

## PROJECT IDEA NOTE (PIN)

Name of Project: Port Vila Biogas Project, Vanuatu

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 CO<sub>2</sub>e 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

<b>OBJECTIVE OF THE PROJECT</b> <i>Describe in not more than 5 lines</i>	<p>The project aims at replacing the existing sludge disposal practice by installing a well-designed and properly managed anaerobic sludge treatment facility with biogas based electricity generation at a new site to be purchased, close to Port Vila Golf and Country Club.</p>
<b>PROJECT DESCRIPTION AND PROPOSED ACTIVITIES</b> <i>About ½ page</i>	<p>In the Port Vila Area and in Vanuatu generally most of the liquid waste generated is disposed of onsite using either septic tanks or simple soak away pits. This is the case for all classes of construction from informal housing to luxury villas in residential areas. The sludge thereby generated is transported by tankers and discharged into a pit for anaerobic decay within Bouffa sanitary landfill to the east of Port Vila and methane is emitted to the atmosphere.</p> <p>The proposed project aims at providing safer sanitation services to all the residents of greater Port Vila. The proposed project will continue the current practice of onsite waste water collection, but it will build and operate some sludge collection, disposal and management facilities. To achieve this, at first stage sludge collection activities by private tankers shall be increased and improved. The existing highly unsatisfactory sludge disposal method shall be replaced by installing a well-designed and properly managed anaerobic sludge treatment facility. The biogas generated will be captured and utilized for electricity generation at a new site to be purchased, close to port Vila Golf and Country Club. On an average, it is estimated that 138,00 m<sup>3</sup> of biogas will be generated annually which is estimated to generate 275 MWh of electricity per year.</p> <p>The biogas project will be implemented under the first phase based on the option recommended by stakeholders. It will reinforce and modernize on-site sanitation for the next 10 years by the provision of more sludge transportation facilities to the disposal area where it will be treated anaerobically to generate biogas and digested sludge disposed of appropriately. Agricultural wastes, if any, would be co-digested along with the sludge based on the data assessment on availability of agricultural waste to be co digested.</p> <p>The project is expected to be operational by 2015 The estimated project cost s US \$7.7 million (excluding tax).</p>
<b>TECHNOLOGY TO BE EMPLOYED<sup>1</sup></b> <i>Describe in not more than 5 lines</i>	<p>The process of treatment will involve anaerobic digestion of sludge from septic tanks and night soil from pit latrines with agricultural wastes as available.</p> <p>In the project activity the sludge will be anaerobically treated in an anaerobic digester and the biogas generated will be recovered and utilized for energy generation. The anaerobic (thermophilic) digestion at 55°C with 10 to 12 days of retention time in sludge digester is considered efficient and comprehensive to hygienise sludge allowing its use in agriculture without sanitation risks.</p>
<b>TYPE OF PROJECT</b>	
Greenhouse gases targeted CO <sub>2</sub> /CH <sub>4</sub> /N <sub>2</sub> O/HFCs/PFCs/SF <sub>6</sub> <i>(mention what is applicable)</i>	CH <sub>4</sub> and CO <sub>2</sub>
Type of activities Abatement/CO <sub>2</sub> sequestration	Abatement

<sup>1</sup> 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.

Field of activities <i>(mention what is applicable)</i> <i>See annex 1 for examples</i>	Waste Management – Bio-digester (4d) Renewable –Biogas (1b)
<b>LOCATION OF THE PROJECT</b>	
Country	Vanuatu
City	Port Villa
Brief description of the location of the project <i>No more than 3-5 lines</i>	The project will be located in Mele between the Country Golf Course, along the Mele Bay shore line.
<b>PROJECT PARTICIPANT</b>	
Name of the Project Participant	Port Vila Municipality /Ministry of Infrastructure and Public Utilities, Government of Vanuatu
Role of the Project Participant	a. Project Operator
Organizational category	a. Municipality
Contact person	Willie Watson
Address	Public Works Department , George-Pompidou C/o PO Box 472,Port Vila, Vanuatu
Telephone/Fax	+678 26351
E-mail and web address, if any	
Main activities <i>Describe in not more than 5 lines</i>	The Ministry of Infrastructure and Public Utilities is responsible for the public infrastructure of the government. It has a leadership role and focuses on policies and strategic directions for the departments. It coordinates the activities of the departments, working relationship with other ministries and statutory
Summary of the financials <i>Summarize the financials (total assets, revenues, profit, etc.) in not more than 5 lines</i>	Not Applicable as Government Entity
Summary of the relevant experience of the Project Participant <i>Describe in not more than 5 lines</i>	Not Applicable as Government Entity
<i>Please insert information for additional Project Participants as necessary.</i>	
<b>EXPECTED SCHEDULE</b>	
Earliest project start date <i>Year in which the plant/project activity will be operational</i>	2015
Expected first year of CER/ERU/VERs delivery	2016
Project lifetime <i>Number of years</i>	10 years
For CDM projects: Expected Crediting Period <i>7 years twice renewable or 10 years fixed</i>	10 years fixed
Current status or phase of the project <i>Identification and pre-selection phase/opportunity study finished/pre-feasibility study finished/feasibility study finished/negotiations</i>	The pre-feasibility study for biogas component of project has been completed under the ADB Project Preparatory Technical Assistance (PPTA) during 2011. The PPTA project has been extended until July 2012.  Based on meeting with ADB technical consultant team in March 2012, the final feasibility study report for the biogas component, including detailed technical design and specifications, is planned to be carried out within 6 months after

<i>phase/contracting phase etc. (mention what is applicable and indicate the documentation)</i>	selection of project implementing entity.
Current status of acceptance of the Host Country <i>Letter of No Objection/Endorsement is available; Letter of No Objection/Endorsement is under discussion or available; Letter of Approval is under discussion or available (mention what is applicable)</i>	The DNA Guidelines has been finalized and approved by National Advisory Committee on Climate Change (NACCC). The draft Cabinet paper for approval by Council of Ministers (CoM) is under circulation for comments. It is expected that the approval by CoM will be completed before June 2012.
The position of the Host Country with regard to the Kyoto Protocol	Has the Host Country ratified/acceded to the Kyoto Protocol? <u>Yes, 2001</u>  Has the Host Country established a CDM Designated National Authority / JI Designated Focal Point?  <u>In the process of establishing DNA to be completed by June 2012.</u>

## B. METHODOLOGY AND ADDITIONALITY

<b>ESTIMATE OF GREENHOUSE GASES ABATED/ CO<sub>2</sub> SEQUESTERED</b> <i>In metric tons of CO<sub>2</sub>-equivalent, please attach calculations</i>	Annual (if varies annually, provide schedule): <u>4200</u> tCO <sub>2</sub> -equivalent Up to and including 2012: <u>0</u> tCO <sub>2</sub> -equivalent Up to a period of 10 years: <u>42000</u> tCO <sub>2</sub> -equivalent Up to a period of 7 years: <u>NA</u> tCO <sub>2</sub> -equivalent
<b>BASELINE SCENARIO</b> 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: <ul style="list-style-type: none"> <li>Which emissions are being reduced by the proposed CDM/JI project?</li> <li>What would the future look like without the proposed CDM/JI project?</li> </ul> <i>About ¼ - ½ page</i>	CH <sub>4</sub> and CO <sub>2</sub> emissions are being reduced by the proposed CDM project activity. In absence of the project activity current practice of wastewater collection and sludge disposal in a pit in sanitary landfill would have continued; leading to methane emissions into the atmosphere.  In the project activity sludge will be degraded anaerobically in a closed system and biogas generated will be captured and used for power generation. Currently electricity generation in Vanuatu is based on imported diesel fuel.  The baseline scenario in case of the project activity consists of open anaerobic degradation of sludge and diesel based electricity generation with very high operational costs due to high costs of diesel transportation.
<b>ADDITIONALITY</b> Please explain which additionality arguments apply to the project: (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	It is envisaged that the demonstration of additionality will be done by justifying that the proposed project activity is 'First of its Kind' in the host country.  Also as per the 'Guidelines for Demonstrating Additionality of Micro-scale Project Activities' all renewable energy projects up-to 5MW and emission reduction of less than 20,000 tCO <sub>2</sub> e in LDC/SIDS are considered additional. .  Further additionality assessments will be carried out demonstrating that the project activity cannot be implemented in the absence of the CDM by carrying out barrier analysis and/or investment analysis as appropriate.

(iv) other	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><b>SECTOR BACKGROUND</b> 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>Efficient and adequate infrastructure systems are vital to the well-being and economic progress of Vanuatu, particularly for Port Vila, the national capital and seat of government and the nation's main centre of commercial activity. Furthermore, Port Vila is a principal destination for tourism in Vanuatu, which is of great importance to the national economy. Tourists require and expect high-quality infrastructure and services.</p> <p>Vanuatu's urban development sector encompasses a wide range of structural and non-structural services and amenities. In Port Vila, the capital of Vanuatu, the impact of high urban population growth rates (4%) has created policy and planning challenges for national and local governments to meet the rapidly increasing demands for urban infrastructure and services. Constraints on the availability of land and the cost of housing are forcing many urban immigrants to live in poor environmental conditions in urban and peri-urban settlement communities with limited or no infrastructure or urban services. There is an urgent need to promote sustainable and climate-resilient urban development in Port Vila through the building of hygiene and sanitation infrastructure. A phased approach will be required to improve (i) the drainage system and the road network to solve the flooding problems and lift the conditions of the roads within the urban area and those that link to peri-urban areas; (ii) sanitation disposal and vital infrastructure to raise environmental conditions, with emphasis on treatment systems; and (iii) the hygiene system and hygiene awareness.</p> <p>Planning and policy have been largely nonexistent in guiding the development of Port Vila's infrastructure. The Port Vila Master Plan for Sanitation and Drainage, which has recently been developed through project preparatory technical assistance, provided a plan for undertaking investment in vital urban infrastructure.</p> <p>The sanitation system in Port Vila is largely decentralized, consisting of privately managed household and commercial septic tanks for the collection of human waste. These allow the decomposition of the waste but the process leaves sludge as a by-product. Periodically the residual sludge is removed by private service providers through tankers and disposed of at a site designated and maintained by the Port Vila Municipality.</p> <p>The proposed project may involve some grant contributions from the Government of the Australia and New Zealand as ODA. No diversion of ODA will be confirmed.</p>
<p><b>METHODOLOGY</b> Please choose from the following options:</p> <p>For CDM projects:</p> <p>(i) project is covered by an existing Approved CDM Methodology or Approved CDM</p>	<p>The project is covered under the following approved methodologies:</p> <p><i>Type:</i> III: Other Project Activities</p> <p>Category : III AO<sup>2</sup> – Methane Recovery Through Controlled Anaerobic Digestion (EB58./Version 01)</p> <p>Scope Number: 13</p> <p><i>Type:</i> I. Renewable energy projects</p>

<sup>2</sup> <http://cdm.unfccc.int/methodologies/DB/F5U41CTG7ENWK9RSSL5BV1LUPDG76W>

Small-Scale Methodology  (iii) projects needs modification of existing Approved CDM Methodology	<i>Category:</i> I.D <sup>3</sup> – Grid connected renewable electricity generation (I.D./Version 17,EB 61) Scope Number: 01
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**C. FINANCE**

<b>TOTAL CAPITAL COST ESTIMATE (PRE-OPERATIONAL)</b>																					
\Total project costs	<table border="1"> <thead> <tr> <th>Phase</th> <th>Description</th> <th>Year</th> <th>Cost US\$</th> </tr> </thead> <tbody> <tr> <td>I Part A</td> <td>Inlet works, Physical treatment, Sludge Digestion, Dehydration, Tertiary treatment and others</td> <td>2015</td> <td>4,960,000</td> </tr> <tr> <td>I Part B</td> <td>Biogas Treatment &amp; Cogeneration</td> <td>2018</td> <td>1006,000</td> </tr> <tr> <td>I Part B</td> <td>Biological Treatment of Digestion Liquid &amp; Solar Drying</td> <td>2018</td> <td>1,701,000</td> </tr> <tr> <td>Total</td> <td></td> <td></td> <td><b>7,667,000</b></td> </tr> </tbody> </table>	Phase	Description	Year	Cost US\$	I Part A	Inlet works, Physical treatment, Sludge Digestion, Dehydration, Tertiary treatment and others	2015	4,960,000	I Part B	Biogas Treatment & Cogeneration	2018	1006,000	I Part B	Biological Treatment of Digestion Liquid & Solar Drying	2018	1,701,000	Total			<b>7,667,000</b>
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<b>SOURCES OF FINANCE TO BE SOUGHT OR ALREADY IDENTIFIED</b>																					
Equity Name of the organizations, status of financing agreements and finance (in US\$ million)	Government of Vanuatu																				
Debt – Long-term Name of the organizations, status of financing agreements and finance (in US\$ million)	Asian Development Bank Loan																				
Carbon finance advance payments sought from the buyer. (US\$ million and a brief clarification, not more than 5 lines)	The project has potential of receiving upfront co-financing from the Future Carbon Fund (FCF) for up to 50% credits generated until 2020, part of ADB's Carbon Market Programme(CMP). The ADB, through the Credit Marketing Facility, can further assist the project entity in selling the additional credits on a pay-on-delivery basis to enhance the financial viability of the project																				
<b>SOURCES OF CARBON FINANCE</b> Name of carbon financiers that you are contacting (if any)	To be decided.																				
<b>INDICATIVE CER/ERU/VER PRICE PER tCO<sub>2</sub>e</b> <i>Price is subject to negotiation. Please indicate VER or CER preference if known.</i>	USD\$ 8-10																				
<b>TOTAL EMISSION REDUCTION PURCHASE AGREEMENT (ERPA) VALUE</b>																					
A period until 2012 (end of the first commitment period)	NA																				
A period of 10 years	US\$ 336,000 – 420,000 (Indicative values only)																				
A period of 7 years	NA																				

<sup>3</sup> <http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X>

**D. EXPECTED ENVIRONMENTAL AND SOCIAL BENEFITS**

<p><b>LOCAL BENEFITS</b> E.g. impacts on local air, water and other pollution.</p>	<p>Biogas emissions elimination through the implementation of the anaerobic sludge treatment process and the use of the collected biogas for electricity generation has several positive social and environmental impacts:</p> <ul style="list-style-type: none"> <li>✓ Improve the local environment in the vicinity of sanitary landfill; by elimination of noxious air pollution arising from the biogas emanations in the plants, resulting in a considerable reduction of health risks associated with these emissions.</li> <li>✓ Improve local air quality</li> <li>✓ Reduce the nuisance cause by the malodor's associated with biogas emanation.</li> <li>✓ Use a renewable source for energy generation.</li> </ul>
<p><b>SOCIO-ECONOMIC ASPECTS</b></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>Following social and economic effects are envisaged as a result of project activity:</p> <ul style="list-style-type: none"> <li>✓ Electricity generation in Vanuatu is based on imported diesel fuel. Project activity will offset a proportion of the diesel currently used, and so reduce the overall cost of generation. There may be additional, indirect, benefits that result from the reduced cost of annual generation.</li> <li>✓ Safer sanitation services to all residents of greater Port Vila</li> <li>✓ The project will address the immediate concerns raised by the local population and communities in terms of improving the local environmental hygiene by eliminating obnoxious odours and air pollution in the project vicinity and surroundings. This will benefit the local communities in terms of improved living and working conditions.</li> </ul>
<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"> <li>✓ Jobs, training and income generation during construction and operation through direct employment.</li> <li>✓ Access to electricity.</li> <li>✓ Income generation opportunities generated from increased human activity in the area.</li> <li>✓ The project will reduce methane resulting in increased revenue to the national government from the sale of carbon credits. The additional revenue is envisaged to be used for the implementation of urgently needed developmental activities in the country.</li> </ul>
<p><b>ENVIRONMENTAL STRATEGY/ PRIORITIES OF THE HOST COUNTRY</b> 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>The project activity supports provision of affordable, effective, and sustainable sanitation services to the residents of Port Vila and surroundings and is consistent with relevant laws and regulations.</p> <p>A detailed EIA will be carried out for this project including developing Environment Management Plan (EMP).</p> <p>There are other Acts that affect or are related to the protection, management and conservation of the environment. They are :</p> <ul style="list-style-type: none"> <li>• the Public Health Act on controls of disposal of waste in public places and littering,</li> <li>• Water Resources Management Act on pollution control and protection of water catchment,</li> <li>• Foreshore Development Act,</li> <li>• Fisheries Act,</li> <li>• Forestry Act, and</li> </ul>

	<ul style="list-style-type: none"><li>• Coastal Management Act, among others</li></ul> <p>The Environment Management and Conservation Act No. 12, was enacted into law in 2002, simultaneously with the Water Resources Management Act. The principal purpose of the Environment Management and Conservation Act is to provide for sustainable development in Vanuatu through sound environmental planning and management and the conservation, protection and environmentally sound management of all natural resources</p> <p>The Department of Environment (DOE) under the Ministry of Lands, has the overall responsibility for environment management. It requires mandatory Environmental Impact Assessment (EIA) for all development projects that affect the environment and Bioprospecting permit.</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. N<sub>2</sub>O removal
8. HFC23 Destruction
9. SF<sub>6</sub> Recovery
10. Transportation
  - 9a. Fuel switch
  - 9b. Modal switch
11. Others