PROJECT IDEA NOTE (PIN)

Name of Project: ***Sewerage Treatment PoA 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 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 CO_2e 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

Objective of the Program *(Describe the policy/measure or stated goal that the PoA seeks to promote)*	The objective of the Programme of Activity (PoA) is to recover methane generated by the anaerobic decomposition of organic matter in sludge of sewerage treatment plant. The PoA introduces methane recovery and combustion system to the existing and new anaerobic sludge treatment units (anaerobic digesters). As methane collected from some units will be used for electricity generation or heating, the implementation of the proposed PoA can also achieve GHG emission reductions (mainly CH_4 and CO_2) by replacing diesel for electricity generation or heating. In addition, the proposed project seeks to reduce CH_4 emissions in an economically sustainable manner.
Program Description and Proposed Activities *(About ½ page)*	Water Authority of Fiji (WAF or Water Authority) was established by the Government of Fiji to provide efficient and effective water and wastewater services in an environmentally sound and sustainable manner. The Fiji Water Authority is responsible for providing access to quality drinking water and waste water services to over 144,000 residential and non-residential metered customers reaching over 800,000 people nationwide and is in charge of public water supplies, sewerage services in Fiji. Methane collection and using for energy purpose is considered a good PoA opportunity because there is a proven technology, appropriate for application in Fiji and a Coordinating Entity (Water Authority of Fiji) with experience in wastewater and sewerage projects. Till now, there are eight major Sewage Treatment Plant (STPs) including Suva (Kinoya), Nausori, Pacific Harbour, Lautoka, Nadi, Sigatoka, Ba and Labasa. The proposed PoA project will utilize local wastewater from residents' daily life and other agricultural and industrial wastewater resources by installing new methane capture and combustion system to supply thermal energy or generate electricity. Each sewerage project activities will be developed as a CPA among these cities. Access to additional revenue through carbon credits from the proposed PoA project will provide access to maintenance funding, procuring spare parts and essential tools, development of adequate staff training and maintenance management systems.
Technology to be Employed *(Describe in not more than 5 lines)*	The primary technology of biogas is an anaerobic digester equipped with a system for the capture, collection and utilization of biogas for local heating and cooking or the biogas will be used as fuel to generate electricity in a dedicated engine. The proposed project will install anaerobic digesters so that the sewerage would be fermented in the digester instead of being stored in a deep pit, in which, the sludge is stored in anaerobic condition. The methane collected will be flared by installation of a simple methane flaring system to avoid methane emission to the atmosphere as the most cost effectively way for some projects under the PoA. In other

	cases, the methane collected will be plan to be fed into gas turbine for power generation or as thermal energy to replace the fossil fuel currently used to meet the households' or industries' daily energy needs for cooking and heating. The technology applied for each CPA shall be determined by the needs of local conditions.
Type of Program	
Greenhouse gases targeted $CO_2/CH_4/N_2O/HFCs/PFCs/SF_6$ *(mention what is applicable)*	CH_4 and CO_2
Boundary of the Program	
The boundary for the PoA in terms of a geographical area	Fiji
Duration of the Program	
Starting Date	2013
Duration/Length	28 years
Program Coordinating/managing Entity	
Name of the Coordinating Entity	Fiji Water Authority
Confirm that the program is a voluntary action by the coordinating/managing entity	Confirmed
Organizational category (private entity or public entity)	Public entity
Summary of the relevant experience and capability of the Coordinating Entity (*Describe in not more than 5 lines)*	Water Authority of Fiji (WAF or Water Authority) was established by the Government of Fiji to provide efficient and effective water and wastewater services in an environmentally sound and sustainable manner. Fiji Water Authority is responsible for providing access to quality drinking water and waste water services to over 144,000 residential and non-residential metered customers reaching over 800,000 people nationwide.
Host Parities	Republic of Fiji
Program Participants	
Name of the Project Participant	Fiji Electricity Authority (FEA)
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 *Describe in not more than 5 lines*	Over the last 30 years, floating drum design, the tubular plastic bag type, fibreglass digesters and fixed dome digesters are used in a poor performances and lack of maintenances in Fiji.
Please insert information for additional Project Participants as necessary.	
Operational /management arrangements	
Operational and management arrangements between the coordinating entity and the	N/A

participating organisations	
Expected Schedule	
Earliest Program starting date *Month/Year in which PoA will be operational*	01/2013
Expected first year of CER delivery	2014
Lifetime of the CPAs *Number of years*	20 years
For CPAs: Expected Crediting Period *7 years twice renewable or 10 years fixed*	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 relevant sector (e.g. any law/regulation on waste disposal or renewable energy targets)	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 heating, cooking, and electricity in Fiji firewood; petroleum products. Apart from LPG, kerosene is also used as cooking fuels. The fuel woods including agricultural residues are predominantly used in the villages surveyed: 67% of households surveyed use these fuels, for the reasons of its availability, its ease of collection and because it is free. Fijian households collect fuel wood 2 to 3 times a week. Interestingly, dual-fuel use for cooking is common in rural households. This includes 31% of the households surveyed. Very few households (2%) use three different fuel types for cooking. 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, thought this is not quantified. They have to walk 3km or more to collect firewood, and hence firewood collection is becoming laborious and time consuming. Kerosene is the dominant fuel used for lighting and the survey found that 39% of the households surveyed use this fuel, while only 0.2% uses LPG for lighting. Hence there is little experience with the use of gas for lighting, and this should be borne in mind in the detailed planning of the utilization of biogas in rural households. Although it is a well known fact that, methane recovery and utilization has various advantages, it is still not widely applied, particularly in the Pacific Island countries like Fiji. For organizations to venture into such an unexplored area, it is a steep diversification from their core activities, wherein the project proponents needs to meet requirements and challenges of techno-commercial, social and other issues associated with the project activity. In terms of wastewater treatment, the current situation is that coastal environments near urban areas, such as Suva Lagoon, are subject to contamination from wastewater from

	industry, domestic waste, urban stormwater and shipping related activities. High concentrations of nutrients and micororganisms related to sewage contamination appear to be the major problem. Metal contamination is generally isolated to locations near industry. In this situation, the methane is directly venting to the atmosphere and the local water quality cannot be protected. The registration of PoA project activity will assist in terms of overcoming the above challenges due to increased technical capabilities and commercial incentives and it will also result in other environmental co-benefits.
Description of a typical CPA (activities and measures to be covered, e.g. a MSW site or multiple MSW sites in a city)	The primary technology of biogas is an anaerobic digester equipped with a system for the capture, collection and utilization of biogas for local heating and cooking or the biogas will be used as fuel to generate electricity in a dedicated engine.
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)	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 Demenstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme of Activities. (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 end-user locations will be identified with a program logo by CME and the information will be documented by CME. (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 2013. (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. (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. (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. (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 domestic urban users. (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 (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. (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 C[1] of the Simplified Modalities and Procedures for Small-Scale CDM project activities.
Methodology (to be applied by all the CPAs)	AMS III.H-Methane recovery in wastewater treatment AMS-I.C .Thermal energy production with or without electricity. Based on the EB 65 Report Annex 3 Page 6 (Application of Multiple small-scale CDM Methodologies), a single methodology is consistently applied in each CPA of a PoA but using multiple technologies/measures, then the applying combinations of technologies/measures and/or methodologies are eligible.
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: • Which emissions are being reduced by the proposed PoA? • What would the future look like without the proposed PoA?	CH_4 is the targeted emission reductions by the proposed PoA. Baseline scenario: 1) For energy sources Currently the main sources of energy for household thermal and electricity demand in Fiji are rely on petroleum products. In the absent of the proposed PoA, the baseline scenario for energy sources in Fiji would be the continuation of the current practice.

(About ¼ - ½ page)	2) For wastewater treatment In terms of wastewater treatment, the current situation is that coastal environments near urban areas, such as Suva Lagoon, are subject to contamination from wastewater from industry, domestic waste, urban storm water and shipping related activities. High concentrations of nutrients and microorganisms related to sewage contamination appear to be the major problem. In this situation, the methane is directly venting to the atmosphere. In the absent of the proposed PoA, the baseline scenario for wastewater treatment would be the continuation of the current practice.
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;	Accroding to 'Combined tool to identify the baseline scenario and demonstrate additionality', the additionality as following: Technology barrier: Although it is a well known fact that, methane recovery and utilization has various advantages, it is still not widely applied in Fiji. Another technical barrier is that because of infiltration into the sewerage network during any rainy weather and from seawater during high tide due to old piping and breaks in pipe, the sewerage treatment plants cannot overcome the problems. Common practice: Although there are eight major Sewage Treatment Plant (STPs) including Suva (Kinoya), Nausori, Pacific Harbour, Lautoka, Nadi, Sigatoka, Ba and Labasa. Currently, only Suva (Kinoya) was registed as CDM project with the existing Kinoya sewage treatment plant. These projects include the Suva-Nausori Water Supply and Sewerage Project (serving 90,000 people), the Labasa Sewerage Scheme (6,000 people), and the Nadi Regional Sewerage Scheme (20,000 people). Most other STPs have been planned in the national strategy but these are on hold awaiting financial resource allocations.

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

Title of the CPA	Lautoka Sewerage Treatment Project in Fiji
Description of the CPA (Describe in not more than 5 lines)	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) and combustion system. The proposed CPA could also use the existing local sewerage treatment facilities in Lautoka which consists of both primary and secondary processes with the final treated effluent being disposed to the sea and the sludge generated by the anaerobic digester being tapped off for drying and used for soil application as end use. Lautoka Sewerage Treatment Project potential electricity generation is estimated to be 1,533 MWh per year, and its biogas production will be 255,500 m^3 per year.
Greenhouse gases targeted $CO_2/CH_4/N_2O$/HFCs/PFCs/SF_6 *(mention what is applicable)*	CH_4 and CO_2
Boundary of the CPA	Fiji Viti-Levu
The boundary for the CPA in terms of a geographical area	Fiji Viti-Levu

Crediting Period of the CPA	
Starting Date	2013
Duration/Length	20 years
Entity/individual responsible for the CPA	
Name	Fiji Electricity Authority (FEA)
Role of the Entity/individual	Projec Owner, Owner and seller of emission reductions
Organizational category	Government Agency
Eligibility of the CPA (Justify why the CPA is eligible to be covered under the PoA)	Accroding to the eligibility criteria of CPA defined in Section B above. The CPA is also located in Viti-Levu. It will be designed to supply thermal energy or electricity. All the specification of technology/measure will be compliance with National testing/certifications. The start date of CPA is estimated as 2013. CME will check the start date of the CPA and documentary evidence. The CPA is small-scale and will apply the approved multiple methodologies; then it will be carried out under the local offical environmental regulation; This will be carefully checked and stipulated by CME. Currently, there is not any fundings for the PoA. The target group is urban energy users.
Baseline & Additionality Please demonstrate that in the absence of the CDM, the proposed CPA will not be implemented.	Baseline for energy sources: Currently the main sources of energy for household thermal and electricity demand in Fiji are rely on petroleum products. In the absent of the proposed PoA, the baseline scenario for energy sources in Fiji would be the continuation of the current practice. Baseline for wastewater treatment: The baseline scenario is Venting of methane into the atmosphere (continuation of current situation). Technology barrier: Although it is a well known fact that, methane recovery and utilization has various advantages, it is still not widely applied in Fiji. Another technical barrier is that because of infiltration into the sewerage network during any rainy weather and from seawater during high tide due to old piping and breaks in pipe, the sewerage treatment plants cannot overcome the problems. Common practice: Although there are eight major Sewage Treatment Plant (STPs) including Suva (Kinoya), Nausori, Pacific Harbour, Lautoka, Nadi, Sigatoka, Ba and Labasa. Currently, only Suva (Kinoya) was registed as CDM project with the existing Kinoya sewage treatment plant.
Expected Schedule	
Earliest CPA starting date *Month/Year in which the plant/project activity will be operational*	01/2013
Estimate of GHG Abated/ CO_2 Sequestered *In metric tons of CO_2-equivalent, please attach calculations*	Annual (if varies annually, provide schedule): __16,625_ tCO_2-equivalent Up to and including 2012: ___ tCO_2-equivalent Up to a period of 10 years: ___ tCO_2-equivalent Up to a period of 7 years: _116,378__ 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)	_0__ US$ million (Feasibility studies, resource studies, etc.)
Management/operational costs	0.62_ US$ million (Property plant, equipment, etc.)
CDM transaction costs (PDD preparation, validation, registration etc)	TBD
Total costs at PoA level	8.97 US$ million (estimated)(Feasibility studies, resource studies, etc.) The total costs at PoA level is still needed to be identified, due to it is directly related to project scale and biogas plant quantities.
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$ 83,680
Management/coordinating costs	TBD
Operational costs	US$ 3,347 per year
Other costs	TBD
Total	US$ 150,624
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 or not. If yes, confirm whether	N/A

any Official Development Assistance has been diverted for the implementation of this CPA	

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

ENVIRONMENTAL IMPACTS **E.g. impacts on local air, water and other pollution.**	PoA level: Promotion of environmental sustainability. The utilization of sewerage treatment plant would provide a solution for local wastewater disposal. Another major environmental benefit is that the by implemented wastewater treatment plant, the local water quality will be improved and secured. CPA level: Improve the local residents' living environment and prevent the drinking water pollution; meanwhile, it will supply energy for users.
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**	PoA level: The main outcome for the local residents is that wastewater treatment provides a wide range of improvements in overall living standard espically in the sector of water quality. At the view of PoA, Employment, professional qualification will be created during the implementation of proposed PoA. CPA level: One of the main benefits at PoA level is that public health will be improved as a result of wastewater will be treated well.
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**	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. CPA level: At the CPA level, the proposed CPA will meet the demand of Nation's environmental sustainability.