Upolu Wind Power Project, Samoa

Document Prepared By Subbarao Consulting Services Limited

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PROJECT DETAILS

1.1 Summary Description of the Project

Demand for energy has increased in Samoa (officially known as the Independent State of Samoa) over the last decade, thus reliable, affordable and environmentally sound energy services and supply is crucial to meeting the country's electricity demand. Electricity in Samoa is generated primarily from diesel engine generators from facilities on Upolu (close to Apia), Savai'i and Manono Islands. The objective of the proposed project activity is to generate electricity using wind, a clean source of energy. This project will contribute to Samoa's climate change mitigation efforts.

The Government of Samoa, the power utility Electric Power Corporation (EPC), the Secretariat of the Pacific Islands Applied Geoscience Commission (SOPAC) and the United Nations Development Program (UNDP) are undertaking a wind resource assessment project for Upolu Island, Samoa. The project has installed, and operated two wind monitoring stations on Upolu: one in Aleipata on the southeast coast and one on higher ground at the Afulilo dam. The grid connected Upolu Wind Power Project entails installation of seven Vergnet GEV MP 275 kW wind turbines. The proposed project activity of installed capacity 1.925 MW is expected to generate electricity to the order of 3,626 MWh annually which otherwise would have been generated by diesel gensets.

1.2 Sectoral Scope and Project Type

Sectoral scope: 01 Energy industries (renewable - / non-renewable sources)

The proposed project is a renewable energy project.

The proposed project is not a grouped project.

1.3 Project Proponent

Project proponent	Electric Power Corporation (EPC)
Contact Person	Tile Leia Tuimalealiifano
Address	P.O.Box 2011, 5th Floor, TATTE Building, Sogi, Apia, Samoa
Email	leiat@epc.ws
Office Phone	Telephone 685 65401 Fax 685 23748
Website	http://www.epc.ws/
Responsibilities	1. Coordinate and obtain permits and necessary approvals within the government 2. Dedicate legal resources to complete main contracts 3. Take over the O&M work after the completion of the services under the O&M contract

1.4 Other Entities Involved in the Project

Not Applicable.

1.5 Project Start Date

01/01/2015

1.6 Project Crediting Period

01/01/2015 - 31/12/2024

10 years twice renewable

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

Project	√
Mega-project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
2015	1,740
2016	1,740
2017	1,740
2018	1,740
2019	1,740
2020	1,740
2021	1,740
2022	1,740
2023	1,740
2024	1,740
Total estimated VCUss	17,400
Total number of crediting years	10
Average annual VCUss	1,740

1.8 Description of the Project Activity

The project activity involves renewable energy generation by means of harnessing the wind power potential – a natural source of energy by setting up windmills. The wind turbine generators (WTGs) considered under the proposed project activity together has a cumulative power generation capacity of 1.925 MW. The estimate lifetime of the WTG is 25 years. The power generated in the project activity is delivered to the grid. The details of the WTGs considered under the project activity are tabulated below:

Table 1: Wind Turbine Characteristics

Manufacturer	Vergent S.A
Type and rated power GEV MP	275 kW
Axis of the rotor	Horizontal
Height of the hub	60m
Rotation speed of the rotor	31 0r 46 rpm
Rated wind speed	13 m/s
Cut-in wind speed	4 m/s
Power Control System	Regulation by setting in flag (pitch). Active control with hydraulic system

Table 2: Generator Specification

Manufacturer	Leroy Somer ou ABB
Type	Asynchronous bi-speed
Frequency	50/60 HZ
Rated Capacity	275 kW
Rotation Speed	1514 rpm
Grid Connection Mode	Specialized electronic Mode
Output with Full load	95.8%
Class of Insulation	F reinforced

Table 3: Gear Box

Manufacturer	Dynamic Oil
Type	Planetary with rectified teeth, ratio 32,6 / 1
Weight	1200 Kg
Maximum Power	275 kW
Cooling	By oil circulation

The project activity has an envisaged electricity generation potential to the tune of 3,626 MWh per annum which would be exported to the Upolu grid.
The purpose of the project activity is clean energy generation through a renewable source of energy and export of the net electricity generation to the grid. The electricity exported by the project displaces an equivalent amount of electricity by a majority of diesel fired sources. The project activity therefore results in reduction in greenhouse gas (GHG) emissions associated with fossil fuel based electricity generation and also contributes to the causes of conservation of fossil fuel and depleting natural resources

1.9 Project Location

The project is planned at Mount Lepu'e on Upolu Island. The geographical coordinates of the project activity are 13°48’39.63”S and 171°41’54.31”W.

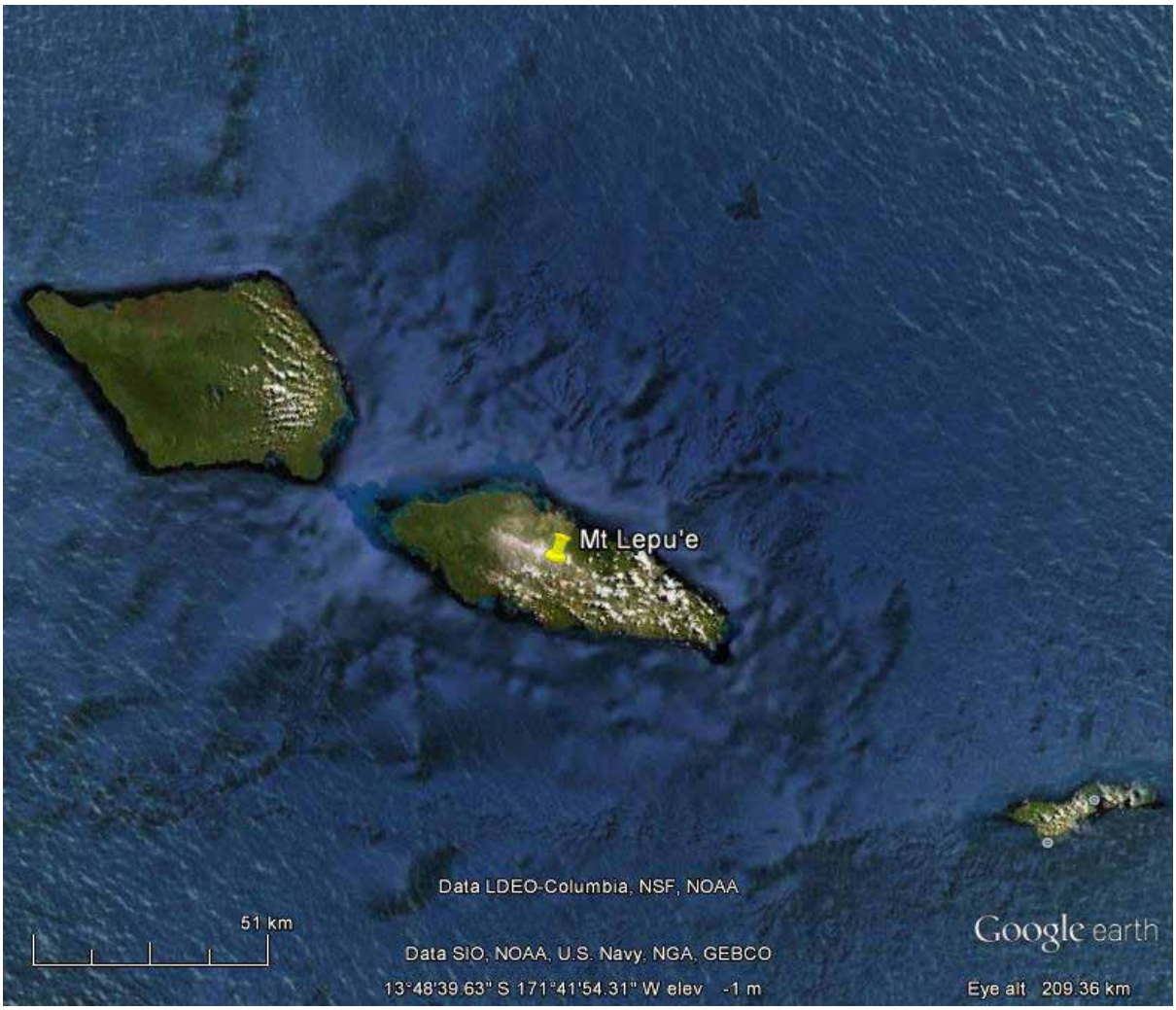

Figure 1: Project Site

1.10 Conditions Prior to Project Initiation

The project activity involved setting up of WTGs to harness the wind power to produce electricity and supply electricity to the grid. In the absence of the project activity, an equivalent amount of power would have been supplied by the grid which is fed mainly by diesel fired plants. The share of renewable energy in electricity generation in Samoa is estimated at 13% for 2011[1]. The proposed project is a green field wind power project without any GHG emissions.

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

Samoa is committed to ensuring environmental sustainability, therefore environment sustainability is core to sustainable development criteria of the country. It is a priority focal area of the Ministry of Natural Resources & Environment (MNRE) work program. The environment features prominently as a cross-cutting issue in all development initiatives. According to Strategy for

[1] Samoa Energy Sector Plan Master Draft.

development of Samoa 2012-2016 key strategic areas for sustainable energy supply are identified as:

- Promote and increase renewable energy investment and generation;
- Efficient, affordable and reliable electricity supply;
- Effective management of petroleum supply;
- Promote energy efficiency practices in all sectors particularly the transport sector; and
- Efficient and effective coordination and management of the sector through the implementation of the energy sector plan.

The key indicators for the above-mentioned strategic areas are identified as:

- Gradually phase out fossil fuels;
- Increase the contribution of RE for energy services and supply by 8% over the 4 year planning horizon;
- Complete and implement energy sector plan; and
- Establish the energy regulatory functions.

The proposed project activity uses wind energy for power generation. It is considered more environmentally friendly and cleaner than fossil fuel and is in line with Samoa sustainable energy plans.
Environment Impact Assessment of the project needs to be carried out before starting of the project. Also a preliminary impact assessment needs to be studied and included in the Feasibility study report. The environment impacts of the proposed project will be studied during the feasibility study stage and later. However no significant negative effects are envisaged from the wind power project.

1.12 Ownership and Other Programs

1.12.1 Right of Use

According to the Feasibility Study, the proposed project is owned by EPC. More evidences such as contracts will be provided once signed.

1.12.2 Emissions Trading Programs and Other Binding Limits

Not Applicable

1.12.3 Participation under Other GHG Programs

The proposed project has neither been registered, nor is it seeking registration under any other GHG programs.

1.12.4 Other Forms of Environmental Credit

The proposed project neither has generated nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program since it has neither been registered, nor is it seeking registration under any other GHG programs.

1.12.5 Projects Rejected by Other GHG Programs

The proposed project has not been rejected by any other GHG programs because it neither has been registered, nor is seeking registration under any other GHG programs.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

Not applicable as the proposed project is not a grouped project.

Leakage Management

In accordance with the applied methodology "AMS-I.D. – Grid connected renewable electricity generation (I.D./Version 17,EB 61)", "If the energy generating equipment is transferred from another activity, leakage is to be considered." However, the proposed project is a green field project without transfer of any equipment from another activity. Thus, leakage does not require to be taken into consideration for the proposed project.

Commercially Sensitive Information

There is no commercially sensitive information for the proposed project

Further Information

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

Title	Reference	Version
Grid Connected Renewable Electricity Generation[2]:	AMS-I.D., EB 61	Version 17
Tool to calculate the Emission factor for an electricity System[3]	EB 63, Annex 19	Version 2.2.1

2.2 Applicability of Methodology

	Applicability Criteria with AMS-I.D.	Project Applicability
1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:[4] (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity involves renewable energy generation unit specifically wind power plant that will supply electricity to the Grid. Thus the Project Activity complies with the applicability criteria.
2	Illustration of respective situations under which each of the methodology (i.e. AMS-I.D., AMS-I.F. and AMS-I.A.[5]) applies is included in Table 2.	The project supplies electricity to Grid. Thus the project complies with the applicability criteria of AMS-I.D.

	Project type	AMS-I.A.	AMS-I.D.	AMS-I.F.

[2] http://cdm.unfccc.int/filestorage/V/9/L/V9LRSXKP24Q7YT6HZDUBO3C0ING8AJ.1/EB61_repan17_Revision_AMS-I.D_ver17.pdf?t=QlV8bTZrdTQ2fDBxrixMDU9A-EHoJXRXBdUg

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

[4] Refer to EB 23, annex 18 or the definition of renewable biomass.

[5] AMS-I.D. "Grid connected renewable electricity generation", AMS-I.F. "Renewable electricity generation for captive use and mini-grid" and AMS-I.A. "Electricity generation by the user"

		1	Project supplies electricity to a national/regional grid		√	
		2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (xcess electricity may be supplied to a grid)			√
		3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
		4	Project supplies electricity to a mini grid[6] system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
		5	Project supplies electricity to household users (included in the project boundary) located in□off grid areas	√		
2	This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition[7]; (c) involve a retrofit[8] of (an) existing plant(s); or (d) involve a replacement[9] of (an) existing plant(s).					The project activity shall install a new wind power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant). Thus the Project Activity complies with the applicability criteria (a)
3	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:					NA

[6] The sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW.

[7] A capacity addition is an increase in the installed power generation capacity of an existing power plant through: (i) the installation of a new power plant besides the existing power plant/units, or (ii) the installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.

[8] Retrofit(or Rehabilitation or Refurbishment). It involves an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed (mothballed) power plants. A retrofit restores the installed power generation capacity to or above its original level. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures.

[9] Replacement. It involves investment in a new power plant or unit that replaces one or several existing unit(s) at the existing power plant. The installed capacity of the new plant or unit is equal to or higher than the plant or unit that was replaced.

	· The project activity is implemented in an existing reservoir with no change in the volume of reservoir; · The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; · The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m2.	
5	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel[10], the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity will harness wind energy and have no non-renewable component and has 100% renewable component. Hence this condition is not applicable to the project activity.
6	Combined heat and power (co-generation) systems are not eligible under this category.	There is no Combined heat and power (co-generation) in the project activity. Thus the Project Activity complies with the applicability criteria.
7	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[11] from the existing units.	The project activity does not that involve the addition of renewable energy generation units at an existing renewable power generation facility. Hence this condition is not applicable to the project activity.
8	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The project activity does not seek any retrofit or replacement. Hence this condition is not applicable to the project activity.

2.3 Project Boundary

[10] A co-fired system uses both fossil and renewable fuels.
[11] Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered "physically distinct".

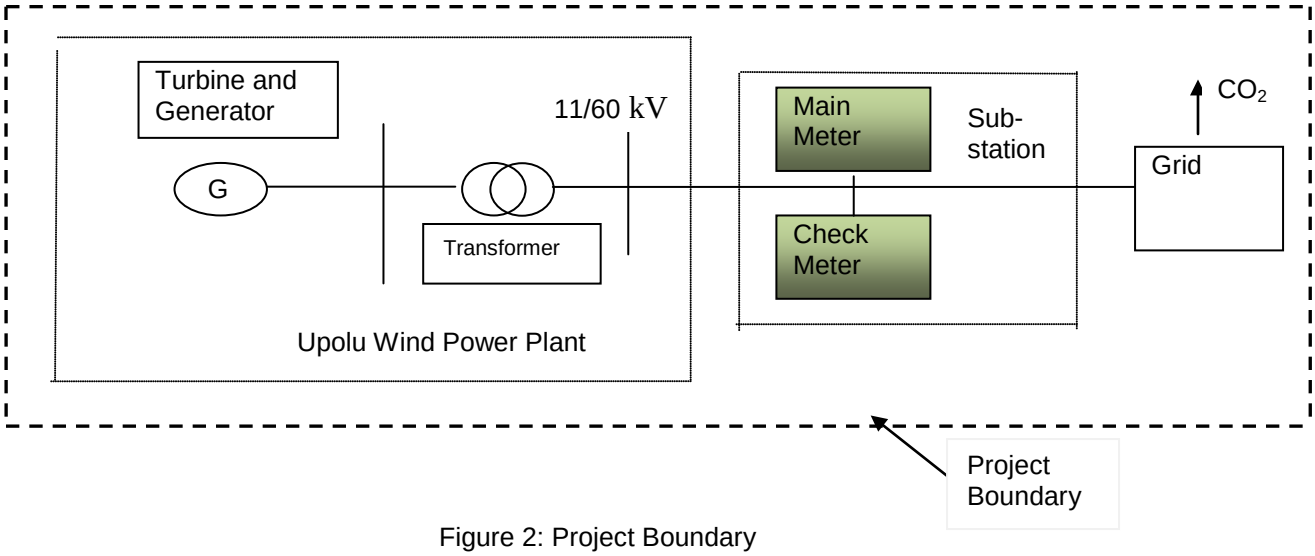

Figure 2: Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Electricity Delivered to the grid by the project activity that otherwise would have been generated by the operation of grid connected power plants and by the addition of new generation sources.	CO_2	Yes	Main Emission Source.
		CH_4	No	Not Significant. Excluded for simplification and conservativeness.
		N_2O	No	Not Significant. Excluded for simplification and conservativeness.
		Other	No	Not envisaged
Project	Emissions associated with combustion of fossil fuel associated with operation of	CO_2	No	Not Significant. Excluded for simplification and conservativeness
		CH_4	No	Not Significant. Excluded for simplification and conservativeness.
		N_2O	No	Not Significant. Excluded for simplification and conservativeness.
		Other	No	Not envisaged.

Source		Gas	Included?	Justification/Explanation
	project			

2.4 Baseline Scenario

As per applicable methodology AMS – I.D. version 17, EB 61 paragraph 10: *the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.*

Electricity supply in Samoa is dominated by diesel-based electricity generation. The share of renewable energy in electricity generation in Samoa is estimated at 13% for 2011[12]. In absence of the project activity in baseline scenario equivalent electricity would have been generated by existing grid connected diesel fired power plants.

2.5 Additionality

Project additionality is demonstrated as per "Guidelines for Demonstrating Additionally of Micro Scale Project Activities" (EB 68, version 04)**.**

As per the paragraph 2 of the guidelines:

Project activities up to 5 MW that employ renewable energy technology are additional if any one of the below conditions are 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 (SUZ) of the host country.

b) The project activity is an off-grid activity supplying energy to households/communities (less than 12 hours grid availability per 24 hours day is also considered as off grid. for this assessment);

c) The project activity is designed for distributed energy generation (not connected to a national or regional grid) with both conditions (i) and (ii) satisfied;

(i) Each of the independent subsystem/measure in the project activity is smaller than or equal to 1500 kW electrical installed capacity;

(ii) End users of the subsystem or measure are households/communities/ Small and Medium-sized Enterprises (SMEs).

d) The project activity employs specific renewable energy technologies/measures recommended by the host country DNA and approved by the Board to be additional in the host country

According to the United Nations, Samoa is classified as both a Least Developed Country (LDC) and Small Island Developing State (SIDS)[13]. Hence proposed project, which is having installed capacity of 1.925MW, is considered to be automatically additional as per the above EB guidelines.

[12] Source EPC
[13] http://www.un.org/special-rep/ohrlls/sid/list.htm

2.6 Methodology Deviations

Not applicable.

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity supplied by the renewable generating unit multiplied by the grid emission factor.

$$BEy = EG_{Bl,y} \; X \; EF_{CO2,grid,y}$$

Where:

BE_y : Baseline Emissions in year y (tCO_2)

$EG_{BL,y}$: Quantity of net electricity supplied to the grid as a result of the implementation of the proposed project activity in year y (MWh)

$EF_{CO2,grid,y}$ emission factor of the grid in year y (tCO_2/MWh).

The emission factor can be calculated in a transparent and conservative manner as follows:
(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the .Tool to calculate the Emission Factor for an electricity system.;
OR
(b) The weighted average emissions (in tCO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used. Calculations shall be based on data from an official source (where available)[14] *and made publicly available*.

As the latest 3 year data is not available, the weighted average emissions (in tCO_2/MWh) of the current generation mix has been calculated. Based on latest available data (2010) $EF_{grid,OMaverage,y}$ = 0.48 tCO_2e/MWh.

$BE_y = EG_y \times EF_{CO2,grid,\ y}$
= 3,626 MWh X 0.48 (tCO_2e/MWh)
= 1,740 tCO_2e

[14] Plant emission factors used for the calculation of emission factors should be obtained in the following priority:
1. *Acquired directly* from the dispatch center or power producers, if available; or
2. *Calculated*, if data on fuel type, fuel Emission Factor, fuel input and power output can be obtained for each plant;
If confidential data available from the relevant host Party authority are used, the calculation carried out by the project participants shall be verified by the DOE and the CDM-PDD may only show the resultant carbon emission factor and the corresponding list of plants;
3. *Calculated*, as above, but using estimates such as: default IPCC values from the 2006 IPCC Guidelines for *National* GHG Inventories for net calorific values and carbon emission factors for fuels instead of plant-specific values technology providers name plate power plant efficiency or the anticipated energy efficiency documented in official sources (instead of calculating it from fuel consumption and power output). This is likely to be a conservative estimate, because under actual operating conditions plants usually have lower efficiencies and higher emissions than name plate performance would imply; conservative estimates of power plant efficiencies, based on expert judgments on the basis of the plants technology, size and commissioning date; or
4. *Calculated*, for the simple OM and the average OM, using aggregated generation and fuel consumption data, in cases where more disaggregated data is not available.

3.2 Project Emissions

The proposed project is a wind energy project. Besides, there is no on-site consumption of fossil fuels due to the proposed project activity. So as per the applied methodology, the project emission is zero.

3.3 Leakage

According to Section 1.13, leakage of the proposed project is zero.

3.4 Summary of GHG Emission Reductions and Removals

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
2016	1,740	0	0	1,740
2017	1,740	0	0	1,740
2018	1,740	0	0	1,740
2019	1,740	0	0	1,740
2020	1,740	0	0	1,740
2021	1,740	0	0	1,740
2022	1,740	0	0	1,740
Total	17,400	0	0	17,400

4 MONITORING

4.1 Data and Parameters Available at Validation

Not Applicable. All data parameters used in calculation are monitored

4.2 Data and Parameters Monitored

Data Unit / Parameter	$EG_{BL,y}$
Data Unit	MWh/year
Description	Quantity of net electricity supplied to the grid in year *y*
Source of data	Electric meter readings located at the project site
Description of measurement methods and procedures	Measurement will be undertaken using electricity meter.
Value Applied	3,626

Monitoring equipment:	A bidirectional electricity meter as well as check meter will be installed to measure the net electricity supplied by the proposed project.
Frequency of Monitoring/Recording	Continuous monitoring, hourly measurement and monthly recording
QA/QC procedures to be applied:	The meter(s) will be subject to maintenance and calibration according to manufacturer standard. On-site staff will receive training in VCS project activity monitoring and the maintenance requirements of the electricity meters. Data measured by the meter(s) will be cross checked using electricity sales receipts. The accuracy of the measurement is ensured through annually calibration by a qualified party as per appropriate national/international standard.
Calculation Applied:	-
Any comment:	Data will be archived at least for two years after the end of the crediting period, or the last issuance of VCUs, whichever occurs later.

Data Unit / Parameter	$EF_{CO2\ grid,y}$
Data Unit	tCO_2e/MWh
Description	Grid Emission Factor
Source of data	Calculation
Description of measurement methods and procedures	Calculated
Value Applied	0.48
Monitoring equipment:	Not Applicable
Frequency of Monitoring/Recording	Annually
QA/QC procedures to be applied:	-
Calculation Applied:	
Any comment:	-

4.3 Description of the Monitoring Plan

The monitoring plan is made to ensure that the emission reductions be monitored transparently and clearly in the crediting period. The details of the monitoring plan are summarized as follows:

1. Monitoring Institution

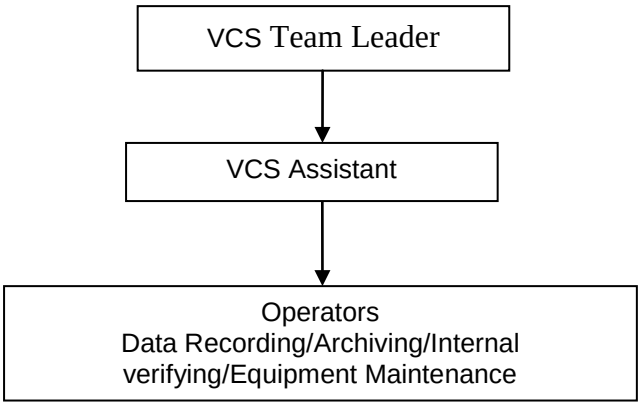

Figure 3: Monitoring Institution of the Project

This monitoring plan will be carried out by a VCS team (See Figure 3), designated by the project owner, which consists of a team leader, a VCS assistant and operators who are responsible for recording and storing the metering readings, etc.
The team leader has the overall responsibility for the monitoring and verification process, training and managing all VCS team members and acting as the focal contact for DOE, DNA and other organizations relating to VCS. The assistant will help the team leader to supervise the operation of the project.

2. Equipments for monitoring and installation

A set of meters, consists of a main meter and a check meter, are to be installed at Metering Point shown as Figure 2） to monitor the imported electricity from and exported electricity to the Grid by the project. All the meters are all two-way meters and should have same made of models, specifications, and the accuracy rates (no lower than 0.5S). The readings of the main meters will be used for the business as well as VCS purposes, while the readings of the check meters only serve for the emergency situation.

3. Data management

All data will be archived with backup in case of any data damage:

- Data of electricity supplied to the grid will be archived in electronic spread sheet at the end of each month. The electronic files will be stored on hard disk or other media. In addition, a hard copy printout will be archived.
- Physical documentation such as paper-based maps, diagrams and environmental assessment will be collated in a central place, together with this monitoring plan. In order to facilitate auditor's reference, monitoring results will be indexed. All paper-based information will be stored by the VCS team and kept at least one copy.
- All these data should be kept until two years after the end of the crediting period.
- The Project owner would provide the DOE with electricity sales receipt;

- The Project owner would provide the DOE with readings of the main meter and copies of the receipt.

4. Monitoring report

The VCS group leader is responsible for finalising the monitoring report of the proposed project, and the records of calibration, reading and invoices will be readily accessible for the verification of the DOE. The monitoring report shall include all information used to calculate the emission reductions of the proposed project, which can reflect the real, measurable and long-term GHG reductions achieved by the proposed project.

5 ENVIRONMENTAL IMPACT

Environmental Impact Assessment in Samoa is regulated by the Environmental Impact Assessment (EIA) Regulations 2007. The Planning and Urban Management Agency (PUMA) is the lead agency in environmental management for new development in Samoa. The Agency is a Division within the Ministry for Natural Resources and Environment (MNRE) that is responsible for administering the Planning and Urban Management Act 2004.

As part of the statutory responsibility, the agency reviews EIA provided in support of new developments that require development consent under the Act. The EIA must be prepared in accordance with the EIA Regulations 2007.

There are two main steps in the environmental assessment of a development proposal: (i) the Preliminary Environmental Assessment Report (PEAR), and (ii) a full EIA, which is undertaken if PEAR recommends that EIA is needed.

The Electric Power Corporation (EPC) will need to submit an Application for Development Consent for the project to the PUMA for approval. The PUMA will publicly notify the proposed subproject in the local newspaper (in both Samoan and English) and call for submissions over a 2-week period. The interested public can get further information from the PUMA, and it is suggested that the public can also get this further information from the EPC.

The project is currently at the pre-feasibility stage and the EIA of the project activity will be carried out during the detailed engineering and design stage and the outcome of the assessment will be reported to the PUMA as soon as the EIA report is available.

However, it is envisaged that since the project is a clean energy initiative it will not present any significant impact on the natural environment and will contribute to the socioeconomic development of the region and the reductions of the GHG emissions.

6 STAKEHOLDER COMMENTS

The local stakeholders' consultation meeting was held on 27th November 2012at the Ministry of Finance conference room in Apia, Samoa. The participants for the local stakeholder meeting were invited through the public consultation meeting notice. A prior notice was sent all the relevant stakeholders which included representatives from relevant government ministries, NGOs, power utility companies and private sector and facilitators.

Generally the stakeholder comments are invited at the initial stage of the project. Wind energy being an environment friendly process of electricity generation, the project proponent did not envisage any adverse effect on the local stakeholders. Instead it was expected to improve the

rural infrastructure and bring in socio-economic development in the locality. The extent of the development could be verified only after actually operating the wind mills for a period of time.

Some of the questions by the participants and the responses by project proponent and participants' discussions are as below:

- Will the project affect the livelihood of the nearby villagers?

  The project proponent clarified that the project would generate opportunities for work during construction and they expect employment during operation.

- Would the project activity affect the agricultural/ cultivation activities of the neighbourhood villagers?

  Explanations were provided informing that agriculture would not been adversely affected due to the project activity.

- Will there be a change in the noise level after the commencement of the wind farm installation activities?

  The project proponent expressed that there would be no disturbance arising from the wind farm installation at the project site.

- Will there be a noticeable aesthetic change in the landscape features?

  The project proponent confirmed in negative stating that based on the experiences with wind farms in other countries, this was mostly not the case.

In general there was no adverse comment on the project activity by the local stakeholders.