PROJECT IDEA NOTE (PIN)

Name of Project: Plant Oil power generation for Maritime communities

Date submitted: 11 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 CO_2e 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

OBJECTIVE OF THE PROJECT *Describe in not more than 5 lines*	The objective of the proposed project is to utilize the oil extracted from plentiful vegetable oil resources (mainly coconut oil and palm oil) in Fiji for electricity generation and transportation. The proposed project will reduce the use of diesel and improve the energy supply situation and structure in Fiji and at the same time reduce the greenhouse gas (GHG) emissions.
PROJECT DESCRIPTION AND PROPOSED ACTIVITIES *About ½ page*	Vegetable oils of various types have long been used as fuels in diesel engines for electricity generation and transportation. Many Pacific Island Countries (PICs) have experimented with coconut oil (CNO) as a diesel replacement both with the raw oil and with chemically modified oil. However, it should also be noted that the existing projects have generally expected that the market price for coconut oil in the PICs will remain low, whereas fossil diesel prices will keep increasing in real terms, making coconut oil an attractive alternative. Fortunately, Fiji has very plentiful coconut resources and thus the price would be expected to keep in a low level. The annual copra production in the country is about 25,000 tonnes, from which 15 million litres of CNO can be extracted[1]. As a result, the plantation area of coconut palms is sufficient to support the proposed project (annual output is about 365,000L) and thus no cost and environmental impact caused by coconut palm plantation require to be taken into consideration. The Government of Fiji also plans to construct a number of coconut oil processing mills to produce biodiesel for power generation in Fiji. The first one on Koro Island was built in 2009. The second mill was installed in Rotuma in May 2011[2]. Apart from these, there are seven CNO mills expected to be constructed this year (2012) at the following locations: Matuku, Moala, Lakeba, Vanuabalavu, Gau, Rabi and Kadavu. The total output of the seven mills is around 365,000L per year. According to the heating values and densities of diesel and CNO[3], the above amount of CNO can substitute 341,000L of diesel.
TECHNOLOGY TO BE EMPLOYED *Describe in not more than 5 lines*	Typically CNO is extracted from the kernel and meat of matured coconuts harvested from coconut palms, which have been widely planted in Fiji. Extraction of meat from shells is the first step for CNO production. Then the meat requires to be dried by fire or sunlight to produce cobra, which would be pressed or dissolved in solvents for CNO extraction. Whether the diesel generators can directly use CNO mixed with diesel in a specific proportion or have to be retrofitted depends on the design of the machines. For instance, specially devised MaK generators are able to use of up to 10% CNO blended with diesel as fuel without any modification of the machine. But for most types of diesel generators, retrofitting is indispensable for using CNO-blended fuel. Due to the different physical and chemical properties between CNO and diesel, additional tank, valves, fuel heater, hoses and filter is required. Some key parameters for CNO utilization in electricity generation and transportation are shown as following: Description | Parameters Type of Power Plant | Coconut Oil Extraction

[1] http://www.agriculture.org.fj/_resources/main/files/Fiji%20Farmer%20Issue%203%202009%20Eng1.pdf

[2] High Potential PoA Pacific v3.3

[3] Herchel T.C. Machacon et al., Performance and emission characteristics of a diesel engine fueled with coconut oil-diesel fuel blend, Biomass and Bioenergy 20 (2001) 63-69.

	Annual Output	365,000L
TYPE OF PROJECT		
Greenhouse gases targeted $CO_2/CH_4/N_2O$/HFCs/PFCs/SF_6 *(mention what is applicable)*	CO_2	
Type of activities Abatement/CO_2 sequestration	Abatement	
Field of activities *(mention what is applicable)* *See annex 1 for examples*	Fuel Switch	
LOCATION OF THE PROJECT		
Country	Fiji	
City	Matuku, Moala, Lakeba, Vanua Balavu, Gau, Rabi and Kadavu islands (estimated)	
Brief description of the location of the project *No more than 3-5 lines*	The above islands are scattered in the sea of around 40,000km^2 to east of Veti Levu, the largest and most important island of Fiji	
PROJECT PARTICIPANT		
Name of the Project Participant	Department of Energy, Fijian Government	
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: _____	
Contact person	Mr Peceli Nakavulevu; Ms Susana Pulini;	
Address		
Telephone/Fax		
E-mail and web address, if any	PNakavulevu@fdoe.gov.fj; susana.pulini@fdoe.gov.fj	
Main activities *Describe in not more than 5 lines*	The Department of Energy (DOE) focuses on four strategic areas for the development of a sustainable energy sector in Fiji: 1. Energy planning; 2. Renewable energy; 3. Energy Security; 4. Power sector	
Summary of the financials *Summarize the financials (total assets, revenues, profit, etc.) in not more than 5 lines*	Not applicable as government entity	
Summary of the relevant		

experience of the Project Participant *Describe in not more than 5 lines*	
PROJECT PARTICIPANT	
Name of the Project Participant	NA
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 Other, please specify: _____
Organizational category	a. Government b. Government agency c. Municipality d. Government-owned company e. Private company f. Non Governmental Organization Other, please specify: _____
Contact person	
Address	
Telephone/Fax	
E-mail and web address, if any	
Main activities *Describe in not more than 5 lines*	
Summary of the financials *Summarize the financials (total assets, revenues, profit, etc.) in not more than 5 lines*	
Summary of the relevant experience of the Project Participant *Describe in not more than 5 lines*	
EXPECTED SCHEDULE	
Earliest project start date *Year in which the plant/project activity will be operational*	7 biofuel mills are expected to be constructed in 2012.
Expected first year of CER/ERU/VERs delivery	2013
Project lifetime *Number of years*	30 years
For CDM projects: Expected Crediting Period *7 years twice renewable or 10 years fixed* For JI projects: Period within which ERUs are to be earned *(up to and including 2012)*	7 years twice renewable

Current status or phase of the project *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)*	3 biofuel mills have been put into operation and 7 biofuel mills are expected to be constructed in 2012.
Current status of acceptance of the Host Country *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)*	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? _____Yes, 1998_____ Has the Host Country established a CDM Designated National Authority / JI Designated Focal Point? _____DNA was established in 2002._____

B. METHODOLOGY AND ADDITIONALITY

ESTIMATE OF GREENHOUSE GASES ABATED/ CO_2 SEQUESTERED *In metric tons of CO_2-equivalent, please attach calculations*	Annual (if varies annually, provide schedule): _818__ tCO_2-equivalent Up to and including 2012: __0_ tCO_2-equivalent Up to a period of 10 years: _NA_ tCO_2-equivalent Up to a period of 7 years: __5726_ tCO_2-equivalent
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: • Which emissions are being reduced by the proposed CDM/JI project? • What would the future look like without the proposed CDM/JI project? *About ¼ - ½ page*	CO_2 is the targeted emission reductions by the project activity. The proposed project will substitute diesel for electricity generation and transportation. According to the annual CNO output of the proposed project (365,000L) and the different heating values and densities of CNO and diesel, the baseline scenario would be the usage of 341,000L diesel for electricity generation and transportation.
ADDITIONALITY Please explain which additionality arguments apply to the project:	Project additionality can be demonstrated as per "Guidelines for demonstrating additionally of Micro-scale project activities" EB 63 (version 3)**".**

(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	As per the paragraph 3 of the guidelines: "Project activities up to five megawatts that employ renewable energy technology are additional if any one of the conditions below is satisfied: (a) The geographic location of the project activity is in one of the least developed countries or the small island developing States (LDCs/SIDS) or in a special underdeveloped zone of the host country identified by the government before 28 May 2010. Other project activities not included in paragraphs 2 or 3 above, i.e. Type III project activities4 that aim to achieve emission reductions at a scale of no more than 20 ktCO2e per year, are additional if any one of the following conditions is satisfied: (a) The geographic location of the project activity is an LDC/SIDS or special underdeveloped zone of the host country as identified by the government before 28 May 2010." Since Fiji is one of the SIDS5 and the equivalent capacity of electricity generation for 365,000L CNO per year is about 217kW (assuming the annual operation time is 6,000 hours), the power generation part of the proposed project activity is additional. Similarly, for the transportation use of CNO in the proposed project (it is a Type III project activity according to the methodology), the amount of annual emission reductions is no more than 818tCO2e, far less 20kt. So the transportation part of the proposed project activity is additional.
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. 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.	Fiji, like any other country in the region, is heavily dependent on imported fuel to meet a major component of its energy demand. As such, it is vulnerable to the continuous fluctuation of world crude oil prices. Currently the main sources of energy for Fiji are biomass from bagasse, firewood and coconut residues; petroleum products; and hydropower for electricity generation. Solar and wind energy are also utilized, however, their installed capacity and energy production is relatively small compared to energy usage from the main sources. Apart from LPG, fuel wood and kerosene are also used as cooking fuels. No public funding has been indicated for the proposed project.
METHODOLOGY Please choose from the following options:	The project is covered under the following approved CDM methodology : AMS-I.G : Plant oil production and use for energy generation in stationary

[4] All technologies/measures included in approved Type III small-scale CDM methodologies are currently eligible to be considered, except for AMS-III.V .Decrease of coke consumption in blast furnace by installing dust/sludge recycling system in steel works., AMS-III.P .Recovery and utilization of waste gas in refinery facilities., AMS-III.Q .Waste Energy Recovery (gas/heat/pressure) Projects. and AMS-III.W. Methane capture and destruction in non-hydrocarbon mining activities.. In the latter cases furtheranalysis is required.

[5] http://www.un.org/esa/sustdev/sids/sidslist.htm

For CDM projects: (i) project is covered by an existing Approved CDM Methodology or Approved CDM Small-Scale Methodology (iii) projects needs modification of existing Approved CDM Methodology	applications (thermal, power, cogeneration) AMS-III.T: Plant oil production and use for transport applications --- Version 2.0

C. FINANCE

TOTAL CAPITAL COST ESTIMATE (PRE-OPERATIONAL)	
Total project costs	For coconut mills: Item / Total (US dollars) / Percentage Total Installed Cost / 654,300 / 4.63% Annual O&M Cost (lifetime: 30 years) / 448,800 / 95.37% Total Project requirements / 14,118,300 / 100%
SOURCES OF FINANCE TO BE SOUGHT OR ALREADY IDENTIFIED	
Equity Name of the organizations, status of financing agreements and finance (in US$ million)	TBD
Debt – Long-term Name of the organizations, status of financing agreements and finance (in US$ million)	TBD
Debt – Short term Name of the organizations, status of financing agreements and finance (in US$ million)	TBD
Carbon finance advance payments sought from the buyer. (US$ million and a brief clarification, not more than 5 lines)	TBD
SOURCES OF CARBON FINANCE Name of carbon financiers that you are contacting (if any)	TBD
INDICATIVE CER/ERU/VER PRICE PER tCO_2e *Price is subject to negotiation. Please indicate VER or CER preference if known.*	USD 8 – 10 (Indicative price range only. To be decided upon selection of IPP)

TOTAL EMISSION REDUCTION PURCHASE AGREEMENT (ERPA) VALUE	
A period until 2012 (end of the first commitment period)	NA
A period of 10 years	NA
A period of 7 years	USD 45,808 – USD 57260

D. EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS

ENVIRONMENTAL BENEFITS E.g. impacts on local air, water and other pollution.	The replacement of diesel with coconut or palm oil offers the following environmental benefits: ✓ Reduces greenhouse gas emissions through a replacement of diesel. ✓ Impact the project activity on resource sustainability and resource degradation, if any, due to proposed activity; bio-diversity friendliness; impact on human health; reduction of levels of pollution in general ✓ Biofuels contribute to climate change mitigation as they produce much lower CO_2 emissions in their lifecycle compared to fossil fuels. They also have other advantages such as cleaner combustion and therefore lower local air pollutant emissions than fossil fuels. They are biodegradable, which make them very suitable for use in the fragile reef environments of the Pacific island region.
SOCIO-ECONOMIC ASPECTS	
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*	The social and economic benefits can be stated as following: ✓ It will reduce the dependence on imported fossil fuel usage and help modernize the energy usage patterns in the rural areas; ✓ Reduce greenhouse gas emissions through a replacement of diesel;. ✓ Energy prices mostly ignore the social and environmental costs and risks (including health expenditure and pollution) associated with fossil fuels, and the various benefits of renewable energies. Hence, the utilization of biomass also achieves those benefits in public health and pollutants reduction; ✓ Improves the quality of people's daily life with an environmental friendly energy source; ✓ Less risk of spillage of diesel during transportation to remote islands; ✓ Improved health and education services through rural electrification; ✓ Incentive for young people to stay on the island. ✓ Create a niche market between the energy consumption and agriculture production process in the local communities, which means that the coconut plantation system, the coconut plantation system, the logistics system and the electricity supply system are able to create more jobs

	✓ Energy cost in the rural areas will be reduced by using biomass technology. ✓ Women can engage themselves in other household economic activities, since they wouldn't walk long distance for firewood. ✓ Energy cost in the rural areas will be reduced by using biomass technology.
What are the possible direct effects (e.g. employment creation, provision of capital required, foreign exchange effects)? *About ¼ page*	The proposed project will provide business opportunities for local construction, logistics and mechanical sector as following: ✓ Create a niche market between the energy consumption and agriculture production process in the local communities, which means that the coconut plantation system, the coconut plantation system, the logistics system and the electricity supply system are able to create more jobs ✓ Women can engage themselves in other household economic activities, since they wouldn't walk long distance for firewood.
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*	The Environmental Management Bill guides the assessment and approval process for development projects in Fiji. According to the Clause 33 of the Bill, an Environment Impact Assessment will be done for the proposed project activity. All the proposed project activity including construction, operation and maintenance should be in accord with related laws and regulations. The emission reduction of air pollutants and carbon dioxide due to the proposed CNO substitution will be helpful for the execution of the National Climate Change Policy of Fiji.

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. N_2O removal
8. HFC23 Destruction
9. SF6 Recovery
10. Transportation
   9a. Fuel switch
   9b. Modal switch
11. Others