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands |
| **Implementing Partner (Executing Agency)**  | Ministry of Energy and Public Utilities (NEX) |
| **GEF Outcome/Atlas Activity** | **Responsible Party** | **Fund ID** | **Donor Name** | **Atlas Budgetary Code** | **ATLAS Budget Description** | **Amount Year 1 (USD)** | **Amount Year 2 (USD)** | **Amount Year 3 (USD)** | **Amount Year 4 (USD)** | **Total (USD)** | **Notes\*** |
| **Outcome 1** | **MEPU** | **62000** | **GEF** | 71200 | International Consultants | 60,000 | 60,000 | 15,000 | 15,000 | 150,000 | 1) |
| Streamlined and comprehensive market-oriented energy policy and legal/regulatory framework to promote PV grid-connected electricity generation. | 71300 | Local Consultants | 7,000 | 7,000 | 2,000 | 2,000 | 18,000 | 2) |
| 72100 | Contractual services | 0  | 0  | 0  | 0  | 0 |  |
| 71600 | Travel | 2,000 | 2,000 | 2,000 | 2,000 | 8,000 |  |
| 74500 | Misc. | 1,500 | 1,500 | 1,500 | 1,500 | 6,000 |  |
| 74200 | Audio, video and print production costs | 2,000  | 2,000  | 2,000  | 2,000  | 8,000 |  |
|   |  |  |  |   | **Total Outcome 1** | **72,500** | **72,500** | **22,500** | **22,500** | **190,000** |  |
| **Outcome 2** | **MEPU** | **62000** | **GEF** | 71200 | International Consultants | 30,000 | 30,000 | 11,250 | 11,250 | 82,500 | 3) |
| Capacity available within MEPU and other key Government and Financial Institutions to evaluate the economic and financial viability of grid-connected PV systems and to formulate incentives to attract investors. | 71300 | Local Consultants | 18,000 | 18,000 | 4,500 | 4,500 | 45,000 | 4) |
| 72100 | Contractual services | 10,000 | 20,000 | 0 | 0 | 30,000 | 5) |
| 71600 | Travel | 2,000 | 2,000 | 2,000 | 2,000 | 8,000 |  |
| 72200 | Equipment/Software | 4,000 | 20,000 | 2,000 | 0 | 26,000 | 6) |
| 74200 | Audio, video and print production costs | 3,000 | 3,000 | 1,000 | 1,000 | 8,000 |  |
|   |  |  |  |   | **Total Outcome 2** | **67,000** | **93,000** | **20,750** | **18750** | **199,500** |  |
| **Outcome 3** | **MEPU** | **62000** | **GEF** | 71200 | International Consultants | 28,000 | 28,000 | 13,250 | 13,250 | 82,500 | 7) |
| Capacity available to upgrade existing solar radiation data, expand geographical coverage for solar resource measurement, formulate technical guidelines and standards for PV system components, determine grid absorption capacity and provide oversight, monitoring and certification of PV systems, and provide installation, operation, maintenance and repair services. | 71300 | Local Consultants | 16,000 | 16,000 | 4,250 | 4,250 | 40,500 | 8) |
| 72100 | Contractual services | 10,000  | 10,000 | 0 | 0  | 20,000 | 9) |
| 71600 | Travel | 5,000 | 5,000 | 2,000 | 2,000 | 14,000 |  |
| 74500 | Misc. | 2,000 | 2,000 | 2,000 | 2,000 | 8,000 |  |
| 72200 | Equipment/Software | 25,000 | 25,000 | 0  | 0  | 50,000 | 10) |
|   |  |  |  |  | **Total Outcome 3** | **86,000** | **86,000** | **21,500** | **21,500** | **215,000** |  |
| **Outcome 4** | **MEPU** | **62000** | **GEF** | 72605 | Misc. | 0 | 260,000 | 520,000 | 520,000 | 1,300,000 | 11) |
| Promoters assisted financially through Feed in Tariffs and projects implemented and supplying electricity to the CEB grid. |
|   |  |  |  |   | **Total Outcome 4** | **0** | **260,000** | **520,000** | **520,000** | **1,300,000** |  |
| **Outcome 5** | **MEPU** | **62000** | **GEF** | 71200 | International Consultants | 5,000 | 10,500 | 11,000 | 11,000 | 37,500 | 14) |
| Outreach programme and dissemination of project experience/best practices/lessons learned for replication throughout the country. | 71300 | Local Consultants | 3,000 | 6,000 | 6,000 | 6,000 | 21,000 | 15) |
| 71600 | Travel | 1,000 | 1,000 | 3,000 | 3,000 | 8,000 |  |
| 74200 | Audio, video and print production costs | 2,000 | 2,000 | 5,000 | 5,000 | 14,000 |  |
|  |  |  |  | **Total Outcome 5** | **11,000** | **19,500** | **25,000** | **25,000** | **80,500** |  |
| **PROJECT MANAGEMENT** | **MEPU** | **62000** | **GEF** | 71400 | Project Assistant | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 16) |
|  |
| **UNDP + Govt.** | 71400 | Project Assistant | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 | 16) |
| 71400 | Project Manager | 1,500 | 1,500 | 1,500 | 1,500 | 6,000 |  |
| 71400 | Project Manager (Govt) | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 | 16) |
| 71600 | Travel | 2,000 | 2,000 | 2,000 | 2,000 | 8,000 |  |
| 72100 | Contractual services  | 1,500 | 1,500 | 1,500 | 1,500 | 6,000 | 17) |
| 72200 | Equipment | 3,000 | 1,000 | 1,000 | 1,000 | 6,000 |  |
| 72500 | Stationery | 1,000 | 1,000 | 1,000 | 1,000 | 4,000 |  |
|  |   | **Total Management** | **39,000** | **37,000** | **37,000** | **37,000** | **150,000** |  |
|  |  | **PROJECT TOTAL** | **275,500** | **568,000** | **646,750** | **644,750** | **2,135,000** |  |

1. Costs of five international consultants to be employed for specific tasks under Component 1.
2. Costs of three local consultants to be employed for specific tasks under Component 1.
3. Costs of three international consultants to be employed for specific tasks under Component 2.
4. Costs of five local consultants to be employed for specific tasks under Component 2.
5. Contracts with companies for provision of specific tasks under Component 2.
6. Computing equipment and software programmes to undertake economic and financial analyses of individual on-grid PV systems, taking into account a mix of equity, debt and grant (if available) to determine IRRs, NPVs, etc., including flexibility to undertake sensitivity analyses under different scenarios of economic and financial parameters.
7. Cost of three international consultants to implement specific tasks under Component 3.
8. Costs of five local consultants to be employed for specific tasks under Component 3.
9. Contract with a company for provision of specific tasks under Component 3.
10. Equipment for measuring solar radiation icw upgrading Meteorological Services’ data/expanding geographical coverage of data collection and software for data interpretation
11. The GEF allocation for this component will act as complementary financial assistance to catalyse the PV market. This sum will be provided to the Central Electricity Board who is mandated to remunerate power producers. The disbursement of this fund will be conditional and analogical to the Power Purchase Agreements that are signed between the utility and the private sector.
12. None.
13. Costs three international consultants to be employed for specific tasks under Component 5.
14. Costs of three local consultants to be employed for specific tasks under Component 5
15. The GEF allocation for PM costs will be used for the Project Assistant cost. Government cash contribution ($80,000) will be used for the Project Manager and UNDP will top up the cost for the Project Manager and Project Assistant and finance the remaining components i.e. travel, audit, etc
16. Costs of annual audit

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Summary of Funds: [[4]](#footnote-4)** |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  | **Amount ($)****Year 1** | **Amount ($)****Year 2** | **Amount ($)****Year 3** | **Amount ($)****Year 4** | **Total ($)** |
|  |  |  |  | **GEF**  | 241,500 | 536,000 | 614,750 | 612,750 | 2,005,000 |
|  |  |  |  | **UNDP** | 14,000 | 12,000 | 12,000 | 12,000 | 50,000 |
|  |  |  |  | **MID fund (Cash)** | 0 | 216,000 | 432,000 | 432,000 | 1,080,000 |
|  |  |  |  | **Government (Cash)** | 20,000 | 20,000 | 20,000 | 20,000 | 80,000 |
|  |  |  |  | **Government (In Kind)** | 69,500 | 69,500 | 69,500 | 69,500 | 278,000 |
|  |  |  |  | **Private Sector** | 0 | 8,750,000 | 8,750,000 | 0 | 17,500,000 |
|  |  |  |  | **TOTAL**  | 345,000 | 9,603,500 | 9,898,250 | 1,146,250 | 20,993,000 |

## Management Arrangements

The project will be implemented through the NEX execution modality by theMinistry of Energy and Public Utilities. The Ministry will appoint a National Project Director who will assume overall responsibility for project implementation, ensure the delivery of project outputs and the judicious use of project resources. The National Project Director will be assisted by a Programme Management Unit headed by a Project Manager (PM). The PM will be responsible for overall project coordination and implementation, consolidation of work plans and project papers, preparation of quarterly progress reports, reporting to the project supervisory bodies, and supervising the work of the project experts and other project staff. The PM will also closely coordinate project activities with relevant Government and other institutions and hold regular consultations with project stakeholders. In addition, a Project Assistant (PA) will be recruited to support the PM on administrative and financial issues.

National and international consultancy services will be called in for specific tasks under the various project components. These services, either of individual consultants or under sub-contacts with consulting companies, will be procured in accordance with applicable UNDP/GEF guidelines (see Annex C for the list of envisaged local and international consultants).

A Steering Committee (SC), chaired by the Ministry of Energy and Public Utilities will be established to provide strategic directions and management guidance to project implementation. It will consist of representatives of the relevant ministries and Government departments participating in the project, the UNDP Country Office, the National Project Director as well as representatives of the NGO community. Representatives of the private sector may be invited to participate.

Finally, the UNDP CO will provide specific support services for proper project implementation, as required, through its Administrative, Programme and Finance Units. An organogram representing the implementation arrangement is presented below.



**The Steering Committee (SC)** is responsible for providing strategic guidance and making management decisions for the project, in particular when guidance is required by the Project Manager. The SC plays a critical role in project monitoring and evaluations by quality assuring these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems with external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities. Based on the approved Annual Work Plan, the SC can also consider and approve the quarterly plans (if applicable) and also approve any essential deviations from the original plans.

In order to ensure UNDP’s ultimate accountability for the project results, SC decisions will be made in accordance to standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition.

The Steering Committee is responsible for the overall direction and management of the project and it covers the following three roles:

The *Executive* is ultimately responsible for the Project, supported by the Senior Beneficiary and the Senior Supplier. The Executive role will be held by the Ministry of Energy and Public Utilities.

The *Senior Beneficiary* ensures the realization of the project benefits from the perspective of project beneficiaries. MEPU, as the beneficiary, will ensure that the results, corresponding interventions (outputs/activities) be formulated in line with the national development priorities and goals and objectives of the sector.

The *Senior Supplier* represents the interests of those designing and developing the project deliverables and providing project resources. This role provides guidance regarding the technical feasibility of the project. This role will be held by the donors supporting the project.

*Project Assurance* is the responsibility of each Steering Committee member, but the role can be delegated. The Project Assurance role supports the Steering Committee by carrying out objective and independent project oversight and monitoring functions. This role ensures that appropriate project management milestones are managed and completed. A UNDP Programme Officer typically holds the Project Assurance role for the UNDP Board.

*Project Manager:* The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Steering Committee within the constraints laid down by the latter. The Project Manager is responsible for day-to-day management and decision-making for the project. The Project Manager’s prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost. The Project Manager is appointed by the Implementing Partner.

*Project Support:* Project Support provides project administration, management and technical support to the Project Manager, as required by the needs of the individual project or Project Manager.

## Monitoring Framework and Evaluation

The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

**Project start:**

A Project Inception Workshop will be held within the first 2 months of project start with those with assigned roles in the project organization structure, UNDP country office and where appropriate/feasible regional technical policy and programme advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

* ***Assist*** all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of UNDP CO and RCU staff vis-à-vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
* ***Based*** on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
* ***Provide*** a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
* ***Discuss*** financial reporting procedures and obligations, and arrangements for annual audit.
* ***Plan*** and schedule Steering Committee meetings. Roles and responsibilities of all project organisation structures should be clarified and meetings planned. The first SC meeting should be held within the first 12 months following the inception workshop.

An Inception report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

**Quarterly:**

* ***Progress*** made shall be monitored in the UNDP Enhanced Results Based Management Platform.
* ***Based*** on the initial risk analysis submitted (Annex 2), the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high.
* ***Based*** on the information recorded in Atlas, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.
* ***Other*** ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

**Annually:**

* ***Annual*** Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

* Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
* Project outputs delivered per project outcome (annual).
* Lesson learned/good practice.
* AWP and other expenditure reports
* Risk and adaptive management
* ATLAS QPR
* Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

**Periodic Monitoring through site visits:**

UNDP CO and the UNDP RCU will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the SC may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RCU and will be circulated no less than one month after the visit to the project team and Steering Committee members.

**Mid-term of project cycle:**

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project’s term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF. The management response and the evaluation will be uploaded to UNDP corporate systems, in particular the [UNDP Evaluation Office Evaluation Resource Center (ERC)](http://erc.undp.org/index.aspx?module=Intra).

The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term evaluation cycle.

**End of Project:**

An independent Final Evaluation will take place three months prior to the final Steering Committee meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project’s results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the [UNDP Evaluation Office Evaluation Resource Center (ERC)](http://erc.undp.org/index.aspx?module=Intra).

The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project’s results.

**Learning and knowledge sharing:**

Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects.

Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

**M & E Work Plan and Budget**

| **Type of M&E activity** | **Responsible Party(ies)** | **Estimated Total Budget ($)**(Excluding Project Team staff time) | **Time-frame** |
| --- | --- | --- | --- |
| Inception Workshop (IW) | * Project Manager
* MEPU/RRA/OIDC
* UNDP Country Office (CO)
* UNDP/GEF RCU
 | $ 4,000 | Within first two months of project start-up. |
| Inception Report | * Project Team
* UNDP CO
 | None | Immediately following IW. |
| Measurement of Means of Verification for Project Purpose Indicators | * Project Manager will oversee the commissioning of specific studies and delegate responsibilities to relevant team members
 | $ 5,000(Note: To be finalized during inception phase and at Inception Workshop). | Start, mid and end of project. |
| Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)  | * Oversight Project Manager
* Measurements by regional field officers and local IAs
 | $ 10,000(Note: To be determined as part of the Annual Work Plan's preparation). | Annually prior to APR/PIR and to the definition of annual work plans |
| Annual Project Report / Project Implementation Review (APR/PIR) | * Project Team
* UNDP CO
* UNDP/GEF RCU
 | None | Annually  |
| Tripartite Project Review (TPR) and TPR report | * Government Counterparts
* UNDP CO
* Project team
* UNDP/GEF RCU
 | None | Annually, upon receipt of APR |
| Steering Committee Meetings | * Project Manager
* MEPU/RRA/OIDC
* UNDP CO
 | None | Following Project IW and subsequently every twelve months. |
| Periodic progress reports | * Project Team
 | None | To be determined by Project Team and UNDP CO |
| Technical reports, as per project activities | * Project team
* Consultants, as needed
 | Cost to be covered by consultancy budget | To be determined by Project Team and UNDP CO |
| Mid-term Evaluation | * Project team
* MEPU/RRA/OIDC
* UNDP CO
* UNDP/GEF RCU
* External Consultants (i.e. evaluation team)
 | $12,000 | At the mid-point of project implementation.  |
| Project Terminal Report | * Project Team
* MEPU/RRA/OIDC
* UNDP CO
 | None | At least one month before the end of the project |
| Independent Final Evaluation | * Project Team
* MEPU/RRA/OIDC
* UNDP CO
* UNDP/GEF RCU
* External Consultants (i.e. evaluation team)
 | $ 18,000 | At the end of project implementation |
| Lessons learned/Best practices | * Project Team
* MEPU/RRA/OIDC
* UNDP/GEF RCU
 | $ 3,000 | Yearly |
| Audit | * UNDP CO
* Project team
 | $ 8,000 | Yearly |
| TOTAL |  | $ 60,000 |  |

## Legal Context

This document together with the CP signed by the Government and UNDP which is incorporated by reference constitute together a Project Document as referred to in the SBAA [or other appropriate governing agreement] and all CP provisions apply to this document.

Consistent with the Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP’s property in the implementing partner’s custody, rests with the implementing partner.

The implementing partner shall:

1. put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
2. assume all risks and liabilities related to the implementing partner’s security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via <http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm>. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

1. Audit Clause:

The project will be audited according to UNDP Financial Rules and Regulations and applicable audit policies.

## Annexes

## Annex 1: Preliminary list of sites for installation of Government-funded PV on-grid PV systems

|  |  |
| --- | --- |
| **Site No.** | **Site (each having a 5-kW PV system)** |
| 1 | Jean Lebrun Government (Primary) School |
| 2 | La Tour Koenig State Secondary School |
| 3 | D. Ramphul State Secondary School |
| 4 | R. Gujadhur State Secondary School |
| 5 | Rivière du Rempart State Secondary School |
| 6 | F.Boyer de la Giroday State Secondary School |
| 7 | Forest side State Secondary School (Boys) |
| 8 | Willoughby Government School |
| 9  | Palma State Secondary School |
| 10 | La Gaulette State Secondary School |

## annex 2: Risk Analysis

|  |  |  |
| --- | --- | --- |
| **Project Title:** Removal of Barriers to Solar PV Power Generation in Mauritius, Rodrigues and the Outer Islands. | **Award ID:** 4333 | **Date:** |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Description** | **Date Identified** | **Type** | **Impact &****Probability** | **Countermeasures / Mngt response** | **Owner** | **Submitted, updated by** | **Last Update** | **Status** |
| 1 | Regulatory: The putting in place of a fair and transparent project selection process, appropriate financial incentives and licensing regime for the targeted PV installations does not happen or is delayed; the establishment of an independent regulator is not established on a timely basis. | During FSP formulation. | Policy | Frustration among private sector investors over lack of regulatory framework, which may result in delays of investing in demo plantsP = 2I = 4 | Keep investors apprised of progress in barrier-removal activities and establishment of regulatory framework. | CO to monitor. |  |  |  |
| 2 | Institutional: Apprehension in some quarters in Rodrigues of the likelihood that it may not be covered under the project although mention is made in the project title and text. | During FSP formulation. | Policy | Frustration among stakeholders in Rodrigues.P = 2I = 2 | Ensure close collaboration among involved Government entities. | CO to monitor. |  |  |  |
| 3 | Financial: Lack of commitment from private and public sector to invest in RE | During FSP formulation | Financial | Investors do not follow through with their commitments.P = 1I = 2 | Keep investors apprised of progress in barrier-removal activities.Complementary financial assistance through GEF provided for FIT | CO to monitor. |  |  |  |
| 4 | Financial: The government does not agree to fund the proposed feed-in-tariffs at a level required for private sector developers to invest | During FSP formulation | Financial | Delay in FiT formulation or disagreement between government and PS investors on FiT levels, leading to less investment than expectedP = 1I = 3 | Keep investors apprised of progress in barrier-removal activities. | CO to monitor. |  |  |  |
| 5 | Technical: Lack of technical information, knowledge and skills to design and implement on-grid PV projects. | During FSP formulation | Operational  | Delays in on-grid PV systems coming on line.P = 1I = 2 | Close monitoring of support provided to stakeholders. | CO to monitor. |  |  |  |

 P = Probability on a scale from 1 (low) to 5 (high). I = Impact on a scale from 1 (low) to 5 (high).

## Annex 3: Terms of Reference

**1. Project Manager**

|  |  |
| --- | --- |
| Post title: Office: Organisation: Duration of Employment: Duty station:  | Project Manager Project Management Unit (PMU)Ministry of Energy and Public UtilitiesOne year with possibility of extension Port Louis, Mauritius |
| **II. Duties** |
| 1. Lead, manage and coordinate the day-to-day activities of the PMU to be established within MRRD including administration, accounting, technical expertise, and actual project implementation and reporting;
2. Lead the development of project design including preparation of consultants’ and sub-contractors’ terms of reference, identification and selection of national and international sub-contractors/consultants, cost estimation, time scheduling, contracting, and reporting on project activities and budget;
3. Monitor and follow-up on the status of delivery by consultants, sub-contractors, etc.
4. Coordinate activities of consultants including contract management, direction and supervision of field operations, logistical support, review of technical outputs/reports, measurement/assessment of project achievements and cost control;
5. Assist in the design, supervision and outreach activities of the project;
6. Provide technical support to small hydropower policy discussions and development;
7. Act as a liaison/facilitator among the various stakeholders, including the private sector, international and national partners;
8. Assume responsibility for the quality and timing of project outputs;
* Establish and maintain relationships and act as the key focal point with UNDP CO to ensure that all programming, financial and administrative matters related to the project are transparently, expediently and effectively managed, in line with established UNDP Rules and Regulations.
* Undertake other management duties that contribute to the effective implementation of the project.
 |
| **III. Qualifications and Experience** |
| Education: | * Master’s degree or equivalent in engineering, economics, international development, social sciences, public administration or other relevant field.
 |
| Experience: | * Minimum of 4 years of experience in the utility/energy field.
* Proven ability to draft, edit and produce written proposals and results-focussed reports.
* Proven experience working with Government, civil society, international organizations or donors in combination with the knowledge of economic and financial analysis, institutional, regulatory and policy frameworks.
* Good knowledge of and experience GEF Climate Change issues, operational modalities and familiarity with UNDP-GEF procedures;
* Familiarity with UNDP rules, regulations and administrative procedures;
* Prior knowledge and experience of the political, social and environmental factors and issues related to energy development and climate change mitigation in island countries;
* Experience in the use of computers and office software packages (MS Word, Excel, etc.)
 |
| Language Requirements: | * Excellent English and French, both written and oral.
 |

**2. Project Assistant**

|  |
| --- |
| **I. Position Information**  |
| Post title: Office:Organisation: Duration of Employment: Duty station:  | Project Assistant Project Management UnitMinistry of Energy and Public UtilitiesOne year with possibility of extension Port-Louis, Mauritius |
| **II. Functions**  |
| Under the overall supervision of the Project Manager, the Project Assistant will:1. Support the activities of international/national experts, potential investors and sub-contractors;
2. Provide administrative support re. typing, filing, arranging visas for international experts/sub-contractors, maintaining project’s financial records, etc.;
3. Administer project accounting as per UNDP procedures;
* Assist the Project Manager in organising workshops, meetings of the Steering Committee and other events.
* Assist in procurement of goods and services;
* Draft letters of invitation and agendas for meetings of Steering Committee/workshops;
* Prepare background information, briefing materials, reports, etc., as required;
* Draft minutes of meetings, monitor/follow-up on actions required.
 |
| **III. Qualifications and Experience** |
| **Education:** * Higher education in economics, management, accounting, finance or other related field
* Specialized training in finance is desirable
 |
| **Experience:** * 3 years of relevant administrative, accounting and financial experience at national and/or international level is required.
* Experience in the usage of computers and office software packages (MS Word, Excel, etc.).
* Previous experience of working for nationally executed programme (s) funded by bilateral/multilateral organisations.
* Practical experience in procurement will be an asset.
 |
| **Language Requirements:*** Excellent English and French, both written and oral.
 |

## Annex 4: Letters of Co-financing and Support from the Government

Provided in separate file

1. [↑](#footnote-ref-1)
2. This electricity generation figure reflects the expectation as noted in Section 38 that all new plants specifically targeted for installation as part of the project would be fully operational by January 2013 [↑](#footnote-ref-2)
3. *Only cash co-financing (cost sharing at project level or other trust funds) actually passing through UNDP accounts should be entered here and in Atlas. Other co-financing should NOT be shown here*. [↑](#footnote-ref-3)
4. *Summary table should include all financing of all kinds: GEF financing, co-financing, cash, in-kind, etc...*  [↑](#footnote-ref-4)