

**Vanuatu – Project Idea Notes (PINs)
and Project Design Documents
(PDDs) developed Under ACP MEA
Project**

Port Vila Biogas Project

Background

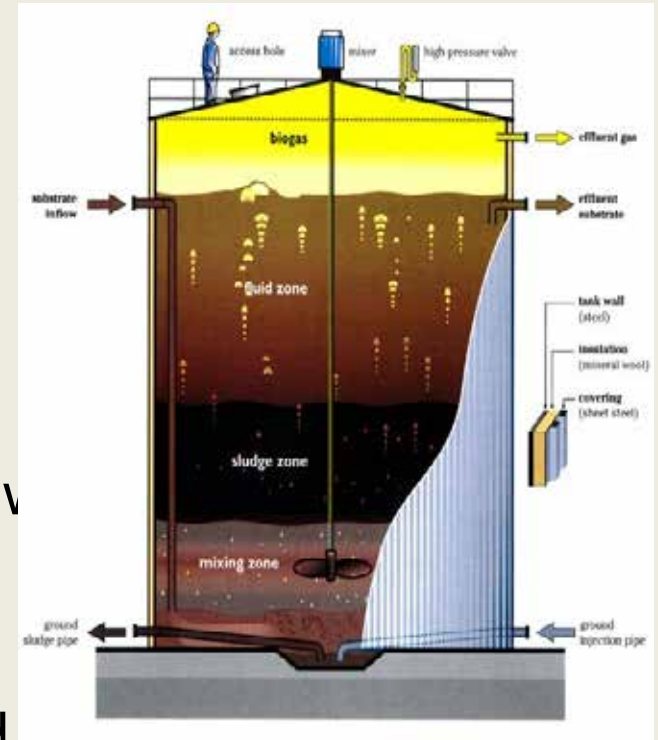
- Sanitation system in Port Vila is largely decentralized, consisting of privately managed household and commercial septic tanks for the collection of human waste.
- The sludge generated is transported by tankers and discharged into a pit for anaerobic decay within Bouffa sanitary landfill.
- Results in methane being emitted to the atmosphere
- Un-hygenic local environment

Objective

- 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

Project Description

- Project aims at providing safer sanitation services to all the residents of greater Port Vila.
- existing highly unsatisfactory sludge disposal method shall be replaced by installing a well-designed and properly managed anaerobic sludge treatment facility.
- 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 138,000 m³ of biogas will be generated annually which is estimated to generate 275 MWh of electricity per year.
- The estimated project cost for this phase is US \$7.7 million.



Project Participants

Port Vila Municipality /Ministry of Infrastructure and Public Utilities, Government of Vanuatu.

Contact Details:

Contact Person: Willie Watson

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CDM Aspects

Baseline Scenario

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.

Additionality

- 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 tCO₂e in LDC/SIDS are considered additional

CDM Aspects Contd...

Additionality

- 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.
- 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.

CDM Aspects Contd...

Applicable Methodology

Type: III: Other Project Activities Category : III AO – Methane Recovery Through Controlled Anaerobic Digestion (EB58./Version 01) Scope Number: 13

Type: I. Renewable energy projects Category: I.D – Grid connected renewable electricity generation (I.D./Version 17,EB 61) Scope Number: 01

Estimated Emission Reductions – 4200 tCO₂-equivalent/year

Local Benefits & Socio-Economic Impacts

Local Benefits

- 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.
- Improve local air quality
- Reduce the nuisance cause by the malodor's associated with biogas emanation.
- Use a renewable source for energy generation.

Environmental & Socio-Economic Impacts

Socio-economic

- 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.
- Safer sanitation services to all residents of greater Port Villa
- Will address the immediate concerns raised by the local population and communities - improving the local environmental hygiene by eliminating obnoxious odours and air pollution
- Benefit the local communities in terms of improved living and working conditions.
- Income generation opportunities generated from increased human activity in the area.
- Improve access to electricity

Brenwe River Mini- Hydropower Project in Malekula, Vanuatu

Background

- Electricity supply throughout Vanuatu is dominated by diesel generation, resulting in very high tariff.
- The power supply in Malekula island (second largest island in Vanuatu) where the proposed project is planned is limited, which constraints the economic development on the island.

Objective

- To utilize the Brenwe hydropower potential which is technically and economically feasible in turn improve electricity access in the region through the development of grid-connected renewable energy for rural areas. Further to stimulate economic development in the region and support development of local industry.

Project Description

- Proposed project activity is a run-of-river hydropower project.
- Hydropower station will be located in the Brenwe River in the North West of the Malekula Island, Malampa Province.
- Has an estimated power generating capacity of 1.2 MW and equivalent annual energy production of 5,636,141 KWh.
- will provide cheaper and more reliable power supply to Melekula Island.
- replace demand for imported fossil fuels
- The estimated total project cost is US\$13.3 million.



Project Participants

Department of Energy under the Ministry of Lands and Natural Resources (MLNR), Government of Vanuatu

Contact Details

Contact Person: Leo Moli / Benjamin Jesse

Address: Department of Energy, PMB 9067, Port Vila, Vanuatu

CDM Aspects

Baseline Scenario

- In the absence of this program the baseline scenario would be continued usage of diesel based electricity generation with very high operational costs due to high costs of diesel.

Additionality

- Can be demonstrated as per “Guidelines for demonstrating additionally of Micro-scale project activities” EB 63 (version 3)”. As per the paragraph 3 of the guidelines:

CDM Aspects Contd...

Additionality

- Project activities up to 5 MW that employ renewable energy technology are additional if :
 - ∅ *The geographic location of the project activity is in LDC/SID or special underdeveloped zone of the host country identified by the Government before 28 May 2010;*
- According to the United Nations, Vanuatu is classified both as a Least Developed Country (LDC) and Small Island Developing State (SIDS). Hence proposed project, which is having installed capacity of 5 MW is considered to be automatically additional as per the above EB guidelines.

CDM Aspects Contd...

- **Additionality**

- In addition, potential barrier analysis in terms of prevailing practice barrier and technological barriers (availability of skilled labour, capacity for operation and maintenance etc.) can also be explored.

- **Methodology**

- Type: I. Renewable energy projects Category: I.F – Renewable electricity generation for captive use and mini-grid (Version 02/EB61)

- **Estimated Emission Reductions**

- 4,214tCO₂-equivalent/year

Local Benefits & Socio-Economic Impacts

Local Benefits

- Will deliver improved air quality, both locally and globally, by eliminating NOx, SOx and CO2 emissions associated with diesel based power generation.

Socio-economic

- Cheaper and more reliable power supply to meet the Malekula power demand.
- Reduce demand for imported fuels
- offset a proportion of the diesel currently used - reduce the overall cost of generation.
- Increase in electricity supply in the island which will benefit the local industry.

Environmental & Socio-Economic Impacts

Socio-economic

- Jobs, training and income generation during construction and operation through direct employment.
- Compensatory benefit through improved services and infrastructure and support of livelihoods programmes.
- Access to electricity.
- Income generation opportunities generated from increased human activity in the area.
- Overall poverty reduction and improvement in living standards.

Wambu Hydropower Project, Santo Island, Vanuatu

Background

- The Espiritu Santo (largest island in Vanuatu) where the proposed run-of river hydro project is planned is virtually un-electrified except for town of Luganville (second largest town after Port Villa in Vanuatu).
- The town of Luganville is supplied with grid connected electricity which is supplied by Vanuatu Utilities and Infrastructure Ltd (VUI).
- The electricity comes from a diesel power generator based on Luganville and from the Sarakata Hydro Power Station.

Objective

To help island of Espiritu Santo to meet its increasing load demand and to reduce reliance on diesel power during the daytime and also aid prospective development in neighboring island Aore

Project Description

- Proposed project activity is a run-of-river hydropower project.
- Mini Hydro Scheme is located West of provincial capital Luganville in Santo Island.
- Has an estimated power generating capacity of 4 MW and equivalent annual energy production of 18.35 GWh.
- will provide cheaper and more reliable power supply to Santo Island.
- replace demand for imported fossil fuels
- The estimated total project cost is US\$ 54.41 million.



Project Participants

Department of Energy under the Ministry of Lands and Natural Resources (MLNR), Government of Vanuatu

Contact Details

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CDM Aspects

Baseline Scenario, Additionality & Methodology

Similar to Brenwe hydro project

- **Average Estimated Emission Reductions**
- 11,569 tCO₂-equivalent/year

Local Benefits & Socio-economic Impacts

Similar to Brenwe hydro project

Efate Geothermal Power Project Phase 1

Background

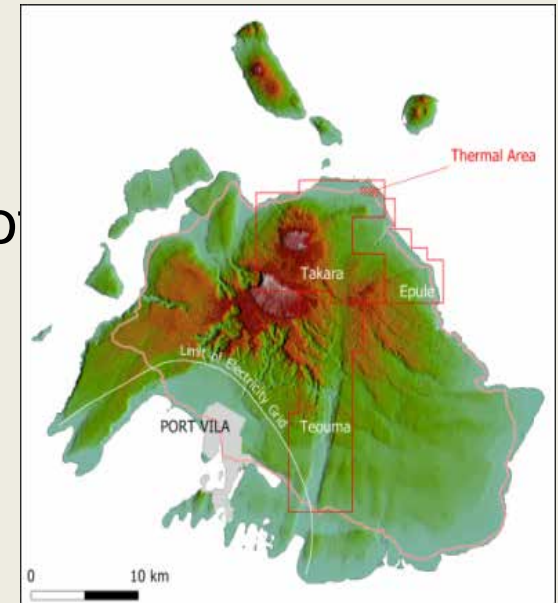
- Electricity supply throughout Vanuatu is dominated by diesel generation, resulting in very high tariff.
- Vanuatu's national electrification rate is around 28%, reflecting low affordability and accessibility.
- Needs additional generation sources to meet its increasing power demand and to foster economic development

Objective

- To utilize the geothermal energy resource which is technically and economically feasible leading to an increase in the electricity supply in the region, reducing the grid cost of electricity and expand grid electricity supply to part of Efate which is not electrified currently

Project Description

- Phase 1 involves construction and operation of a 5 MW geothermal power station.
- located at Takara springs on Efate island of Vanuatu
- Proposed to be constructed and operated by Australian geothermal company Kuth Energy Ltd.
- Considering the resource temperatures at Takara a binary cycle technology has been identified as the most appropriate technology
- Transmission system which would comprise a 11/60 kV generation substation, a single 60 kV transmission circuit and 60/20 kV interconnection substation at Tagabe.



Project Participants

Kuth Energy Limited

Contact Details

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Department of Energy under the Ministry of Lands and Natural Resources (MLNR), Government of Vanuatu.

Contact Details

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CDM Aspects

Baseline Scenario

- In the absence of this project the baseline scenario would be continued usage of diesel based electricity generation with very high operational costs due to high costs of diesel.

Additionality

- First of its kind
- “Guidelines for demonstrating additionally of Micro-scale project activities” EB 63 (version 3)”.
As per the paragraph 3 of the guidelines:

CDM Aspects Contd...

- **Methodology**

- Type: I. Renewable energy projects Category: I.D – Grid connected renewable electricity generation (I.D./Version 17,EB 61) Scope Number: 1

- **Estimated Emission Reductions**

- 19,237 tCO₂-equivalent/year

Local Benefits & Socio-Economic Impacts

Local Benefits

- The exploitation of geothermal energy does not produce NOx or SOx, and will produce substantially less GHG emissions compared to fossil fuel generated electricity.

Socio-economic

- Primary benefit - reduction in the unit cost of generation in the coming years- positive impact on overall economy.
- Increase in additional electricity generation - increase electricity supply in the under-served and un-served region - investment in new transmission system in areas which have no grid connectivity.
- offset a proportion of the diesel currently used - reduce the overall cost of generation.
- Involve technology transfer - training of local staff for the Project will provide them with new skill sets enabling them to choose a career in their chosen field

Efate Geothermal Power Project Phase 2

Background

- The Takara license area has a conservative geothermal power potential of 10 MW.
- Following successful implementation of Phase 1 (5 MW gross) it is envisaged to be followed by a Phase 2 (5 MW gross).
- Proposed to be constructed and operated by Australian geothermal company Kuth Energy Ltd.

Objective

Similar to Phase 1 - utilize the geothermal energy resource - increase in the electricity supply - reducing the grid cost of electricity - expand grid electricity supply to part of Efate which is not electrified currently

Project Description

- The project will utilize the same binary cycle technology as in first phase

CDM Aspects

Baseline Scenario, Additionality & Methodology

Similar to Phase 1

- **Average Estimated Emission Reductions**
- 19,237 tCO₂-equivalent/year

Local Benefits & Socio-economic Impacts

Similar to Phase 1

PoA for Disseminating Solar Lamps and Efficient Cook Stoves in Pacific Island Countries

Background

- Domestic energy supply for the vast majority of rural households in PIC's is limited to kerosene lamps for lighting and open fire systems wherein woody biomass is burnt for cooking.

Objective

- The Programme of Activity (PoA) aims to replace kerosene lamps with portable solar lighting systems and inefficient open fire cooking system with efficient cook stoves.

PoA Description

- The proposed PoA will be implemented and coordinated by Green Power.
- Green Power is 'for trading' arm of Vanuatu Renewable Energy and Power Association (VANREPA); a non profitable organization.
- Program is a voluntary action by Green Power and is not required by law in any of the country where program will be implemented.
- The program is envisaged to be rolled out initially in four Pacific Island Countries, namely: Papua New Guinea (PNG), Solomon Islands, Fiji and Vanuatu.



Project Participants

Green Power

Contact Details

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CDM Aspects

Baseline Scenario

- In the absence of this PoA the baseline scenario would be continued usage of kerosene lamps for lighting and inefficient open fire system for cooking.
- **Additionality**
- Can be demonstrated as per “Guidelines for demonstrating additionally of Micro-scale project activities” EB 63 (version 3)”. As per the paragraph 3 of the guidelines:

CDM Aspects Contd...

Additionality

As per the paragraph 3 & 4 of the guidelines:

- Other project activities Type III project activities that aim to achieve emission reductions at a scale of no more than 20 ktCO₂e per year & Energy Efficiency project activities that aim to achieve energy savings at a scale of no more than 20 Gwh per year , are additional if :
 - ∅ *The geographic location of the project activity is in LDC/SID or special underdeveloped zone of the host country identified by the Government before 28 May 2010;*
- According to the United Nations, Fiji, Solomon Islands, PNG and Vanuatu are all classified as Small Island Developing State (SIDS). Further Solomon Islands and Vanuatu are also classified as Least Developed Country (LDC). Each CPA under this PoA is expected to fall within the limits of micro-scale guidelines referred above

First CPA - Disseminating Solar lamps and Efficient Cook Stoves in Vanuatu

- **CPA Description**

- Involves distribution and installation of solar lighting systems and improved cook stoves in rural households in the Vanuatu.
- Involve distribution of solar lighting systems known as “pico solar” for lighting and mobile charging and efficient cook stoves called rocket stoves for cooking.
- Aims at distributing 20,000 solar lamps over a period of 5 years and 4500 cook stoves over a period of 3 years.
- Implemented by Green Power and the distribution of lamps and cook stoves shall begin in early/mid 2013.

CDM Aspects

Baseline Scenario

- In the absence of this CPA the baseline scenario would be continued usage of kerosene lamps for lightning and inefficient open fire system for cooking.

Additionality

- “Guidelines for demonstrating additionally of Micro-scale project activities” EB 63 (version 3)”.
As per the paragraph 3 of the guidelines:

CDM Aspects Contd...

- **Methodology**

- The CPA meets the applicability requirements of all the relevant CDM methodologies - AMS III.AR. version 02 EB 65 and AMS II.G version 03 EB 60

- **Estimated Emission Reductions**

- Average 3790 tCO₂-equivalent/year

Local Benefits & Socio-Economic Impacts

Local Benefits

- Reduces indoor air pollution.
- Reduced deforestation and degradation of forests and associated impacts on biodiversity and ecosystem services.
- Reduced soil erosion and nutrient loss.

Socio-economic (Solar Lamps)

- Improves /enables evening study. Hence improves literacy.
- Decreases group alcoholism and other drug abuse as with electricity availability at home people are incentivized to spend more time at home.
- Stems urban migration.

Environmental & Socio-Economic Impacts

Socio-economic (Improved Cook Stoves)

- Reduced poverty, as the efficient wood stove reduces annual expenditure on cooking fuels.
- Provide very poor households with effective, low cost means of improving livelihood security.
- Use 40-50% less fuel than an open fire hence people spend less time collecting firewood or less money buying firewood.
- Reduced exposure of firewood collectors (mainly women) to hazards in remote areas
- Reduced burns and injuries from cooking.
- Conserves foreign exchange with reduced expenditure on petroleum products
- People will be trained to individually own and maintain the devices.
- Reduced cooking and wood collection time; householders can spend more time on other household tasks, as well as schooling and supervising children.

PINs Selected for PDD Development

- Efate Geothermal Power Project Phase 1
- Brenwe River Mini- Hydropower Project in Malekula, Vanuatu

Taking into consideration: Feedback from project proponent & stakeholders; the current status of project; feasibility studies; viability; CDM benefits including fulfilling CDM modalities and requirements; credibility of project proponent

Thank You!