PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project
THE GEF TRUST FUND

Submission Date: August 20, 2009

PART I: PROJECT IDENTIFICATION

GEF PROJECT ID[1]: **PROJECT DURATION:36**months
GEF AGENCY PROJECT ID:
COUNTRY(IES): Nauru, Niue and Tuvalu
PROJECT TITLE: "Low Carbon- Energy Islands": Accelerating the Use of Energy Efficient and Renewable Energy Technologies in Tuvalu, Niue and Nauru
GEF AGENCY(IES): UNEP, (select), (select)
OTHER EXECUTING PARTNER(S): IUCN-Oceania
GEF FOCAL AREA (S)[2]: Climate Change
GEF-4 STRATEGIC PROGRAM(s): CC-SP1, CC-SP3, (see preparation guidelines section on exactly what to write)
NAME OF PARENT PROGRAM/UMBRELLA PROJECT (if applicable**):GEF PACIFIC ALLIANCE FOR SUSTAINABILITY (GPAS)**

INDICATIVE CALENDAR*	
Milestones	**Expected Dates mm/dd/yyyy**
Work Program (for FSP)	Nov 2009
CEO Endorsement/Approval	Nov 2010
Agency Approval Date	Feb 2011
Implementation Start	April 2011
Mid-term Evaluation(if planned)	Oct 2012
Project Closing Date	March 2014

* See guidelines for definition of milestones.

A. PROJECT FRAMEWORK

Project Objective: To help reduce GHG emissions by strengthening national capacities to formulate policies, plans, strategies and programs for the accelerated private sector led medium-term and long-term deployment of low-carbon energy systems in small-island countries.

Project Components	Indicate whether Investment, TA, or STA[b]	Expected Outcomes	Expected Outputs	Indicative GEF Financing[a]		Indicative Co-Financing[a]		Total ($) c =a + b
				($) a	%	($) b	%	
1. Enabling framework for energy demand strategies involving energy efficiency programs and embedded renewable energy generation.	TA	I. Low-carbon energy policies promoting energy demand management strategies involving energy efficient end use technologies and embedded renewable energy-based electricity generation strategies defined and endorsed by governments.	I. A) Medium- & long-term electricity demand scenarios per country consisting of a business-as-usual scenario & several scenario options consisting of energy demand management strategies involving energy efficient technologies. I. B) Medium- & long-term national electricity sector plans per country consisting of specific energy demand management strategies (including *smart grids*), energy efficiency programs & energy supply strategies involving embedded RETs. I.C) Regulatory framework for grid access & certification modalities for eligible embedded RETs developed. I.D) Medium- & long-term assessment studies of the potential for embedded	300,000	66%	150,000	33%	450,000

[1] Project ID number will be assigned by GEFSEC.
[2] Select only those focal areas from which GEF financing is requested.

			RET electricity generation for different types of techno-economically feasible RETs. I. E) Capable, locally-based private businesses and/or private-public partnerships to act as suppliers/providers of low-carbon energy goods and services.					
2. Imple-mentation of country-specific accelerated low-carbon energy island strategies.	TA, Investments	II. Feasibility of low-carbon energy technologies in small island setting demonstrated through investment from the private sector and/or public-private partnerships.	II A) Financing mechanism, smart subsidies and contribution of investors formulated and mobilized per country II B) Energy demand management strategies involving commercialized deployment of energy efficient technologies implemented in all countries. II C) Operational embedded RETs (e.g.; wind and/or solar PV) that has been tested for its technical & operational viability with the grid and assessed of its techno-economic competitiveness. II D) Potential low-carbon energy service companies (i.e.; both private ventures and public-private sector partnerships) which have undergone training/capacity-building and have developed their respective business plans.	718,776	30%	1,700,000	70%	2,418,776
3. Building market awareness and local capacities.	TA	III: Awareness of low-carbon energy utilization and supply technologies of policy makers, potential markets and investors deepened.	III A) Media and other awareness programs to support energy efficiency investments by various end-users. III B) Information package on potential of low-carbon energy technologies and the potential role of electricity end-users as investors III C) Pilot training course on utility management for grid integration of embedded renewable energy generation. consultations	150,000	75%	50,000	25%	200,000
4. Project management				129,860	44%	165,000	56%	294,860
Total project costs				1,298,636	39%	2,065,000	61%	3,378,637

[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	Project
Project Government Contribution	In-kind	300,000
GEF Agency(ies)	Unknown at this stage	
Bilateral Aid Agency(ies)	Grant	500,000
Multilateral Agency(ies)	Grant	700,000
Private Sector	Soft Loan	500,000
NGO	In-kind	65,000
Others	(select)	
Total Co-financing		2,065,000

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

	Previous Project Preparation Amount (a)[3]	Project (b)	Total c = a + b	Agency Fee
GEF financing		A 1,298,636	1,298,636	129,864
Co-financing		B 2,065,000	2,065,000	
Total		3,363,636	3,363,636	129,864

D. GEF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES)[1]

GEF Agency	Focal Area	Country Name/ Global	(in $)		
			Project (a)	Agency Fee (b)[2]	Total c=a+b
UNEP	Climate Change	Nauru	432,880	43,288	476,168
UNEP	Climate Change	Niue	432,878	43,288	476,166
UNEP	Climate Change	Tuvalu	432,878	43,288	476,166
(select)	(select)				
(select)	(select)				
(select)	(select)				
(select)	(select)				
(select)	(select)				
(select)	(select)				
Total GEF Resources			1,298,636	129,864	1,428,500

[1] No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

[2] Relates to the project and any previous project preparation funding that have been provided and for which no Agency fee has been requested from Trustee.

PART II: PROJECT JUSTIFICATION

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

The three countries targeted by this project, namely Nauru, Niue and Tuvalu - are practically 100% dependent on imported fossil fuels for their energy needs, especially for transport and electricity production. Nauru consists of a single raised coral equatorial island with an area of 21 sq. km. and has a population of 10,000. It is the world's smallest independent republic. Niue is also a single raised coral island of 259 sq. km and has population of about 2,000. Tuvalu is about 26 sq km spread over eight islands. The largest, Vaitupu, has an area of about 5.6 sq. km. while the smallest, Niulakita, has only 0.42 sq. km. of land. Tuvalu has a population of about 9,000. The isolated location of the three countries places them at the end of a very long and costly supply chain for imported petroleum fuels. This results in significantly higher energy services costs in comparison to larger countries within and outside the Pacific region.

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

Currently, all three countries have plans to install grid-connected renewable energy systems with support from international development partners. Nauru has pipelined a 40 KWp PV system and in Niue a 35-55 KWp PV system will be installed. Both projects are supported by the European Union's REP-5 Programme. Tuvalu has successfully operated a 40KWp solar system connected to the grid on the main island and is planning to expand solar power generation into the outer islands. The next project will be another 40KWp system, to be established with support from the Italian government on the island of Vaitupu. These projects will only generate a comparatively small percentage of all electricity supply but are considered first steps towards a more substantial use of clean, indigenous energy.

All three countries are participating in the GEF-UNDP project "Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project" (PIGGAREP). PIGGAREP has programmed a variety of interventions that focus on supporting and following up on projects and activities implemented under other projects. Specific activities include grid integration analysis for the EU/EDF funded solar installations together with renewable awareness campaigns in Niue, training needs assessments for Nauru and hands on training for utility technicians to handle the Italian funded PV system implemented through IUCN. In Tuvalu, there are also provisions to follow-up on activities implemented under the Danish-funded PIEPSAP project that funded a wind measuring programme and a detailed tariff study for the national power utility.

To complement PIGGAREP, UNEP has been allocated $1.5M of GEF funds to provide support to Nauru, Niue and Tuvalu under the GEF Pacific Alliance for Sustainability (GPAS) Program. The three island countries are the smallest and also the more difficult to access in the region. With GPAS funds, UNEP aims to accelerate the use of energy efficient and renewable energy technologies in these countries by complementing and/or building on PIGGAREP activities, and by focusing on the specific characteristics of the three countries, namely: (1) Very high dependence on imported fuels for power generation; (2) Very low electricity consumption in absolute terms; (3) Very high cost to supply fuels; (4) Very high access rates to existing electricity infrastructure; (5) Very low development of private sector to provide goods and services in renewable energy and energy efficiency; and (6) Very low mobilization of private households and small businesses in the area of clean energy.

The socio-economic and energy situations, the natural resource endowment, and thus the potential energy interventions for three countries are different from each other. The three countries are also physically very far from each other. The primary reason why GPAS grouped together these three countries under this project is because they are the least covered by regional programs targeting the region as they are the most difficult to reach countries and they are the smallest in terms of population. This project therefore cannot really be considered a regional project, but rather a collection of three national projects. The target of the modestly-sized demonstration projects/activities therefore will primarily be the own populations of the islands and not the whole South Pacific region. It may really be interesting to promote for region-wide (or even global-wide) duplication the interventions piloted on these islands that may become successful. That however will be very difficult to do under this project, given that a maximum of only $1.5M GEF funding has been allocated to it.

All three countries have recently updated and modernized their energy policies, nevertheless, some improvements and fine tuning will be required as follows: (a) Ensure inclusiveness of major stakeholders in relevant strategic discussions and implementation committees; (b) Minimum efficiency standards for buildings designs, and important equipment such as household appliances, air conditioners, lights and vehicles; (c) Establishment of regulatory framework and standards for energy technologies and grid access (net metering grid access codes); (d) Institutional framework and unambiguous mandate for certification of technologies and technology providers/installers; (e) Definition of role of private sector as provider of technology and of financing services; (f) Establishment of unambiguous procedures to deal with unsolicited proposals and creation of independent, external advisory panel for assessment of new technologies to be introduced in the countries.

Project Objectives - The project objectives will be the following: (a) to systematically mobilize all energy conservation/efficient energy use potentials in the countries by incorporating them in energy demand management strategies, (b) to enable and promote decentralized, embedded renewable energy generation, and (c) to enable public-private partnerships and/or private sector companies to supply the goods and services needed to move towards 'low-carbon energy islands'. The electric utilities of the island countries are expected to play key roles in this process. *Integrating energy demand management/energy efficiency programs with renewable energy programs* are the emerging global "best practices" for *low-carbon energy strategies*, which aim to maximize reduction of GHG emission for energy use. By integrating the two components, GHG reduction from energy use can be maximized. This was also the recommendations by the GEF-UNDP PIREP (Pacific Islands Renewable Energy Project) studies done earlier in these countries. Thus the project aims to promote an integrated supply-demand approach to low-carbon energy strategies as there are opportunities for both in the countries, and can be done despite the small GEF funding, given the relatively small population of the countries. Work on renewable energy under this project will link and build upon the initiatives of bilateral and multi-lateral agencies, including those of PIGGAREP. Again, as stated earlier, this strategy is also a means to maximize and make significant the GHG emission reduction from energy use in small island states as it will be targeting both the production/supply and consumption of energy.

The project on-the-ground country activities will focus on building both enabling and regulatory frameworks and local capacity through training in (1) formulation of short-term (accelerated), medium-term (5-year) and long-term (10-year plus) low-carbon energy scenarios, programs and strategies; (2) technical and economic assessment of low-carbon energy technologies and certification; (3) energy business development and planning; (4) engineering/ installation/operation of low-carbon energy technologies by private sector entities and/or a public-private sector partnerships; and (5) managing/monitoring/evaluation of the strategies and programs for 'low-carbon energy islands'.

The project will give primary focus on implementing *energy demand management/energy efficiency strategies* as they are the least expensive GHG mitigation strategies and should be tackled first, before embarking on the more capital-intensive RE technologies. They can also generate larger immediate reduction of GHG emission reduction as shown in the PIREP studies, and provide for shorter payback periods. Furthermore, as mentioned earlier, PIGGAREP and other donor projects are already focusing on RE technologies, and what this project can alternately do is to build upon and promote strategies for RET deployment by adopting more innovative approaches compared to what PIGGAREP and the other projects are currently doing.

Thus, the project energy supply component will involve assessing the potential of *RET-based embedded generation systems.* A WB techno-economic assessment done in 2005 based on actual experiences in several Asian developing countries indicates that numerous renewable energy technologies (biomass, biogas, geothermal, wind, and micro-hydro) are the potential least-cost generation option for mini-grids, assuming a sufficient renewable energy resource is available. Mini-grid applications are village- and district-level networks with loads between 5 kW and 500 kW not connected to a national grid. Two biomass technologies – biogas digesters and biomass gasifiers – seem particularly promising, due to their high capacity factors and availability in size ranges matched to mini-grid loads. For off-grid electrification applications, renewable energy technologies - wind, mini-hydro, and biomass-electric - are the least-cost option (on a levelized basis), assuming availability of the renewable resource. Pico-hydro, small wind, and PV-wind hybrid technologies in particular are projected to be in the range 15-25 cents/kWh, less than half the 30-40 cents/kWh for gasoline and diesel engine generators. The most expensive renewable energy technology (solar PV) is comparable in levelized electricity costs to the projected costs for gasoline or diesel engine generators, especially for small power applications (50-300 W). These techno-economic assessments were conducted with the assumption of crude oil prices ranging from 30-38 $/bbl of crude oil.

The project will conduct similar on-the-ground techno-economic assessments to identify which RE technologies are currently techno-economically competitive for embedded generation. The embedded RET-based power generation is an innovative approach for promoting private sector involvement (which are also the energy users themselves) in small-scale grid-connected RE systems. It also addresses one constraint faced by small islands in using RETs, particularly PV and wind – land availability. Embedded generations allows for "building-integrated PV systems" (e.g.; on roof tops) and small wind turbine systems built on backyards of homes and public buildings such as schools, clinic and churches. Thus these RETs will not compete with land use in these small islands, as land allocation for centralized PV systems has become a major issue in them.

The project will initially look at (conduct *desk assessment* of) all techno-economically viable RETs in the immediate-, medium- and long-term scenarios. It will then select one technology for pilot implementation to test the technical and operational viability of the concept, and showcase RE-based embedded decentralized generation. This will provide concrete basis for developing enabling policy frameworks for such RE-based grid-connected systems.

Another innovative concept that this project will initiate is to assess for possible applications in the islands of *"smart grids"* to maximize the use of RETs generated electricity, particularly by energy efficient appliances. This project will explore the adoption smart grids, or in the case of these PICs, "smart mini-grids" to help achieve a renewable-energy based island electrification systems. Smart grid, which is now being established in developed countries, include electronic controls/information systems that allow instantaneous matching of electricity demand and supply, in which renewable energy sources can or are given priority use. A smart grid supports renewable energy because it can anticipate the intermittency of these sources, making renewables more efficient and reliable, thus maximizing their contribution to the grid. The potential for introducing this in the countries will be first assessed during the PPG phase. As of now, there is not enough information available on the possible interest, or even awareness of the three countries of this concept, but there are already good examples available, such as in New Zealand, which is relative close to the three countries.

PPG Phase Activities - Because it has been difficult to consult and get good data from the countries at the PIF preparation stage, it has been agreed that the techno-economic assessments to select the appliances (e.g,; refrigerators, freezers, air-conditioners, electric stoves, etc.) to be promoted in each country; in addition to efficient lighting, will be done during the PPG phase. For the pilot demonstration project on RET-based embedded generation, only one "wind energy embedded generation" in one country will be considered because of the limited GEF funding (US$1.5M) that will be provided to this project. The great distances that separate the three small island countries can substantially jack up project management and consultancy costs, eating up on the amounts allocated for project activities (It has been estimated that almost half of this amount will be technical assistance cost that which will be used to pay for honoraria, transportation and travel costs of consultants that will be hired by this project.).

There is however great interest by both countries and donors to deploy more solar PV systems in the islands. According to IUCN Oceania (the project's EA), which has been extensively involved in sustainable energy development in the region, it is expected that more donor funding will be coming to these islands, particularly to fund the capital cost of RET installations. Donors doing work in these three countries include the EU, the Italian and Japanese governments. Thus, this project will aim to leverage funding from these donors, and at the same time, influencing them into adopting the "embedded generation" approach, rather than just focusing on "off-grid" or "centralized grid-connected" systems. The project will conduct the feasibility studies that will indicate the technical, economic, social and institutional viability of the approach for these small island communities. It is then expected that the donors will provide the investment needed for hardware costs of additional embedded generation RETs, and the project can then focus on local capacity-building, formulation of supportive policy framework, and other institutional strengthening and market development activities. More detailed discussions will be conducted during the PPG phase linking this project with RE investments being done by other projects, a couple of which are also implemented also by IUCN Oceania. The potential contribution of these donors will be made clearer during the PPG phase, when there will also be more certainty of a GEF-UNEP project being approved for the three countries.

Experience from donor projects and on-going initiatives under PIGGAREP, plus initial discussions with electric utilities in the countries, indicate that the power utilities in the countries will play a "private sector" role (or partner with a private sector) in this project in the marketing/distribution of efficient appliances and technologies. This has been done in Tuvalu before; during the 1990s the country's electric utility imported low cost, low efficient refrigerators and freezer to build up electricity demand. The power utilities, acting as a private sector entity (on its own or in a public-private partnership) can also be the energy service companies that will install/maintain/monitor/repair the embedded RETs; and the conduit for financing the acquisition of EE/RETs technologies. Still, it is possible that purely private companies will come in and do these actvities,, in the spirit of private enterprise development, depending on the policies and incentives the government in each country will adopt.

Expected Outcomes - The expected major outcomes of the project will be the building up of local expertise and development of institutional capacity for public-private partnerships and/or private business operations for the accelerated and expanded deployment of low-carbon energy technologies; and wider awareness and deeper understanding of low-carbon energy sysyerms bypolicy makers, local businesses and the general public. The project will have as outputs; (1) identification of suitable operational low-carbon energy technologies focusing on pilot commercialization of energy efficient enduse technologies and operationalization/testing of at least one renewable energy-based embedded generation system in each country, (2) financing for these technologies, (3)organizational structures based on private-public partnerships to sustainably supply, market/distribute, install, operate and maintain these technologies and (4) policy recommendations to sustain and accelerate the expansion of these applications. It is then expected that the promotion of low-carbon energy technologies will help to create a local low-carbon energy service industry. Such a local industry will need an enabling technology acquisition framework consisting of the following elements: (i) a government certification scheme for approving equipment quality and design; (ii) A credit support facility which maybe channelled through commercial banks; (iii) particularly for embedded power generation, a regulatory capacity providing investors with protection of rules for participation; and (iv) an awareness and education campaign that explains to potential investors the nature of the opportunity.

Potential GHG Emission Reductions

Estimation of GHG emission reduction potential was part of the 2004 country energy studies done under the GEF-UNDP PIREP studies. The studies were based on data and information collected between 2002 and 2003, but the GHE emission estimates appears to be actually based on GHG emissions studies done in the countries in late 1990s. Basically three areas were identified for reduction of use of fossil fuels; energy efficient appliances programs, efficient transportation and deployment of RE technologies. The following were the results of those assessments done almost a decade ago:

Nauru – A reduction of as much as 50% of electricity use appears possible with an aggressive energy efficiency programme that includes replacement of inefficient appliances, raising the electricity price to at least equal its cost and disconnection of service for non-payment of energy bills. It was estimated that this will generate a reduction of about 13.8 Gg CO2 emission or about 29% of the projected 2013 emissions. An additional reduction in emissions of 2.8Gg CO2 (about 6% of projected 2013 emissions) was estimated from the use of solar energy.

Niue - A modest growth in energy use was projected based on assumptions that the population would not grow and appliance and vehicle ownership had approached market saturation. Any growth would be in the commercial and government sectors. The study identified that primary opportunity for GHG reduction lies in increasing the efficiency of energy use in transport and electrical consumption. Energy efficiency measures that reduce non-aviation transport fuel by five percent could be applied by 2012 and a 15% reduction in electricity use appears possible, equivalent to a reduction of .40Gg CO2 emission or 42% of projected 2012 emissions. An additional 0.48Gg CO2 (50% projected 2012 emissions) emission reduction is possible from use of solar and wind power systems.

Tuvalu – The primary energy use in households is for refrigeration. During the mid-1990s low cost, low efficiency refrigerators was imported and sold by the electric utility to customers to increase of electricity revenues, thus, about half of the households on Funafuti have a refrigerator and about half have a freezer (some houses have both). On the outer islands, after two years of electrification, around 11% of households had a refrigerator and 38% had a freezer. Energy efficiency programs, addressing particular the replacement of these inefficient appliances, have the potential of 1.41 Gg CO2 emission reduction (about of 64% of projected 2013 emissions). An additional 0.79Gg CO2 (36% of 2013 emissions) emission reduction is possible from deployment of renewable energy.

Since these studies were done, there have definitely been changes in the economy and energy use in the three islands, but more significantly, there have also been significant advances in the last five years on the technical and economic viability and competitiveness of EE and RE technologies that can have significant impacts on the potential replacement/reduction of fossil fuel use in them, and thus the reduction of CO2 emissions. Nevertheless these studies provide the most recent information on potential GHG emission reductions from promoting EE and RE techonlogies in the islands, and thus can be used to provide the needed background information to assessing this proposal. This information however will be updated and may be detailed further during the PPG phase; determining the specific types of energy efficient technologies to be promoted, energy demand management strategies to be adopted and the embedded RET that can be considered in the three countries, in the immediate, medium- and long-term scenarios.

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL/REGIONAL PRIORITIES/PLANS: All three countries have recently endorsed or adopted policy statements that embrace accelerated development of clean energy technologies and

the use of renewable, indigenous energy resources. National economic policies in each country emphasize the need to strengthen the private sector and develop businesses that are able to create employment and generate income for the local population. In response to this policy settings UNEP GPAS will develop and prove an expandable model for delivering clean energy to Pacific island households and communities. Providing access to clean energy technology for communities, households and small businesses offers a growing business opportunity for local enterprises, either users or suppliers of energy..

In Nauru, the emphasis of the recently endorsed National Energy Policy framework is the provision of secure and sustainable energy services '… enabling the social and economic development of Nauru.' One of the strategies to achieving the above vision is the promotion of widespread use of renewable energy. The National Energy Policy highlights Nauru has abundance solar energy and has the potential to add substantially to its energy balance. The promotion of renewable energy in Nauru is line with the aspiration of the National Sustainable Development Strategies (NSDS) i.e. to achieve a 50% energy threshold based on renewable energy by the year 2015. The NSDS supports private sector focused development. It aims to increase revenue by effectively managing the remaining phosphate deposits and pelagic fish stocks, spurring the development of small-scale agriculture and cottage industries, and increasing the level of education of Nauruans so that they are more competitive on the international labour market and can increase the amount of remittances sent home. Nauru has endorsed this project; in the letter, the GEF Operational Focal Point confirmed that this project proposal is in accordance with the government's national priorities and communications made by Nauru under relevant global environment conventions and has been discussed with relevant stakeholders.

Energy sector development is a priority for the Niue Government. The National Energy Policy is supportive of renewable energy and energy efficiency technologies. Niue's current National Integrated Strategic Plan also considers policies and strategies in the field of economic and sustainable development and was adopted with the environment, climate change, achieving the MDGs, and poverty alleviation measures ranking high on its priorities for sustaining a living and vibrant community on Niue. In Niue 2005 Energy Policy Document has the following sub-sectoral policy statements showing consistency with the country's priorities and the project activities will build on on-going programs, policies and political commitments: (a) The Electricity Sector: 'Establish and maintain an efficient, semi-autonomous and commercially orientated power corporation, the Niue Power Corporation (NPC) that is able to provide an ongoing, cost-effective, affordable, use-friendly and reliable electricity supply to meet the developing demand for electricity in its areas of service.' (b) New and Renewable Sources of Energy: 'Promote low-carbon energy options for power generation including solar, wind and biomass energy resource; and assess and promote the natural resource potential and improve the technical capacity to meet Niue's energy needs.' (c) Energy Conservation and Efficiency: 'Minimize Niue's energy demand and consumption without adversely affecting Niue's economic and social well being; and maximize the efficiency with which energy is used.' (d) Private sector: To mobilize development assistance and financing from international and multilateral development partners and the private sector, for the implementation of national and regional energy strategies.

Tuvalu emphasizes the need to develop indigenous forms of energy and conserve energy in its National Energy Policy. The following sub-sectoral policy statements are quoted from the counry's energy policy: (a) Electricity: The importance of establishing a reliable electricity supply to support socio-economic development cannot be understated… the provision of electricity both in the urban and rural areas is critical and given high priority in the government development plan (Te Kakeega II). (b) Renewable Energy: The link between energy and the environment highlights the importance of having to place more efforts to the development of the renewable energy resources available in Tuvalu. The development of renewable energy resources to diversify the energy mix in Tuvalu offers some degree of security for the energy supply in Tuvalu. The development of renewable energy resources such as solar, wind, bio-fuel, etc, provides a good prospect to broaden the energy supply sources in Tuvalu. (c) Conservation and Efficiency: The rising energy cost together with the associated adverse impacts of energy production & use on the environment necessitate policy responses aimed at conserving & the efficient use of energy.

C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS: This project will be submitted under the climate change focal area strategy and will address the following strategic programs:

- Strategic Program 1: Promoting energy efficiency in residential and commercial buildings –The project will address energy efficiency in lighting, water heating, air-conditioning and refrigeration in households, and in commercial and service buildings.
- Strategic Program 3: Promoting market approaches to renewable energy – The energy enterprise model that will be develop under this project is fully aligned with Strategic Program 3. The focus will be on enabling the private sector to deliver renewable energy technologies to communities, households and small businesses, but will also include public-private partnerships. The development and financing of local, small clean energy businesses in unproven markets requires public sector engagement to raise the private investment capital needed to increase and accelerate use of low-carbon energy technologies, i.e.; EE & RE technologies. There are substantial public benefits inherent in the building of entrepreneur capacity, the mitigation of market risk, and the smaller nature of the businesses and investments that produce less-than commercial returns. Without the support of this project and its development partners, these investments would not flow, decentralized energy businesses would not be launched and the resultant environmental benefits would not occur.

D. JUSTIFY THE TYPE OF FINANCING SUPPORT PROVIDED WITH THE GEF RESOURCES: GEF funds will be used to improve enabling conditions and regulatory frameworks for demand side management/energy efficiency programs at consumer level and embedded renewable energy generation . The project will carefully assess the potential for decentralized, embedded generation both with respect to available resources and with respect to technical limitations of grid integration. Funds will also be used to finance

pilot demonstration projects that will showcase the viability and advantages of a market driven, enterprise centered, and a decentralized dissemination strategy for low carbon energy technologies. The pilot projects will not only showcase the technical and economic viability of decentralized participation of households and businesses in low carbon energy programs but will also address the issue of capacity building in both the public and private sectors. The project with closely work with local financial institutions in order to leverage credit finance for renewable energy and energy efficiency investments. The country-demonstration projects will basically be a targeted research activity that will characterize the technical, economic, financial, management, tariff structuring, organizational and policy-related factors needed for the successful operation and implementation of decentralized, privately owned and operated low carbon-energy systems. The results should also help develop guidelines for expanding such efforts in the three countries, and replicating the same in other countries, within and outside the Pacific region.

E. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES: In all three countries, there are a considerable number of other activities and projects that also aim to improve energy sector management and to promote renewable energy and energy efficiency. The most important ongoing program is the GEF-UNDP PIGGAREP (for all three countries) and the EU EDF 9 and EDF 10 activities (in Niue and Nauru). There is already cooperation with PIGGAREP even at the PIF formulation stage of this project. DGEF has had several meetings and exchanges of e-mails with the UNDP-GEF focal point for PIGGAREP. The activities defined in this PIF were defined based on the review and analysis of the 'gaps" in the PIGGAREP PPM for the three countries (see attached matrix). Such interaction continues and will be formalized when this project is finally approved and implemented. In Tuvalu, there is also an Italian funded renewable energy project implemented through IUCN-Oceania. (IUCN-Oceania is also currently executing a regional energy programme involving six Pacific Island countries with funding from the Governments of Italy and Austria and Tuvalu is one of the six countries involved in this programme) In addition, there are related activities supported by the World Bank, the Asian Development Bank and AusAid. NGOs such as Alofa Tuvalu and Greenpeace have been active in the promotion of clean energy and the idea of low carbon island economies.

This proposed UNEP GPAS project, through its executing agency IUCN-Oceania whose headquarters is based in Suva, Fiji will directly engage with these players and share all project related information such as project documents, proposals, progress reports. Regular meetings, especially with UNDP, SREP and the EU will ensure that complementarity is achieved and synergies can be mobilized. IUCN will provide access to all relevant documents on its web page and in addition mail any relevant document to the focal points of the respective agencies. In addition UNEP/IUCN will actively participate in general regional co-ordination. In response to the multitude of clean energy related activities across Pacific Island countries, and in order to improve donor coordination the World Bank has under its 'Energizing the Pacific Programme' established a co-ordination mechanism (Donor Working Group). IUCN on behalf of the Italian Government has participated in this group and will continue to engage in the group on behalf of UNEP GPAS. Concrete activities according to the ToR for the group consist of: Circulate project concepts and proposals for peer review/comment; Seek out/support programs/facilities/activities for financing; Share information on liaisons with governments, utilities and regional energy organizations; Seek to coordinate donors' energy sector TA and investments within: a) national energy policy frameworks; and b) any regional energy initiatives, related to regulation, fuel procurement, Pacific Regional Infrastructure Facility (PRIF), renewable energy, energy access, carbon financing, etc. Part of the project initiation activities will be stakeholders' analysis. The key stakeholders identified from this exercise will be invited in a project inception workshop for consultation to define their roles, inputs and expected benefits from the project.

At the national level there will be a lead partner organization in each country, and this will be the electric utilities as they are the most organized energy-related organizations in those countries. They are already working in tandem in PIGGAREP, enhancing thus the complementarity and coordination of this project with PIGGAREP. They are the Nauru Utilities Authority, Niue Power Corporation (in coordination with the Energy Division of the Department of Economics & Planning), and Tuvalu Electric Corporation. As mentioned previously, previous and current experiences in these countries indicate that their respective power utilities will be keen to play a "private sector" role (or partner with a private sector) in this project in the marketing/distribution of efficient appliances and technologies and as energy service companies that will install/maintain/monitor/ repair "embedded" RETs; and even as conduit for financing the acquisition of EE/RETs technologies. Still, it is possible that private companies will come in and do this in the spirit of private enterprise development, depending on the policies and incentives the government in each country will adopt.

DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING : Without this GEF project, the countries will continue to be primarily dependent on fossil-based energy systems complemented by utility scale renewable energy technologies such as PV and wind power systems. As these RE projects have been and will be 100 % grant funded by donors such as the EU the penetration of RE technologies and even EE technologies will continue to be 100% dependent on external funding. While the externally funded projects will make contributions to greenhouse gas mitigation, they are unlikely to trigger any additional investment from households and private enterprises.

The UNEP GPAS project will aim to leverage private investment in energy efficiency and embedded renewable energy, and thus accelerate the introduction of these technologies on a wider scale. Subsidizing clean energy is a valid means of introducing new technologies and concepts. It is, however, not considered sustainable. UNEP GPAS will promote an approach where households co-finance the installation of these low carbon energy technologies with the savings they gain from using less electricity generated by fossil fuels. It is expected that through a promotion of these low carbon energy systems, the fossil fuel consumption of electricity generation will be halved over a period of 8 to 10 years.

Although the global environmental benefits will be small in absolute terms, there will be significant educational and public relation benefits from the implementation of low carbon energy strategies on these island countries. All previous and ongoing projects promoting clean energy have focused on a government/public sector led approach. This is certainly a valid concept as long it is complemented by comprehensive attempts to mobilize the potential the private sector to supply, sell, install, maintain and repair the technologies implemented. Clearly, developing such capacity will also benefit the public sector focused clean projects. The experiences generated by the countries will provide lessons that can be valid in many isolated communities which need to be served by micro/mini-grid systems, that almost always require public-private partnerships.

In addition, distributed or decentralized generation as promoted under GPAS will add to energy security by providing opportunities to maintain supply of electricity to critical parts of the systems in the event the main generators are down. Using a decentralized, embedded approach, critical facilities such as social infrastructure (hospitals, schools, churches) can be equipped with renewable energy generation and storage which not only helps to stabilize small grids but also allows to maintain supply to such facilities in case of network failure. Utility-scale or centralized renewable energy systems also have technical and social limitations on the islands in question. Centralized renewable energy installations require dedicated space and landowner consent. The former is not always available given the small size of the islands the latter is difficult and sometimes impossible to obtain as previous experiences in Tuvalu (location of a wind measuring mast under PIEPSAP) and Niue (location of a medium scale wind generator under REP5) have demonstrated (as was also pointed out earlier). In order to overcome these constraints, this project will take an innovative, participatory approach (such as building integrated PV systems) of promoting embedded, decentralized generation by enabling the landowners themselves to become suppliers of electricity.

In the field of energy efficiency, there will be a focus on creating a regulatory framework that allows local businesses to successfully market low energy technologies such as CFL and efficient appliances. Up until now, there is no regulation in the countries that would restrict, ban or penalize the import of ineefficient technologies and this project will work on consensus building through public awareness and education to promote and commercialize EE technologies.

F. INDICATE 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: There is a risk that climate change impacts the technologies promoted under this project. Mitigating these risks will be necessary. Extreme weather events such as hurricanes have damaged and destroyed wind generators and solar equipment in the Pacific region and elsewhere. During tropical cyclone Heta in Niue, wind speeds have been registered in excess of design survival speeds of the highest IEC class for wind turbines. The cyclone destroyed solar installations on the island. (This is a major concern; as the whole of Niue was totally flatten by that cyclone that hit the country in 2004.) Given the likelihood of an increase in frequency of such events in the future, renewable technology employed in these countries has to be cyclone proof. UNEP GPAS will specify equipment standards that ensure survival under extreme whether events, and currently, addressing these risks is one of the key focus of on-going projects in the countries, including PIGGAREP, which are promoting wind energy on the islands. Note also that the WB study on the techno-economic competitiveness of RETs quoted in this PIF has also accounted for the additonal cost of making wind energy systems stronger to withstand strong cyclones/typhoons.. It based its study on an actual wind farm in the Philippines, which is similarly frequently battered by strong typhoons as these island countries.

DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT: UNEP GPAS will establish an innovative, sustainable, business-minded approach to tackle the issues of energy security and climate change through low carbon energy strategies. To do this, a variety of elements are required: supportive policies and incentives, innovative public-private sector partnerships, local enterprises, finance and services, and cleaner technologies. UNEP GPAS innovation will be bringing together all the required pieces in one model: investment promotion, business development support and investment capital. Cost effectiveness will be achieved through focusing on the joint characteristics of the three countries and a limited number of interventions. The three countries are small in terms of size, population, energy consumption and thus, of emission of greenhouse gasses. It is therefore cheaper, faster, and easier to reach a higher share of renewable energy in its energy balance than in larger countries with more complex energy systems and also, faster and easier to disseminate of energy efficient technologies; thus, it will be a cheaper, faster and easier way of demonstrating and showcasing to the world how to achieve low-carbon energy societies. With the limted level of GEF funding (US$1.5M) provided for this project, this project can be considered as the one cost-effective "global laboratory" for a formulating and implementing a comprehensive low carbon-energy strategy.

Electricity tariff affordability issues are important aspects in assessing cost effectiveness of the project and this will be discussed during the PPG phase. Most of the RE projects (mainly PV centralized systems) were from donor projects, and most government (particularly Nauru), have heavily subsidized electricity tariff (almost providing free electricity in some points in the past). All however recognized the need for and are initiating the removal of subsidies. Thus, affordability of electricity in general, not just for RET-generated electricity, is an issue that has to be resolved. Although consumer financing (one of the strategies to be undertaken by this project) or outright donation (by other donors) may be able to help address this, affordability will need to be tackled with broader economic programs that provide higher income job opportunities to the islanders, *a scope that although is beyond this project, the project may still be able to indirectly contribute to*. Thus if less costly RE systems (like wind energy, even if they have to be built stronger because of typhoons) can be provided as energy supply options, then this lessen a bit the difficulty of removing the subsidies or lessen the subsidies at all (if governments opt to continue them; a political decision that this project may not have enough weight to

influence on). Also, note that subsidized RETs will generate less CO2 than subsidized diesel genset; the project will still thus achieve its overall objective of reducing GHG emissions.

Consumer financing will be the main strategy for marketing energy efficient technologies, particularly for households. Consumer financing can also be used for "embedded RETs" but the customer base will be narrower as it will target only the richer households and commercial establishments. Donor funding, and if available, government budget, can be used for "embedded generation" in public building and service establishments (schools, health clinics, hospitals, churches and government buildings). It is possible to convince larger establishments (such as hotels, but they are not so many in these islands), to finance embedded RETs on their own. However, even if it can be proven that it can be profitable for them, still they may also need financing, and thus they can be targeted by the financing schemes that this project aims to develop.

There is anecdotal information that there are families in these three countries who have relatives abroad who send them money to buy costly appliances, even their solar home systems (which can be upgraded for embedded generation). The number of such families is one type of information that will be obtained during the PPG phase as it provides an indication of the potential market for "embedded generation" and "smart grid + EE" technologies. What is interesting here is the observation that these families are not making their decision to invest on PV systems on the basis that this is the least cost option for them, as the decision to purchase systems are usually made by the relative working abroad. Those relatives' decisions may be based on factors such as 'expected' 24-hour availability of electricity supply and independence from the grid (particularly if grid is unreliable), inaccessibility of diesel fuel and no maintenance and operation cost (if they are using diesel gensets), one-time expenditure (one-time acquisition cost vs monthly bills), and a purely consumer-driven psychology (i.e.; acquisition of new affordable technology) .

JUSTIFY THE COMPARATIVE ADVANTAGE OF GEF AGENCY: UNEP's comparative advantage for the GPAS project is related to its being the only United Nations organization with a mandate derived from the General Assembly to coordinate the work of the United Nations in the area of environment and whose core business is the environment. UNEP's comparative strength is innovation by providing the GEF with a range of relevant experiences, proof of concept, testing of ideas, and the best available clean energy science and knowledge. UNEP has also comparative advantage in the area of "scientific and technical analysis, assessment, monitoring/tools and perhaps most importantly in standards and norms for clean energy technologies which are key elements of this project. UNEP's comparative advantage also includes its ability to serve as a broker in multi-stakeholder consultations an element that will be of critical importance in a project that touches upon ongoing and/or pipelined activities of a large variety of bi-and multilateral agencies including UNDP, EU, World Bank and Asian Development Bank.

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)*
Russ J Kun	**Secretary**	**Department of Commerce, Industry & Environment, Nauru**	**DEC 02, 2008**
Sauni Tungatule	**Director**	**Department of Environment, Niue**	**SEP 23, 2008**
Mataio Tekinene	**Director**	**Department of Environment, Ministry of Natural Resources & Environment, Tuvalu**	**APR 14, 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
Maryam Niamir-Fuller, Director, UNEP Division of GEF Coordination (DGEF)		08/20/2009	Conrado S. Heruela	254-20-762 4795	conrado.heruela@unep.org