

PROJECT IDEA NOTE (PIN)

Name of Project: Methane Capture and Flaring at Naboro Landfill, Fiji

Date Finalized: 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

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| <p>OBJECTIVE OF THE PROJECT <i>Describe in not more than 5 lines</i></p> | <p>The purpose of this project is the development of a new modern high standard, properly managed landfill and replacing the old style dumps and providing proper waste disposal facilities with improved environmental protection. The landfill management will also involve capturing and flaring of the methane produced.</p> <p>The site is designed to accept municipal waste from the Suva (city), Nasinu (city), towns including Nausori, Lami and Navua and other neighboring rural areas.</p> |
| <p>PROJECT DESCRIPTION AND PROPOSED ACTIVITIES <i>About ½ page</i></p> | <p>The Naboro Landfill is a project of the Fiji Government, funded by the European Union and the Government of Republic of The Fiji Islands. The site was officially opened by The Prime Minister of Fiji, Hon. Laisenia Qarase and His Excellency Dr. Roberto Ridolfi from the Delegation for the European Union for the South Pacific on the 2nd of August, 2005. The site is operated by HG Leach (Fiji) Limited, as wholly owned subsidiary of H.G. Leach & Co. Ltd, Waste managers, Quarrymen and Contractors of New Zealand.</p> <p>The Naboro Landfill is located on an ideal site, well away from central Suva and properly screened behind a natural barrier and not clearly visible from Queens Road. The location of this new landfill is a vast improvement from the old Lami dump site located at the entrance to Suva, within the mangroves on the foreshore. The old site was an eyesore and posed a high risk to the surrounding community.</p> <p>The Naboro Landfill is engineered to a high standard to contain leachate which is the liquid residue produced by decomposing organic waste. The compacted clay liner and leachate collection system prevents leachate permeating into the underlying ground water or nearby rivers or the sea as was the case at Lami. A high standard day to day operation ensures proper placement and compaction of the waste, along with daily cover and intermediate capping layers which minimise the fire risk and helps minimise odour issues, windblown refuse, and vermin along with uncontrolled discharge of landfill gas.</p> <p>The landfill site infrastructure comprises: gate office, a certified weighbridge providing accurate measure and charging of all waste coming to the site, an administration block, workshop and main access roads along with the first stage protective clay liner, associated leachate drainage and treatment, storm water control systems and soon a bin washing facility will be added for washing bins used to carry special and odorous waste.</p> <p>Naboro is expected to become the only landfill in the Greater Suva area where waste may be deposited .The landfill site is envisaged to operate for 50 years. The current contractor HG Leach from New Zealand have been managing the landfill since 2005 and the contract is being renewed every 5 years.</p> <p>The proposed CDM project activity involves capture and flaring of methane from the Landfill. The Naboro landfill has been in operation since 2005. The landfill is expected to receive on an average 50,000 tonnes of waste annually over the next 10 years. Till date approximately 375,000 tonnes of waste is already received.</p> |

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| | The installation of a gas collection system and gas flare at Naboro is estimated to cost around USD1.5 m. The information on LFG collection system and flare operator will be provided during PDD stage. The proposed landfill gas capture and flaring project is currently at planning stage and is expected to be implemented over a period of three years inclusive of detailed design, procurement and construction activities. The project is expected to be operational by 2016. |
| TECHNOLOGY TO BE EMPLOYED¹ <i>Describe in not more than 5 lines</i> | <p>Some of the key aspects of the project are mentioned below :</p> <ul style="list-style-type: none"> • Average quantity of municipal solid waste (MSW) dumped per year since 2005 : approximately 50,000 tonnes • Sampling & analysis of MSW dumped need to be carried out using appropriate techniques to determine the average waste composition • The waste composition (based on IPCC 2006 guidelines default values for Pacific countries) is as follows: Food: 60%, Paper/Card board: 6%, Wood: 2.5%, Textile: 1.5%, Inorganic/other: 30%. <p>It is expected that once around 400,000 to 500,000 tonnes of waste is collected at the site, it will be technically feasible to start collecting landfill gas (LFG). The LFG is expected to comprise 50 – 60 % methane and 40 – 45 % CO₂ and vapor. The balance gases comprise of Oxygen, Nitrogen, and Sulphides. Considering that the LFG is expected to be wet, some pre-treatment before flaring will be required.</p> <p>The gas collection network will consist of gas wells and piping, blowers, valves and flow control systems; traps and knockout vessels and pipes to remove gas condensates. The details on flare specifications shall be provided later during the PDD stage.</p> |
| TYPE OF PROJECT | |
| Greenhouse gases targeted CO ₂ /CH ₄ /N ₂ O/HFCs/PFCs/SF ₆ <i>(mention what is applicable)</i> | CH ₄ |
| Type of activities Abatement/CO ₂ sequestration | Abatement |
| Field of activities <i>(mention what is applicable)</i> <i>See annex 1 for examples</i> | Waste Management – Landfill Gas recovery/utilization |
| LOCATION OF THE PROJECT | |
| Country | Fiji |
| City | Suva |
| Brief description of the location of the project <i>No more than 3-5 lines</i> | The Naboro Landfill is located on the Queens Road approximately 24km from central Suva. Access to the site is directly off Queens Road. |
| PROJECT PARTICIPANT | |
| Name of the Project Participant | The Ministry of Local Government, Urban Development, Housing and Environment, Government of Fiji |
| Role of the Project Participant | a. Project Operator |

¹ 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.

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| | 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. Jope Daventanivalu |
| Address | Level 1 P.D Patel Building,90 Raojibhai Patel Street, Suva,Fiji |
| Telephone/Fax | +679 3311 699/+679 3312 879 |
| E-mail and web address, if any | jdavetanivalu@environment.gov.fj |
| Main activities <i>Describe in not more than 5 lines</i> | The work of the Ministry of Local Government, Urban Development, Housing and Environment are focused on legislative reviews, urban planning and managing the impacts of rapid urbanisation, municipal reforms, fire protection and disaster management, and control and regulation of land use. The main focus of the activities is to develop and implement the government's local government and town and country planning legislations, policies and programmes. |
| Summary of the financials <i>Summarize the financials (total assets, revenues, profit, etc.) in not more than 5 lines</i> | Not Applicable as Government Agency |
| Summary of the relevant experience of the Project Participant <i>Describe in not more than 5 lines</i> | Not Applicable as Government Agency |
| EXPECTED SCHEDULE | |
| Earliest project start date <i>Year in which the plant/project activity will be operational</i> | 2016 |
| Expected first year of CER/ERU/VERs delivery | 2017 |
| Project lifetime <i>Number of years</i> | 25- 30 years |
| For CDM projects: Expected Crediting Period <i>7 years twice renewable or 10 years fixed</i> | 7 years twice renewable |
| 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.</i> | Available documents: <ul style="list-style-type: none"> • Naboro Landfill Contract No. WSC 18/05 • Naboro Fact Sheet • Meeting in April 2012 with Mark Hirst, manager H.G Leach. Fiji (Firm currently responsible for management of Naboro Landfill) |

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| <i>(mention what is applicable and indicate the documentation)</i> | <ul style="list-style-type: none"> Email Communication with H.G Leach |
| <p>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</i> <i>(mention what is applicable)</i></p> | <p>Yet to apply for "Letter of No Objection" from DNA.</p> |
| <p>The position of the Host Country with regard to the Kyoto Protocol</p> | <p>Has the Host Country ratified/acceded to the Kyoto Protocol? <u>Yes, 1998</u></p> <p>Has the Host Country established a CDM Designated National Authority / JI Designated Focal Point? <u>Yes, 2002</u></p> |

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>_NA_</u> tCO₂-equivalent Up to and including 2012: <u>_0_</u> tCO₂-equivalent Up to a period of 10 years: <u>_0_</u> tCO₂-equivalent Up to a period of 7 years: <u>108,402</u> tCO₂-equivalent</p> <table border="1" data-bbox="699 1041 1349 1352"> <thead> <tr> <th>Year</th> <th>Estimation of annual emission reductions (tCO₂e)</th> </tr> </thead> <tbody> <tr><td>2016</td><td>15,092</td></tr> <tr><td>2017</td><td>15,249</td></tr> <tr><td>2018</td><td>15,387</td></tr> <tr><td>2019</td><td>15,510</td></tr> <tr><td>2020</td><td>15,622</td></tr> <tr><td>2021</td><td>15,724</td></tr> <tr><td>2022</td><td>15,819</td></tr> </tbody> </table> | Year | Estimation of annual emission reductions (tCO ₂ e) | 2016 | 15,092 | 2017 | 15,249 | 2018 | 15,387 | 2019 | 15,510 | 2020 | 15,622 | 2021 | 15,724 | 2022 | 15,819 |
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| 2016 | 15,092 | | | | | | | | | | | | | | | | |
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| 2021 | 15,724 | | | | | | | | | | | | | | | | |
| 2022 | 15,819 | | | | | | | | | | | | | | | | |
| <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 project? What would the future look like without the proposed CDM project? <p><i>About ¼ - ½ page</i></p> | <p>CH₄ is the targeted emission reductions by the project activity.</p> <p>The old landfill site and recently built Naboro Landfill site currently has no landfill gas management system in place. In the absence of the project activity the methane emissions due to decay of waste (from human activities including municipal, industrial, and other solid wastes containing biodegradable organic matter) dumped at the landfill will be emitted in the atmosphere as is being followed currently.</p> | | | | | | | | | | | | | | | | |
| <p>ADDITIONALITY Please explain which additionality arguments apply to the project:</p> | <p>Solid waste disposal facilities are currently very poor in Fiji with about 7 out of the 11 sites being located in mangroves, which are polluting the water bodies.</p> | | | | | | | | | | | | | | | | |

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| <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>These dumps are managed poorly. The Naboro Landfill will be the first intergraded waste management site in Fiji. Currently there is no regulation for methane capture/utilization from waste in Fiji.</p> <p>As per the 'Guidelines on additionality of First-of-its-kind project activities' the proposed project is a first of its kind.</p> <p>As per the 'Guidelines for Demonstrating Additionality of Microscale project activities' all renewable energy projects upto 5MW and emission reduction of less than 20,000 tCO₂e in SIDs/LDC countries are considered additional. According to the United Nations, Fiji is classified as Small Island Developing State (SIDS)². Hence proposed project activity with average annual emission reductions 15, 486 tCO₂e is considered to be automatically additional as per the guidelines</p> <p>In addition, potential barrier analysis in terms of technological barriers (availability of skilled labour, capacity for O&M etc) and barriers due to prevailing practice can also be explored.</p> |
| <p>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.</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>The Government has to date made a significant investment in the long term waste disposal facility. This is a significant commitment by the Government and the first step towards an integrated solid waste management solution for the greater Suva area.</p> <p>The staff of the Department of Environment is committed to see Naboro Landfill operated to best practice and for the site to be developed as planned and to provide a solution for the Great Suva Area waste for the next fifty (50) years. However the Department faces many challenges, including having only limited resources both in terms of technical expertise as well as funding.</p> <p>The proposed project activity is not envisaged to run under a public incentive scheme or is required by law.</p> <p>The following acts are applicable to the sector in Fiji</p> <ul style="list-style-type: none"> • Public Health Act Cap 111 • Environment Management Act 1 of 2005 • Local Government Act. Cap 125 • Town Planning Act (Cap.139) and • Subdivision of Land Act (Cap.140). |
| <p>METHODOLOGY Please choose from the following options:</p> <p>For CDM projects:</p> <p>(i) project is covered by an existing Approved CDM</p> | <p>The project is covered by an existing Approved CDM Small-Scale Methodology Type III</p> <p>AMS III.G. Landfill Methane Recovery – version 07,EB 63³</p> <p>Sectoral Scope : 13</p> |

² <http://www.un.org/special-rep/ohrls/sid/list.htm>

³ http://cdm.unfccc.int/filestorage/I/G/4/IG4BKAYTO90MQ28SL1U5E6RWZ3HXND/EB63_repan21_Draft%20revision_A MS-III.G_ver07.pdf?t=b0h8bTF6aGs4fDBZlwgRIBZYPPJIHJV5zcJv

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| Methodology or Approved CDM Small-Scale Methodology (iii) projects needs modification of existing Approved CDM Methodology | |
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C. FINANCE

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| TOTAL CAPITAL COST ESTIMATE (PRE-OPERATIONAL) | |
| Total project costs | The estimated project cost is USD1.5 million. This would mainly include the gas collection system and flaring system. |
| 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 |
| SOURCES OF CARBON FINANCE Name of carbon financiers that you are contacting (if any) | NA |
| INDICATIVE CER/ERU/VER PRICE PER tCO_{2e} <i>Price is subject to negotiation. Please indicate VER or CER preference if known.</i> | US\$ 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 | US\$ 867,216 – 1,084,020 |

D. EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS

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| LOCAL BENEFITS E.g. impacts on local air, water and other pollution. | <p>The project will contribute to the establishment of a better practice for municipal solid waste management and landfill gas recovery. Also it will prove the use of a new technology and to demonstrate the viability of a LFG capture and flaring project.</p> <p>More importantly it will improve air quality in the area and health conditions for the local inhabitants and its neighboring areas. Environmental and sanitary impacts associated with the emissions of methane and other organic compounds will also be prevented.</p> <p>Furthermore, the capture and flaring of the landfill gas will also avoid emissions of other gases such as hydrogen sulfide (H₂S) and other odorous compounds.</p> |
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| | <p>The proposed project can lead to a cleaner environment in the area surrounding the landfill site and help improve public health and quality of life.</p> <p>The benefits/effects will be identified in the Environmental Impact Report (EIA) to be carried out for this project. Appropriate mitigation measures is planned to be developed through the EIA and the Environmental Management Plan (EMP).</p> |
| <p>SOCIO-ECONOMIC ASPECTS</p> | |
| <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>Some of the key local benefits associated with the projects are:</p> <ol style="list-style-type: none"> a) Reduction in the greenhouse gas emissions that are currently occurring through uncontrolled release of landfill gas to the atmosphere; b) Introduction of new landfill gas management technology in the country and region; c) Training of local staff to become experts in the monitoring and control of landfill gas emission; d) Provision of a number of employment opportunities relating to the operation and maintenance of equipment. e) Capture and flaring of the landfill gas will reduce explosion and fire risks. |
| <p>What are the possible direct effects (e.g. employment creation, provision of capital required, foreign exchange effects)? <i>About ¼ page</i></p> | <ul style="list-style-type: none"> • Jobs, training and income generation during construction and operation through direct employment. • Benefit through improved services and infrastructure and support of livelihoods programmes. • Reduced health diseases • Overall poverty reduction and improvement in living standards. |
| <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>Fiji like all other Small Island Developing States in the Pacific region recognizes that waste management is the single most pressing issue that needs immediate action. Fiji National Solid Waste Management Strategy is an effort by Fiji Government through the Department of Environment to produce a well-structured plan to manage country's solid waste better. Project activity fits in very well with the Strategy by providing waste management practices, which minimize the environmental risk and harm to human health.</p> <p>Project activity which is first sanitary landfill in Fiji sets example for community waste management solutions. This landfill has alleviated some major solid waste problems associated with open dumps, such as health concerns from flies, rodents, and environmental health concerns from leachates. With installation of flaring system the project activity will also eliminate methane emissions generated from, the landfill.</p> <p>The Fijian Government in 2005 passed the Environment Management Act. The Department of Environment, within the Ministry of Tourism, Labour and the Environment, is responsible for implementing the Act and the Environmental Approvals process.</p> <p>Environmental Approval is required from the Department for development similar to the proposed project.</p> <p>An Environmental Impact Assessment (EIA) must be prepared by the developer and submitted to the Department of Environment for approval. A Terms of Reference (TOR) that outlines the scope of the works for the EIA is first prepared and submitted to the Department of Environment. Once the TOR is</p> |

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| | <p>approved, the EIA report must be prepared in accordance with the TOR.</p> <p>The Department can insist on public notification of the EIA for 21 working days, and the public can make submissions on the EIA which then must be taken into account when processing the approval.</p> <p>A detailed EIA for the project activity will be carried out in accordance with the national regulations.</p> |
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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