

PROJECT IDEA NOTE (PIN)

Name of Project: *National Biogas Programme of Activity in Fiji*

Date submitted: 10/05/2012

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 program
- its location
- the anticipated total amount of GHG reduction compared to the “business-as-usual” scenario (which will be elaborated in the baseline later on at PoA DD and CPA DD level)
- Duration of the program and crediting period of the CPAs under the Program
- the estimated CER price in US\$/ton CO₂e reduced
- the financial structuring (indicating which parties are expected to provide the project’s financing)
- the project’s other socio-economic and 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. Program Description, Type, Boundary and Schedule

<p>Objective of the Program (Describe the policy/measure or stated goal that the PoA seeks to promote)</p>	<p>The proposed program of activities (PoA) aims to demonstrate a credible carbon trade process for a household-based biogas digester program, through developing, building, and putting into operation biogas digesters utilizing animal manure and agricultural waste as raw material. The project will reduce the greenhouse gas (GHG) emission. In addition, the project will improve the local rural environment and household living conditions, including household health and cleaner energy sources for cooking.</p>
<p>Program Description and Proposed Activities (About ½ page)</p>	<p>Fiji enjoys a few advantages to initiate a national biogas programme (NBP). The advantage is that Fiji can learn from the many experiences abroad to date, as well as interface with a vast pool of knowledge – programmatic, institutional and technical – that supports these programmes. At the same time, there is a role that Fiji can play into the future having piloted and established a NBP by supporting further biogas programme developments in the Pacific Island Countries (PICs)¹.</p> <p>The Department of Energy (DoE) had engaged a Consultant from Africa, AGAMA Energy, in 2008 to undertake a Feasibility Study of the Biogas Programme in Fiji. The outcome of the report stated that Fiji had great potential for biogas projects.</p> <p>The activities under the program project will utilize the rich agriculture resource in Fiji for installation of several household biogas digester projects around rural area of Fiji as one Programmatic CDM activity. The biogas collected will be applied mainly as fuel for local residents for cooking etc.</p> <p>A proposed biogas activity under the PoA will utilize an 8 m³ biogas digester at each household for energy purpose, such as cooking. There are 4,385 households (around 21,000 people) in Naistasiri in Veti-Levu. Therefore, totally 4,385 biogas digesters would be installed in Lautoka.</p> <p>Other areas in Fiji also have potentials for such biogas project development as CPA. The Department of Energy of Fiji plans to install 5 to 10 new projects each year from 2012 onwards.</p>
<p>Technology to be Employed (Describe in not more than 5 lines)</p>	<p>The primary technology of biogas is an anaerobic digester equipped with a system for the collection and utilization of biogas as fuel for cooking by local residents.</p> <p>The proposed project will install biogas digesters so that the manure would be fermented in the biogas digester instead of being stored in a deep pit, in which, the manure is stored in anaerobic condition. In each household, the proposed PoA will also support improvement of a toilet, animal pens and renovation of the kitchen, and installation of a gas burner. The biogas will be used as thermal energy to replace the</p>

¹ STRENGTHENING THE FIJI BIOGAS PROGRAMME (A study for the Department of Energy, Government of Fiji) REPORT

1: feasibility study & institutional assessment

	fossil fuel currently used to meet the households' daily energy needs for cooking. In addition, the recovery and utilization of biogas from digested slurry in a biogas digester will reduce CH ₄ emission from the slurry that would otherwise would be accumulated in a deep pit and emitted to the atmosphere.
Type of Program	
Greenhouse gases targeted CO ₂ /CH ₄ /N ₂ O/HFCs/PFCs/SF ₆ (mention what is applicable)	CO ₂ and CH ₄
Boundary of the Program	
The boundary for the PoA in terms of a geographical area	Viti-Levu in Fiji
Duration of the Program	
Starting Date	2013
Duration/Length	28 years
Program Coordinating/managing Entity	
Name of the Coordinating Entity	Fiji Department of Energy
Confirm that the program is a voluntary action by the coordinating/managing entity	The program is a voluntary action by the DoE
Organizational category (private entity or public entity)	Public entity
Summary of the relevant experience and capability of the Coordinating Entity (<i>Describe in not more than 5 lines</i>)	<p>The Department of Energy with its vision of a sustainable energy sector in Fiji and through its mission it intends to achieve this through providing an enabling environment that will facilitate the provision of a sustainable energy sector in Fiji.</p> <p>The DoE 54 staff are grouped into 5 distinct groupings namely;</p> <ul style="list-style-type: none"> i. DoE Corporate Structure ii. Renewable Energy & Energy Conservation Section iii. Rural Electrification Unit iv. Bio-fuel Unit v. Sustainable Energy Financing Project - DoE
Contact	<p>Department of Energy</p> <p>P O Box 2493, Government Buildings Suva, Fiji Islands.</p> <p>43 Foster Road, Walu Bay, Suva, Fiji Islands.</p> <p>Ph: (679) 3386006, 3386677 Fax: (679) 3386301</p> <p>E-mail: info@fdoe.gov.fj</p> <p>Website: www.energy.gov.fj</p>
Host Parities	Republic of Fiji
Program Participants	
Name of the Project Participant	Fijian Department of Energy
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	a. Government b. Government agency c. Municipality d. Private company e. Non Governmental Organization f. Other, please specify: _____
Summary of the relevant experience of the Project Participant <i>Describe in not more than 5 lines</i>	The Department of Energy, recruited a Biogas Expert from AGAMA Energy, a South Africa consulting firm to assist in the implementation of the technology in Fiji. Their work includes theory training, compilation of assessment reports of the Biogas Programme and also develops appropriate frameworks for implementation for local use.
Name of the Project Participant	N/A
Role of the Project Participant	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	a) Government b) Government agency c) Municipality d) Private company e) Non Governmental Organization f) Other, please specify: _____
Summary of the relevant experience of the Project Participant <i>Describe in not more than 5 lines</i>	N/A
<i>Please insert information for additional Project Participants as necessary.</i>	
Operational /management arrangements	
Operational and management arrangements between the coordinating entity and the participating organisations	N/A
Expected Schedule	
Earliest Program starting date <i>Month/Year in which PoA will be operational</i>	Jan/2013
Expected first year of CER delivery	2014
Lifetime of the CPAs <i>Number of years</i>	20 years
For CPAs: Expected Crediting Period <i>7 years twice renewable or 10 years fixed</i>	7 years twice renewable

B. Methodology and Additionality of the Programme of Activities

Sector Background Please describe the laws, regulations, policies and strategies of the Host Country that are of central relevance to the proposed project, as well as any other major trends in the	Fiji, like any other country in the region, is heavily dependent on imported fuel to meet a major component of its energy demand. Currently the main sources of energy for household cooking in Fiji are firewood and agricultural residues. The fuel woods including agricultural residues are predominantly used in the villages surveyed: 67% of
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<p>relevant sector (e.g. any law/regulation on waste disposal or renewable energy targets)</p>	<p>households surveyed use firewood and agriculture residues for cooking, for the reasons of its availability, its ease of collection and because it is free. 25% of households surveyed use fuel wood and LPG; 6% of households using fuel wood and kerosene; Very few households (2%) use three different fuel types (Fuel wood and LPG and Kerosene stove) for cooking.</p> <p>It is notable that 100% of the unelectrified households use some percentage of fuel wood for cooking. At the same time, some villages are experiencing shortages of firewood, though this is not quantified. They have to walk 3km or more to collect firewood, and hence firewood collection is becoming laborious and time consuming.</p>
<p>Description of a typical CPA (activities and measures to be covered, e.g. a MSW site or multiple MSW sites in a city)</p>	<p>Methane recovery</p>
<p>Eligibility criteria for CPAs (Define the eligibility criteria for inclusion of a project activity as a CPA under the PoA, which shall include, as appropriate, criteria for demonstration of additionality of the CPA, and the type and/or extent of information that shall be provided by each CPA in order to ensure its eligibility)</p>	<p>The eligibility criteria for inclusion of a project activity as a CPA under the PoA shall cover the following list according to the EB 65 Report Annex 3: Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme of Activities.</p> <ul style="list-style-type: none"> (a) The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA; Due to the boundary of PoA is Viti-Levu, Fiji, all CPAs are also located in Viti-Levu. (b) Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations, each household will be identified by a special programme logo by CME, therefore, it will be used to avoid double counting. (c) The specifications of technology/measure including the level and type of service, performance specifications including compliance with testing/certifications; The proposed CPAs shall all compliance with National testing/certifications. (d) Conditions to check the start date of the CPA through documentary evidence; currently, the CPAs are under the feasibility study stage, the start date of CPA is estimated as Jan/2014. (e) Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs; The detailed applicability and other requirements will be in consistence with the approved methodologies. (f) The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality; In terms of demonstration of additionality, it will be carried out strictly with the requirements of Attachment A of Appendix B of the 'Simplified Modalities and Procedures for small-scale CDM project activities.

	<p>(g) The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis; The PoA will be carried out local stakeholder consultations and environmental impact analysis following relevant PoA-specific requirements, which will be carefully checked and stipulated by CME.</p> <p>(h) Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance; there is no funding from Annex I parties.</p> <p>(i) Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation); Target group is the rural off-grid energy users. The distribution mechanisms will be direct installation.</p> <p>(j) Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys; N/A</p> <p>(k) Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA; Each CPA will be strictly consisted with threshold criteria in approved methodologies.</p> <p>(l) Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories. Debundling check will be strictly followed Appendix C¹ of the Simlified Modalities and Procedures for Small-Scale CDM project activities.</p>
<p>Methodology (to be applied by all the CPAs)</p>	<p>Type: III: Other Project Activities</p> <p>AMS-I.C “Thermal energy production with or without electricity”</p> <p>AMS-III.R: “Methane recovery in agricultural activities at household/small farm level”</p>
<p>Baseline Scenario PoAs 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 PoA? • What would the future look like without the proposed PoA? 	<p>CO₂ and CH₄ are the targeted emission reductions by the project activity.</p> <p>Currently the main sources of energy for household cooking in Fiji are firewood and agricultural residues. In the absent of the proposed PoA, the baseline scenario would be the continuation of the current practice. For example, the urine of livestock is not collected as manure. Often, the dung and fodder residues are heaped in the open, leading to heavy losses of minerals through sun radiation and wash-out by rain.</p>

<i>(About ¼ - ½ page)</i>	
<p>Additionality Please demonstrate that in the absence of the CDM either: (i) the proposed voluntary measure would not be implemented, or (ii) the mandatory policy/regulation would be systematically not enforced and that non-compliance with those requirements is widespread in the country/region, or (iii) that the PoA will lead to a greater level of enforcement of the existing mandatory policy /regulation. This shall constitute the demonstration of additionality of the PoA as a whole;</p>	<p>Additionally can be demonstrated as per 'Attachment A of Appendix B of the 'Simplified Modalities and Procedures for small-scale CDM project activities'.</p> <p>Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:</p> <p>(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions; The main obstacle of investment barrier is that most of local residents cannot afford the biogas plant. On the other hand, they are willing to use firewood, as it is free for them.</p> <p>(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions; The main technical problems have been with the implementation of biogas technology, as Fiji has some micro biogas plants, but the failure rate of biogas plants is as high as 77%. As a result of insufficient skillful staff and knowledge of biogas technology, most of biogas plants are failed.</p>

C. Real Case CPA - Description, Type, Boundary and Schedule

Title of the CPA	Naistasiri <i>Biogas Project</i>
<p>Description of the CPA <i>(Describe in not more than 5 lines)</i></p>	<p>Naistasiri Biogas Project is located in Central Division of Fiji.</p> <p>The proposed CPA includes 2 anaerobic lagoons, 2 facultative lagoons and 4 maturation ponds and capturing the biogas from the anaerobic digesters and ponds (existing and proposed). The proposed CPA could also use the existing local animal manure, agricultural waste and other organic sources.</p>
<p>Greenhouse gases targeted CO₂/CH₄/N₂O/HFCs/PFCs/SF₆ <i>(mention what is applicable)</i></p>	CO ₂ and CH ₄
Boundary of the CPA	Viti-Levu in Fiji
The boundary for the CPA in terms of a geographical area	Naistasiri in Viti-Levu of Fiji
Crediting Period of the CPA	
Starting Date	2014
Duration/Length	20 years
Entity/individual responsible for the CPA	
Name	Fijian Department of Energy
Role of the Entity/individual	Project owner, Owner and seller of emission reductions
Organizational category	Government
<p>Eligibility of the CPA <i>(Justify why the CPA is eligible to be covered under the PoA)</i></p>	<p>According to the eligibility criteria of CPA defined in Section B above.</p> <p>The CPA is also located in Viti-Levu. It will be directly installed at local site. In terms of double counting of emission reductions, each site will be documented by CME.</p>

	<p>All the specification of technology/measure will be compliance with National testing/certifications. The start date of CPA is estimated as Jan/2014. CME will check the start date of the CPA and documentary evidence. As the emission reduction is over 20 thousand tonnes which is small-scale and will apply the approved multiple methodologies. The PoA will be carried out under the local official environmental regulation; This will be carefully checked and stipulated by CME. Currently, there is not any fundings for the PoA. The target group is rural off-grid energy users and all the biogas digesters will be directly installed at local area</p>																									
<p>Baseline & Additionality Please demonstrate that in the absence of the CDM, the proposed CPA will not be implemented.</p>	<p>Baseline: The main sources of energy for household cooking in Fiji are firewood and agricultural residues..</p> <p>Based on Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the small-scale projects would not have occurred anyway due to at least one of the following barriers:</p> <p>(a) Investment barrier: Based on the survey that carried out by DoE, the Fijian households income level as following:</p> <table border="1" data-bbox="667 936 1372 1223"> <thead> <tr> <th>Annual Income US\$</th> <th>Monthly Income US\$</th> <th>Weekly Income US\$</th> <th>Annual Expenditure US\$</th> <th>House hold %</th> </tr> </thead> <tbody> <tr> <td>< 1,500</td> <td>120 max</td> <td>30 max</td> <td>962</td> <td>30</td> </tr> <tr> <td>1,500– 3,000</td> <td>240 max</td> <td>60 max</td> <td>2,080</td> <td>44</td> </tr> <tr> <td>3,000 – 5,000</td> <td>400 max</td> <td>100max</td> <td>3,640</td> <td>11</td> </tr> <tr> <td>> 5,000</td> <td>400+</td> <td>100+</td> <td>9,620</td> <td>15</td> </tr> </tbody> </table> <p>Only 15% of households have more than US\$ 5,000 annual income, the maintenance cost of each household's biogas is around US\$ 9,300. On the other hand, the biogas digester cost is around US\$7,000. Most of households cannot afford it.</p> <p>Therefore, an obvious obstacle to the introduction of biogas technology is the fact that the majority of the rural population cannot afford the capital cost of investment for a biogas plant. A further difficulty is that they cannot afford the maintenance cost even with the biogas plant. Therefore, the investment and sources of funding is the first obstacle for Fijian to develop biogas plants.</p> <p>(b) Technological barrier: Although, Fiji has some micro biogas plants, the failure rate of biogas plants is as high as 77%; many of biogas plants still in operation are of poor performances. The application of biogas energy technology is still facing those barriers mentioned above.</p>	Annual Income US\$	Monthly Income US\$	Weekly Income US\$	Annual Expenditure US\$	House hold %	< 1,500	120 max	30 max	962	30	1,500– 3,000	240 max	60 max	2,080	44	3,000 – 5,000	400 max	100max	3,640	11	> 5,000	400+	100+	9,620	15
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> 5,000	400+	100+	9,620	15																						
<p>Expected Schedule</p>																										
<p>Earliest CPA starting date <i>Month/Year in which the plant/project activity will be</i></p>	<p>Jan/2013</p>																									

<i>operational</i>	
Estimate of GHG Abated/ CO₂ Sequestered <i>In metric tons of CO₂-equivalent, please attach calculations</i>	Annual (if varies annually, provide schedule): <u> 17,233 </u> tCO ₂ -equivalent Up to and including 2012: <u> </u> tCO ₂ -equivalent Up to a period of 10 years: <u> </u> tCO ₂ -equivalent Up to a period of 7 years: <u> 120,631 </u> tCO ₂ -equivalent
No double-counting Confirm that the CPA is neither included in any other PoA nor registered as a CDM project	Confirmed

D. Finance

D1. Finance at PoA Level

Total Cost Estimate	
Subsidies/incentives to the CPAs (if any)	<u> 0 </u> US\$ million (Feasibility studies, resource studies, etc.)
Management/operational costs	TBD <u> </u> US\$ million (Property plant, equipment, etc.)
CDM transaction costs (PDD preparation, validation, registration etc)	TBD
Total costs at PoA level	252.98 US\$ million (Estimated as 7 CPAs at PoA level)
Sources of Finance to Be Sought or Already Identified	
Public Funding and ODA (In case public funding is used a confirmation that official development assistance is not being diverted to the implementation of the PoA)	N/A

D2. Finance of the Real Case CPA

Total Estimated Costs	
Capital investment	US\$ 29.27 million
Management/coordinating costs	TBD
Operational costs	US\$ 0.599 million per year
Other costs	TBD
Total	US\$ 35.25 million
Sources of Funding	
Support from Coordinating/managing entity	N/A
Equity	N/A
Short-term debt	N/A
Long-term debt	N/A
Carbon finance (confirmed or estimated CER sales revenue, price per CER)	US\$ 8 – 10
Public fund (indicate whether public fund is used for the CPA)	N/A

<p>or not. If yes, confirm whether any Official Development Assistance has been diverted for the implementation of this CPA</p>	
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E. Expected Environmental and Social Benefits (In Programmes of Activities CDM, Environmental Analysis can be conducted at PoA level or CPA level, subject to decision by the Coordinating/managing entity and the national regulations)

<p>ENVIRONMENTAL IMPACTS E.g. impacts on local air, water and other pollution.</p>	<p>PoA level: Promotion of environmental sustainability. The utilization of biogas technology would improve the local organic waste usage. Another major environmental benefit is that the mitigation of deforestation and soil erosion through the substitution of firewood as an energy source for household cooking.</p> <p>CPA level: Improve the local residents' living environment and prevent the drinking water pollution; saving their time from collecting firewood and improve the local air quality by using cleaner energy, compared with current thermal energy usage situation.</p>
<p>SOCIO-ECONOMIC IMPACTS 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. About ¼ page</p>	<p>PoA level: The main outcome for the local residents is that biogas provides a wide range of improvements in overall living standard. The PoA will also contribute the local residents' energy saving, as they can utilize local organic waste. Employment, professional qualification and overall food supply of the local population can be improved as well.</p> <p>CPA level: For the local biogas users, the income from the sale of extra biogas could be applicable. Saving their time and cost of disposal and treatment of solid and water waste. The utilization of biogas saves time but also makes cooking more comfortable in comparison to the traditional methods; smoke and soot no longer pollute the kitchen. Especially in the morning rush, a biogas flame is much easier to start than an open fire.</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 About ¼ page</p>	<p>PoA level: As per National Energy Security Situation Report 2010 of Fiji, one of the guiding principles of Strategic Development Plan of Fiji is environmental sustainability.</p> <p>CPA level: At the CPA level, the proposed CPA will meet the demand of Nation's environmental sustainability.</p>