



# PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: MEDIUM SIZE PROJECT

THE GEF TRUST FUND

Submission Date: 18 September 2009

Re-submission Date: 28 October 2009

## PART I: PROJECT IDENTIFICATION

GEF PROJECT ID: PROJECT DURATION: 36 months

GEF AGENCY PROJECT ID: 4358

COUNTRY: Fiji

PROJECT TITLE: Fiji Renewable Energy Power Project (FREPP)

GEF AGENCY: UNDP

OTHER EXECUTING PARTNER: In Fiji – Department of Energy

GEF FOCAL AREA: Climate Change

GEF-4 STRATEGIC PROGRAMS: SP-3: Promoting market approaches for renewable energy; SP-4: Promoting sustainable energy production from biomass

NAME OF PARENT PROGRAM: GEF Pacific Alliance of Sustainability (GEF-PAS)

INDICATIVE CALENDAR*	
Milestones	Expected Dates mm/dd/yyyy
Work Program (for FSP)	N.A.
CEO Endorsement/Approval	Jul 2010
Agency Approval Date	Sep 2010
Implementation Start	Oct 2010
Mid-term Evaluation (if planned)	June 2012
Project Closing Date	Dec 2013

\* See guidelines for definition of milestones.

## A. PROJECT FRAMEWORK

Project Objective: Removal of major barriers to the widespread and cost-effective use of grid-based renewable energy supply via commercially viable renewable energy technologies.								
Project Component s	Inv, TA, STA <sup>b</sup>	Expected Outcomes	Expected Outputs	Indicative GEF Financing <sup>a</sup>		Indicative Co-Financing <sup>a</sup>		Total (\$)
				(\$)	%	(\$)	%	
1. Energy Policy & Regulatory Frameworks	TA	Facilitation of investments on energy projects, particularly on RE-based power generation	Enacted and enforced Fiji Energy Act and implementing rules and regulations	150,000	75	50,000	25	200,000
2. RE Resource Assessments	TA	More energy projects on the utilization of confirmed viable RE resource potentials are planned and implemented.	Completed and published RE resource assessments and mapping  Report on the viability of the development and utilization of identified RE resources.	150,000	38	250,000	62	400,000
3. RE-based Power Generation Demonstrations	TA	Markets for specific renewable energy technologies are developed	Designed and implemented RE-based power generation demonstration  Documentation of demonstration results for distribution	427,500	30	1,000,000	70	1,427,500
4. Institutional Strengthening	TA	Energy policy making and integrated energy planning (IEP) are regularly carried out by FDOE  Initiation of the 100% electrification program of Fiji	Completed training courses on IEP and energy policy making for FDOE personnel  Completed and approved national electrification master plan	150,000	60	100,000	40	250,000
5. Project management				97,500	49	100,000	51	197,500
<b>Total project costs</b>				975,000		1,500,000		2,475,000

<sup>a</sup> List the \$ by project components. The percentage is the share of GEF and Co-financing respectively of the total amount for the component.

<sup>b</sup> 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
Fiji Department of Energy	Cash	1,035,000
Fiji Department of Energy	In-kind	215,000
Private Sector	Cash	250,000
<b>Total Co-financing</b>		1,500,000

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

	Previous Project Preparation Amount (a)	Project (b)	Total c = a + b	Agency Fee
GEF financing	0	975,000	975,000	97,500
Co-financing	0	1,500,000	1,500,000	
<b>Total</b>	0	2,475,000	2,475,000	97,500

**PART II: PROJECT JUSTIFICATION**

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

In 2006, the Government of Fiji at Cabinet level endorsed its first ever National Energy Policy (NEP). The energy policy seeks to address the major constraints of country's energy sector in ensuring the sustainable supply of electricity to support social and economic development. Among these are the following:

- 1) Absence of an integrated energy plan that is in line with a strong and consistent national energy policy – An integrated energy plan that is not susceptible to changes in government administration is lacking in the country. Such situation creates an environment of uncertainty for energy consumers, as well as public and private sector investors. Along with the absence of an integrated energy plan is the uncertain medium and long term investment environment in the country. Among the barriers to the development and utilization of the country's renewable energy resources and the development of large scale renewable energy programs is the lack of comprehensive energy legislation and regulations. Clear and consistent energy policies including the enactment and enforcement of an Energy Act<sup>1</sup> (including the associated implementing rules and regulations) would encourage increased use of, and investment in, RE-based power generation in the country.
- 2) Fiji is highly dependent on imported petroleum products - Concerning imported petroleum products; Fiji continues to be highly dependent on such for power generation, transportation, industrial and household uses. For the last three years, imports of petroleum products have been hovering around the one billion Fiji Dollar mark, e.g. in 2008 the total value of fuel imports was about FJ\$1.3 billion or 37% of the value of total imports<sup>2</sup>. For a small economy like Fiji, the effects of such expenditures can be devastating and also means reduced budgets for critical social concerns such as education and health; and,
- 3) Alternative indigenous energy resources are not being fully developed and utilized. It is stated in the NEP that *'...indigenous energy sources have the potential to meet our energy needs there are many barriers to the immediate transition of the energy mix to favor these sources'*. Currently, bulk of the electricity generated in the major islands of the country is from hydro resources. It once reached 85% in 1999 but had since been declining as a result of the increasing demand and to an extent, limited rainfall within water catchment areas. Current developments in this area

<sup>1</sup> In 2004, the Renewable Energy Charter, which was developed and formulated under the UNDP-GEF project on "Promoting Promoting Sustainability of Renewable Energy Technologies and Rural Renewable Energy Service Companies in Fiji, was approved by the Cabinet. It was later planned to expand it into a Renewable Energy Bill.

<sup>2</sup> Bulk of the fossil fuel consumption of Fiji is used for transport. Oil-based power generation accounts for 35% of the power generation mix in the country.

have been more reactive rather than planned. The monitoring of the extent of the hydro resource is presently carried out only if there's a demand like when a prospective energy project developer is interested in developing a hydroelectricity power project. As to the utilization of the wind energy resource, at present, electricity production from wind accounts only for about 1% of the electricity mix. To ensure energy security, the contribution from wind, hydro and biomass resources should be increased. However there is insufficient knowledge about Fiji's large-scale (and mini) hydroelectric resource, with little long-term monitoring in recent years and relatively poor knowledge about the geothermal, wind energy and biomass resource.

Additional issues include financial constraints, linked to the limited government funding for energy projects. Even the private power developers have financing constraints, and they too are also dependent on external investments for their energy projects in the country. The lack of capacity (manpower and technical) in the Fiji Department of Energy (FDOE), which is the Government's focal point for the energy sector, energy policy development and oversight of energy sector operations, is also something that have to be contend with in order to realize the sustainable development and utilization of the country's RE resources, and the effective application of RE technologies for electricity and non-electricity purposes.

The proposed project consists of 4 main components: 1) Energy Policy & Regulatory Frameworks; 2) RE Resource Assessments; 3) RE-based Power Generation Demonstrations; and, 4) Institutional Strengthening.

**Component 1: Energy Policy & Regulatory Frameworks** – Through this component, the Fiji Government endeavors to put in place an overarching legal/regulatory framework on energy, based on a clear and consistent energy policy. This will be in the form of a formulated Energy Act that will have to be enacted and enforced through a set of clearly defined implementing rules and regulations that will guide developments in the energy sector including in the area of renewable energy development and utilization. This component aims to address the policy and regulatory barriers that hinders the wide-scale development and utilization of Fiji's indigenous RE resources. The outcome of this component is the facilitation of investments on energy projects leading to more energy project development and implementation in the country. To realize this outcome, the activities that will comprise this component will deliver tangible outputs such as: (1) An Energy Act that is expected to be enacted and enforced during the course of the project implementation; and, (2) Approved set of implementing rules and regulations (IRRs). Among the activities that will be carried out to deliver the expected outputs are the following: (1) Review of the current RE Charter to come up with relevant improvements based on the NEP for incorporation in an Energy Act; (2) Conduct of specific policy studies, the findings & recommendations of which will be used in the formulation of the Energy Act; (3) Preparation of the draft Energy Act, including the accompanying IRRs; (4) Conduct of consultation meetings with Government authorities, private sector entities, energy sector entities, including FEA on the draft Energy Act; (5) Conduct of consultation meetings with Government lawmakers to lobby support for the approval of the Energy Act; and, (6) Conduct of advocacy campaigns to promote the proposed Energy Act. All of the above are expected to facilitate and/or influence the enactment and enforcement of the Energy Act.

**Component 2: RE Resource Assessments** – This component will address the technical and information barriers pertaining to the availability and technical feasibility of harnessing the country's RE resources, particularly mini/micro hydro, wind, geothermal, and biomass. The expected outcome from this component is that more energy projects on the utilization of confirmed viable RE resource potentials are planned and implemented. The expected outputs that will help realize this outcome are: (1) Completed and published RE resource assessments and mapping; and, (2) Report on the viability of the development and utilization of identified RE resources for power generation. To deliver these outputs, the envisioned activities include: (1) Review of existing RE resource data; (2) Design and conduct of separate RE resource surveys for each RE resource; (3) Assessment of the results of the RE resource surveys; (4) Preparation of the RE resource mapping; (5) RE resource database development; (6) Conduct of the technical and economic feasibility evaluation of potential sites where substantial quantities of the RE resources are available for use in power generation<sup>3</sup>; (7) Publication and dissemination of the findings of the resource assessments and the technical and economic feasibility assessments of specific sites; and, (8) Design and conduct of capacity development program for FDOE personnel on the RE resource assessment and monitoring.

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<sup>3</sup> The assessments will also include the evaluation of the feasibility of the utilization of the RE resource for non-power purposes (e.g., mechanical power), and also the potentials for other value-added non-energy uses of biomass resources.

**Component 3: RE-based Power Generation Demonstrations** – This component is somehow intended as an attempt to re-establish the RE market in Fiji. Previous solar energy projects of the FDOE in the early part of this decade have spurred growth in the application of RE technologies in the country, particularly solar home systems. Presently, except for the foreign-funded RE projects of FDOE, there are no significant RET application projects in the country. Such situation has affected whatever RE market there is now in the country. The expected outcome from interventions that will be carried out under this component is that markets for specific renewable energy technologies are developed. The envisioned approach to achieve this is to showcase strategically important RE-based power generation applications. Hence, the expected outputs from this component that will contribute to the realization of the expected outcome are: (1) Designed and implemented RE-based power generation demonstrations; and, (2) Documentation of demonstration results for distribution. It is envisioned that there will be 2 major demonstrations, one showcasing on-grid and off-grid RE-based power generation. The demonstrations are not meant only for showing the applied RE technology in the operation of an installed on-grid and off-grid RE-based power generation facility, but also the entire aspect of planning, design, engineering, financing, installation, and management arrangements of the installed facility and their support systems (e.g., feed processing unit, boiler feed water treating system).

Based on initial investigations and consultations with potential partners, the following are the tentatively identified demonstrations:

- (1) 2 MW on-grid Biomass-based Power Generation – This is in a wood processing plant and will make use of the wood waste of the plant (e.g., saw dust, wood cuttings/trimmings, log bark)
- (2) 500 kW off-grid Micro-hydro Power Generation – This is one of the FDOE's funded micro-hydro projects in areas not served by the FEA. This system is intended to serve a micro-grid.

The major activities for each demonstration scheme will be similar to that in full project implementations, starting from the conceptual design, to feasibility study, engineering design, financing, installation, operation, monitoring and evaluation. The results and experiences derived from the demonstrations will be documented and disseminated. The success of these demonstrations is expected to bring forth serious interest in the private sector to invest in RE-based power generation in Fiji inasmuch as these demos would have shown them the effective and feasible process of designing, developing, implementing, and particularly financing, of on-grid RE-based, and on/off-grid biomass-based power generation projects in the country.

Under this component, the following activities will be carried out in order to deliver the expected outputs: (1) Promotion of the demonstration schemes; (2) Evaluation and confirmation of the demo projects; (3) Baseline data establishment for the demo projects; (4) Facilitation of the requirements for the installation of the demonstration projects; (5) Provision of technical assistance (if needed) in securing the financing for the demo projects; (6) Demonstration results evaluation, documentation and dissemination; (7) Capacity building for local engineering and consulting firms on the design, installation, and maintenance of RE-based power generation systems; and, (8) Design of a sustainable follow-up program for financially supporting future RE-based (including biomass) power generation in Fiji.

The project partners (i.e., demonstration hosts) will be responsible for the: (1) Detailed engineering design of the demo projects; (2) Purchase and installation of the hardware required for the demos; (3) Commissioning, operation and performance monitoring of the demo facility; and, (4) Reporting of the performance monitoring results.

**Component 4: Institutional Strengthening** – This component addresses the need to further enhance the capacity of the FDOE and the energy sector in integrated energy planning. A particular focus of this component is the preparation of a definitive master plan for the electrification of the country. Such plan is meant to be an environmentally friendly, sustainable and least cost power expansion plan for the country covering both the provision of increased access by people in the present un-electrified areas to grid and mini-grid based power, as well as addressing the increased demand for power from already electrified areas (among others to ensure that power developments keep pace with population growth). The expected outcomes of the outputs that will be delivered under this component are: (1) Energy policy making and integrated energy planning (IEP) are regularly carried out by FDOE; and, (2) Initiation of the 100% electrification program of Fiji. Among the major outputs that will help bring about these outcomes are: (1) Completed training courses on IEP and energy policy making for FDOE personnel; and, (2) Completed and approved national electrification master plan. The activities that will be carried out to deliver these outputs include: (1) Review of current energy planning

practices, including the methodology for the preparation of national energy balance; (2) Conduct of studies on the energy supply, demand and consumption in Fiji; (3) Conduct of studies on electricity tariff setting; (4) Design and conduct of training program on energy policy making and integrated energy planning; (5) Drafting of the Fiji Electrification Master Plan<sup>4</sup>, including the profiles of the proposed RE-based (including biomass) power generation projects; (6) Conduct of consultation meetings with Government authorities, FEA, private sector and energy sector entities, financing institutions and donor agencies on the draft Master Plan; (7) Conduct of consultation meetings with Government lawmakers to lobby support for the approval of the Electrification Master Plan; and, (8) Conduct of advocacy campaigns to promote the Electrification Master Plan.

During the PPG exercise, the proposed components (including their respective tentative expected outcomes, outputs and activities), as well as the overall financing plan (i.e., project budget) will be reviewed, revalidated and elaborated (and modified if and as required). Specifically, if findings from the PPG exercise indicate: (i) A need for additional demonstration projects and less than anticipated resources needed for Components 1, 2 and 4; and, (ii) A need for additional support to capacity development in the local financial sector; and such can be demonstrated to complement ongoing and planned interventions of the ongoing WB/GEF (SEFP), then such will be included in the final design and reflected in the MSP Document. In addition, the final activities will be explained in more detail. The key tool which will be used for the review and elaboration of the project design will be a Logical Framework Analysis that will be initiated through a Consultation and Design Workshop, which is expected to be attended by representatives from key national stakeholders including the FDoE and the Fiji Electricity Authority (FEA).

### ***Expected Global Environmental Benefits***

It is anticipated that investments that will be facilitated and/or influenced through the envisioned barrier removal activities of this project, as well as the direct support provided to strategically important renewable energy demonstration projects will result in global CO<sub>2</sub> emission reductions through the displacement of petroleum products used for power generation. Based on a trend analysis of the historical CO<sub>2</sub> emissions from the power sector in Fiji, the estimated potential CO<sub>2</sub> emission reduction from the utilization of RE resources for power generation is about 100 k tons/year (2010-2025)<sup>5</sup>. It is estimated that for the 2 demonstration projects alone, the estimated direct CO<sub>2</sub> emission reductions will be around 6,432 tons/year. During the project preparation stage (i.e., PPG Exercise), the estimated total CO<sub>2</sub> emissions reduction attributed to the proposed project (direct, direct post-project and indirect) - will be reviewed and confirmed and set as target for this project. Concerning national level benefits, preliminarily, the expectations are the following: (1) Support to good governance in the energy sector through the provision of an overarching legislation; (2) Reduction of barriers to main- and mini-grid renewable energy supply investments; and, (3) Incorporation of renewable energy as an integral part of the grid-based sector least-cost planning.

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

The proposed project is in line with the overall plan of the Fiji Government through its “Roadmap for Democracy and Sustainable Socio-Economic Development 2009 – 2014”. Furthermore, the proposed project is consistent with the priorities outlined in National Energy Policy (NEP) that has the vision of ‘*A sustainable energy sector for Fiji*’ and a mission ‘*To provide an enabling environment for a sustainable energy sector*’. The implementation of the NEP began in 2007 and is due to be reviewed in 2011. The Strategic Action Plan includes activities that cover 5- year period (2007-2011) which are reviewed annually. There are four key strategic areas in the NEP all of which are of relevance for this proposed project: (1) National energy planning with the strategic objective to strengthen the capacity for energy planning through appropriate policy, regulatory and implementation frameworks and effective and efficient management; (2) Energy security with the strategic objective to enhance energy security through greater participation and collaboration within the industry; (3) Power sector with the strategic objective to increase access to affordable and reliable electricity

<sup>4</sup> This master plan is expected to focus on renewable energy-based power generation including bio-mass. It is estimated that Fiji could produce up to 125 MW of electricity from biomass, but currently the total installed capacity is limited to 9.5 MW. Thus the potential is there to generate significantly more power from biomass. It will also include an implementation plan that will addresses the current shortfall in what has been predicted to be a realistic potential and what has actually been achieved when it comes to the utilization of the country’s biomass and other renewable energy resources for power generation.

<sup>5</sup> The forecast is based on a trend analysis of historical CO<sub>2</sub> emissions data for Fiji from the United Nations Statistics Division – Common Database ([http://unstats.un.org/unsd/cdb/cdb\\_dict\\_xrxx.asp?def\\_code=15](http://unstats.un.org/unsd/cdb/cdb_dict_xrxx.asp?def_code=15)) and the UNEP-Ozone Secretariat on United Nations Statistics Division Website

services; and (4) renewable energy with the strategic objective of research, promotion and utilization of renewable energy applications. Concerning national energy planning, the relevant policies includes: strengthening the capacity of DOE to plan, formulation, implementation and management of the energy policy and other energy related policies and regulations; ensuring appropriate policy and regulatory frameworks for the provision of energy services and strengthening coordination and consultation with other sectors and the external environment on energy developments. Concerning energy security, the relevant policies includes: promote the development of indigenous energy sources such as hydropower, geothermal, solar, wind and biomass and strengthen energy security and improve energy supply mix for the country<sup>6</sup>. With regard to the power sector the policy is to ensure the demand for reliable and affordable electricity is adequately met. Finally concerning renewable energy the policy is as to promote the use of renewable energy resources in the country. Moreover environmental compatibility is one of six cross-cutting areas mentioned in the NEP. Specifically the following is mentioned: 'There are increasingly detrimental economic and environment impacts of energy use, particularly from fossil fuels. In recognizing the environmental effects of energy initiatives, it is intended that all energy initiatives will pay serious attention to environmental issues and in particular the impact of energy projects on land, water and air. Any proposed energy development will include environmental impact assessment. By incorporating the principle of environmental compatibility into energy sector planning, the negative environmental impacts can be lessened'.

#### **C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH [GEF STRATEGIES](#) AND STRATEGIC PROGRAMS:**

This proposed project is in line with the GEF-4 the Strategic Program 3 on promoting market approaches for the supply of renewable electricity in utility scale grid-based power systems; and Strategic Program 4, on promoting sustainable energy production from biomass and modern uses of biomass. The proposed project will focus on the removal of barriers (policy/regulatory, market, finance, and technical) to the wide scale use of RE resources for grid-connected power generation in Fiji. In addition, the project will address barriers to the use of biomass resources for the production of on-grid or off-grid electricity. It involves activities that will investigate suitability and sustainability of producing bio-fuels to substitute imported petroleum products, ensuring that biomass production, conversion and energy use is sustainable.

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

The components of the proposed project consist of interventions that ultimately will augment and strengthen the capacity at the Government of Fiji to facilitate increased utilization of renewable energy resources for the provision of electricity based energy services using modern efficient technologies. Most of these activities are necessary in making possible the current as well as planned initiatives of the country to expand its current development and utilization of its RE resources for power generation. Hence, most of these are incremental activities that will help bring about global environmental benefits derived from the displacement of fossil fuels used in power generation by RE resources. Hence, the GEF funds will be used as grant to pay for technical assistance and capacity building activities to support establishment of required policy reform and regulation, undertake required resource monitoring and assessments, strengthen existing demonstration projects including through capacity development and prepare initiate new ones that will assist strengthening the markets for specific RE technologies and ensure that required project management support is in place. GEF resources will not be used for direct investments.

#### **E. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:**

Fiji is currently participating in two on-going regional renewable energy projects supported by the GEF. These are the: (1) GEF/SPREP/UNDP Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP); and; (2) GEF/WB Sustainable Energy Financing Project (SEFP). The objective of PIGGAREP is the promotion of the productive use of renewable energy to reduce GHG emissions by removing the major barriers to the widespread and cost-effective use of commercially viable renewable technologies. For 2009, the planned PIGGAREP supported in-country activities in Fiji includes a review of the sustainability of the Fiji Renewable Energy Service Company (RESCO) model, strengthening the management of the Energy Information System and preparatory work on the establishment of a biogas market. The SEFP aims to significantly increase the adoption and use of renewable energy technologies in participating

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<sup>6</sup> As part of its mission statement the government-owned power utility – Fiji Electricity Authority (FEA) has a target of generating 90% of its energy through renewable energy resources by 2011. In 2008, FEA generated 68% of the total electricity requirements using own hydro and wind power generation and buying biomass generated power from Independent Power Producers (IPPs).



Pacific Island states including Fiji through a package of incentives to encourage local financial institutions to participate in sustainable energy finance in support of equipment purchase.

During the PPG Exercise, the results of the already completed and planned activities of these 2 projects, and that of other RE projects, as well as past, on-going and planned national and regional interventions on RE development and utilization will be taken into consideration to increase the project impact, and avoid duplication of efforts. Specifically, the following coordination mechanisms will be employed:

- The Executing Partner for the proposed project is the Fiji Department of Energy (DOE), which also is the national focal point for PIGGAREP and SEFP. This in itself will facilitate the other GEF supported RE interventions in Fiji, and will addressing different gaps and aspects of increasing the use of commercially viable renewable technologies.
- Since UNDP is also the GEF Implementing Agency for PIGGAREP, coordination with the PIGGAREP team can be guaranteed, thereby ensuring synergy and complementarities of the activities that will be carried out. Practically this will be done through consultations with SPREP, which is the Executing Agency for PIGGAREP
- Barriers related to financing of RE-based power generation projects will be coordinated with the SEFP project in Fiji, which focuses on innovative financing
- In 2008, UNDP joined several development partners including the WB, ADB, European Union, NZAID and AusAID to establish the Pacific Energy Donor/International Financial Institutions (IFI) Working Group. This group has been established to facilitate coordination and collaboration among donor agencies and IFIs supporting PIC energy sectors in sharing of information and data, and joint funding of activities where appropriate. This is one of the mechanisms that will be used to facilitate that there will be clear work of responsibility between the proposed project and the SEFP.

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

Each component of the proposed project is comprised of baseline and incremental activities whose outputs will collectively contribute to, or help facilitate/influence the reduction of GHG emissions from Fiji's power sector. The baseline activities are those that were identified as the regular initiatives of the Government of Fiji to ensure energy security in the country; the planned electrification expansion activities of FEA; and, stand-alone power projects by private sector entities that are interested in supplanting part of their energy consumption with available RE resources. Except for those carried out by the FDOE as part of their regular activities, the others are at best tentative and may not proceed as planned because of several constraints/limitations that were discussed earlier in Sec A. While those planned activities will contribute significantly in the reduction of the use of fossil fuels in oil-based diesel generator sets that make up 35% of the country's power generation mix, thereby reducing CO2 emissions, these initiatives will not happen because of the existence of the aforementioned barriers/constraints. The barrier removal activities that will be carried out under this project constitute the incremental activities that will bring about or help facilitate the reduction of CO2 emissions from the thermal power generation activities in the country, and thereby contribute to the realization of global environmental benefits. Without the GEF-assistance that is being requested for this project, the necessary enabling environments such as the enactment and enforcement of the Energy Act, that are conducive to the widespread application of RE technologies for power generation will remain absent. Overall the envisioned incremental activities that the GEF will support are necessary in order to realize the global environmental benefits from the utilization of RE (including biomass) for power generation in Fiji.

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

Below are the preliminarily identified key risks (in no order of importance) and possible applicable mitigation measures to address each of them:

Risk	Level of Risk	Mitigation Measures
Ineffective project management - The capacity in the Government of Fiji to effectively manage and implement major national projects is limited. At	Medium	Mitigation Measures: Dedicated project personnel will facilitate effective and efficient implementing of project activities. As such it is the plan that the

Risk	Level of Risk	Mitigation Measures
times, the limited available local capacity is utilized in many externally funded projects thereby diverting attention from higher priority national activities.		proposed project will fund (or co-fund) full time staff, which depending on the need the Government of Fiji will consider absorbing into its service at the end of the project
Limited recognition and commitment of the Government of Fiji including its relevant branches and agencies of the importance of comprehensive energy legislation – This also include the lack of appropriate allocation of government resources and enforcement on energy development initiatives.	Medium	Raise project profile and advocate for project benefits right from the outset including during Consultation and Design Workshop & Inception Workshop, ensure that all key stakeholders are involved and updated on progress regularly, and engage key policy stakeholders in activities
Political change – Changes in the government can result in the new administration not supporting the energy policies, and possibly repeal of the Energy Act	Medium	The Preparation and endorsement of a comprehensive legislative framework (i.e., Energy Act and associated IRRs) will help ensure that the overall directions in the energy sector will survive changes in government
Failure of some of the demonstration projects - Failures of the demo projects will reduce stakeholder (including public and private investors and donors) confidence to invest including finance required hardware installations.	Low	The proposed package of capacity building and enabling environment activities, centered on each demonstration project, will facilitate sustainability of these projects.
Lower oil prices - A significant reduction in fossil fuel prices makes renewable energy a less attractive option to local, national and international investors.	Low	While the project has no control on oil prices, the project will take this into consideration in the formulation of the energy policy and in the integrated energy planning.
Climate change - Impacts on the amount of precipitation and thus the output of hydro power	Low	The impacts of climate change and variability are something that the proposed additional RE resource assessments will also determine. In that way, it would be possible to take such information from the simulations into consideration in the design of the mini/micro hydropower facilities that will be showcased under the project. As to the other risk mitigation strategies, these include: (i) Communities and national level stakeholders to look into managing water supplies to plan for anticipated seasonal shifts in hydroelectric supply and demand; (ii) additional hydroelectric power transmission systems to be built to connect areas expected to be water-rich to areas that could be more drought-prone; and, (iii) most importantly perhaps, Fiji can diversify its energy mix to protect against the shortfall of any single energy source including in this case hydropower. On the latter risk mitigation strategy, diversification is something Fiji has been working on over the last many years. In the Fiji National Energy Policy (2006) there are four key strategic areas one of which is energy security. Specific policies for Fiji in this area are as follows: (i) promote the development of indigenous energy sources such as hydropower, geothermal, solar, wind and biomass; (ii) promote energy efficiency and energy conservation in all sectors; and, (iii) strengthen energy security and improve energy



Risk	Level of Risk	Mitigation Measures
		supply mix for the country.

Tentatively, the overall risk for the proposed project is considered to be medium. During the PPG Exercise, the abovementioned risks will be reviewed, revalidated and elaborated and others possibly identified. In addition to address these anticipated risks, the project will be designed to include effective means to monitor and to the extent possible mitigate these risks.

#### **H. DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT:**

The proposed project is based on a barrier removal approach. Since the uptake of RE-based power generation in Fiji is hindered by clear and generally well understood barriers/constraints, addressing the removal of such barriers in a holistic and integrated manner will help facilitate the widespread utilization of the country's feasible RE resources for sustainably meeting the country's target of 100% electrification. At the same time such approach leads to a cost-effective way of contributing to the reduction of CO2 emissions in the power sector. Compared to other approaches which address only specific aspects of RE-based power generation development and application, an integrated approach of addressing the various inter-related issues would bring about more benefits.

The proposed project, which is focused on the creation of the enabling environments that are supportive to the development and application of RE technologies in power generation, will mainly bring about indirect CO2 emission reductions. However, the 2 demonstrations that will be implemented under the project will result in CO2 emission reductions that can be directly attributed to the project. The 2 tentatively identified demonstrations: (1) On-grid 2 MW biomass-fired power generation from a saw mill; and, (2) Off-grid 500 kW micro-hydro power generation funded by FDOE; are expected to reduce CO2 emissions annually by 3,427 tons, and 3,005 tons, respectively. Estimating these annual amounts throughout the lifetime of these 2 projects (25 years for biomass-based power plant; 30 years for micro-hydro), the total CO2 emission reductions from these 2 power plants is about 175.8 ktons. This translates to a unit abatement cost (GEF\$/ton CO2) of about US\$ 5.55/ton<sup>7</sup>.

This measure of the project's cost effectiveness (i.e., UAC) will be tracked using a monitoring and evaluation system that the proposed project will develop. These preliminary UAC figures will be re-evaluated and updated during the PPG exercise particularly in quantifying the potential energy savings from the confirmed demonstration project and projected replication and in coming up with the CO2 emission reduction estimates. The updated CO2 emission figures and UAC will be indicated in the project document that will be submitted later for CEO endorsement.

#### **I. JUSTIFY THE COMPARATIVE ADVANTAGE OF GEF AGENCY:**

The proposed project involves implementation of technical assistance and capacity building activities in the area of renewable energy, which are among the comparative advantages of UNDP.

### **PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT AND GEF AGENCY**


#### **A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT ON BEHALF OF THE GOVERNMENT:**

NAME	POSITION	MINISTRY	DATE
NASOME, Epeli	Director	Department of Environment, Government of Fiji	September 9 2009

#### **B. GEF AGENCY CERTIFICATION**

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

<sup>7</sup> This estimation is based on the procedures specified in the Manual for Calculating GHG Benefits of GEF Projects, 2008.

Agency Coordinator, Agency name	Signature	Date	Project Contact Person	Telephone	Email Address
John Hough, Deputy Executive Coordinator, UNDP-GEF		October 28, 2009	Manuel Soriano, UNDP-GEF Regional Technical Advisor for Climate Change Mitigation	+66 2 288 2720	Manuel.soriano@undp.org