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Gold Standard for the Global Goals
Key Project Information & Project Design Document (PDD)

Version 1.1 – August 2017

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KEY PROJECT INFORMATION

Title of Project:	Adavikanda, Kuruwita Division Mini Hydro Power Project
Brief description of Project:	The main purpose of this project activity is to generate electricity from a small-scale hydropower plant and supply of power generated to the Sri Lankan national utility grid which is Ceylon Electricity Board. Alternate Power Systems (Pt.) Ltd. is the promoter of the proposed project activity. The project activity involves installation of run-of-river 6.5 MW mini hydro power plant in Sri Lanka. The generated power from this project activity will be supplied to the grid. The generation of electricity from hydro power is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Therefore, the project activity led to reduction in GHG emissions as it displaces power from fossil fuel based electricity generation in the regional grid.
Expected Implemetation Date: Expected duration of Project:	The project is commissioned since 29/9/2009 25 years
Project Developer:	Infinite Environmental Solutions LLP
Project Representative:	Infinite Environmental Solutions LLP
Project Participants and any communities involved:	Alternate Power Systems (Pvt.) Ltd.
Version of PDD: Date of Version:	1 16/11/2017
Host Country / Location:	Sri Lanka
Certification Pathway (Project Certificatin/Impact Statements & Products	Project Certification
Activity Requirements applied: (mark GS4GG if none relevant)	GS4GG
Methodologies applied:	AMS I. D. Version 13
Product Requirements applied:	
Regular/Retroactive:	Retroactive
SDG Impacts:	1 – SDG 7 Affordable and Clean Energy 2 – SDG 8 Decent Work and Economic Growth 3 – SDG 9 Industry Innovation and Infrastructure 4 – SDG 13 Climate Action
Estimated amount of SDG Impact Certified	13,483 tons CO2e

SECTION A. Description of project

A.1. Purpose and general description of project

>> *(Provide a brief description of the project including the description of scenario existing prior to the implementation of the project.)*

The main purpose of this project activity is to generate electricity from a small-scale hydropower plant and supply of power generated to the Sri Lankan national utility grid which is Ceylon Electricity Board. Alternate Power Systems (Pvt.) Ltd. is the promoter of the proposed project activity. The project activity involves installation of run-of-river 6.5 MW mini hydro power plant in Sri Lanka.

The generated power from this project activity will be supplied to the grid. The generation of electricity from hydro power is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Therefore, the project activity led to reduction in GHG emissions as it displaces power from fossil fuel based electricity generation in the regional grid.

The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 13,483 tCO2e per annum, thereon displacing 19,929 MWh/year amount of electricity from the generation-mix of power plants connected to the electricity grid, which is mainly dominated by thermal/fossil fuel based power plant. The project leads to reduction in GHGs and achieve sustainable development of the host country.

A.2. Eligibility of the project under Gold Standard

>> *(Describe how the project meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document and the relevant activity requirements document)*

The project activity meets the eligibility criteria as per section 3.1.1 of GS4GG Principles & Requirements document as described below.

- The project applies methodology AMS I.D., which is an approved methodology under Gold Standard.
- The project type is hydro which is an eligible project type as it is in accordance with 1.1.1 a) and 1.1.1 b) of the Eligible Project Types & Scope under Renewable Energy Activity Requirements.
- The project activity results in displacement of electricity from thermal power stations while contributing to sustainable development of Sri Lanka. Hence, the project contributes to the Gold Standard Vision and Mission.
- Hydropower is an approved project type and does not require approval from Gold Standard.
- This project activity is not associated with geo-engineering or energy generated from fossil fuel or nuclear, fossil fuel switch, nor does it enhances or prolongs such energy generation.

General Eligibility Criteria under Renewable Energy Activity Requirements

Project Type: As discussed above, the project type is eligible.

Project Location: The project is located in Sri Lanka which and is not located in an HCV area. Thus, the project is eligible.

Project scale: The project activity is a 6.5 MW_{el} hydro project and thus qualifies under small scale projects.

Additional Eligibility Criteria for Hydropower project activities

- The project activity is not located in High Conservation Value (HCV) area. This was ascertained after detailed consultations with the local authorities. Moreover, international sources of information such as the World Database on protected planets (IUCN, UNEP) , the Ramsar list of wetlands, and the United Nations list of protected areas were referred to confirm that the project is is not located in High Conservation Value (HCV) area.

- The project has conducted a Environmental Examination Report which was submitted to the Central Environmental Authority, Sri Lanka.

- In case any issues are identified by the GS Board during PFA, training for the hydropower plant staff shall be planned and conducted.

- **The project activity is a 6.5 MW_{el} which is below the 20 MW_{el} threshold.**

- A Stakeholder Consultation Report, which will be in accordance with the relevant guidelines for a Stakeholder Consultation, has already been conducted.

- Since the project activity is a run-of-the-river project, thus WCD assessment is not required.

A.3. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

>> (Justify that project owner has full and uncontested legal ownership of the products that are generated under Gold Standard Certification and has legal rights concerning changes in use of resources required to service the Project for e.g water rights, where applicable.)

The project participant Alternate Power Systems is the legal owner of the project and has the legal rights for the credits.

A.4. Location of project

A.4.1. Host Country

Sri Lanka

A.4.2. Region/State/Province etc.

Ratnapura District

A.4.3. City/Town/Community etc.

Kuruwita Division

A.4.4. Physical/Geographical location

>> (Include information allowing the unique identification of this project.)

The project area is located in the Kuruwita Division of the Ratnapura District, in Adavikanda and is in close proximity to the Adams Peak Pilgrims road through Erathna. The power house will be located about 300 meters upstream of the Erathna town. The weir site is situated close to the pilgrims trail from Erathna to Sri Pada in the village of Warnagala. The road access to the project area from Colombo is via Kuruwita (87 km. from Colombo on Route A4), to Erathna (12.2 km) and to Adavikanda (2.5 km).

The Coordinates of the weir are: 6 49’ 56” N, 80 25’ 27” E.

A.5. Technologies and/or measures

>> *(Describe the technologies and measures to be employed and/or implemented by the project, including a list of the facilities, systems and equipment that will be installed and/or modified by the project. Include information essential to understand the purpose of the project and how it will contribute positively to three SDGs.)*

The project is constructed along the River Kuru Ganga. Since the project is run of river type, minimal storage of water is required at the weir. A small weir of 25 meters length with a maximum height of 2 meter has been constructed across the river to divert water to an Intake. The weir is a concrete gravity structure with dowels for added safety against sliding. Water is taken through an Intake conduit of 10 meters x 3.6 m x 1.5 m. The Intake is a closed reinforced concrete conduit with a flow area of 3.6 meters wide and 1.5 meter high. The Intake leads to the Head race channel of 280 meters. The initial 10 meters of the channel from the Intake is a closed conduit. From the headrace channel, water is led to a Forebay. A silt settling tank is provided to settle any silt and sand. The water from the Forebay is taken through a Penstock for a distance of 2250 meters across very difficult terrain. Water flows at a total head of 153 meters through the penstock to three Francis type turbines in the Power house. Francis type is selected due to the flow available in the project. Each turbine is connected to a Synchronous Generator. The electricity is generated at 690 V, which is stepped up to 33 KV through 3 nos. 3 MVA Transformers. The stepped up electricity is connected to the grid of electric utility grid, Ceylon Electric Board (CEB). The exported energy is transmitted through a 33 KV line for a distance of 25 km to the Ratnapura Grid Sub-Station.

The electricity required for auxiliary consumption of the project activity will be consumed by the stepping down part of the generated electricity through a 100 KVA transformer. Regardless of the amount of the auxiliary consumption the electricity meter installed by the CEB records the net energy exported to the CEB grid. During the non operational time the auxiliary consumption is met by the supply from the CEB grid and such import is also recorded in the CEB meter installed at the meter hut. So, the auxiliary consumption of the plant is also met through CEB supply for which CEB used to raise a separate bill every month.

The net electricity generated by the project activity will be exported to the CEB grid. A standby diesel generator (DG) of 40 KVA is provided to supply electricity for lighting and other domestic uses of the project activity when both the sources of electricity supply namely, electricity from the project activity and the CEB grid are not available. The standby generator would be used very rarely because non availability of electricity from both the sources – from the project activity and the grid – would be a rare occurrence.

Application of environmentally sound and safe technology

The run of the river hydro power technology is the production of power through use of the gravitational force of falling or flowing water. Since the project is run of the river type, minimal storage of water is required at the weir. The water leaves the generating station and is returned to the river without altering the existing flow or water levels. The electricity is generated at 690 V, which is stepped up to 33 KV through 3 nos. 3 MVA Transformers to match the frequency with the local grid. The generated power is then transmitted through a 33 KV line to the Ratnapura Grid Sub-station.

In this mini hydro power project, flooding the upper part of the river is not required as it doesn't need a large reservoir. As a result, people living at or near the river don't need to be relocated and natural habitats are preserved. Once a hydro power plant is constructed, the project produces no direct waste. In the hydro power generation process there would be no greenhouse gas emissions and it does not involve burning of fossil fuels during the process. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment. Hence, the technology adopted for the project activity is environmentally safe and sound technology.

<u>Technical Specifications:</u>

Hydrology

Catchments Area at Intake Site	: 19.5 km^2
Catchments rainfall	: 4900 mm
Design Discharge	: 6m3/sec (3x2.0 m^3/sec)
Design Flood Discharge	: 170 m^3/sec (once in 100 years)

Waterways

Total Length	: 300m
Structures	: Channel – Boxed

Intake – (near outfall of Erathna Project)

Type of Intake	: Side Intake
Size of Intake Opening	: 3.6m wide and 1.5m high with Open channel, supported on columns
Type	: Rectangular – Box
Length	: 310 m
Size	: 3.1m wide and 1.5high, internally

Forebay / Sedimentation

Tank Capacity of Forebay	: 1000 m^3
Length excluding transition	: 18 m
Width	: 6 m
Depth	: 3.8 m

Penstock

Material	: Steel
Penstock Length of Main Pipe	: 2100 m
Size of main pipe (dia/thickness)	: 1.65m @ 10 mm 1.55m @ 12 mm 1.45m @ 12 mm 1.35m @ 14 mm 1.25m @ 14mm 0.9m @ 14 mm
Length of Branched triple Pipes	: 149 m
Size of triple pipes (dia. thickness)	: 0.9 @ 14 mm
Design Discharge	: 6 m3/sec
Design Net Head	: 141m

Turbine

Manufacturer	: Gilbert Gilkes & Gordon Ltd.
Country of Origin	: United Kingdom
Model	: 550G150
No. of Units	: 3(Three) Mean
Diameter of Runner	: 550 mm
Rated Speed	: 1000 RPM
Over speed	: 1960 rpm
Inlet Pipe Nominal Diameter	: 800 mm
Shaft Attitude	: Horizontal
Altitude	: 302 m.a.s.l.
Turbine Power Output	: 2418 KW

Generator

Item	: 1
No. of Units	: 3
Input Power	: 2418 KW
Type	: NIR6375A-6
Apparent Output	: 2920 KVA
Maximum Power Output	: 2336 KW
Power Factor	: 0.8
Tension	: 660 V
Frequency	: 50 Hz
Speed	: 1000 rpm
Runaway speed	: 1960 rpm
Runaway Speed Period	: 60 min every 24 hours
Protection	: IP-23
Service	: S1

As per the feasibility study the proposed maximum power output of each generator of the three generator configuration should be 2166 KW. However when the project proponent (PP) approached the equipment supplier, the supplier offered a slightly higher power output of 2336 KW generator which could be made available within the shortest possible time. Due to the expected delay in the implementation and cost escalation (if PP will ask for a set of generators with a maximum output of 2166 KW each to be designed especially for the Project) the PP agreed to purchase the slightly higher capacity generators for the Project. However, from the standpoint of the design of the civil structure, the hydrological data, and the power purchase agreement, the project will remain to all practical purposes a hydro power project of maximum installed capacity of 6.5 MW. Most importantly the Project is capable producing maximum of 6.5 MW regardless of the generator capacity due to the civil design that could accept maximum of 6.0 cubic meters of water flow per second. The Ceylon Electricity Board will also not accept the Project if it can produce energy at more than 6.5 MW of capacity. It shall be the responsibility of the equipment supplier to prove the maximum capacity of the Plant is 6.5 MW at the time of handing over the plant after commissioning.

A.6. Scale of the project

>> (Define whether project is micro scale, small scale or others. Justify the scale referring to relevant activity requirement.)

Small Scale

A.7. Funding sources of project

>> (Provide the public and private funding sources for the project. Confidential information need not be provided.)

Private funding and funding from bank.

A.8. Assessment that project complies with 'gender sensitive' requirements

>> (Answer the four mandatory questions included under Step 1 to 3 in "Gold Standard Gender Equality Guidelines and Requirements" available here.)

***Question 1*:** Does the project reflect the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy? Explain how.

Response: As per Gold Standard Gender Policy, p. 10 "*Foundational gender-sensitive requirement - This strengthens Gold Standard's 'do no harm' approach and addresses safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. Such action is mandatory for all projects seeking Gold Standard certification and includes compliance with the gender 'do no harm' safeguards, gender gap analysis and gender sensitive stakeholder consultations.*"

The project being a renewable energy project is not gender sensitive project. The project does not adversely impact women or men.

***Question 2*:** Does the project align with existing country policies, strategies and best practices? Explain how.

Response: Sri Lanka is party to "Convention on the Elimination of All Forms of Discrimination against Women[1]" and the project is aligned its labour policies which does not discriminate on gender.

***Question 3*:** Does the project address the questions raised in the Gold Standard Safeguarding Principles & Requirements document? Explain how.

Response: *The Project shall complete the following gender assessment questions below:*

1. *Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits?* No, the Project being a run of river hydro project does not reduce access to or control of resources for women.

[1] http://hrlibrary.umn.edu/research/ratification-srilanka.html

2. *Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential increased burden on women or social isolation of men)?* No, the Project beneficiaries in terms of employment and social upliftment of the area are common for both the gender. Further the project has carried out various CSR activities leading to welfare of community at large.

3. *Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)?* No, the CSR activities carried our by the project proponent are discussed with the community consisting both the genders.

4. *Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)?* Yes the project takes into account gender roles and abilities of women/men. Job profile is allocated based on the type of work to be carried out.

5. *Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?* No, on the contrary the project leads to increased availability of electricity in the regional grid thereby uplifiting the living standards.

6. *Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?* No, since the project is a renewable electiricity generation project, thus it will not have discriminated against women.

7. *Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services?* No, in fact, the project leads to improved electricity in the regional grid thereby leading to less usage of fueil for lighting.

8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? *No, in fact, due to improved electricity availability the usage of fuel for lighting would be reduced as well as indoor air quality would be improved.*

Question 4: Does the project apply the Gold Standard Stakeholder Consultation & Engagement Procedure Requirements? Explain how.

Response: The project is currently a CDM project applying for retroactive GS registration. The LSC conducted as part of the CDM project involved around 50 participants including local villages, NGOs, government officials, suppliers, employees and general stakeholders.

Since the project is applying retroactively for GS registration, a Stakeholder Feedback round would be carried out. A physical meeting would be carried out accordingly.

SECTION B. Application of selected approved Gold Standard methodology

B.1. Reference of approved methodology

>>

Type I, Category D, "Grid Connected Renewable Energy Generation" (AMS I. D.), Version 13

B.2. Applicability of methodology

>> *(Justify the choice of the selected methodology(ies) by demonstrating that the project meets each applicability condition of the applied methodology(ies))*

The applicability criteria of AMS I.D and the justification of the choice of this project category for the Project activity are as follows:

1. This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.
   - This category comprises of renewable energy generation units including hydro, that supply electricity to an electricity distribution system that would have been supplied by at least one fossil fuel fired generating unit.

2. If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.
   - This project has a total installed capacity of 6.5 MW, which is significantly less than the maximum eligibility limit of 15MW for a small-scale CDM project activity

3. Combined heat and power (co-generation) systems are not eligible under this category.
   - The Project activity is only renewable electricity generation and does not include co-generation.

4. 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 from the existing units.
   - The Project activity does not involve the addition of renewable energy generation units at an existing renewable power generation facility.

5. Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.
   - The Project activity does not seek to retrofit or modify an existing facility for renewable energy generation.

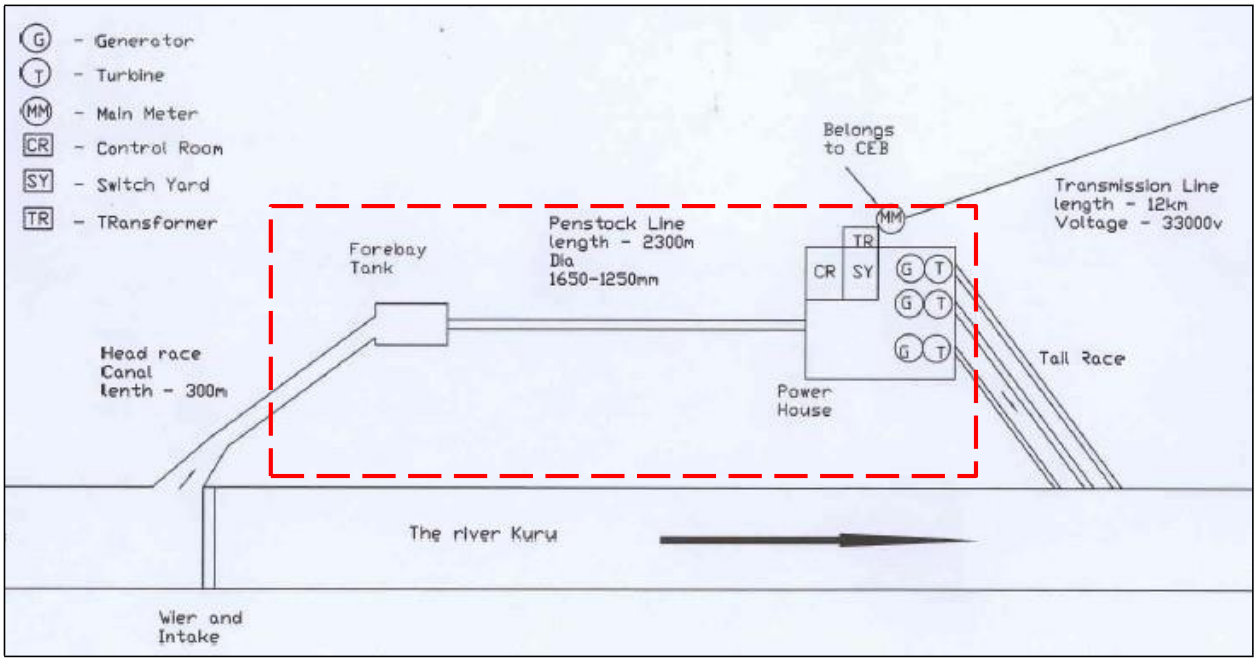
Therefore it is evident that the project activity meets all the applicability condition of the approved small scale methodology AMS I.D/ Version 13.

B.3. Project boundary

>> *(Present a flow diagram of the project boundary, physically delineating the project, based on the description provided in section A.5 above.)*

The project boundary of the project activity will consist of diversion structure, penstock, powerhouse, DG Set, tail race channel and the transmission system till switch yard. The project activity is connected to the Ceylon electricity grid. The figure below shows the project boundary with location of major installations of the project activity –

---- Project Boundary



For the purpose of GHG mitigation/sequestration following table shall be completed (delete if not required)

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Grid	CO_2	Yes	The baseline scenario represents emissions in the grid.
		CH_4	No	Minor impact thus not considered
		N_2O	No	Minor impact thus not considered
Project scenario	No emissions	CO_2	No	No emission sources
		CH_4	No	No emission sources
		N_2O	No	No emission sources

B.4. Establishment and description of baseline scenario

>> (Explain how the baseline scenario is established in accordance with guidelines provided in GS4GG Principles & Requirements and the selected methodology(ies). In case suppressed demand baseline is used then same should be explained and justified.)

The proposed project activity qualifies to use the simplified methodology for small scale projects total capacity of the project is 6.5 MW which is less than the 15 MW (upper limit) as per the CDM guideline for a small scale project and this position will remain unchanged during the crediting period.

As per the guidance provided in AMS I.D. Version 13 (point 9) for this project "the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner" as:

(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(Version 01.1)'.

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Here we used the method (a) for baseline determination. Since the project will sell entire energy generated to the Ceylon Electricity Board (CEB) grid, the relevant electric power system for the purpose of calculating the CM is the CEB grid.

Calculation of OM emissions factor

As per Annex 12, EB 35 Report "Tool to calculate the emission factor for an electricity system (Version 01.1)" (now referred as "Grid Tool") the OM emissions factor can be calculated in one of four ways:

a) Simple OM
b) Simple adjusted OM
c) Dispatch data analysis OM
d) Average OM

The table B.4 below shows data on the generation by the CEB for the latest five years for which data are available (2003 to 2007) by low cost/must run resources (hydro and wind) and total grid generation (the additional plants all being thermal plants).

(In GWh)

Generation	2003	2004	2005	2006	2007
Total Power Generation	7,218	7,534	8,769	9,389	9,814
Total Thermal Power Generation	3,904	4,571	5,314	4,750	5,864
Total Low Cost Power Generation	3,314	2,963	3,455	4,638	3,950
Thermal % of Total grid generation	54.09	60.67	60.60	50.60	59.75
Low Cost % of Total grid generation	45.91	39.33	39.40	49.40	40.25
Average of the five most recent years of % of Low Cost generation out of Total grid generation					42.86

Since the total percentage of low cost/must run generation is less than 50% it is possible to use the Simple OM method to calculated the operating margin, as specified in Grid Tool. Option B is used to calculate the Simple OM. The relevant formula as given in the Grid Tool is

$$EF_{grid,OMsimple,y} = \frac{\sum_{m} EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m = All power units serving the grid in year y except low-cost / must-run power units
y = the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option)

We used the ex ante approach to calculate the Simple OM, namely, "A 3 year generation weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation"

The latest generation statistics available from the CEB at this time was for the calendar year 2007. We have therefore used data for the three years 2005, 2006 and 2007 to calculate the OM.

Calculation of BM emissions factor

As per the Grid Tool all plants (including hydro), other than plants which have been registered as CDM activities, must be considered for calculating the build margin (BM). Equation 12 of the Grid tool for calculating the BM is taken for this project.

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year y (tCO2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)

m = All power units included in Build Margin calculation

y = Most recent historical year for which power generation data is available (2007)

As for the OM the most recent generation information available is for the year 2007. We therefore use this information to calculate the BM. The data sources used in the calculation are also the same as for calculation of the OM.

Calculation of the CM emissions factor

As per equation 13 of the Grid Tool the combined margin (CM) emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh)

w_{OM} = Weighting of operating margin emissions factor (%)

w_{BM} = Weighting of build margin emissions factor (%)

As per the Grid Tool, a default value of 0.5 for the weighting factors is used to average the OM and the BM emissions factors for the first crediting period.

Calculation of the Baseline

As per the Grid Tool, the baseline (in tCO2) is the MWh produced by the project multiplied by the Combined Margin expressed in tCO2/MWh.

Leakage

As specified in paragraph 12 of AMS I.D./Version 13, leakage is to be considered when generating equipment is transferred from another activity or when existing equipment is transferred to another activity. In the Project, neither of these situations applies, and therefore no leakage source needs to be considered for this project. The generating equipment is new, and there is no existing equipment that could be transferred to another activity.

B.5. Demonstration of additionality

>> (If the proposed project is not a type of project that is deemed additional, as stated below, then follow guidelines in section 3.5.1 of GS4GG Principles & Requirements to demonstrate additionality.)

The table below is only applicable if the proposed project is deemed additional, as defined by the applied approved methodology or activity requirement or product requirement.

Specify the methodology or activity requirement or product requirement that establish deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	NA
Describe how the proposed project meets the criteria for deemed additionality.	NA

For grid connected mini hydro project in Sri Lanka, realistic and credible baseline scenarios may include:

1. Supply of the electricity form Grid Connected Fossil fuel based Power plants (current practice)
2. The proposed project not undertaken as a CDM project activity.

Alternative 1: "Supply of the electricity form Grid Connected Fossil fuel based Power plants" does not face any barriers and can be a credible baseline scenario. In the absence of the project activity electricity will be generated in CEB Grid Connected Fossil Fuel based Power Plants.

Alternative 2: "The proposed project activity not undertaken as a CDM project activity" cannot be a baseline scenario as it faces associated barriers as explained further in section B.5

Early consideration of CDM

The current development is the second attempt to implement the project. The first attempt begun in April 2005 by preparation of original feasibility study, but faced delay due to various regulatory clearances in acquisition of land for the project which concluded in October 2007. By this time the original feasibility study was out dated because of various cost escalations. The second attempt begun in November 2007 and a new feasibility study were prepared. The Project cost identified in the new feasibility study was significantly higher than the original feasibility study. The project developer approached two banks for enhanced debt financing on account of cost escalation of the Project, which was approved at a very high interest rate(Prime Lending Rate plus 3.5%) than the earlier agreed rate of AWDR plus 5%. The banks also advised project developer for seeking CDM status in order to make the project financially feasible2.

The project developer had conducted a feasibility study to undertake this project in April 2005 which concluded that the project was a viable proposition. Based on this study the project developer started preparation work for the project including seeking project finance from banks and seeking the requisite land from the concerned authorities. This was based on a total project cost of LKR 540 Mn. The project developer could raise two loans from DFCC Bank and Commercial Bank of Ceylon Ltd totaling to LKR 301 Mn at an interest of AWDR plus 5% approved in May/June 2005.

However, due to various regulatory reasons, the project developer had to wait for a long time for acquiring the requisite land for implementing the project which could finally be obtained in October 2007. By the time the project developer was in possession of the land in October 2007 the cost of the project had dramatically escalated due to high rate of inflation and depreciation in the of the local Sri Lankan Rupee (LKR) against hard currencies.

In order to assess the viability of the project, a revised feasibility study was conducted by a third party who estimated the total project cost at LKR 895 Mn which was 65.74 % higher than the original project cost estimations. However, with the escalated project costs, the project became financially un-attractive to the project developer due to much lower project IRR.

2 Copy of Loan Approval letters from the two banks dated 20th November 2007.

Faced with the escalated project cost, the project developer approached two banks for enhanced debt financing on account of cost escalation of the Project. Both the banks agreed in principle to offer additional debt financing amounting to LKR 150 Mn contributed by the two banks equally. However, both DFCC Bank and Commercial Bank agreed to offer the additional debt of LKR 150 Mn at the rate of PLR plus 3.5%. In addition, both the banks demanded that the project sponsor increase its equity contribution and meet any further cost escalation by additional equity contribution. The two banks also stipulated the project developer that the Project should obtain the benefits under the Clean Development Mechanism (CDM) project in order to achieve its financial viability3.

The project proponent sees the revenue from sale of Certified Emission Reductions (CER) generated by the project as a vital means of overcoming the barriers described above. The project proponents adopted a resolution during the Board of Directors Meeting held on 22.11.2007 confirming that the project would have to avail of CDM in order to be implemented. The project activity took more than 4 years for completion due to the envisaged problems in raising the debt financing. As soon as the funds problem was solved and banks sanctioned additional loan in November 2007, the PP immediately started negotiations to hire a consultant for CDM. As soon as the PDD was ready the PP started negotiations for hiring of the DOE from January 2009.

The project activity is expected to be commissioned by July 2009. The following tables show the timeline of the actions taken for the project implementation as well as the CDM registration.

Timeline for Project Implementation

S. No.	Event	Date	Supporting document
1.	First Feasibility Study for the project	April 2005	Copy of Feasibility Report prepared by OVARA consultant
2.	Bank approval for financing the project	30/5/2005 and 17/6/2005	Copy of Letter from DFCC bank Copy of Letter from Commercial bank of Ceylon Limited
3.	1st Board Resolution to undertake the project without CDM	22/6/2005	Copy of Certified extracts from the minutes of the Board meeting
4.	Land deed execution	28/5/2007	Copies of Land Deeds
5.	Land deed execution (second part)	03/10/2007	Copies of Land Deeds
6.	Bank application for additional financing	04/10/2007	Copy of Company letter to two banks
7.	Second Feasibility Report	November 2007	Copy of Feasibility Report prepared by external consultant
8.	Bank approval for additional finance	20/11/2007	Copy of Loan Approval letters from the two banks
9.	2nd Board Resolution to undertake the project with CDM	22/11/2007	Copy of Certified extracts of the Board resolution
10.	Signing of the first contract for Penstock	21/01/2008	Copy of the contract for Penstock clearing, transportation & painting with M/s APS & Liyanage (Pvt.) Ltd
11.	Letter of confirmation for supply of Turbines, Generators to Gilbert Gilkes & Gordon Ltd.	28/02/2008	Letter of acceptance of offer for Turbines, Generators and Associated Equipment issued by APSL

Timeline for CDM registration

S. No.	**Event**	**Date**	**Supporting document**
1.	2nd Board Resolution to undertake the project with CDM	22/11/2007	Copy of Certified extracts of the Board resolution
2.	Offer from Mitsubishi UFJ Securities for providing Consulting services	12/12/2007	Copy of the offer letter

3 Copy of Loan Approval letters from the two banks dated 20th November 2007

3.	Signing of CDM consulting agreement with Mitsubishi UFJ Securities for CDM Consulting services	20/3/2008	Copy of the consulting agreement
4.	Submission of PIN to the Sri Lankan DNA	11/09/2008	Copy of the application
5.	In-principle approval from the Sri Lankan DNA	20/09/2008	Copy of the letter received from the Ministry of Environment
6.	Stakeholder consultation meeting	16/12/2008	Copy of minutes of meeting
7.	Offer from DoE for providing Validation Services	13/02/2009	Copy of the proposal from TUV Nord

The project is a small scale project activity. As such, the provisions of Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities will apply to this project. The 'indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories' require the project proponents to show that the project activity would not have occurred anyway due to at least one of the following barriers:

a) **Investment barrier**: A financially more viable alternative to the project activity would have led to higher emissions.
b) **Technological barrier**: A less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions.
c) **Barrier due to prevailing practice**: Prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions.
d) **Other barriers**: Without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

The project proponent has considered proving the additionality using investment barrier. The same is shown in the following sections:

Investment Barrier:

Low return on investment

According to the latest guidelines given by CDM – Executive Board on "Guidelines on the Assessment of Investment Analysis (Version 03)", Benchmark Analysis has been chosen to demonstrate additionality. The PP has considered weighted average Prime Lending Rate (PLR) in October 2007 the as benchmark for the purpose of comparison with post tax project IRR. The benchmark is available publically on the Central Bank of Sri Lanka website4. The Weighted Average PLR in the month of October 2007 was 18.31%.The Benchmark considered is in conformity with the Clause 12 of the "Guidelines on the Assessment of Investment Analysis (Version 03)" which allows Local Commercial Lending Rates as suitable benchmark for Project IRR. The project is a case of refinancing where a portion of the loan was sanctioned at a concessional rate lower then Bank PLR and the balance loan at a higher interest rate then the Bank PLR. The 16.82% is the weighted average interest rate on total loan sanctioned. The explanation is included in the PDD for more clarity.

We have considered the Bank PLR as the benchmark for the project activity, which is in con-formity with the Guidance EB 51, Annex 58 (Para 12-13).

The project costs and PLF directly influence the project Internal Rate of Return. An IRR analysis has been prepared for the project activity to determine the project IRR, its attractiveness and the effect of GHG income using the feasibility report prepared by one external consultant.

S. No.	Particulars	Value	Source
1.	Installed Capacity(MW)	6.5	Feasibility Study/Equipment Supplier Certificate

4 http://www.cbsl.gov.lk/htm/english/_cei/ir/i_4.asp?date=&Mode=2&Page=5

2.	Annual Electricity Generation	19.93	Estimated at 35% PLF as per Hydrology Study
3.	Electricity generated in year 2009-10 (GWh)	15.17	For 9 months generation in 2009-10 (7 month wet and 2 month dry)
4.	Plant Load Factor	35%	As per Hydrology study
5.	Selling price LKR per kWh for 2009-10[5]	7.92	Computed based on Tariff rates announced by CEB from 2003 to 2007 and SPPA
6.	Yearly escalation in selling price	5.33%	Computed based on Tariff rates announced by CEB from 2003 to 2007
7.	Operations & Maintenance costs for 2009-10 (LKR Mn)	19.90	Computed as shown in the IRR calculation sheet
8.	Yearly escalation in O&M cost	6.63%	Computed based on the Tariff Explanatory Note of 2009 (Point 6.7)[6]
9.	Total Project Cost (LKR Mn)	895.0	Estimated as per BOQ estimates and Offers from various vendors
10.	Total Loan Amount (LKR Mn)	451.0	Bank Loan approval Letters
11.	Total Equity Amount (LKR Mn)	444.0	Computed (Total Capital Cost less Total Debt amount)
12.	Average rate of Interest on Loan	16.82%	Computed (Interest calculation sheet)
13.	Loan Repayment Period (years)	6	Bank Loan approval Letters
14.	Annual land Lease (LKR Mn)	0.11	Lease payment receipts
15.	Water levy (LKR per Horse Power per annum)	25	Letter from Land Commissioner General's Department
16.	Economic Service Charges (% of Revenue)	0.25%	Economic Service Charge Act, No. 13 of 2006 (Sri Lanka)
17.	Depreciation per year (LKR Mn)	82.06	Calculated as per The Inland Revenue Act of 2006
18.	Residual value of assets at the end of 2029-30(LKR Mn)	87.30	10% of the Asset value assumed for calculation
19.	Taxation for the first 5 years	nil	Agreement with Board of Investment of Sri Lanka
20.	Taxation for 6th & 7th year	10%	Agreement with Board of Investment of Sri Lanka
21.	Taxation for rest of the period	20%	Agreement with Board of Investment of Sri Lanka
22.	Social Responsibility Levy (% of Income Tax)	1.50%	Finance Act, No.5 of 2005 (Sri Lanka)

The IRR works out to 16.13% in the baseline case which is significantly less than the benchmark of 18.31%.

Sensitivity analysis

The robustness of the conclusion drawn above has been tested with reasonable variations in the critical assumptions. Annex 58 "Guidelines on the Assessment of Investment Analysis" issued by the EB in its 51st Meeting covers two aspects on sensitivity analysis, viz., subjecting only those variables which constitute more than 20% of either total project cost or total project revenue to sensitivity analysis and considering a ± 10% variations in the selected variables. Accordingly, two sets of scenarios have been identified, viz., variation in project cost and variation in revenue by 10% on either side. In addition, a sensitivity analysis has also been conducted for a variation in O&M Expenses by 10% on either side. The sensitivity analysis for the project activity in consideration of these three scenarios is furnished below:

[5] The tariff considered from the 16th year till 21st year is based on the third tier of the tariff in force on the date of the signing of the new SPPA. This is described in the Point 12 of the explanatory note available on Sri Lankan Government website (http://www.energy.gov.lk/pdf/explanatory_note_april_2009.pdf)

[6] http://www.energy.gov.lk/pdf/explanatory_note_april_2009.pdf. A separate excel sheet is provided to the DoE for computation of the O&M escalation rate as per the recommended procedure by the local government.

DETAILS	+10%	BASE CASE	-10%
Project Cost	14.57%	16.13%	17.96%
Plant Load Factor (PLF)	18.00%	16.13%	14.16%
O & M Expenses	15.85%	16.13%	16.40%

The sensitivity analysis proves beyond doubt that the project is unlikely to be financially attractive even under the most optimistic conditions of project cost going down by 10% or PLF going up by 10%. In either case, the project IRR remains at 17.96% and 18.00% respectively in comparison to the benchmark return of 18.31%.

In addition, the project proponent is contractually obligated to accept any rate announced by the CEB. The CEB has guaranteed only 90% of the stated tariff in the Standard Power Purchase Agreement to the project proponent. This means, that the tariff will not go below the guaranteed tariff in the next year, which is 90% of the stated tariff in the SPPA. Still the Project proponent has no option other then selling the power to CEB due to the lack of opportunity to sell power outside the CEB controlled grid. This barrier combined with the uncertainty in tariffs results in a significant investment risk barrier to the project, particularly in Sri Lanka where inflation has run at an average of 10.63% per annum over the past 5 years(from 2003 to 2007).

The CDM benefits will improve the financial attractiveness of the project activity, as evident from the fact that with CDM benefits, the project IRR in the baseline scenario improves to 18.59%. Hence, the project definitely requires CDM benefits to make it financially attractive for the project proponent.

Conclusion

From the foregoing, it could be seen that the project faces significant investment barrier as well as other barriers. The difficulty in quantification of such risks renders them a serious barrier for the project. Small hydro power projects have been a learning-by-doing exercise for both the project developers and financiers. With limited information, both project developers and financiers have to take a decision on setting up and financing the project, which is a major constraint in this project. Thus, the project is not a business -as –usual scenario. The project is, therefore additional and requires CDM benefits to overcome the barriers.

B.6. Sustainable Development Goals (SDG) outcomes

B.6.1. Relevant target for each of the three SDGs

>> (Specify the relevant SDG target for each of three SDGs addressed by the project. Refer most recent version of targets here .)

a. SDG13 : Climate Action : The project would lead to reduction of approx. 13,483 tCO2 per annum
b. SDG 7 : Affordable and Clean Energy : The project is expected to generate 19,929 MWh of clean energy per annum
c. SDG 8 : Decent Work and Economic Growth : The project provides employment to around 13 persons.
d. SDG 9 : Industry Innovation and Infrastructure : The project is development of a run-of-river small hydro project. The Turbines for the project are of international quality setting up industry bechnmark for best infrasturcutre and technonology available in the country.

B.6.2. Explanation of methodological choices/approaches for estimating the SDG outcome

>> (Explain how the methodological steps in the selected methodology(ies) or proposed approach for calculating baseline and project outcomes are applied. Clearly state which equations will be used in calculating net benefit.)

SDG13 : Climate Action :

The project leads to mitigation of 13,483 tCO2 per annum.

The methodological choices made to estimate the baseline are directly in keeping with the guidance provided in AMS I.D. Version 13 (paragraph 9). The project activity is generation of electricity using hydro power and exporting the same to the local grid system, which is mainly fed by fossil fuel based power plants. Emission

reductions due to the project activity are considered to be equivalent to the emissions avoided in the baseline scenario by displacing the electricity generated to the Grid.

Baseline Emission

As per the guidance provided in AMS I.D. Version 13 (point 9) for this project "the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO2e/kWh) calculated in a transparent and conservative manner" as:

(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 (Version 01.1)" (now referred as "Grid Tool").

OR

(b) The weighted average emissions (in kg CO2e/kWh) of the current generation mix. The data of the year in which project generation occurs must be used.

Here we have used the method (a) for baseline determination. The baseline emissions are calculated based on the net energy supplied to the grid (in kWh/year), and an emission factor for the displaced grid electricity (in kg CO2 e/kWh).

$BEy = EGy * EFy$

Where,

EGy = the net electricity exported to the grid system during the year y
EFy = the emission factor of the grid to which the project exports electricity

In accordance with the "Tool to calculate the emission factor for an electricity system," the grid emission factor is calculated using Combined Margin (CM), comprised of an Operating Margin (OM) emission factor and a Build Margin (BM) emission factor. The following procedure was adopted for estimating the grid electricity emission factor:

Step 1. Identify the relevant electric power system.
Step 2. Select on operating margin (OM) method.
Step 3. Calculate the operating margin emission factor according to the selected method.
Step 4. Identify the cohort of power units to be included in the build margin (BM).
Step 5. Calculate the build margin emission factor.
Step 6 Calculate the combined margin (CM) emission factor.

Step 1 – Identify the relevant electric power system

Since the project will sell entire energy generated to the Ceylon Electricity Board (CEB) grid, the relevant electric power system for the purpose of calculating the CM is the CEB grid.

Step 2 – Select an operating margin (OM) method

The approved methodological tool recommends the use of one of the following for the calculation of the operating margin emission factor (EFgrid,OM,y):
a) Simple OM, or
b) Simple adjusted OM; or
c) Dispatch data analysis OM; or d) Average OM.

The methodological tool recommends the use of dispatch data analysis as the first methodological choice. However, in Sri Lanka availability of accurate data on grid system dispatch order for each power plant in the system and the amount of power dispatched from all plants in the system during each hour is practically not possible. Also, still the merit order dispatch system has not become applicable and is unlikely to be so during the crediting period.

In view of this it is proposed to apply other choices as suggested in the Grid Tool. The table B.4 (mentioned in Section B.4 of the PDD) shows data on the generation by the CEB for the latest five years (2003 to 2007) by low cost/must run resources (hydro and wind) and total grid generation (the additional plants all being thermal

plants). As shown in the Table B.4 , since the power supplied by low cost must run power plants to the CEB grid during 2003-2007 is clearly below 50%, the Simple OM method is used.

The data vintage option selected is the ex-ante approach, where a 3 year average OM is calculated. The most recent three year generation data provided from the CEB authority is used for the calculation.

Step 3 – Calculate the operating margin emission factor according to the selected method.

In the Simple OM method, the emission factor is calculated as generation weighted average CO2 emissions per unit net electricity generation (tCO2/MWh) of all generating sources serving the system, not including low-operating cost and must-run power plants. Simple OM can be calculated using any of the three available methods in the Grid Tool. Option B is used to calculate the Simple OM in absence of the data availability for Option A. The relevant formula as given in the Grid Tool is

$$EF_{grid,OMsimple,y} = \frac{\sum_{m} EG_{m,y} \cdot EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

EFgrid, OMsimple, y = Simple operating margin CO2 emission factor in year y (tCO2/MWh)
EGm, y = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
EFEL, m, y = CO2 emission factor of power unit m in year y (tCO2/MWh)
m = All power units serving the grid in year y except low-cost / must-run power units
y = the three most recent years for which data is available at the time of submission of the CDM-PDD to the DOE for validation (ex ante option)

The ex ante Simple Operating Margin calculated using the data for the CEB Grid for the years 2005, 2006 and 2007 is 0.7073 tCO2/ MWh.

Step 4 – Identify the cohort of power units to be included in the build margin

The tool to calculate the emission factor for an electricity system offers two options for determination of build margin emission factor: ex ante and ex post determination of the Build Margin (BM). The build margin emission factor is calculated ex- ante based on most recent information available on plants already built for sample group m in CEB grid. This simplifies the monitoring procedures, but also offers a conservative approach of BM calculation.

The sample group m shall be the one having higher power generation between (a) five power plants that have been built most recently and (b) the capacity additions in the electricity system that comprises 20% of the system generation built most recently. It is found that the option (a) has more than 20% of the total generation in the year 2007. Hence Option (a) is chosen.

Step 5 – Calculate the build margin emission factor

The build margin emissions factor is the generation of weighted average emission factor (tCO2/MWh) of all power units m during the most recent year y for which power generation data is available. Equation 12 of the Grid tool for calculating the BM is taken for this project.

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

EFgrid,BM,y = Build margin CO2 emission factor in year y (tCO2/MWh)

EGm,y = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
EFEL,m,y = CO2 emission factor of power unit m in year y (tCO2/MWh)
M = All power units included in Build Margin calculation
y = Most recent historical year for which power generation data is available (2007)

As for the OM the most recent generation information available is for the year 2007. We therefore use this information to calculate the BM. The data sources used in the calculation are also the same as for calculation of the OM. Using this method the ex ante Build Margin emission factor is determined as 0.6459 tCO2/ MWh.

Step 6 – Calculation of the baseline emission factor (Combined Margin)

As per equation 13 of the Grid Tool the combined margin (CM) emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Where:

EFgrid,BM,y = Build margin CO2 emission factor in year y (tCO2/MWh)
EFgrid,OM,y = Operating margin CO2 emission factor in year y (tCO2/MWh)
wOM = Weighting of operating margin emissions factor (%)
wBM = Weighting of build margin emissions factor (%)

As per the Grid Tool, a default value of 0.5 for the weighting factors is used to average the OM and the BM. The ex ante Combined Margin calculated based on the above method is 0.6766 tCO2/MWh

Project emissions

As part of the project activity a backup diesel generator to meet the emergency requirements of power house will be installed. Emissions resulting from usage of diesel backup generator will be accounted as project emissions based on the following equation as provided in the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02)".

PE Diesel,y = FCDiesel,y * COEFDiesel,y

Where,

PE Diesel,y = Project emissions due to combustion of Diesel for the project activity (tCO2)
FCDiesel,y = Is the quantity of Diesel combusted in process during the year (Liters)
COEFDiesel,y = Is the CO2 emission coefficient of Diesel (tCO2/ Liters)

The CO2 emission coefficient COEFDiesel,y is calculated based on net calorific value and CO2 emission factor of the Diesel , as follows:

COEFDiesel,y = Density * NCVDiesel,y * EFCO2,Diesel,y

Where,

Density = Density of Diesel in Kg/Liter (http://www.energy.gov.lk/spec/fual.php)
NCVDiesel,y = Is the weighted average net calorific value of the fuel type i in year y (GJ/Kg)
EFCO2,Diesel,y = Is the weighted average CO2 emission factor of fuel type i in year y (tCO2/GJ)

Leakage:

No leakage emissions are considered for the proposed project activity since no energy generating equipment will be transferred from another activity and no existing equipment will be transferred to another activity.

Emission Reductions:

Because no leakage is anticipated, the emission reductions are equal to the baseline emissions less any project emissions that occur. Baseline emissions are calculated based on the monitored net amount of electricity supplied to the grid, and the baseline emission factor.

ERy = BEy - PEy

Key baseline information is furnished in Annex 3. Also, a detailed emission factor calculation based on the data available from the CEB is presented in an Excel sheet to the DoE.

SDG 7 : Affordable and Clean Energy

The baseline for the project is no project, thus leading to generation in the relevant grid which is dominated by fossil fuel. The clean energy generated by the project is calculated based on the amount of electricity generated by the project per annum. The project is expected to generate 19,929 MWh of clean energy per annum

SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possiblein the baseline scenario. The project provides employment to around 13 persons.

SDG 9 : Industry Innovation and Infrastructure

The project leads to development of Hydro project and related infrastructure around the location.

Further the project has lead to development of infratrucure in the local area through various initiatives such as

- Restoration of Paladeniya road
- Construction of Paladeniya Computer Room at school
- Construction of Adavikanda Paladeniya Bridge
- Concreting of Erathna, Lassakanda Yaya Road
- Construction of Adavikanda Community Hall

B.6.3. Data and parameters fixed ex ante for monitoring contribution to each of the three SDGs

(Include a compilation of information on the data and parameters that are not monitored during the crediting period but are determined before the design certification and remain fixed throughout the crediting period like IPCC defaults and other methodology defaults. Copy this table for each piece of data and parameter.)

a. SDG13 : Climate Action : The project would lead to reduction of approx. 13,483 tCO2 per annum
b. SDG 7 : Affordable and Clean Energy : The project is expected to generate 19,929 MWh of clean energy per annum
c. SDG 8 : Decent Work and Economic Growth : The project provides employment to around 13 persons.
d. SDG 9 : Industry Innovation and Infrastructure : The project is development of a run-of-river small hydro project. The Turbines for the project are of international quality setting up industry bechnmark for best infrasturcutre and technonology available in the country.

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	Density
Unit	Kg/Liter
Description	Density of Diesel used at project activity
Source of data	Sri Lanka Sustainable Energy Authority
Value(s) applied	0.8460
Choice of data or Measurement methods and procedures	National default value for the Auto Diesel is used. The values are publically available on the Sri Lanka Sustainable Energy Authority's website at http://www.energy.gov.lk/spec/fual.php

Purpose of data	Calclation of Baseline Emissions
Additional comment	

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	NCVDiesel,y
Unit	GJ/Kg
Description	Weighted Average Net Calorific Value of Diesel
Source of data	IPCC 2006 default values
Value(s) applied	43.3 * 10-3
Choice of data or Measurement methods and procedures	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.2 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Purpose of data	Calclation of Baseline Emissions
Additional comment	

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{CO2,Diesel,y}$
Unit	tCO2/GJ
Description	Weighted Average CO2 emission factor of Diesel
Source of data	IPCC 2006 default values
Value(s) applied	74.8 * 10-3
Choice of data or Measurement methods and procedures	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Purpose of data	Calclation of Baseline Emissions
Additional comment	

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{elec,i,i,y}$
Unit	tCO2/MWh
Description	CO2 emission factor for the electricity source i (i=grid), displaced due to the project activity, during year y
Source of data	Calculated
Value(s) applied	0.6766
Choice of data or Measurement methods and procedures	Calculated as per "Tool to calculate the emission factor for an electricity system(Version 01.1)"
Purpose of data	Calclation of Baseline Emissions
Additional comment	This parameter will be calculated once for each crediting period

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{OM\ y}$

Unit	tCO2/MWh
Description	Simple Operating Margin for the CEB Grid
Source of data	Calculated based on the Official data provided by Ceylon Electricity Board
Value(s) applied	0.7073
Choice of data or Measurement methods and procedures	Calculated according to procedure prescribed in the "Tool to calculate the emission factor for an electricity system (Version 01.1)".
Purpose of data	Calclation of Baseline Emissions
Additional comment	This parameter will be calculated once for each crediting period

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{BM\ y}$
Unit	tCO2/MWh
Description	Build Margin for the WESTERN Grid
Source of data	Calculated based on the Official data provided by Ceylon Electricity Board
Value(s) applied	0.6459
Choice of data or Measurement methods and procedures	Calculated according to procedure prescribed in the "Tool to calculate the emission factor for an electricity system (Version 01.1)".
Purpose of data	Calclation of Baseline Emissions
Additional comment	This parameter will be calculated once for each crediting period

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$EF_{CO2,m,i,y}$
Unit	tCO2/GJ
Description	CO2 emission factor of fossil fuel type i in year y
Source of data	IPCC 2006 Default Values
Value(s) applied	Naphtha: 69.3 Diesel oil: 72.6 Furnace oil: 75.5
Choice of data or Measurement methods and procedures	This parameter is monitored once for each crediting period using the most recent three historical years for which data is available at the time of submission of the CDM-PDD to the DOE for validation. (ex-ante option)
Purpose of data	Calclation of Baseline Emissions
Additional comment	

Relevant SDG Indicator	SDG13 : Climate Action
Data/parameter	$\eta_{m,y}$
Unit	-
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	The default values provided in the Annex I of "Tool to calculate the emission factor for an electricity system(Version 01.1)"
Value(s) applied	Please refer to Annex 3

Choice of data or Measurement methods and procedures	The default values provided in the Annex I of "Tool to calculate the emission factor for an electricity system (Version 01.1)" is used for the calculation.
Purpose of data	Calclation of Baseline Emissions
Additional comment	This parameter is monitored once for each crediting period

B.6.4. Ex ante estimation of outcomes linked to each of the three SDGs

>> (Provide a transparent ex ante calculation of baseline and project outcomes (or, where applicable, direct calculation of net benefit) during the crediting period, applying all relevant equations provided in the selected methodology(ies) or as per proposed approach. For data or parameters available before design certification, use values contained in the table in section B.6.3 above. For data/parameters not available before design certification and monitored during the crediting period, use estimates contained in the table in section B.7.1 below)

Baseline emissions

As per AMS I.D, the baseline emissions are calculated as the net electricity generated by the project activity, multiplied with the baseline emission factor for the project grid.

Baseline emissions calculated as explained in section B.6.1 above are summarized as below. BEy = EGy * EFy

Where,
EGy = the net electricity exported to the grid system during the year y (19929 MWh/annum)
EFy = the emission factor of the grid to which the project exports electricity (0.6766 tCO2/MWh)

Hence,

BEy = 19,929 MWh/annum * 0.6766 tCO2/MWh

BEy = 13,483 tCO2 per annum

Project emissions

The quantity of diesel consumed for operating the DG set during emergency situations is expected to be negligible. The project emissions due to the combustion of diesel are considered as zero for estimating ex-ante emission reductions. However, the quantity of diesel consumed in the project activity will be monitored during each year of crediting period and respective project emissions will be deducted from baseline emissions.

PE Diesel,y = FCDiesel,y * Density * NCVDiesel,y * EFCO2,Diesel,y

Hence,

PE Diesel,y = 0 * 0.8460 * 74.8 * 43.3* 10-6 = 0 tCO2e

Leakage

No leakage emissions are applicable.

Emission reductions

ERy = BEy - PEy ERy = 13,483 – 0

ERy = 13,483 tCO2 (ERy = BEy)

B.6.5. Summary of ex ante estimates of each SDG outcome

SDG 13 Climate Action

Year	Baseline estimate	Project estimate	Net benefit (tCO2)
Year 1	13,483	0	13,483
Year 2	13,483	0	13,483
Year 3	13,483	0	13,483
Year 4	13,483	0	13,483
Year 5	13,483	0	13,483
Year 6	13,483	0	13,483
Year 7	13,483	0	13,483
Total	94,381	0	94,381
Total number of crediting years			
Annual average over the crediting period	13,483	0	13,483

SDG 7 : Affordable and Clean Energy

Year	Baseline estimate	Project estimate	Net benefit (MWh)
Year 1	0	19,929	19,929
Year 2	0	19,929	19,929
Year 3	0	19,929	19,929
Year 4	0	19,929	19,929
Year 5	0	19,929	19,929
Year 6	0	19,929	19,929
Year 7	0	19,929	19,929
Total	0	139,503	139,503
Total number of crediting years			
Annual average over the crediting period	0	139,503	139,503

SDG 8 : Decent Work and Economic Growth

The project leads to employment opportunities which would not have been possiblein the baseline scenario. The project provides employment to around 13 persons.

SDG 9 : Industry Innovation and Infrastructure

The project leads to development of Hydro project and related infrastructure around the location. Further the project has lead to development of infratrucure in the local area through various initiatives such as

- Restoration of Paladeniya road
- Construction of Paladeniya Computer Room at school
- Construction of Adavikanda Paladeniya Bridge
- Concreting of Erathna, Lassakanda Yaya Road
- Construction of Adavikanda Community Hall

B.7. Monitoring plan

B.7.1. Data and parameters to be monitored

(Include specific information on how the data and parameters that need to be monitored in the selected methodology(ies) or proposed approaches or as per mitigation measures from safeguarding principles assessment or as per feedback from stakeholder consultations would actually be collected during monitoring. Copy this table for each piece of data and parameter.)

Relevant SDG Indicator	SDG13 : Climate Action SDG 7 : Affordable and Clean Energy
Data / Parameter	EG_Y
Unit	MWh
Description	Net Electricity exported to the grid
Source of data	Monthly Invoice
Value(s) applied	Value of the data will be used to calculate the baseline emissions
Measurement methods and procedures	Measured by the export meter installed at the project boundary. The net electricity exported will be jointly recorded and certified by CEB and the project developer. The data will be archived electronically for the entire crediting period.
Monitoring frequency	Monthly
QA/QC procedures	Meter will be calibrated as per CEB standards. A check meter is also installed near to the export meter to cross check the electricity exported to the CEB grid. The check meter reading would also be used in case of failure of export meter
Purpose of data	Calclation of Baseline Emissions
Additional comment	The accuracy class of the energy meter is 1.0

Relevant SDG Indicator	SDG13 : Climate Action SDG 7 : Affordable and Clean Energy
Data / Parameter	El_Y
Unit	MWh
Description	Electricity imported from the grid
Source of data	Monthly bill from CEB
Value(s) applied	Value of data would be used to calculate the project emissions
Measurement methods and procedures	Measured by the import meter installed by the CEB at the project site for billing the project activity. This CEB bill will be used to calculate the project emission which includes the auxiliary consumption for the plant equipments. The data will be archived electronically for the entire crediting period.
Monitoring frequency	Monthly
QA/QC procedures	The meter will be calibrated as per CEB standards. A check meter is also installed near to the import meter to cross check the electricity imported from the CEB grid. The check meter reading would also be used in case of failure of import meter.
Purpose of data	Calclation of Baseline Emissions
Additional comment	The accuracy class of the energy meter is 1.0

Relevant SDG Indicator	SDG13 : Climate Action
Data / Parameter	$FC_{Diesel,y}$
Unit	Liter
Description	Quantity of Diesel used in DG sets during the year

Source of data	Stores Record/ On site measurements
Value(s) applied	0 (Projected)
Measurement methods and procedures	The total number of operating hours of DG set and the corresponding quantity of diesel consumed for the purpose will be recorded in the log book maintained at the DG set room. The operating hours and the quantity of diesel consumption will be recorded shift wise by shift superintendent.
Monitoring frequency	Monthly
QA/QC procedures	The weigh bridge meter will undergo calibration/maintenance subject to appropriate manufacturer standards. The calibration will be done once in every 3 years. The data recorded can be cross checked against the fuel purchase receipts.
Purpose of data	Calclation of Baseline Emissions
Additional comment	The data on quantity of diesel procured would be collected separately. Data archived: Crediting period + two years. Instruments : Level gauge The project activity may combust only one type of fossil fuel i.e., diesel during the project operation. .DG set is used only for lighting for emergency purposes and hence consumption of diesel will be negligible.

Relevant SDG Indicator	SDG 8 : Decent Work and Economic Growth
Data / Parameter	Number of employment generation
Unit	Number
Description	Number of people employed directly due to the project activity
Source of data	Plant records
Value(s) applied	13
Measurement methods and procedures	The total number of persons working in the plant would be calculated based on the daily log available at site.
Monitoring frequency	Monthly monitoring and annual compilation
QA/QC procedures	The number of persons employed would be mentioned in the plant register, which can be crossed checked with daily attendance register.
Purpose of data	-
Additional comment	-

Relevant SDG Indicator	SDG 8 : Decent Work and Economic Growth
Data / Parameter	Salary/Wages distributed to employees
Unit	Rupees
Description	Amount of salary/wages distributed to the employees
Source of data	Plant records
Value(s) applied	-
Measurement methods and procedures	Salary paid to the employees is available in the HR records.
Monitoring frequency	Monthly monitoring and annual compilation
QA/QC procedures	Salary Slips
Purpose of data	-
Additional comment	-

Relevant SDG Indicator	SDG 9 : Industry Innovation and Infrastructure
Data / Parameter	Infrastructure development

Unit	-
Description	The project has lead to development of infratrucure in the local area through various initiatives such as • Restoration of Paladeniya road • Construction of Paladeniya Computer Room at school • Construction of Adavikanda Paladeniya Bridge • Concreting of Erathna, Lassakanda Yaya Road • Construction of Adavikanda Community Hall Apart from the above the project also carries out as part of CSR activity, plantation drives, distribution of milk packets, silviculture development etc.
Source of data	Plant records, interaction with the community members
Value(s) applied	-
Measurement methods and procedures	The activities as mentioned above can be checked with plant records, photographs of events, actual visit and feedback from stakeholders.
Monitoring frequency	Annually
QA/QC procedures	-
Purpose of data	-
Additional comment	-

B.7.2. Sampling plan

>> (If data and parameters monitored in section B.7.1 above are to be determined by a sampling approach, provide a description of the sampling plan.)

Not applicable

B.7.3. Other elements of monitoring plan

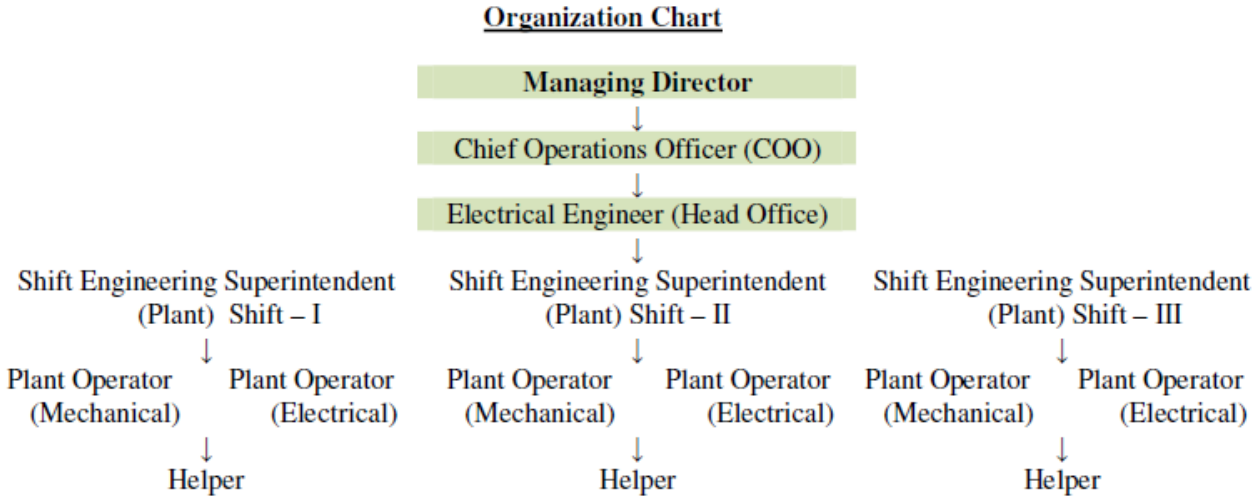
>>

Monitoring Organisation

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data would rest with the COO of the Company. A team of experienced personnel in various disciplines will assist the Shift Engineering Superintendents in plant operation, measurements and management. The primary responsibility of the team is to measure, monitor, record and report the information on various data items to the Engineer-in-Charge, in accordance with the applicable standards.

The responsibility of review, storage and archiving of information in good condition would lie with the COO. The COO would undertake periodic verifications and onsite inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions. An internal verification report would be prepared for review by the COO, which would be later submitted for verification by an independent entity (DOE).

The team including the Engineer-in-Charge would be appointed by the COO in advance before the start of project operations. The Engineer-in-Charge would report to the COO and seeks guidance in case of conflicts or difficulties in order to maintain the monitoring organisation in good spirit.



Parameters Requiring Monitoring

This monitoring plan would require monitoring of all parameters indicated in section B7 of the PDD. Necessary documents required for verification of the data would be maintained for later archiving. Using the power exported to the grid, emission reductions would be calculated as illustrated in Section B 6.3. Emission reductions generated by the project would be monitored at regular intervals and would be reported to the Managing Director.

Procedures for training of monitoring personnel

The project would employ qualified and experienced persons for plant operation. Basic personnel to deal with monitoring of parameters are Shift Engineering Superintendents. The project would maintain standard log sheets and formats to record the monitoring parameters. The persons would be given proper training to maintain the plant records. The Engineer-in-charge of the Plant would be the designated person to verify, compile and archive all the monitored data. The parameters to be monitored during the crediting period would be provided in a tabular format to the designated person. The Shift Engineering Superintendents and the Engineer-in-charge of the Plant would be provided necessary training with respect to maintenance of the relevant monitoring records to enable him/her to deal the monitoring independently. The training would be provided to the monitoring personnel for monitoring of the following parameters:

- Electricity Export
- Electricity Import
- Gross electricity generated
- Periodical calibration of monitoring equipment
- Diesel consumption

Procedures for documentation and storage:

Operations of the hydro power project will be overseen by the Shift Engineering Superintendent (ES) of the company. The company will have three Shift Engineering Superintendent (ES) for each of the three shifts. The Shift Engineering Superintendent (ES)'s position will be occupied by qualified electrical engineers who have obtained necessary training in plant operations, data monitoring, report generation etc. For the smooth operations of the plant, the company will have Two Plant Operators (Mechanical and Electrical) and one helper for each of three shifts to help the shift Engineering Superintendent.

The Shift Engineering Superintendents would record the parameters every day during the operation of the plant. Since the project is a hydro power project, only the following energy related data are to be monitored: Gross Electricity generation, Energy Export and import and diesel consumption for the DG set.

The Energy meter readings would be taken at the end of each shift at a designated time every day to ensure constant recording frequency of parameter. The recorded parameters would be documented every day in the

standard log books maintained at the plant. The day to day records would be verified by Engineer In charge, compiled and documented for preparation of internal verification reports.

The net electricity exported to the grid will be recorded from the export meter installed within the premises, jointly with the representatives of Ceylon Electricity Board in the last week of each month. This reading will be taken as the basis for raising invoice on the CEB for the payment against net electricity exported to the grid.

The energy imported from the CEB grid is recorded in the import meter installed by the CEB for billing the project activity for the electricity imported from the CEB grid.

This record will be maintained by the project proponent at the project site as well as at the head office.

Internal audits

The company will introduce an internal verification system for documentation and safe storage of data. Internal verification would be carried out as per the monitoring plan and whenever necessary. An internal verification report would be prepared for review by the Chief Operating Officer (COO). The COO would verify the records independently with reference to the power exported and imported. Internal verification reports are the basic documents for the monitoring and storage of plant operational data.

The Managing Director of the company will visit the plant once in a month and conduct an internal audit of various monitoring parameters of the project. The Managing Director will review all safety installations, operating procedures, monitoring records, etc. and will discuss any corrective action to be taken for the smooth functioning of the plant.

Procedures for Corrective actions

The parameters to be monitored during a crediting period would be compiled as internal verification report for every quarter of each crediting year and submitted to the Managing Director for review. The parameters include the Gross generation, Auxiliary consumption, Energy export, Import and diesel consumption for the DG set. Based on the verification report submitted by Shift Engineering Superintendents

The Engineer-in-Charge would assess the performance of plant. The COO would discuss and recommend necessary mechanism to improve the operational efficiency of the plant and directs the respective person to rectify the problem.

QA & QC Procedures

The projects would employ such equipment or instruments that would measure, record, report, monitor and control of various key parameters of the plant. These monitoring and controls would be the part of the Control Systems of hydroelectric plant.

For measuring the energy exported / imported main meter and a check meter as required would be in service. The check meter reading will be used to measure electricity export/import in case of failure of the main meter. The CEB officials will replace the main meter immediately on PP request. Both the meters would be calibrated and sealed at least once in 3 years as per the CEB standard. Records of these test certificates would be maintained for verification. Hence, high quality is ensured with the above parameters. Delivery records would be used and kept for checking the consistency of the recorded data.

Data Storage & Archiving

All the data items monitored under the monitoring plan would be kept for 2 years after the end of crediting period or the last issuance of CERs, for this project activity, whichever occurs later. Methodology proposed to be adopted for determining base line emission factor is the combined margin of the generating mix in the CEB grid system, which represents the intensity of carbon emissions of the grid system. The baseline emission factor would be adopted from the CEB published generation data for the latest available year for the CEB grid and the same would be used for the future projection and would be reviewed each year based on data published by the CEB. The monitored data would be presented to an independent verification agency or DOE to whom verification of emission reductions is assigned.

Maintenance of Equipments

All the equipments used in the project activity will undergo scheduled maintenance as specified in the operational manual of the equipment supplier. The Chief Operations Officer is responsible to oversee the maintenance activity on periodic basis.

SECTION C. Duration and crediting period

C.1. Duration of project

C.1.1. Start date of project

>> (Specify start date of the project, in the format of DD/MM/YYYY. Describe how this date has been determined as per the definition of start date provided in section 3.4.3 of GS4GG Principles & Requirements document and provide evidence to support this date.)

21/01/2008 (Signing of contract for Penstock clearing, transportation & painting with M/s APS & Liyanage (Pvt.) Ltd)

C.1.2. Expected operational lifetime of project

>> (Specify in years)

25 Years

C.2. Crediting period of project

C.2.1. Start date of crediting period

>> (Specify in dd/mm/yyyy. This can be start of project operation or two years prior to the date of Project Design Certification, whichever is later.)

Two years prior to date of Project Design Certification

C.2.2. Total length of crediting period

>> (Specify the total length of crediting period sought in line with GS4GG Principles & Requirements or relevant activity requirements.)

15 years

SECTION D. Safeguarding principles assessment

D.1. Analysis of social, economic and environmental impacts

>> (Refer the GS4GG Safeguarding Principles and Requirements document for detailed guidance on carrying out this assessment.)

Safeguarding principles	Assessment questions	Assessment of relevance to the project (Yes/potentially/no)	Justification	Mitigation measure (if required)
SOCIAL & ECONOMIC SAFEGUARDING PRINCIPLES				
Principle 1- Human Rights	1. The Project Developer and the Project shall respect internationally proclaimed	No	1. The Project is not in conflict with the economic livelihood of	Not required

	human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights. 2. The Project shall not discriminate with regards to participation and inclusion.		the local community. Thus, the Project does not cause any human rights abuse and respects internationally proclaimed human rights issue. 2. Sri Lanka has ratified the United Nations Human Rights Rules and regulations. It ratified the same as per web link 7 given below. The project adheres to the host country's commitment to Universal Declaration of Human Rights (UDHR) International Covenant on Economic, Social and Cultural Rights, Sri Lanka Accession 11/06/1980 [8] . International Covenant on Civil and Political Rights Accession 11/06/1980[9].	
Principle 2- Gender Equality and Women's Rights	The Project shall complete the following gender assessment questions in order to inform Requirements, below: 1. Is there a possibility that the Project might reduce or put at risk women's access to or control of resources, entitlements and benefits? 2. Is there a possibility that the Project can adversely affect men and women in marginalised or vulnerable communities (e.g., potential	No	1. The project does not decrease women´s access to or control of resources. 2. No, there is no possibility of adverse effect.	Not Required

7 http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN
8 http://hrlibrary.umn.edu/research/ratification-srilanka.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN
9 http://hrlibrary.umn.edu/research/ratification-srilanka.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

	increased burden on women or social isolation of men)? 3. Is there a possibility that the Project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, child care duties, low literacy or educational levels, or societal discrimination)? 4. Does the Project take into account gender roles and the abilities of women or men to benefit from the Project's activities (e.g., Does the project criteria ensure that it includes minority groups or landless peoples)? 5. Does the Project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities? 6. Would the Project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits? 7. Would the Project potentially limit women's ability to use, develop and protect natural resources, taking into account different roles and priorities of women and men in accessing and managing environmental goods and services? 8. Is there a likelihood that the proposed Project would expose women and girls to further risks or hazards? The Project shall not directly or indirectly lead to/contribute to adverse impacts on		3. No, the Project does not disconsider gender roles and in fact actively engages both women and men. Community meetings are scheduled considering participation by both Men and Women. 4. The project does nto discriminate on basis of gender, caste or religion. 5. No the Project was not designed to increase women´s workload nor add care responsibilities. 6. There is no place for discrimination against women in this Project. The project does nto discriminate on basis of gender, caste or religion. 7. The Project will not limit women´s ability regarding natural resources. The project being run-of-river hydro project thus does not have any major impact on natural resources of the region. 8. No the Project will not expose women and girls to further risks or hazards.	

	gender equality and/or the situation of women. 1. Sexual harassment and/or any forms of violence against women - address the multiple risks of gender-based violence, including sexual exploitation or human trafficking. 2. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. 3. Restriction of women's rights or access to resources (natural or economic). 4. Recognise women's ownership rights regardless of marital status - adopt project measures where possible to support to women's access to inherit and own land, homes, and other assets or natural resources.		1. The project proponent has a grievance cell which would look into compalints. 2. There is no such risk for the project. Participation in the project is 100% voluntary. The project proponent has a grievance cell which would look into compalints. 3. The Project will not restrict women´s rights or access regarding natural resources. The project proponent does not discriminate on gender, caste, religion etc. 4. Marital status is completely irrelevant to the Project. The project proponent does not discriminate on gender, caste, religion etc.	
	Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work, specifically: 1. Where appropriate for the implementation of a Project, paid, volunteer work or community contributions will be organised to provide the conditions for equitable participation of men and women in the identified tasks/activities. 2. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. 3. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits.		1. Yes, the Project has equal opportunity for women and men to contribute both in volunteer and working positions 2. The project proponent has a stipulated HR policy that takes into account participation by both men and women. 3. There is no limit on the access to Project participation and benefits from either of these conditions.	

	The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.		The project is aligned to the country's National Action Plan for the Protection and Promotion of Human Rights 2017 – 2021 [10] which has a separate section with them on rights of women.	
Principle 3- Community Health, Safety and Working Conditions	The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community.	No	There are no perceived health risks due to the project activity. Safety of employees would be taken care and safety training to each employee is carried out.	Not Applicable
Principle 4- Cultural Heritage, Indigenous Peoples, Displacement and Resettlement	Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g., knowledge, innovations, or practices)? Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)? Does the Project require any change to land tenure arrangements and/or other rights? For Projects involving land-use tenure, are there any uncertainties with regards land tenure, access rights, usage rights or land ownership?	No	No cultural heritage is observed on the project site, thus no harm observed. The site below gives the list of cultural heritage sites in Sri Lanka by UNESCO from which it is clear that the project site does not form a cultural heritage site. Source: http://whc.unesco.org/en/statesparties/lk The Land for the project has been approved by the local Authorities. The proponent obtained NOC for establishing the plant. The project does not involve and is not complicit in involuntary resettlement in any way. The project activity does not have any major impact on land use patterns. Further, in accordance with Article 1 of the International Covenant on economic, Social and Cultural Rights the project does not complicit in involuntary resettlement.	Not Applicable

[10] http://www.mfa.gov.lk/index.php/en/home/national-action-plan-2017-2021

	Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?		No cultural heritage/ indigenous people are displaced due to the project.	
Principle 5- Corruption	The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects.	No	Indulgence in corruption is an illegal activity in the host country and the local labour compliance takes into account of the same. The project abides by the United Nations Convention Against Corruption. Sri Lanka ratified the same on 15/03/2004**11**.	Not Required
Principle 6- Economic Impacts	1. The Project Developer shall ensure that there is no forced labour and that all employment is in compliance with national labour and occupational health and safety laws, with obligations under international law, and consistency with the principles and standards embodied in the International Labour Organization (ILO) fundamental conventions. 2. Child labour, as defined by the ILO Minimum Age Convention is not allowed. 3. Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures.	Potential	1. The project developer does not complicit in any form of forced or compulsory labor. All employees offering their services on a voluntary basis and are free to quit the services at any time without a menace or penalty. 2. The project neither employs nor intends to employ child labour. 3. Sri Lanka has ratified the United Nations Human Rights Rules and regulations. It ratified the same as per web link[12] given below. The project adheres to the host country's commitment to Universal Declaration of Human Rights (UDHR) International Covenant on Economic, Social	

11 http://www.unodc.org/unodc/en/treaties/CAC/signatories.html
12 http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

			and Cultural Rights, Sri Lanka Accession 11/06/1980 [13] . International Covenant on Civil and Political Rights Accession 11/06/1980[14].	
ENVIRONMENTAL & ECOLOGICAL SAFEGUARDING PRINCIPLES				
Principle 1- Climate and Energy	Will the Project increase greenhouse gas emissions over the Baseline Scenario? Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	The project will reduce greenhouse gas emissions and fossil fuel use compared to the baseline scenario. On the contrary the project generates renewable energy and supplies to the grid.	Not required
Principle 2- Water	Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	Potential	The project being a run-of-river project thus there is no impact of water resources due to the project.	Not required
Principle 3- Environment, ecology and land use	Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	No	The environmental impact of the proposed project was considered negligible and the Central Environment Authority granted environmental approval for the project on 17th February 2005. The Central Environment Authority studied the response to the environmental questionnaire submitted by the project developer and a report for flora & fauna in the region.	Not required

13 http://hrlibrary.umn.edu/research/ratification-srilanka.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN
14 http://hrlibrary.umn.edu/research/ratification-srilanka.html and http://tbinternet.ohchr.org/_layouts/TreatyBodyExternal/Treaty.aspx?CountryID=79&Lang=EN

			The project does not lead to release of any hazardous substances that pose threat to the environment. Rather it aims at reducing the air pollution that is prevalent due to use of fossil fuel power plants. The project promotes environmental protection through the use of cleaner technology.	

SECTION E. Local stakeholder consultation

E.1. Solicitation of comments from stakeholders

>> (Describe how stakeholder consultation was conducted in accordance with GS4GG Stakeholder Procedure Requirements and Guidelines.)

Alternate Power Systems (Pvt) Ltd. invited the local stakeholders for a joint Stakeholder Meeting by way of a Press Advertisements in two national news papers (both In English and Sinhala) and by way of direct invitation to some of the key stakeholders. A local stakeholders meeting was conducted by Alternate Power Systems (Pvt) Ltd. on 16th December, 2008. The meeting took place at the Paladeniya School, which is situated near the site where the proposed project will be carried out. The meeting was attended by around 50 local residents including local Member Parliament, various community leaders, local priest, school principal, Govt officials, employees, workers and local residents. The composition of the participants who attended was:

Category / Occupation	Number of attendees
Local villagers	18
Technology Supplier	1
Local NGO's members	4
Government Officials	3
Intellectuals working in the Local Area	11
Company Employees of APSL	13
Total	**50**

The Managing Director of Alternate Power Systems (Pvt) Ltd. welcomed all those present and briefed them about the proposed CDM project activity and various activities undertaken by the project developer for the socio-economic advantage of the local community / residents of the Adavikanda Village where the project is located. He highlighted the importance of the project to the national power scenario and the economy. At the end of the presentation, the Managing Director invited the participants to ask any question or raise any issues arising from the construction of the project that may be of concern to them..

E.2. Summary of comments received

>> (Provide a summary of key comments received during the consultation process.)

The participant's whole heartedly spelt out the advantages being availed / to be availed by the local community from the project activity. The community leaders highlighted the contributions made by the project developer in terms of constructing a bridge between two neighbouring villages (Adavikanda and Paladeniya), enhancing facilities at the local school building, preaching hall at the local temple, community centre (Praja Shalawa) as well as providing direct and indirect employment for local residents.

E.3. Report on consideration of comments received

>> (Describe how the comments have been addressed by providing a clarification to the stakeholder or by altering the design of the project or by proposing to monitor any anticipated negative impacts etc.)

Representatives of the local community requested the project developer for additional contributions for arranging a bus stop to facilitate pilgrims, improving the road network of the village and facilities at the local hospital. The local residents also suggested plantation of tree to maintain natural look of the area. Although the questions raised by the participants were not directly relevant to the Project activity, the project developer agreed to consider the requests made by the local community leaders / residents favourably.

Appendix 1. Contact information of project participants

Organization name	Alternate Power Systems (Pvt.) Ltd.
Registration number with relevant authority	
Street/P.O. Box	27-2 East Tower, Echelon Square,
Building	World Trade Centre,
City	Colombo
State/Region	
Postcode	1
Country	Sri Lanka
Telephone	+94-11-2381111
Fax	+94-11-2381111
E-mail	leel_wickrema@yahoo.com
Website	
Contact person	Leel Wickremarachchi
Title	Managing Director
Salutation	Mr.
Last name	Wickremarachchi
Middle name	
First name	Leel
Department	
Mobile	
Direct fax	+94-11-2381111
Direct tel.	+94-11-2381111
Personal e-mail	leel_wickrema@yahoo.com

Appendix 2. Summary of post registration design changes

Revision History

Version	Date	Remarks
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1	10 July 2017	Initial adoption