PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: FULL-SIZED PROJECT
THE GEF TRUST FUND

Submission Date: 4 November 2009
Re-submission Date: 3 December 2009

PART I: PROJECT IDENTIFICATION

GEF PROJECT ID[1]:
PROJECT DURATION: 36 months
GEF AGENCY PROJECT ID: 4331
COUNTRY: Seychelles
PROJECT TITLE: Grid-Connected Rooftop Photovoltaic Systems
GEF AGENCY: UNDP
OTHER EXECUTING PARTNER(S): Seychelles Energy Commission (Ministry of Environment, Natural Resources and Transport) and Public Utilities Corporation (PUC)
GEF FOCAL AREA: Climate Change
GEF-4 STRATEGIC PROGRAM(S): SP3 Promoting Market Approaches for Renewable Energy
NAME OF PARENT PROGRAM/UMBRELLA PROJECT: NA

INDICATIVE CALENDAR	
Milestones	**Expected Dates**
Work Program (for FSP)	Mar 2010
CEO Endorsement/Approval	Feb 2011
Agency Approval Date	Mar 2011
Implementation Start	Apr 2011
Mid-term Evaluation (if planned)	Oct 2012
Project Closing Date	Mar 2014

A. PROJECT FRAMEWORK

Project Objective: Increased use of grid-connected rooftop photovoltaic (PV) systems as a sustainable means of generating electricity in selected main islands and smaller islands of the Seychelles.

Project Components	Investment TA, or STA[b]	Expected Outcomes	Expected Outputs	Indicative GEF Financing[a]		Indicative Co-Financing[a]		Total ($) c = a + b
				($) a	%	($) b	%	
Component 1: Policy, strategy and legal framework	TA	Adapted and enhanced legislative and policy framework for PV system development	o Energy policy that prioritizes renewable energy and sets specific targets for renewable energy as a percentage of national energy production o Revised PUC Act that includes third party energy generation, and entry and sale of this energy to the grid, submitted to National Assembly o Completed education and awareness campaigns promoting PV systems, targeted at 3 groups: key policy stakeholders, potential adopters of PV technology, and general public o Financing mechanisms developed with local banks to support adoption of PV systems	20,000	11	141,000	89	161,000
Component 2: Strengthening of the technology support and delivery system	TA	Enhanced national capacity for the development, operation, and financing of PV systems	o Key policymakers at the Energy Commission, PUC, and the National Assembly trained in the technical and economic aspects of PV systems and their relation to energy policy o PV suppliers and financing institutions trained in business planning, life cycle costing, quality assurance, maintenance, procurement, and marketing for PV systems o Certified PV system technicians capable of installing, operating and maintaining	150,000	58	110,000	42	260,000

[1] Project ID number will be assigned by GEFSEC.

			PV systems to enable the expansion of PV technology in the Seychelles o Established international partnerships and alliances with PV industry players and technical partners, including a regional network of PV system operators					
Component 3: PV demonstration projects	Investment, TA	Increased electricity production from PV systems and interest among energy sector investors and operators.	o Completed PV pilot project system assessments (site selection and pre-feasibility analysis) o Completed life cycle cost analyses for PV pilot project systems (based on models developed in other countries) o Formal agreements/contracts with partners for installation, operation and maintenance of PV pilot project systems o Installed 3 grid-connected PV systems: 1) a 200kWp PV project on Mahé island; 2) a 48kWp Medium demonstration project on Praslin island; and 3) 1-2 small (2 kWp) demonstration projects on outer islands (with private sector co-financing)	920,000	41	1,337,357	59	2,257,357
4. Project management				70,000	35	130,000	65	200,000
Total project costs				1,160,000		1,718,357		2,878,357

[a] List the $ by project components. The percentage is the share of GEF and Co-financing respectively of the total amount for the component.
[b] TA = Technical Assistance; STA = Scientific & Technical Analysis

B. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE and by NAME (in parenthesis) if available, **($)**

Sources of Co-financing	**Type of Co-financing**		**Total Amount**
	Cash	**In-kind**	
Project Government Contribution			
- Public Utilities Corporation	101,980	315,377	417,357
- Ministry of National Development	16,000	10,000	26,000
- Energy Commission		70,000	70,000
- Ministry of Finance	980,000		980,000
GEF Agency (UNDP): Energy Policy Review	60,000		60,000
Bilateral Agency (Govt. of France – ARER)	100,000		100,000
Private Sector (Masdar Company)		45,000	45,000
NGO (Seychelles Islands Foundation)	10,000	10,000	20,000
Total Co-financing	1,267,980	450,377	1,718,357

C. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT ($)

	Previous Project Preparation Amount (a)[2]	**Project (b)**	**Total c = a + b**	**Agency Fee**
GEF financing	0*	1,160,000	1,160,000	116,000
Co-financing	0	1,718,357	1,718,357	
Total	0	2,878,357	2,878,357	116,000

* Expected PPG submission will be $67,000 in GEF funds plus $6,700 in Agency Fee.

[2] Include project preparation funds that were previously approved but exclude PPGs that are waiting for approval.

PART II: PROJECT JUSTIFICATION

A. THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED:

Scope/Strategy

The project proposed will support implementation of a grid-connected rooftop PV system, by carrying out pilot projects for rooftop PV systems for commercial buildings on the main islands of the Seychelles (population of 85,000), and for overall power generation on selected smaller outer islands (total population less than 1,000). The potential for PV systems in the Seychelles is excellent, as the country has high levels of solar radiation due to the fact that the main islands are situated only 4 degrees south of the Equator. At the same time, the cost of generating electricity is very high due to the archipelago's isolated location and its reliance on imported heavy fuel. The immediate potential for other alternative energies, such as hydro, wind or wave power is more limited, based on previous studies in the country. On the main islands, where the Public Utilities Corporation (PUC) is the supplier of almost all electricity, there is a well-established grid system that can support the feeding of PV generated electricity into the grid, although a well-defined feed-in tariff system is not yet in place. Most importantly, the PUC is willing, for the first time, to support the sale of power back to the grid (due in part to the country's desire for WTO accession, which requires it to "open up" its energy market). In addition, although there are only a handful of PV systems currently installed in the country, rising fuel costs have sparked interest among more isolated energy users, particularly those managing small or outer islands.

Problem statement

The Seychelles is almost 100% reliant on imported oil for energy needs, which is a significant economic and budgetary cost, and is the single largest contributor of greenhouse gases in the country (based on emissions during the shipping process and in the burning of fuel to produce electricity). There is also an ongoing risk of transshipment accidents and spillage, a particularly significant threat for the remote UNESCO World Heritage Site of Aldabra, an atoll which is located close to a major petroleum shipping route through the Mozambique Channel. A study in 2007 found that national primary energy consumption (petroleum fuels that are imported and consumed locally) increased by an average of 5.4% per year between 1996 and 2007, and in the 3-year period 2005-2007 the average rate of increase was 9.7% per year. In 2000, primary energy consumption stood at 84,817 toe (ton of oil equivalent), whereas by 2007 it had increased to 115,000 toe. Demand is likely to continue to increase as a result of continued expansion of the electricity distribution system, the rising standard of living and the deployment of projects created by a recent influx of foreign investment.

PV systems development and barriers related to it

Given that Seychelles is a tropical country receiving large amounts of sunshine, with an average 6.9 hours of sunshine per day, there is great potential to replace at least some of the current oil-generated (and polluting) electricity with solar energy systems. One opportunity with high economic, financial and environmental viability is the implementation of rooftop grid-connected PV systems. At present, the only active grid-connected PV system in the entire country is a 600-watt (4-panel) PV system installed by the Public Utilities Corporation (PUC). The PUC would like to expand its use of PV systems, but has not done so to date because of relatively low oil prices and a lack of investment capital. A few organizations and companies (Island Development Corporation, Seychelles Islands Foundation, etc.), which manage some of the smaller islands of the Seychelles archipelago, are investigating opportunities for alternatives to oil-generated electricity, in some cases including PV systems. The interest and experience of these other organizations represents an opportunity for partnerships in the demonstration of PV systems in the country.

The full potential of energy from the sun to produce electricity and to heat water has been only minimally exploited in the Seychelles. Previous efforts to promote and adopt renewable energy technologies in the country, including PV systems, wind, biomass and biomass gasification projects, have largely failed. In some cases, the proposed technology was not technologically feasible in the context of a Small Island Developing State. More often, however, these efforts have failed because of legal, regulatory, and policy constraints that have promoted fossil-fuel based energies and restrained the adoption of RETs; from a lack of understanding and political will among policy makers of the need to change the country's energy production strategy; and as a result of these conditions, from an unwillingness among government

agencies, the private sector, and other sectors of the society to investigate and pilot alternative energy production systems. These barriers to a more widespread utilization of PV systems in the Seychelles can be broken down into three categories:

- *Market barriers:* Although the availability of suitable PV systems has increased worldwide, there is as yet no market in place for the supply and maintenance of this technology in Seychelles for small-scale or large-scale producers. There is no well-established and functioning supply chain and technical support system in place that would ensure broad availability of PV systems and better service support for end-users. The high capital cost of PV systems, including existing Goods and Services Tax applied to solar panels, is a significant barrier to the adoption of PV systems, in particular in the Seychelles, where the very small market, represented by an isolated, mid-ocean Small Island Developing State (SIDS) (population c. 82,000; nearest suppliers South Africa or Southeast Asia), reduces economies of scale and greatly increases transport costs. For many of the smaller outer islands, which currently depend almost entirely on oil-generated electricity, the lack of demonstrated successful adoption of RE systems in the country and the high initial costs of adopting these systems (including PV) have resulted in lack of uptake, in spite of very high fuel transport costs resulting from the remoteness from the main islands. In addition, there is very little awareness and information on the opportunities and advantages of PV systems.
- *Institutional and regulatory barriers:* Currently there is only one institution, the Public Utilities Corporation, providing electricity to the majority of the population living on the three main islands (in the most recent census of 2002, 96% of households are connected to the public electricity distribution system). PUC generates electricity by means of generators running on heavy fuel oil alone, with associated high importation costs. PUC's interest lies mainly in producing a fully functioning public electricity supply at a profit. There is no administrative mechanism in place that allows for alternative producers to access and feed into the public electricity grid, nor is there a feed-in tariff system. Moreover, there are no laws or regulations in place that allow for such mechanisms to exist (though the Government has confirmed that this does not stand in the way of implementing a pilot project as proposed by this project). In addition, previous experience with solar water heating technology adoption shows that without incentives (financial or other kind), the uptake of alternative systems by commercial and private sectors is limited.
- *Technical barriers:* There is a lack of technical and institutional capacities for the installation and maintenance of PV systems, and of the technical information to enable grid access. The number of experts and technicians in Seychelles who are trained and experienced in the installation, maintenance and repair of PV systems is very small. Previous experience with solar water heating technology reveals that without adequately trained technicians to service and repair equipment, it will quickly fall into disuse. Furthermore, PV systems may require specific adaptations for the humid tropical climate and salt-laden air of Seychelles.

Description of PV systems

PV is the process whereby the light component of sunshine (made up of light and heat) is converted to electrical energy through PV (solar) panels. As these panels only produce DC current, this will be converted to AC (alternating current) using special inverters and stepped up through a step-up transformer, and then fed directly into the national grid. This would be an innovative concept as it would be the first attempt in the Seychelles to connect alternative energy producing systems to the established electrical grid system.

The three proposed systems would together have a total capacity of 250 kWp, using individual panels of 100 Wp. Using the average daily insolation of 5760 Wh/m2, these systems are expected to produce around 350,000 kWh of electricity per year. The 1st system will be on the island of Mahe, with an installed capacity of 200 kWp (using individual panels of 100Wp), producing 280,000 kWh of electricity, and covering an area of 1,400m2 on the roof of Power Station C at Roche Caiman, which is designed to hold significant weight. The 2nd system will be located on the island of Praslin, with an installed capacity of 48 kWp, producing 67,200 kWh of electricity to be fed into the grid for the islands of Praslin and La Digue. This system will be placed on the roof of the generating facilities on Praslin, covering an area of 336 m2. The 3rd system will be a 2 kWp system on the outer island of Aldabra, connected to the micro-grid and producing 2,800 kWh per year. This will cover an area of 14 m2. The conversion to AC will be through a bank of grid inverters that would be approved by PUC and fit the grid specifications (230/400 Volts AC). The cabling and transformers to tie to the low voltage grid will be the responsibility of PUC (cable only for the system on Aldabra). The system runs automatically as long as the grid supply is available.

Project strategy

The barriers described above are interrelated. These barriers will need to be addressed in a holistic manner to enable the introduction and successful deployment, diffusion and transfer of PV systems in the country. Although one approach is to demonstrate pilot PV projects on small islands with appropriate partners, this approach alone would not ensure that long-term benefits of sustainable energy production technology are applied to the energy production system for the majority of the Seychelles population. Therefore, suitable PV systems need to become an inclusive part of the main public grid systems of the 3 main islands - where the greater part of the population lives, almost all industrial production is carried out, and much of the tourism activities takes place. This requires the appropriate institutional, policy and legislative framework to be put in place.

The *objective of the project* is to increase the use of PV systems as a sustainable means of generating electricity, thereby significantly reducing reliance on fossil fuel, through pilot projects for rooftop PV systems on all of the main and selected smaller islands, of the Seychelles. The identified barriers to the deployment, diffusion and transfer of solar PV systems will be addressed through the following project components:

Component 1: Policy, strategies and legal framework

This project component aims to review current energy production policies and legislation to improve the opportunities for solar PV power generation systems applications in Seychelles, in particular to allow for third party generation of energy and for selling energy to the grid (this would be an innovative legislation for Seychelles). The project will investigate the possibility that Government could set targets for RE as a specified percentage of the electricity generated in the country. In this regard, particular attention will be directed towards PV systems and a suitable technical feed-in system to support it, but with the potential of adopting other RE technologies in the future.

Increasing the awareness of decision-makers will be an important aspect of the project strategy to strengthen the legislative, administrative and financial support for PV systems. Providing information and raising awareness about PV systems among investors, local businesses and island developers will also encourage support from the private sector and help to generate suitable partnerships for PV projects. These partnerships will be critical for the development and implementation of financing mechanisms to support the importation and adoption of PV systems. Possible financing mechanisms include: partnerships with PUC to provide funding (as well as technical support and in-kind contributions) to reduce start-up costs; establish built-in parity correction factors to the feed-in tariff, such as a “carbon tax” on energy production, to counter balance fluctuations in fossil fuel prices; reduction or elimination of taxes on PV systems equipment; analysis of potential carbon finance benefits which could increase the profitability of PV systems vis-a-vis generation of carbon credit offsets; and development and establishment of private sector loan programs to support the purchase of PV systems (facilitated by pilot projects showing the long-term cost savings/revenues provided by such systems). In addition, by increasing public awareness about the PV pilot projects (especially among NGOs and community organizations), the project will increase support for the adoption of PV and other RE technologies throughout the country.

Specific outputs are:

1.1 Energy policy that prioritizes renewable energy and sets specific targets for renewable energy as a percentage of national energy production
1.2 Revised PUC Act that includes third party energy generation, and entry and sale of this energy to the grid, submitted to National Assembly
1.3 Completed education and awareness campaigns promoting PV systems, targeted at 3 groups: key policy stakeholders, potential adopters of PV systems, and general public
1.4 Financing mechanisms developed with local banks to support adoption of PV systems

Component 2: Strengthening of the technology support and delivery system

Although there is already some knowledge of PV systems and equipment in Seychelles, significant capacity building will be required to enable adoption on a wider scale and to include grid feed-in systems. The type of training will depend on

the existing capacities and future requirements of various partners, including public sector personnel (particularly strengthening PUC's capacity to absorb and deliver PV systems), potential private sector partners (e.g. electricians, technology sales companies, end-users such as hotels and island developers), and managers of outer island infrastructure. For example, training for trainers courses and workshops for in-service personnel will be conducted to allow for the further dissemination of knowledge on PV technology and its installation, maintenance and repair. This will pave the way for further adoption of PV systems and/or other suitable technologies over the long term. The proposed demonstration projects (see Component 3) represent an opportunity to start capacity building and tie it directly to the installation and operation of pilot PV systems. In addition to technical know-how about PV systems, the transfer of knowledge must also include guidance and information on ownership and management models, financial mechanisms and supportive policy instruments. To enable this, training could be carried out through partners such as the Seychelles Institute of Technology (SIT) and the newly established Seychelles University (SU). Furthermore, partnerships will be developed with selected institutions and companies in those countries that have broad experience with PV systems (in particular those in other developing countries, such as South Africa, Kenya, China or India), to enable adoption of technology from these countries to the Seychelles. Finally, joint training workshops/courses and related information sharing will be implemented with the proposed UNDP-GEF technology transfer project "Removal of Barriers to Renewable Energy in Mauritius, Rodrigues and the Outer Islands".

Specific outputs are:

2.1 Key policymakers at the Energy Commission, PUC, and the National Assembly trained in the technical and economic aspects of PV systems and their relation to energy policy
2.2 Government, private sector, and NGO managers trained in business planning, life cycle costing, quality assurance, procurement, and marketing for PV systems
2.3 Certified PV system technicians capable of installing, operating and maintaining PV systems to enable the expansion of PV systems in the Seychelles
2.4 Established international partnerships and alliances with PV industry players and technical partners, including a regional network of PV system operators

Component 3: PV demonstration projects

The implementation of the entire project will be an innovative concept that will lay the groundwork (policy, legislative aspects, technical and market conditions) for the future of grid-connected RE Technology (RET) projects in the Seychelles. The PV demonstration projects will be able to show whether rooftop PV systems are technically feasible and cost effective for Seychelles, both for small-scale systems on the smaller islands and for commercial buildings on the main islands, with the possibility of scaling up, thus allowing a greater percentage of energy production in the form of PV systems. It will be particularly important to demonstrate whether or not PV is a cost effective means of energy production for outer islands, which currently rely on fuel-driven energy supplies. The demonstration project should include an analysis of the true costs of fuel supply for outer islands, which is not always taken into consideration. On the main island of Mahe, the project will work with the PUC to install a 200kWp system on the roof of one of their power stations. On the island of Praslin, the project will again work with PUC to install an 80kWp system on another of their buildings. On the outer island of Aldabra, the project will work in partnership with the Seychelles Islands Foundation to install a 1kWp system, which will be connected to a micro-grid that supports the 12 residential and operations buildings on the island.

Specific outputs are:

3.1 Completed PV pilot project system assessments (site selection and pre-feasibility analysis)
3.2 Completed life cycle cost analyses for PV pilot project systems (based on models developed in other countries)
3.3 Formal agreements/contracts with partners for installation, operation and maintenance of PV pilot project systems
3.4 Installed 3 grid-connected PV systems: 1) a 200kWp PV project on Mahé island; 2) an 48kWp demonstration project on Praslin island; and 3) 1-2 small (2 kWp) demonstration projects on outer islands (with private sector co-financing)

Global Benefits

The PV systems developed by the project are expected to produce approximately 350,000 kWh of electricity (figure based on actual output of PUC small PV pilot system). Since the electricity produced will be connected to the grid, or will replace existing fossil fuel based electricity production, this will reduce annual consumption of fuel oil by 81 metric tons

(station efficiency of 0.23kg fuel oil/kWh), and thereby reduce CO2 emissions by approximately 243 metric tons per year (1 metric ton of fuel oil produces 3.02 metric tons of CO2). Over the course of the project, the total reduction in CO2 emissions will be approximately 607.5 metric tons (assuming 2 ½ years of operation during the project), while the overall reduction in CO2 emissions will be 6,075 metric tons (expected lifetime of the PV system of 25 years). In addition, indirect reductions through replication of the PV systems in the Seychelles may be estimated. Based on a replication factor of 3 (project type: demonstration with capacity building), the additional total indirect CO2 emissions reduced (with investments after the project period) as a result of the project can be conservatively estimated (bottom-up approach) at 18,225 metric tons. Moreover it is important to recognize that the Government of Seychelles has discussed a target of 5% of national energy production from PV systems (pending Cabinet approval). One of the main expected outcomes of this project is to support such an energy policy that sets specific targets for renewable energy as a percentage of national energy production, and to promote the introduction of PV systems as the best technology option to meet such targets. Current overall annual power production is 270,490,000 kWh, so a 5% displacement by solar PV systems (13,524,500 kWh) would create additional reduction in CO2 emissions per year of 9,394 metric tons per year nationally.

B. CONSISTENCY OF THE PROJECT WITH NATIONAL/REGIONAL PRIORITIES/PLANS:

This project inserts itself in a very consistent manner into the framework of national priorities and plans. The current Environmental Management Plan for Seychelles (2000-2010), a government policy document intended to guide and coordinate sustainable development, includes as one of its objectives "to promote and implement energy conservation practices, use of renewable energy resources and technologies, and energy efficient and clean technologies." (p.77). However, it is only within the last two years that the government has begun to seriously address the RET aspect of this plan. In his State of the Nation address in February 2008, President James Michel stated: "The issue of energy is one that is critical for us, and for our future. The amount of petroleum products our country is consuming now is not sustainable in the long term. Government is presently drafting an energy policy that will look at radical solutions that we will have to adopt. Government will remove all taxes, including GST [Goods and Services Tax], on certain solar energy products such as solar panels."

The Ministry of National Development (which is also in charge of energy policy) established an Energy Security Steering Committee in 2008, with the aim of studying how the country can move away from its dependence on imported oil to satisfy its energy needs. A report from this committee, with a list of policy recommendations ranging from short- to long-term, identified the need to promote other viable technologies, including grid-connected PV, as part of the national energy mix. Recommendations for the medium-term measures were aimed at changing the energy mix to make it more sustainable and reduce the country's vulnerability. The report was produced in December 2008, updated in early 2009, and submitted to the Cabinet of Ministers, where it now awaits final approval. The MND is also negotiating with the Agence Reunionaise pour L'Energie Renouvelable (ARER) to conduct an assessment to determine to what degree renewable energy can contribute to the energy production mix of the country, in support of the Government's commitment to increase energy security. In addition, the recently established Seychelles Energy Commission also strongly supports the idea of implementing more PV systems in the Seychelles.

The National Greenhouse Gas Mitigation Options report, produced for the Second National Communication to the United Nations Framework Convention on Climate Change, recommends increased efforts to promote RET, and specifically PV systems, to reduce CO_2 emissions. This report states that with the use of current technologies, the average emission for the Seychelles for the period from 2000 to 2007 was 698 g CO_2/kWh. In addition, as part of its agreement under the Bali Action Plan, the Seychelles has legally committed itself to reducing its emission of greenhouse gases (GHG). The government has embarked on various initiatives, some with international partners, to promote alternative technologies to satisfy a more significant portion of its energy needs. For example, negotiations are currently underway with the Abu Dhabi-based company MASDAR to look into the feasibility of installing a small wind farm in Seychelles.

C. CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS:

Promotion of grid-connected PV systems is consistent with national priorities on development of the energy sector, as described in Section B. Seychelles has not received previous GEF support for promoting PV systems. The activities proposed will remove barriers to the adoption of RET, consistent with GEF strategic objectives in climate change and those stated in the strategic programming for GEF-4. The project will undertake activities in support of all three of the

key indicators for SP3 under the GEF-4 Climate Change Mitigation program: 1) tons CO2eq avoided; 2) adoption of policy frameworks, allowing renewable generators equitable access to the grid; and 3) kWh generated from renewable sources. The project also will contribute to increased production of RE for supply in the electriciy grid, having a direct impact in market penetration (% of share from renewables).

D. JUSTIFY THE TYPE OF FINANCING SUPPORT PROVIDED WITH THE GEF RESOURCES:

The GEF will provide a grant for the funding of activities that will result in the establishment of a sustainable PV systems program in the Seychelles, and will substantially contribute to reductions in GHG emissions. The GEF funds will be used for developing and implementing legal and policy frameworks, carrying out capacity building activities necessary to enable the adoption and replication of grid-connected PV systems, and demonstrating such systems at several sites around the country. The proposed project is requesting a grant from the GEF, which will be used to support activities that are incremental to the existing baseline.

E. COORDINATION WITH OTHER RELATED INITIATIVES:

In the past few years, the Government of Seychelles (GOS) has recognized the need to review its national energy policies and practices, both to reduce dependence on oil imports (and thereby increase national energy security) and to address the country's contributions to climate change. The President of the Seychelles has directed the relevant agencies and institutions to review the country's existing energy supply system and to explore alternative energy production options. In addition, the GOS has instituted significant changes in its energy management, including the establishment of a new Seychelles Energy Commission within the Ministry of Environment, Natural Resources and Transport in July 2009, which has been charged with overseeing the development of integrated energy project planning.

The table below represents a summary of organizations that have an interest in renewable energy in general, and PV systems in particular, in the Seychelles. The Energy Commission will be the lead implementing agency for the project, and a coordinating committee will be set up inside the Energy Commission to oversee the coordination of activities under the project. This committee will include stakeholders who have an interest in renewable energy in general, and PV systems in particular, in the Seychelles. The table below represents a summary of the relevant stakeholder organizations:

Organization	**Activities**
Ministry of Environment, Natural Resources and Transport (MENRT)	Implements policies and energy conservation projects. In the past, an Energy Affairs Bureau (EAB) implemented a small stand-alone PV project on one of the smaller islands.
Seychelles Energy Commission	Established in July 2009 as part of MENRT; part of its role will be to promote the use of more sustainable and viable alternative technologies, especially RETs. The Commission will take the lead role in policy/legal issues related to renewable energy and PV systems in particular.
Public Utilities Corporation (PUC)	PUC is the sole producer and distributor of electricity in the Seychelles, with a monopoly on grid access. However, PUC has stated its interest in diversifying the energy mix, including the expansion of PV systems, and intends to support the project through providing labor, equipment, and maintenance for the pilot PV systems of the project. In addition, PUC is negotiating a contract with Agence Reunionaise pour L'Energie Renouvelable (ARER) to conduct an assessment to determine to what degree renewable energy can contribute to the energy production of the country.
United Nations Development Programme (UNDP)	UNDP is supporting a team of experts, including a renewable energy specialist, to develop a 2nd National Energy Policy during the period 2009-2010.
MASDAR	This Dubai-based company is active in renewable energy development in the Seychelles. Currently it is focused on wind power development, but it may also act as a partner in the provision and management of PV systems in Seychelles.
Seychelles Institute of Technology (SIT)	The SIT has expressed interest in offering courses in RETs; three lecturers from SIT recently undertook a short-term training in RETs on Reunion Island.
National Climate Change	Promoting use of clean technologies that will contribute to the reduction of GHGs

Committee (NCCC)	and coordination of climate change related policies and programs in the country.
GDFSUEZ	French multinational corporation that will be involved in the electricity sector and has major experience in this field in small island states.
SEYPEC (Seychelles Petroleum Company)	A government organization, SEYPEC has the responsibility for ensuring supply of fuel in the country.
Sustainability for Seychelles	A local NGO promoting the use of clean and renewable energy technologies

F. VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING:

In the absence of the proposed project, government policy and political may continue their recent evolution towards support for RETs, but the specific legal and regulatory mechanisms necessary for their success will remain undeveloped. Furthermore, adoption of PV systems in the Seychelles is likely to be slow or non-existent in the absence of demonstrated examples of economically and technologically viable PV systems in the country, and the lack of technical, financial and strategic capacity to identify good opportunities for PV systems and to install, operate and maintain those systems. GEF funds will be used to specifically remove these barriers. In essence, these barrier removal activities are incremental activities that are needed to facilitate the deployment, diffusion and transfer of solar PV power generation systems in Seychelles. These barrier removal activities of the project will therefore contribute to the realization of global environmental benefits by facilitating the reduction of GHG emissions from the country's power generation sector. Moreover, this could also help initiate the development of other available RE resources of the country, based on the lessons learned and experienced gained from this project.

G. RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND IF POSSIBLE INCLUDING RISK MITIGATION MEASURES THAT WILL BE TAKEN:

The following table shows a brief assessment of the main risks with regard to project sustainability and proposes suitable mitigation measures.

Risk	Risk Rating	Mitigation Measures
TECHNICAL RISKS		
System component may cause distortion on the grid.	Low	Research will be undertaken and a mechanism put in place to ensure appropriate technology.
ECONOMIC & FINANCIAL RISKS		
Economic conditions evolve so that PV (both grid-connected and off-grid) technology is not economically and/or financially viable in the Seychelles	Moderate	The project will reduce life cycle costs sufficiently to greatly minimize the economic risks of this project. In addition, the project will support the work of the Energy Commission to build in parity correction factors into the feed-in tariff, such as a "carbon tax" on energy production, which would counter balance any fluctuations in fossil fuel prices.
Lack of political and institutional support for financial mechanisms to enable adoption of PV systems.	Moderate	Seek commitment of Ministry of Finance and banks from the onset of the project.
MARKET RISKS		
Investment in PV systems is not large enough, given very small national economy, to create economies of scale, necessary to make PV systems financially competitive.	Low	The project will ensure that grid-connected PV systems in Seychelles have the regulatory approval to sell electricity back to the grid, as well as financial support through a feed-in tariff, both of which will make investment in PV systems much more attractive for both public and private sector players. In addition, the project will reduce and/or eliminate technical capacity barriers, such as the lack of expertise in the country for installation, operation and maintenance of PV systems, and for their integration (connection) to the power grid, which currently constrain investment in PV systems. These actions will help the Government of Seychelles to achieve its target of 5% of national energy production coming from renewable energy sources.

OTHER RISKS		
Reviewed legislation blocked by National Assembly.	Moderate	Through the UNFCCC Secretariat, lobby for the review and development of an appropriate regulatory framework to allow for the development of RE, especially grid-connected PV systems

H. THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT:

The 250 kWp PV systems developed by the project are expected to produce approximately 350,000 kWh of electricity. Since the electricity produced will be connected to the grid, or will replace existing fossil fuel based electricity production, this will reduce the annual consumption of fuel oil by 81 metric tons per year (station efficiency of 0.23kg/kWh), and thereby reduce CO_2 emissions by approximately 243 metric tons per year. For the lifetime of the system (25 years), this will be about 6,075 metric tons CO2. Considering this direct CO2 emission reduction from the solar PV demonstrations, the unit abatement cost (GEF$/ton CO2) of the project is about US$ 191/ton CO2.

The project activities are expected to "jumpstart" the market for grid-connected PV systems in the Seychelles, which implies there are significant potentials for further avoided GHG emissions and additional improvements in economies of scale and improved cost efficiencies for PV systems in the country after the project has ended. If indirect CO2 emission reductions are considered (based on the introduction of an expected target of 5% share of solar PV in the national power generation mix systems - 13,524,500 kWh based on the current grid power production) the project would contribute to an additional reduction in CO2 emissions per year of 9,394 metric tons per year nationally. Assuming a 25 years lifetime for such investments and a GEF causality factor of 0.8 (dominant given that one of the main outcomes of the project will be supporting the establishment of such an RE target), the UAC for indirect emissions indirectly caused by the project would be as low as about US$ 6.0/ton CO2. These figures are indicative only. During the PPG phase the exact number of solar PV power generation facilities and total installed capacity with the corresponding CO2 emission reduction will be determined with more precision.

I. THE COMPARATIVE ADVANTAGE OF GEF AGENCY:

The project is a climate change capacity building for and demonstration of grid-connected photovoltaic systems, which falls under UNDP's comparative advantages as presented in Annex L of the document GEF/C.31/5 rev.1. In addition, UNDP is the leading international agency working on climate change related issues in the Seychelles, including ongoing programs to assist the Government of Seychelles in developing a 2nd National Energy Policy and a new National Climate Change Strategy.

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

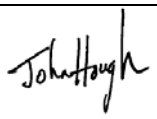
A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the country endorsement letter(s) or regional endorsement letter(s) with this template).

NAME	POSITION	MINISTRY	DATE *(Month, day, year)*
Dr. Rolph Payet	Special Advisor to the President National GEF Operational Focal Point	OFFICE OF THE SPECIAL ADVISOR TO THE PRESIDENT	8/12/2009

B. GEF AGENCY(IES) CERTIFICATION

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

Agency Coordinator, Agency name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
John Hough UNDP/GEF Deputy Executive Coordinator		12/03/2009	Roland Alcindor Environment Programme Manager, UNDP Mauritius	230 212-3726	roland.alcindor@undp.org
			Lucas Black Regional Technical Advisor (acting) Climate Change Mitigation – East & Southern Africa UNDP	212-906-6230	lucas.black@undp.org