



Monitoring Report

Maduru Oya Left Bank Canal Sluice Small Scale Hydropower Project

Eagle Power (Pvt) Ltd.

No 09, Modarawila Industrial Zone, Panadura, Sri Lanka.

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Project Title	Maduru Oya Left Bank Canal Sluice Small Scale Hydropower Project
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CONTENTS

1. Description of Project Activity	4
1.1. Objective of the Monitoring	4
1.2. Summary Description of the Implementation of this Project	4
1.3. Sectoral Scope and Project Type	6
1.4. Project Proponent	7
1.5. Other Entities Involved in the Project	7
1.6 Project Start Date	7
1.7 Project Crediting Period	8
1.8 Registration date of the project activity	8
1.9 Project track and credit use	8
1.10 Project Location	8
1.11 Title and Reference of Methodology	10
1.13 Other Forms of Credits	11
1.14 Sustainable Development	11
2. Implementation Status	12
2.1 Implementation Status of the Project Activity	12
2.2 Deviations	13
2.2.1 Methodology Deviations	13
2.2.2 Project Description Deviations	13
3 Safeguards	13
3.1 No Net Harm	13
3.2 Local Stakeholder Consultation	15
3.3 AFOLU-Specific Safeguards	16
4. Data and Parameters	16
4.1 Data and Parameters Available at Validation	16
4.2 Data and Parameters Monitored	17
4.3 Description of the Monitoring Plan	19
5. Quantification of GHG Emission Reductions and Removals	22
5.1 Baseline Emissions	22
5.2 Project Emissions	23
5.3 Leakage	25
5.4 Net of GHG Emission Reductions and Removals	25
5.5 Comparison of actual emission reductions with estimates in the CMA	26
APPENDIX: Contact information on participants in the project activity	26

1. Description of Project Activity

1.1. Objective of the Monitoring

The purpose of a monitoring is to quantify the amount of actual GHG reduction for a specific period. This project developer has authority to specify the period to be monitored. The monitoring report is the supporting document to independent verification of net GHG reduction during a specific period to obtain Sri Lanka Certified Emission Reduction units (SCER).

1.2. Summary Description of the Implementation of this Project

Maduru-oya left bank sluice hydro power project has been constructed in association with the Dam of the Maduru Oya reservoirs and the penstock lines off taking from the existing sluice conduit. It's the first regulated water way small-scale hydro power project undertaken along a waterway of Mahaweli Authority, with private sector participation. Capacity of the project is 5MW and the annual average output is 24.89GWh and the expected annual GHG emission reduction is 12,014 tCO₂e. This Power plant started operations in 2011.

As the civil works have been completed to a greater extent project is financially feasible even after paying a royalty of 34.2 from the income of the generated power to MASL. Project is feasible as water is assured to meet the irrigation water demand for farmers.

Project	Proposed Installed Capacity	Expected Energy Output	Project Cost & IRR
Left Bank Sluice MASL project No 3	5000 kW	24.89 GWh	MSLRs 585 16.0 %

Parameters related to the Proposed Power Project

Hydrology

Maximum discharge observed	36.11	cumecs
Minimum discharge observed	1.01	cumecs
Average mean discharge	19.55	cumecs
Reservoir active capacity	476.3	mcm
Volume obtain from own catchment	248	mcm/annually

Volume obtain from diversion	550 mcm/annually
Rainfall	1000 – 4000 mm

Reservoir water level (head) variations

Maximum water level at the reservoir	96.0 m msl
Minimum operating level	84.5 m msl
Outlet canal water level	78.0 m msl
Head variations considered	18 ~ 6 m
Designed head	16.5 m

Proposed power plant

Installed Capacity	5.0 MW (as proposed in LOI)
Expected Energy Output	24.89 GWh annually
Type of the turbine	Dual operation Kaplan – Vertical
Efficiency of the flow variation	60%
Generation	Synchronous/semi umbrella type
Generating Voltage	6.6 kV
Frequency	50 Hz
Line of connectivity and Voltage	300 m/ 33 kV

Cost and financial status

Total Project Cost	585 m SLRs
Equity of the Project Proponent	30 %
Lending Banks	70 %
Internal Rate of Return	> 16%
Royalty to MASL	34.2 % from generated power

Operational Conditions

as per MASL seasonal operating plans/RPM sys ‘B’ directives

Parameter of Project and E & M equipment

Hydrology

Reservoir full supply level	96.0 m msl
Minimum operating level	84.5 m msl
Maximum observed discharge	36.11 m ³ /sec
Designed discharge	22.0 m ³ /sec
Head variation	18 ~ 6 m

Turbine Inlet valve

Type	Butterfly
Diameter	2.6 m

Turbine

Type	vertical shaft – Kaplan
Maximum net head	18.0 m
Minimum net head	06.0 m
Rated net head	16.0 m
Rated speed	350 rpm
Runaway speed	750 rpm
Power at rated head	2500 kW
Power at the maximum loading	3000 kW
Sense of rotation	anti clockwise

Generator

Phase	Three
Frequency	50 Hz
Rated Voltage	6600 V
Maximum output	3000 kVA
Power factor	0.9 lead or lag
Synchronous speed	350 rpm
Runaway speed	750 rpm

Main transformer

Frequency	50 Hz
Phase	three
Rated voltage	6.6 kV/33kV
Rated output	3000 kVA
Power factor	0.9 lead or lag
Off load tap changer	- 10% to + 10% in steps of 5%

The estimated annual power generation output of this small hydropower plant is 24.89GWh which is exported to the national electricity grid of Ceylon Electricity Board. This replaces an equal amount of fossil fuel dominated power in the National Grid. The expected annual GHG emission reduction is 12,014 tCO₂ e

Prior to this project activity, there was no hydropower plant belonging to project participant in that region. Hence the project can be considered as a Greenfield project activity. Baseline scenario for this project activity will be the electricity from the grid.

1.3. Sectoral Scope and Project Type

Sectoral scope 1, Type I, AMS-I.D "Grid connected renewable electricity generation"

1.4. Project Proponent

Organization Name	Eagle Power (Pvt) Ltd
Contact Person	Kapila Wjsekara
Title	No 09, Modarawila Industrial Zone, Panadura
Address	Director / General Manager
Telephone	0773822454
Fax	038 4282780
E-mail	kapila@ethimale.lk

1.5. Other Entities Involved in the Project

Organization Name	Anunine Holding (Pvt) Ltd
Role in the project	Mother company of Eagle power (Pvt) Ltd
Contact Person	G.A.Sithara Sewwandi
Title	77 Sri Saranankara Rd, Dehiwala-Mount Lavinia 00600
Address	Sustainability Data Analyst
Telephone	0703672748
Fax	
E-mail	sithara@anunine.com

1.6 Project Start Date

Starting date of the Maduru Oya Left Bank Main Canal small-scale Hydropower project activity is **12th August 2008** (This was the date when first real action was taken by PP and Letter of Award for construction of access road to the power house was made along with the advance payment to the contractor)

1.7 Project Crediting Period

The project crediting period is 30th of April 2021 to 30th of April 2023 and totally 2 years renewable.

1.8 Registration date of the project activity

The project registration date is 17.06.2011.

1.9 Project track and credit use

According to SLCCS this project has been registered in track II to offset all SBUs which belongs to Anunine holdings (Pvt) Ltd.

1.10 Project Location

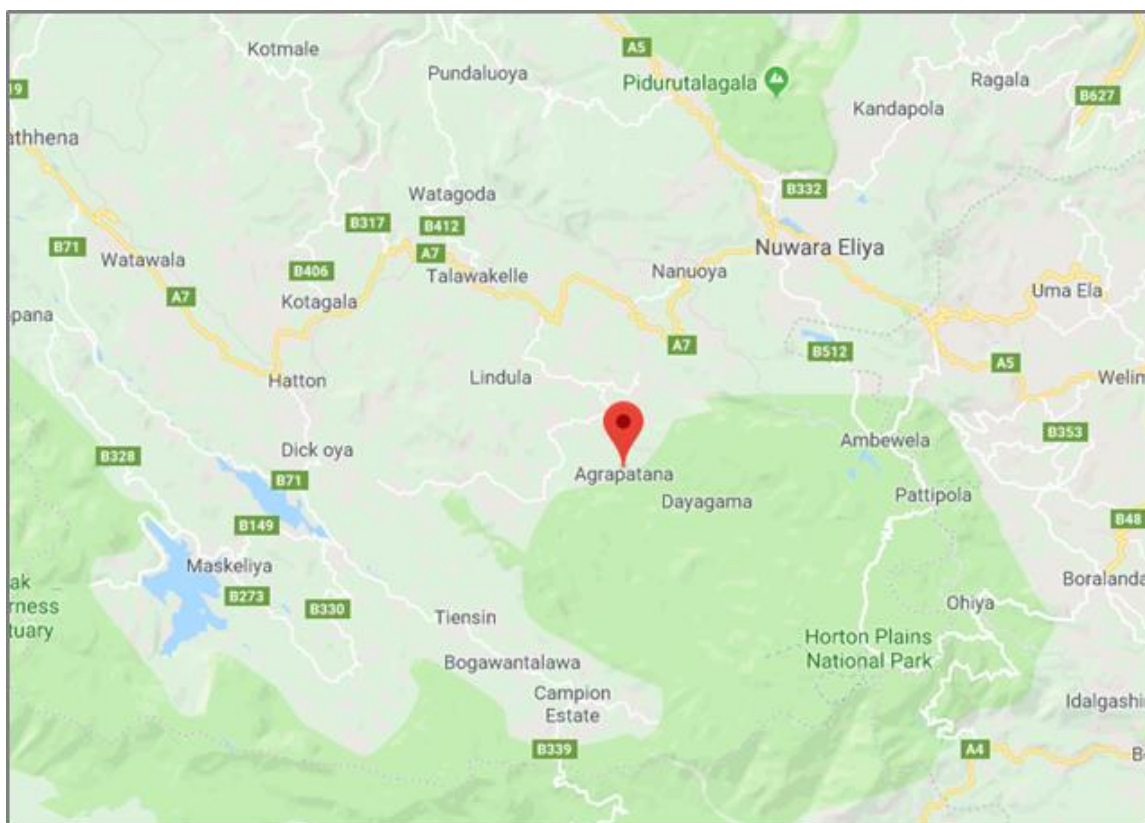
Management of the Project area is vested with MASL, which includes land, other natural resources and social infrastructures. On behalf of MASL the Resident Project Manager (System B) and Maduru Oya Dam Site Engineer Headworks Division have been vested the authority to manage the project and in general;

- Province - North Central Province
- District - Pollonnaruwa
- DS Office - Dimbulagala
- Pradeshiya Saba - Dimbulagala
- GN Office - 239, Alawakumbura
- Village - Alawakumbura

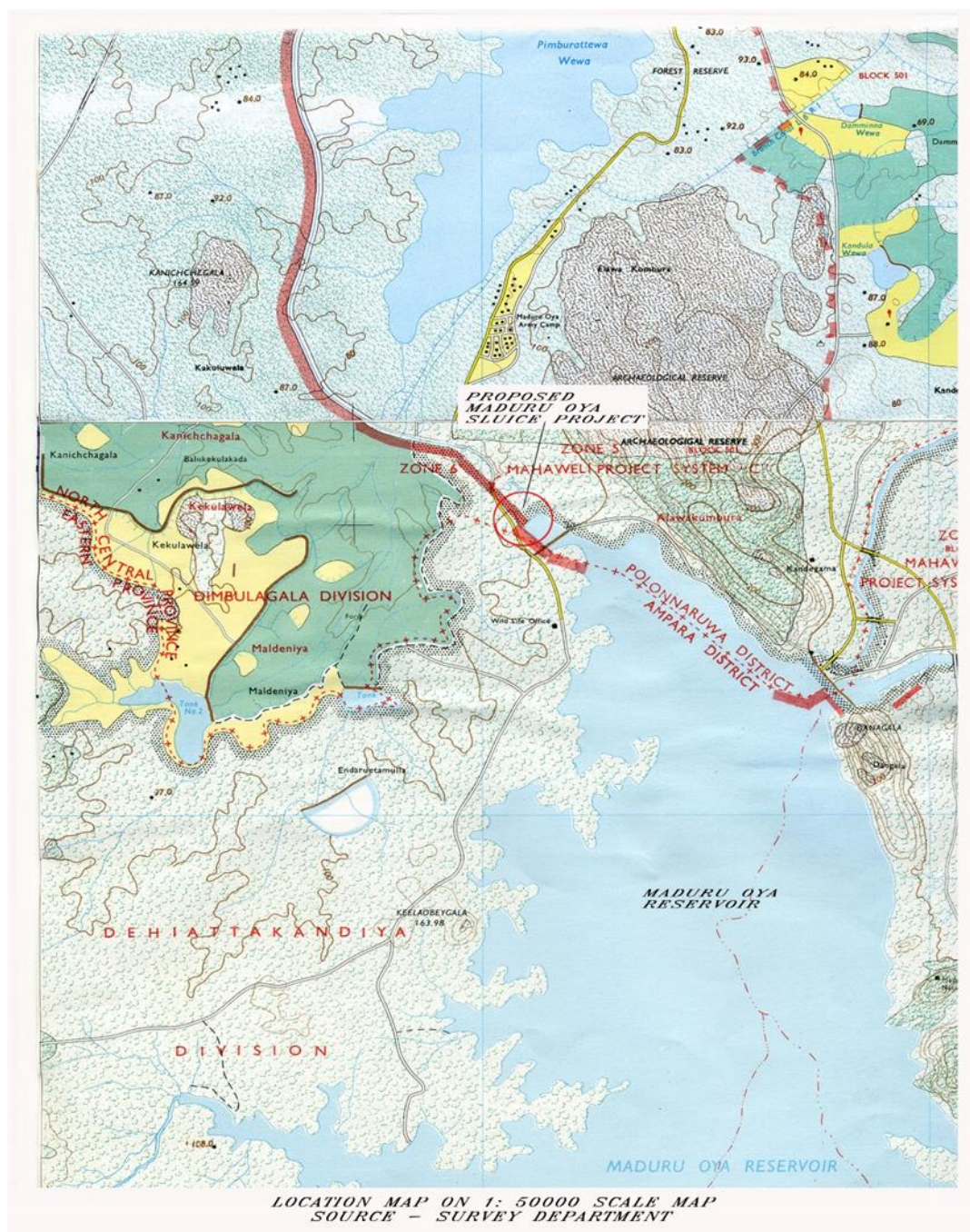
The project site is located at 339 km from Colombo.

Location of Project Activity	Maduru Oya Left Bank Main Canal Sluice
Province	Eagle Power (Pvt) Ltd
District	Sri Lanka
DS Division	Maduru Oya , Pollonnaruwa District, North Central Province

City/Town	Aralaganwilla
Community	Alawakumbura
Coordinates	Latitudes - 7° 66' 69.43" N Longitudes - 81° 19' 77" E



1.11



Title and Reference of Methodology

AMS-1.D "Grid connected renewable electricity generation" Version 18.0

1.12 Participation under other GHG Programs

This project is not registered under any other GHG programs.

1.13 Other Forms of Credits

This project has not sought or received another form of GHG-related environmental credit, including renewable energy certificates.

1.14 Sustainable Development

This renewable electricity generation facility is able to reduce the contribution from thermal electricity generation to meet the electricity demand. Unlike in thermal power plants, this project will positively contribute to the electricity demand without compromising the ability of future generations to meet their own needs. Therefore, this renewable energy project is a positive step toward sustainable development. The national sustainable development criteria are,

- 1) Environmental well-being
- 2) Economic well-being
- 3) Social well-being
- 4) Technological well-being

Environmental well-being

The project contributes to an improvement of the local environment through reducing emissions such as SO_x and NO_x from thermal power plants which have to be operated to generate an equal amount of power using thermal sources if this project is not implemented.

Economic well-being

Discontinuing the use of fossil fuel saves foreign exchange since the entire quantity of fossil fuel requirement is imported to the country.

Social well-being

A good amount of employment opportunities had been created for the local workforce during the project construction phase. The project after implementation provides employment opportunities for the local populace in a sustained manner over the project lifetime. The enhanced employment opportunities created by this project activity will lead to alleviation of poverty, and eradicate unemployment.

Technological well-being

This power plant has been erected as a fully automated power plant. The project activity has used of the reliable and proven technology available locally to ensure that an environmentally safe technology is only being implemented in this project activity.

2. Implementation Status

2.1 Implementation Status of the Project Activity

Eagle Power (Pvt) Ltd, developed a 5.0 MW grid connected hydro power project in Maduru Oya, Alawakumbura, Aralaganwilla, Pollonnaruwa District in Sri Lanka and this project was registered as a renewable energy generation project under Sri Lanka Carbon Crediting Scheme (SLCCS). The entire power generated from this project sells to Ceylon Electricity Board through a power purchase agreement with CEB. The estimated annual power generation output of this hydro power plant is 24890 MWh which is exported to the national electricity grid of Ceylon Electricity Board. This replaces an equal amount of fossil fuel dominated power in the National Grid. The expected annual GHG emission reduction is 12,014 tCO₂e. Prior to this project activity, there was no hydro power plant belonging to project participant in that region. Hence the project can be considered as a Greenfield project activity. The baseline scenario for this project activity was the electricity from the grid.

Eagle Power Project	Technical specification	
General	Catchment Area	490km ²
	Average Annual Catchment Rainfall	1000 mm – 2000mm
	Average Flow	19.55 m ³ /s
	Gross Head	16.5 m
	Installed Capacity	5 MW
	Mean Annual energy generation	24.89 GWh
Weir1 (Main Weir) & Intake	Type	Existing Mahaweli Dam
	Max. Height	N/A
	Length	N/A
Outlet Channel	Type	Reinforced concrete,
	Length	20M
	Height	4M
	Inner Width	20M
	Flow depth at design flow	3M

	Hydraulic slope		0.001
Penstock	Type		Single welded steel pipe
	Length		50 m
	Inner diameter		2.6 m X 2
	Gross Head		16.5 m
Powerhouse	Size of Building		30 m x 13 m x 15 m
	Hydraulic Turbine	Type	Dual Operation Kaplan – Vertical (2500kW x 2)
		Rated Flow	16.5 m ³ /s X 2
	Generator	Type	Synchronous, 6.6kV
		Operating Speed	300RPM

Starting date of the Maduru Oya Left Bank Main Canal Sluice project activity is 12th August 2008 (This was the date when first real action was taken by PP and Letter of Award for construction of access road to the power house was made along with the advance payment to the contractor) and the project was successfully commissioned on 17th June 2011 and no any other changes after registration.

2.2 Deviations

2.2.1 Methodology Deviations

Not applicable

2.2.2 Project Description Deviations

Not Applicable

3 Safeguards

3.1 No Net Harm

This project has not any potential negative environmental and socio-economic impacts.

Analysis of environmental impacts

In terms of regulations in Sri Lanka, small hydropower projects require approval from the Central Environmental Authority (CEA) which looks at both environmental and social aspects. Developers should prepare an Environmental Assessment Report and submit to the CEA for approval. CEA grants approval for the project if they are satisfied, after obtaining all necessary clarifications.

Then this project has received the Environmental Clearance from the CEA.

Table 1: Date of Environment Clearance by CEA

Hydropower plant	Capacity rating (MW)	Date of environment approval received from CEA
Maduru Oya	5	31st December 2007

These clearances by CEA reflect the finding that the environment impacts of this projects is negligible.

The general and specific conditions of approvals of the EAs are in most instances generic, i.e., guidance on minimizing impacts of site preparation. Also, all projects require an environmental monitoring plan that covers surface water (not relevant in practice for run-of-river projects), flora and fauna within the river and below the diversion point, river bank erosion, and sediments upstream of the weir.

The noteworthy specific condition to the project site is summarized below.

- No damage to the rock boulder deposits in the upstream area from the weir
- Maintain the downstream in proper condition, a continuous uninterrupted flow of 30 litres/sec shall be maintained
- Adhere to the approved trace of the transmission line route identified by the CEB
- Solid waste associated with the work force shall be disposed of in consultation with the local authority.
- Shall adapt appropriate conservation methods to stabilize any disturbed slopes.
- Sediments collected at the weir site and accumulated in the setting basin should be disposed in controlled manner
- Soil conservation techniques should be adapted in controlled manner

Should be incorporated in the design at the mouth of intake to prevent entry of fish into conveyances system and build overpass of the open head race canal to facilitate movement of small terrestrial

Environmental impact assessment

The environmental impacts of this project are not considered significant.

3.2 Local Stakeholder Consultation

Stakeholder Consultation Process

There should be some public involvement to ensure that critical issues are identified and that local information about the project area is gathered and that alternative ways of achieving the project objectives are considered. Public involvement could be used to avoid biases inaccuracies in analysis to identify local values and preferences to assist in the consideration of mitigation measures and to select the best practicable alternative.

Eagle Power (Pvt) Ltd had expressed their plan to develop the proposed 5 MW grid connected project and called for the suggestions/comments of the local stakeholders. In line with the public notice, a meeting was held on 7th September 2005. Stakeholder consultation for the project activity has been conducted to account for the views of the people impacted either directly or indirectly due to the project activity as well as impact to the environment. This has been carried out at all levels of stakeholders

The stakeholder consultation process of Maduru Oya Sluice Hydropower project started with the identification of most relevant stakeholders to the project. It was found that the several types of stakeholders with different social status were interested in the project.

Summary of Comments Received

Director and consultant of Eagle Power (Pvt) Ltd. made a detailed description of the project activity. A series of questions were raised by the participants and the majority of them were focused on the possible environmental impacts. In response to them, consultant of project activity described the actions planned to be taken to prevent possible negative environmental impacts. Further the participants were presented with the credentials of stipulated environmental clearance obtained from the relevant authorities. Then villagers were more curious in knowing the advantages and benefits of the project. The participant were convinced that job creation and infrastructure development would be a key outcome of this project. With that insight, participants did not raise any objection against the development and implementation of the project. Describe the process for, and the outcomes from, ongoing communication with local stakeholders conducted prior to verification. Include details on the following:

- The procedures or methods used for engaging local stakeholders (eg, dates of announcements or meetings, periods during which input was sought).
- The procedures or methods used for documenting the outcomes of the local stakeholder communication.
- The mechanism for on-going communication with local stakeholders.
- How due account of all and any input received during ongoing communication has been taken. Include details on any updates to the project design or justify why updates are not appropriate.

3.3 AFOLU-Specific Safeguards

Not applicable

4. Data and Parameters

4.1 Data and Parameters Available at Validation

The responsibilities of various personnel in the organization in keeping records as follow;

Small hydropower operators monitor plant operation including energy generated and exported to the CEB grid by taking at least daily readings of generation levels and recording them on site. The monthly invoice sent to CEB by the small hydropower developers are cross checked by the CEB with the meter reading taken by the CEB staff and payment made accordingly. These data are also archived at Eagle Power (Pvt) Ltd. office in Panadura as well as the power station sites. The verifier will also be welcome to visit the power station sites and the office in Panadura to confirm the status of operations.

No leakage effects are applicable to the plant's operation as the equipment at the plant has not been moved from any other operational location.

Data / Parameter	$EF_{CM,Grid,y}$
Data unit	tCO ₂ e/MWh
Description	Combined margin CO ₂ emission factor for grid connected power generation in year y
Source of data	Sri Lanka Sustainable Energy Authority
Value applied	Year 2022 0.6482 tCO ₂ e/MWh

Justification of choice of data or description of measurement methods and procedures applied	Methodological tool published by UNFCCC to calculate the emission factor for an electricity system
Purpose of Data	Calculate the emission reduction
Comments	

4.2 Data and Parameters Monitored

Complete the table below for all data and parameters monitored during the project crediting period (copy the table as necessary for each data unit/parameter). Data and parameters determined or available at validation are included in Section 4.1 (Data and Parameters Available at Validation) above.

Data / Parameter	EG_{export,y}
Data unit	MWh/year
Description	Quantity of net electricity export to the grid as a result of the implementation of the proposed project activity in the year y
Source of data	This parameter will be continuously monitored and recorded. Monthly electricity export voucher issued by CEB can use to recheck.
Description of measurement methods and procedures to be applied	This parameter will be continuously monitored by project participants using an electronic meter supplied by CEB
Frequency of monitoring/recording	Daily and monthly
Value applied	39,914 MWh for two monitoring years
Monitoring equipment	Energy meter Accuracy class of the meter- class 01 The metering equipment is tested annually by the CEB
QA/QC procedures to be applied	The meter will be properly calibrated and maintained in order to ensure accuracy.

	Testing/Calibration interval : Annually by CEB Cross checking of the data with the cheque received from CEB for exported electricity to the grid
Purpose of data	Calculate baseline emission
Calculation method	N/A
Comments	The recorded data will be checked periodically by the Manager of VS hydropower

Data / Parameter	$FC_{i,j,y}$
Data unit	L/year
Description	Diesel burnt in the back-up generator
Source of data	Onsite measurements
Description of measurement methods and procedures to be applied	Fuel consumed by generator was measured by a ruler gauge fixed to the fuel tank. Power plant operators/ technicians are responsible for taking monthly measurements of the fuel consumption. A log book is maintained for recording monthly fuel consumption
Frequency of monitoring/recording	Measurements were taken on monthly basis
Value applied	320 L
Monitoring equipment	Ruler gauge is used to measure fuel consumption
QA/QC procedures to be applied	The fuel gauge was properly calibrated by the responsible party for achieving required accuracy level. The fuel quantities consumed by generator was cross-checked with the purchased quantities in the monitoring period.
Purpose of data	Calculate project emission for the operation of on-site diesel generator
Calculation method	N/A

Comments	The recorded data were periodically reviewed and authorized by the project manager.
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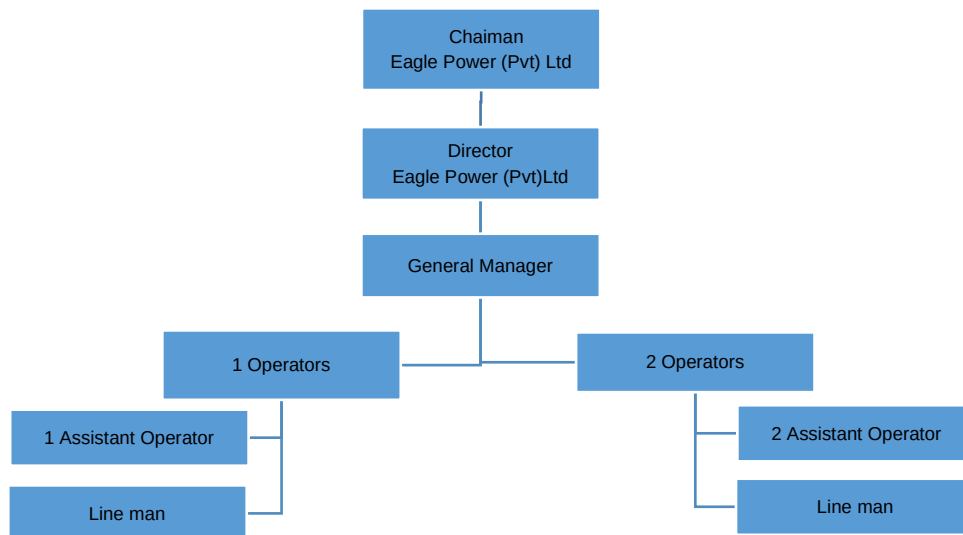
Data / Parameter	$FC_{i,j,y}$
Data unit	kg/year
Description	CO2 fire extinguishers refilling
Source of data	Onsite measurements
Description of measurement methods and procedures to be applied	Refilling amount consumed for fire extinguisher was quantified by the service records.
Frequency of monitoring/recording	Measurements were taken on yearly basis
Value applied	19 kg
Monitoring equipment	Invoice issued by the service provider
QA/QC procedures to be applied	
Purpose of data	Calculate project emission for CO2 fire extinguisher refilling
Calculation method	N/A
Comments	The recorded data were periodically reviewed and authorized by the project manager.

4.3 Description of the Monitoring Plan

The authority and responsibility for registration and overall monitoring would rest with the Director of the Eagle Power (Pvt) Ltd. Power plant operational staff team is headed by a Director from VS hydropower, works as consultant for the project, would continue their services, in the capacity of operational and maintenance supervisors after commissioning of the plant. VS hydropower consists an experienced team in various disciplines and would undertake periodic inspections to ensure the quality of the data collected by the team and initiate steps in case of any abnormal conditions.

The Plant Manager is assisted by operators and labourers. Power house operating staff shall operate the plant safely and shall keep records of plant operations. The responsibility of review, storage and archiving of information in good condition would lie with the Plant Manager. Also it is the responsibility of the Plant Manager to make sure that routine maintenance of plant equipments are carried out in line with the instructions given in operations and maintenance manuals provided by the suppliers of respective equipments and recorded in given formats. Plant assistant operating staff is assisted by senior operators whose primary responsibility is to attend to day-to-day works.

Organization Structure



Parameters Requiring Monitoring

The monitoring of all parameters indicated in section 6.2 of the CMA would be monitored under this plan. 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 5.4. Export & Import readings of main meter shall be taken on monthly basis at appointed day & hour (time) by authorized officer and would be reported to the Director.

Training of monitoring person

The project would employ qualified and experienced persons for plant operations. The project would maintain standard log sheets and formats to record the monitoring parameters. The plant staff would be given proper training to maintain the plant records. The Plant operator 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 Plant operators would be provided with 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
- Parameter of the plant, such as bearing temperature, electrical properties, etc
- Fault/Breakdown recording

Procedures for documentation and storage

Recorded data in monitoring sheets carried out by operators need to be checked by the Plant manager to identify any abnormalities. If any abnormality is noticed, Plant In Charge as well as operators need to take appropriate actions to rectify it. All the abnormalities need to be recorded in the log book maintained at the power house. In addition, regular maintenance work need to be recorded in the given log books for each sections. The day to day records are verified by Plant manager and internal monthly report would be prepared for review by the Director. Internal reports are the basic documents for the monitoring and storage of plant operational data. CEB will prepare monthly bills at the end of each month, based on export and import meter reading. CEB has the facility to monitor the readings through online metering system.

Procedures for Corrective actions

The parameters to be monitored during a crediting period would be compiled as internal report for every month of each crediting year and submitted to the Designated Director for review. The parameters include the Gross generation, Auxiliary consumption, Energy export and Import. The Designated Director would discuss and recommend necessary mechanism to improve the operational efficiency of the plant and directs the respective person to rectify the problem with the consultation from operator team.

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. The meter would be calibrated and sealed at least once a year 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

Export & Import readings from main meter will be collected under the supervision of the Plant Manager. Export and Import data would be recorded and stored in logs as well as in electronic form. The records are checked periodically by the Plant Manager. The period of storage of the monitored data will be 2 years after the end of crediting period or till the last issuance of CERs for the project activity whichever occurs later. 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 Equipment

All the equipments used in the project activity will undergo scheduled maintenance as specified in the operational manual of the equipment supplier. If meters are found to be defective, it would be tested and calibrated immediately. The defective meters will be replaced immediately by a new meter. The plant Manager is responsible to oversee the maintenance activity on periodic basis.

5. Quantification of GHG Emission Reductions and Removals

5.1 Baseline Emissions

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

$$BE_y = EG_{PJ,y} \times EF_{grid,y} \quad \text{Equation (1)}$$

Where:

- BE_y = Baseline emissions in year y (t CO₂)
- $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
- $EF_{grid,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh)

Where,

BE_y - Baseline Emissions in year y (tCO₂)

EG_y - Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

EF_y - CO₂ Emission factor of the grid in year y (tCO₂/ MWh)

Calculation of baseline emission factor

As per paragraph 22 of AMS I.D. Ver18.0, for project activities that do not displace captive electricity generated by an existing plant but displace grid electricity import and/or supply electricity to a grid, the emission factor of the grid shall be calculated as per the procedures detailed in AMS-I.D.

As per AMS I.D, the grid emission factor was calculated using the latest approved version of “Tool to calculate the emission factor for an electricity system” CDM methodology. The grid emission factor calculated and published by the Sustainable Energy Authority in Sri Lanka is used.

5.2 Project Emissions

Project emissions to be considered as per paragraph 39 & 40 of AMS I.D. Ver18.0 and discussion of their relevance for the project are presented in below.

There is one standby generator or other equipments use for the project activity. But it is only use emergency cases.

As a result, the project does involve a standby generator which project emissions as per AMS I.D. Ver18.0. Project emission is 0.88 tonnes of CO₂e, and following mention the relevant formula need to be considered.

$$\text{Emission} = \text{Consumption of diesel (in liters)} * \text{Emission Factor} * \text{GWP}$$

EMISSION CALCULATION 2023		
Fuel (Diesel Consumption)	220.00	L/Year
	0.22	m3/Year
Density	840	kg/m3
Fuel (Mass)	0.00018	Gg

Net Calorific Value	43	TJ/Gg
Energy	0.0079464	TJ
CO2 Emission	0.589	t CO2-e/Year
CH4 Emission	0.0007	
N2O Emission	0.0013	
Total Emission (tons of CO2 equivalent)	0.59	tCO2-e/Year

EMISSION CALCULATION 2024		
Fuel (Diesel Consumption)	100.00	L/Year
	0.1	m3/Year
Density	840	kg/m3
Fuel (Mass)	0.00008	Gg
Net Calorific Value	43	TJ/Gg
Energy	0.003612	TJ
CO2 Emission	0.268	t CO2-e/Year
CH4 Emission	0.0003	
N2O Emission	0.0006	
Total Emission (tons of CO2 equivalent)	0.27	tCO2-e/Year

project emission 2023

EMISSION CALCULATION		
CO2 Gas Refilling	0	kg/Year
Emission from CO2 Consumption(tons of CO2 equivalent)	0.0000	t CO2-e/Year

Project emission 2024

EMISSION CALCULATION		
CO2 Gas Refilling	19	kg/Year
Emission from CO2 Consumption(tons of CO2 equivalent)	0.019	t CO2-e/Year

Hence, PE_y = 1

Table 4: Overview of project emissions as per paragraph 39 & 40 of AMS I.D. Ver18.0 and their relevance for the project

Para 39 & 40 of AMS I.D. Ver18.0: Project emissions include:	Relevance for project activity
For most renewable energy project activities, $PE_y=0$. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of ACM0002. ○ Emissions related to the operation of geothermal power plants (e.g. non condensable gases, electricity/fossil fuel consumption); ○ Emissions from water reservoirs of hydropower plants.	Project activity is hydropower plant with Maduru Oya reservoir
CO₂ emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the tool to calculate project or leakage CO₂ emissions from fossil fuel combustion. CO₂ emissions from CO₂ fire extinguishers due to the project activity were calculated using the latest version of the applicable tool for estimating project.	No No onsite fossil fuel consumption due to project activity

5.3 Leakage

As per the paragraph 40 of selected methodology CO₂ emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the “Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion”.

No fossil fuels consumption for the project activity.

Hence,

$$LE_y = 0$$

5.4 Net of GHG Emission Reductions and Removals

Emissions reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Since $LE_y = 0$;

$$ER_y = BE_y - PE_y$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2023	11573	1	0	11,572
Year 2024	14299	0	0	14,299
Total	25872	1	0	25,871

5.5 Comparison of actual emission reductions with estimates in the CMA

This section shall include a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered CMA.

Item	Values applied in ex-ante calculation of the registered CMA	Actual values reached during the monitoring period
Emission reductions (tCO ₂ e)	24,028	25,871

APPENDIX: Contact information on participants in the project activity

Since this project comes under the Eagle Power (Pvt) Ltd, it is responsible for managing carbon assets. Therefore contact information on Eagle Power (Pvt) Ltd is given below for more clarification.

Document Information

Title of document	Monitoring Report
Document No	SLCCS-MON-FRM
Document Type	Form
Business Function	Monitoring the Project Activity
Version	03.0

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