

PROJECT IDEA NOTE (PIN)

Name of Project: Lighting Energy Efficiency Project in Fiji

Date submitted: 10 May, 2012

Description of size and quality expected of a PIN

Basically a PIN will consist of approximately 5-10 pages providing indicative information on:

- the type and size of the project
- its location
- the anticipated total amount of greenhouse gas (GHG) reduction compared to the “business-as-usual” scenario (which will be elaborated in the baseline later on at Project Design Document (PDD) level)
- the suggested crediting life time
- the suggested Certified Emission Reductions (CERs)/Emission Reduction Units (ERUs)/Verified Emission Reduction (VERs) price in US\$ or €/ton CO₂e reduced
- the financial structuring (indicating which parties are expected to provide the project’s financing)
- the project’s other socio-economic or environmental effects/benefits

While every effort should be made to provide as complete and extensive information as possible, it is recognised that full information on every item listed in the template will not be available at all times for every project.

A. PROJECT DESCRIPTION, TYPE, LOCATION AND SCHEDULE

<p>OBJECTIVE OF THE PROJECT <i>Describe in not more than 5 lines</i></p>	<p>The proposed project involves the distribution of approx. 100,000 light-emitting diodes (LEDs) covering the residential lighting, the commercial or industrial lighting and street lighting in Fiji, to substitute equal amount of incandescent lamps (ICLs).</p> <p>The implementation of the proposed project will achieve CO₂ emission reductions by reducing electricity consumption through the implementation of the energy efficiency measures. Also energy conservation has significant impact on Fiji's economy as the lack of lighting will deter the increase in domestic commodity production.</p>																																
<p>PROJECT DESCRIPTION AND PROPOSED ACTIVITIES <i>About ½ page</i></p>	<p>In Fiji, most of the households, commercial or industrial facilities and street lighting use ICLs. The electricity consumption for lighting is much higher than necessary due to the old, inefficient lamps. LED is now a mature technology that has been used in a number of small-scale projects in the Pacific area. It can sufficiently reduce citizens' home and office lighting cost by up to 90% using one of the most efficient forms of lighting available. LED lighting uses approximately 10% of electricity as a standard light bulb does for the same illumination effect. Energy efficient LED lighting creates less carbon emissions, which helps protect local environment as well as provides a cheap option for lighting¹. In addition, LEDs have longer use life, reducing maintenance costs and waste stream. After finishing, the mercury free bulbs can be disposed of in landfill².</p> <p>The distribution of LEDs will be conducted and coordinated by dividing the country into 8 cities and the distribution range involves the households, the commercial or industrial places and street lighting.</p> <p>The number of LEDs to replace ICLs in different fields is shown as following:</p> <table border="1"> <thead> <tr> <th></th> <th>Households</th> <th>Commercial/Industrial</th> <th>Street Lighting</th> </tr> </thead> <tbody> <tr> <td>Total</td> <td>86,044</td> <td>11,100</td> <td>10,739</td> </tr> </tbody> </table> <p>The rated power distribution of ICLs and their potential substitute-LEDs is shown as following:</p> <table border="1"> <thead> <tr> <th colspan="3">ICLs Distribution</th> <th colspan="3">LEDs Distribution</th> </tr> <tr> <th>Rated power (Watts)</th> <th>Lumen</th> <th>Amount</th> <th>Rated power (Watts)</th> <th>Lumen</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>40</td> <td>347-579</td> <td>97,144</td> <td>8</td> <td>376-400</td> <td>97,144</td> </tr> <tr> <td>100</td> <td>1121-1869</td> <td>10,739</td> <td>20</td> <td>1120-1200</td> <td>10,739</td> </tr> </tbody> </table>		Households	Commercial/Industrial	Street Lighting	Total	86,044	11,100	10,739	ICLs Distribution			LEDs Distribution			Rated power (Watts)	Lumen	Amount	Rated power (Watts)	Lumen	Amount	40	347-579	97,144	8	376-400	97,144	100	1121-1869	10,739	20	1120-1200	10,739
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<p>TECHNOLOGY TO BE EMPLOYED³ <i>Describe in not more than 5 lines</i></p>	<p>Demand-side activities for efficient lighting technologies.</p> <p>LED creates light using nothing but the movement of electricity along the path of its semiconductor. As the electrons stream across the semiconductor, they create electromagnetic radiation. Some forms of this electromagnetic radiation can take the form of visible light.</p>																																

¹ <http://www.ledcentral.com.au/>

² LED Light Project Concept Note by IUCN.

³ Please note that support can only be provided to projects that employ commercially available technology. It would be useful to provide a few examples of where the proposed technology has been employed.

	Lighting efficiency technology will be employed, such as LED lamps, inverters, passive lighting control system such as infrared sensors or sound sensors. All of the technologies are mature in the current commercial market. Actually, energy saving will be achieved by those parts that integrated as a whole lighting system.
TYPE OF PROJECT	
Greenhouse gases targeted CO ₂ /CH ₄ /N ₂ O/HFCs/PFCs/SF ₆ <i>(mention what is applicable)</i>	CO ₂
Type of activities Abatement/CO ₂ sequestration	Abatement
Field of activities <i>(mention what is applicable)</i> See annex 1 for examples	Energy efficiency Other energy efficiency
LOCATION OF THE PROJECT	
Country	Fiji
City	8 Cities in Fiji (Suva, Nasinu, Sigatoka, Nadi, Lautoka, Ba, Lami, Nausori)
Brief description of the location of the project <i>No more than 3-5 lines</i>	These 8 cities are the main cities in Fiji, the numbers of residents, the commercial; the industrial and street lightings of these cities are relatively high.
PROJECT PARTICIPANT	
Name of the Project Participant	International Union for Conservation of Nature (IUCN)
Role of the Project Participant	<ul style="list-style-type: none"> a. Project Operator b. Owner of the site or project c. Owner of the emission reductions d. Seller of the emission reductions e. Project advisor/consultant f. Project investor g. Other, please specify: _____
Organizational category	<ul style="list-style-type: none"> a. Government b. Government agency c. Municipality d. Private company e. Non Governmental Organization f. Other, please specify: _____
Contact person	IUCN Oceania Office
Address	5 Ma'afu Street, Private Mail Bag Suva Fiji
Telephone/Fax	+679 3319084
E-mail and web address, if any	oceania@iucn.org
Main activities <i>Describe in not more than 5 lines</i>	IUCN is a global NGO which established its Fijian department in 2007. It has implemented several renewable energy and energy efficiency programmes in the Pacific Island Countries (PICs) since 2009.
Summary of the financials <i>Summarize the financials (total assets, revenues, profit, etc.) in not more than 5 lines</i>	NA
Summary of the relevant experience of the Project Participant <i>Describe in not more than 5 lines</i>	IUCN is experienced in street lighting projects and prepares to take on the role of coordinating entity in the Pacific Area. A street lighting project can easily be replicated in Fiji as all have street lighting in their main urban centers.

<i>lines</i>	IUCN Oceania Regional Office (IUCN ORO) will execute the project. IUCN ORO has the technical and management capacity to execute the projects effectively. IUCN ORO is currently managing two regional energy programmes in the Oceania region. The first is the Pacific Small Island Developing States (SIDS) Energy, Ecosystems and Sustainable Livelihood Initiative involving six countries and the second is "Accelerating the use of Renewable and Energy Efficiency in three countries. The former is funded by the governments of Italy and Austria and the latter by the Global Environment Facility (GEF). IUCN will engage consultants and the private sector companies where necessary.
EXPECTED SCHEDULE	
Earliest project start date <i>Year in which the plant/project activity will be operational</i>	Estimated 2013
Expected first year of CER/ERU/VERs delivery	Estimated 2014
Project lifetime <i>Number of years</i>	10 years estimated
For CDM projects: Expected Crediting Period <i>7 years twice renewable or 10 years fixed</i> For JI projects: Period within which ERUs are to be earned (<i>up to and including 2012</i>)	10 years fixed
Current status or phase of the project <i>Identification and pre-selection phase/opportunity study finished/pre-feasibility study finished/feasibility study finished/negotiations phase/contracting phase etc. (mention what is applicable and indicate the documentation)</i>	Preparation of the proposed project
Current status of acceptance of the Host Country <i>Letter of No Objection/Endorsement is available; Letter of No Objection/Endorsement is under discussion or available; Letter of Approval is under discussion or available (mention what is applicable)</i>	Yet to apply for "Letter of No Objection" from DNA.
The position of the Host Country with regard to the Kyoto Protocol	Has the Host Country ratified/acceded to the Kyoto Protocol? _____ <u>Yes, 1998</u> _____ Has the Host Country established a CDM Designated National Authority / JI Designated Focal Point? _____ <u>DNA was established in 2002.</u> _____

B. METHODOLOGY AND ADDITIONALITY

<p>ESTIMATE OF GREENHOUSE GASES ABATED/ CO₂ SEQUESTERED <i>In metric tons of CO₂-equivalent, please attach calculations</i></p>	<p>Annual (if varies annually, provide schedule): <u>3,836</u> tCO₂-equivalent Up to and including 2012: <u>0</u> tCO₂-equivalent Up to a period of 10 years: <u>38,360</u> tCO₂-equivalent Up to a period of 7 years: <u> </u> tCO₂-equivalent</p> <table border="1"> <thead> <tr> <th>Average Emission Reduction yearly</th> <th>Households & Commercial/Industry (tCO₂e)</th> <th>Street Lighting (tCO₂e)</th> </tr> </thead> <tbody> <tr> <td>Total</td> <td>2,269</td> <td>1,567</td> </tr> </tbody> </table>	Average Emission Reduction yearly	Households & Commercial/Industry (tCO ₂ e)	Street Lighting (tCO ₂ e)	Total	2,269	1,567
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<p>BASELINE SCENARIO CDM/JI projects must result in GHG emissions being lower than “business-as-usual” in the Host Country. At the PIN stage questions to be answered are at least:</p> <ul style="list-style-type: none"> • Which emissions are being reduced by the proposed CDM/JI project? • What would the future look like without the proposed CDM/JI project? <p><i>About ¼ - ½ page</i></p>	<p>CO₂ is the targeted emission reductions by the project activity.</p> <p>Lights used in the PICs are still predominantly incandescent or low efficiency fluorescent lights although in recent years, hotels and some other commercial operators have started to improve their lighting efficiency due to rising electricity costs. LED is one of the most efficient electrically-powered light sources in terms of lighting effects – up to 200 lumen/Watt⁴.</p> <p>In the absence of this program the baseline scenario would be continued usage of ICLs for lightning. 97,144 of 40W ICLs are used in household/commercial/industry and 10,739 of 100W are used in street lighting.</p>						
<p>ADDITIONALITY Please explain which additionality arguments apply to the project:</p> <p>(i) there is no regulation or incentive scheme in place covering the project (ii) the project is financially weak or not the least cost option (iii) country risk, new technology for country, other barriers (iv) other</p>	<p>Project additionality can be demonstrated as per “Guidelines for demonstrating additionality of Micro-scale project activities” EB 63 (version 3)”. As per the paragraph 3 of the guidelines:</p> <p>Energy Efficiency project activities that aim to achieve energy savings at a scale of no more than 20 GWh per year are additional if any one of the conditions below is satisfied:</p> <ol style="list-style-type: none"> The geographic location of the project activity is in LDC/SID or special underdeveloped zone of the host country identified by the Government before 28 May 2010; The project activity is an energy efficiency activity with both conditions (i) and (ii) satisfied; Each of the independent subsystems/measures in the project activity achieves an estimated annual energy savings equal to or smaller than 600 megawatt hours; and End users of the subsystem or measures are households /communities/ SMEs <p>According to the United Nations, Fiji is classified as a Small Island Developing State (SIDS)⁵. Hence the proposed project with energy savings no more than 20 GWh (around 7.67GWh) per year should be considered to be automatically additional as per the above EB guidelines.</p>						
<p>SECTOR BACKGROUND Please describe the laws, regulations, policies and strategies of the Host Country</p>	<p>Fiji, like any other country in the region, is heavily dependent on imported fossil fuel to meet a major part of its energy demand. As such, it is vulnerable to the continuous fluctuation of world crude oil prices.</p>						

⁴ “Cree Breaks 200 Lumen Per Watt Efficacy Barrier” (Press release). Durham, N.C: CREE. February 3, 2010.

⁵ <http://www.un.org/special-rep/ohrls/sid/list.htm>

<p>that are of central relevance to the proposed project, as well as any other major trends in the relevant sector.</p> <p>Please in particular explain if the project is running under a public incentive scheme (e.g. preferential tariffs, grants, Official Development Assistance) or is required by law. If the project is already in operation, please describe if CDM/JI revenues were considered in project planning.</p>	<p>There is a lack of energy conservation and efficiency planning, guidelines and effective implementation programmes in Fiji. The energy conservation and energy efficiency programmes being initiated by the Fijian Department of Energy (DOE) are still valid but lacks specific stimulus to make them work.</p> <p>With respect to electricity production about 60% of the country's needs is met from renewable energy, the remainder is electricity generation based on fossil fuels, especially heavy fuel oil. Recently the country has set itself a target that by 2016, ninety percent (90%) of electricity produced in the country shall come from renewable energy. There is no specific roadmap for the realization of the current targets, but a strategy has been put in place to identify specific investments in various forms of locally available renewable energy sources that can be developed to achieve the above target.</p>
<p>METHODOLOGY Please choose from the following options:</p> <p>For CDM projects:</p> <p>(i) project is covered by an existing Approved CDM Methodology or Approved CDM Small-Scale Methodology</p> <p>(iii) projects needs modification of existing Approved CDM Methodology</p>	<p>The project is covered under the following approved CDM methodology</p> <p>Type: II. Energy Efficiency Category: II.C/L – Demand - Side Energy Efficiency Activities for specific Scope Number: 03</p>

C. FINANCE

TOTAL CAPITAL COST ESTIMATE (PRE-OPERATIONAL)			
Total project costs ⁶	Item	Total (US dollars)	Percentage
	Total Installed Cost	48,070,000	95.75%
	Maintenance Cost (for 10 years)	2,132,000	4.25%
	Total Project requirements	50,202,000	100%
SOURCES OF FINANCE TO BE SOUGHT OR ALREADY IDENTIFIED			
Equity Name of the organizations, status of financing agreements and finance (in US\$ million)	To be decided		
Debt – Long-term Name of the organizations, status of financing agreements and finance (in US\$ million)	To be decided		
Debt – Short term Name of the organizations, status of financing agreements and	To be decided		

⁶ IUCN, LED Light Project Concept Note

finance (in US\$ million)	
Carbon finance advance payments sought from the buyer. (US\$ million and a brief clarification, not more than 5 lines)	-
SOURCES OF CARBON FINANCE Name of carbon financiers that you are contacting (if any)	To be decided
INDICATIVE CER/ERU/VER PRICE PER tCO₂e <i>Price is subject to negotiation. Please indicate VER or CER preference if known.</i>	US\$ 8 – 10 (Indicative price range only)
TOTAL EMISSION REDUCTION PURCHASE AGREEMENT (ERPA) VALUE	
A period until 2012 (end of the first commitment period)	NA
A period of 10 years	US\$ 306,880 – US\$ 383,600
A period of 7 years	

D. EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS

SOCIO-ECONOMIC ASPECTS	
<p>What social and economic effects can be attributed to the project and which would not have occurred in a comparable situation without that project? Indicate the communities and the number of people that will benefit from this project. <i>About ¼ page</i></p>	<p>Socio-Economic Effects from LED street lightings are as follows:</p> <ul style="list-style-type: none"> ✓ LED creates light using nothing but the movement of electricity along the path of its semiconductor. There are no harmful gases used such as mercury that is applied in the production of fluorescent lights.. Mercury vapor can cause effects in the central and peripheral nervous systems, lungs, kidneys, skin and eyes. Therefore, by updating the LED lights, public health and safety will be well protected and secured. ✓ By using LED technology, the illumination of streets will be improved. Indirectly, the traffic and citizens' safety will also be improved. ✓ Extends the productive work day. As one of the main productive economic incomes is tourism, by using the efficient street lighting system, the working day time will be extended. Such as restaurants, handcraft shops and other evening public entertainments will be extended to late night. ✓ Significantly reduce national electricity demand and stress on energy infrastructure, thereby delaying expenditure in future generation capacity, reducing blackouts and immediately "freeing up" electricity for other uses. ✓ In the case of LED consume less energy and supply higher illumination; it will reduce greenhouse gas emissions through a reduction in fossil fuel use. ✓ Due to the long lifetime of LED lamps, the maintenance of the infrastructures will be reduced as well. The labor cost and maintains cost will also be considerable reduced. ✓ The installation of LED lighting system will not emit any Greenhouse gas,

	<ul style="list-style-type: none"> ✓ The project will include an education component. This education component will aim to raise awareness of the benefits of energy efficiency. <p>The project will result in a significant transfer of technology. Whilst the technologies may not be new, uptake by consumers remains relatively low due to their comparatively high cost.</p>
<p>What are the possible direct effects (e.g. employment creation, provision of capital required, and foreign exchange effects)? <i>About ¼ page</i></p>	<p>In terms of possible direct effects, the benefits as following:</p> <ul style="list-style-type: none"> ✓ There will be large amounts of work such as replacing street lights and testing the lighting system in the beginning of the project, therefore, direct employment created in-country in the distribution and installation phase of the project. ✓ Other direct employment opportunities in-country will be created as mentioned in the section above, it will indirectly bloom the business and other service for citizens and tourists. ✓ There will be carbon project capacity-building opportunities as the project is developed and implemented. ✓ Training and education programs will be directly supplied, not only for the staff of the proposed project but also for the citizen and public to improve the awareness of energy efficiency and changing people’s energy usage patterns which waste energy in their daily life. <p>Apparently, the direct effects are able to figure out. Meanwhile, the indirect and relevant effects are listed in the section above. By utilizing the LED lights, long term and short term social and environmental benefits will be obtained, as well as the financial savings.</p>
<p>ENVIRONMENTAL STRATEGY/ PRIORITIES OF THE HOST COUNTRY A brief description of the project’s consistency with the environmental strategy and priorities of the Host Country <i>About ¼ page</i></p>	<p>According to Fiji National Energy Policy, relevant strategies had been issued as follows:</p> <ul style="list-style-type: none"> ✓ The Fijian Department of Energy recognizes the value of energy efficiency and has policies and/or campaigns in place to encourage consumers to use energy efficiently. The DOE’s Strategic Action Plan states that a key strategy of their current and future activities is to “increase efforts to create energy efficiency and conservation awareness and encourage energy efficiency in all sectors.” ✓ The Fijian Government recognizes that “Fiji must move onto a path of low-carbon growth by improving its energy efficiency”. ✓ The project is consistent with, and will reinforce, support and enact the host country’s energy efficiency policies.

ANNEX I - Technologies

1. Renewables
 - 1a. Biomass
 - 1b. Biogas
 - 1c. Bagasse
 - 1d. Wind
 - 1e. Hydro
 - 1f. Geothermal
 - 1g. Photovoltaic
 - 1h. Solar Thermal
2. Fossil Fuel Switch
3. Energy Efficiency
 - 3a. Cement Efficiency Improvement
 - 3b. Construction material
 - 3c. District heating
 - 3d. Steel Gas Recovery
 - 3e. Other Energy Efficiency
4. Waste Management
 - 4a. Landfill Gas recovery/utilization
 - 4b. Composting
 - 4c. Recycling
 - 4d. Biodigestor
 - 4e. Wastewater Management
5. Coalmine/Coalbed Methane
6. Oil and Gas Sector
 - 6a. Flared Gas Reduction
 - 6b. Reduction of technical losses in distribution system
7. N₂O removal
8. HFC23 Destruction
9. SF₆ Recovery
10. Transportation
 - 9a. Fuel switch
 - 9b. Modal switch
11. Others