



Monitoring Report

Version 02

Forbes & Walker Rooftop Solar Project

Forbes & Walker Tea Brokers (Pvt) Ltd. & Forbes & Walker Warehousing (Pvt) Ltd.
46/38, Nawam Mawatha, Colombo 02.



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Version	02
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1. Description of Project Activity

1.1. Objective of the Monitoring

The purpose of monitoring is to quantify the actual greenhouse gas (GHG) emission reductions achieved over a specific period. The monitoring report serves as a supporting document for the independent verification of net GHG emission reductions during that period, which is required to obtain Sri Lankan Certified Emission Reduction (SCER) units.

1.2. Summary Description of the Implementation of this Project

The solar electricity generation facility at the Forbes & Walker Warehouse in Muthurajawela, Wattala, is managed by Forbes & Walker Tea Brokers (Pvt) Ltd. The facility was established in 2024 and connected to the national electricity grid in August 2024 under the Net Plus Plus power purchasing scheme. The current installed capacity is 461.7 kW. The annual solar electricity generation is projected at 534.384 MWh, with an expected annual greenhouse gas (GHG) emission reduction of 385 tCO₂e.

The system is integrated with four inverters and comprises solar PV modules of varying capacities: 575 W (522 panels), 325 W (374 panels), and 250 W (160 panels).

1.3. Sectoral Scope and Project Type

Sectorial Scopes - 1, 2 & 3.

AFOLU project category activity type – Not Applicable

1.4. Project Proponent

Organization Name	Forbes & Walker Tea Brokers (Pvt) Ltd./ Forbes & Walker Warehousing (Pvt) Ltd.
Contact Person	Ms. R. Amitha Kanthilatha
Title	Human Resource Manager
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1.5. Other Entities Involved in the Project

No other entities are involved in the implementation or operation of the project.

1.6 Project Start Date

The agreement with the Ceylon Electricity Board for the connection of the solar electricity generation facility to the national grid was signed on 26 August 2024. The project start date is considered to be 3rd October 2023, corresponding to the date on which the project received board approval.

1.7 Project Crediting Period

The crediting period represents the duration during which emission reductions generated by the project are eligible for the issuance of carbon credits. The project has a crediting period of seven years, commencing on 26 August 2024 and ending on 26 August 2031. The crediting period may be renewed up to two additional times, subject to a determination by a designated operational entity recognized by the SLCCS that the original project baseline remains valid or has been appropriately updated to reflect new data, where applicable.

1.8 Registration date of the project activity

The registration date shall be the date on which the project is formally approved and registered by the SLCCS.

1.9 Project track and credit use

The Rooftop Solar PV System at the Forbes & Walker Warehouse, connected to the national grid under the Net Plus Plus scheme, is intended to be registered under Track II. The carbon credits generated from the project will be used solely for internal offsetting of emissions.

1.10 Project Location

Location of Project Activity	Kerawalapitiya Industrial Zone, Muthurajawela, Wattala
Province	Western Province
District	Gampaha District
DS Division	Wattala

City/Town	Kerawalapitiya/ Wattala
Community	Sinhala, Tamil & Muslims
Coordinates	



1.11 Title and Reference of Methodology

Title: Grid-connected renewable electricity generation Reference Methodology:
CDM- AMS-1.D/Version 18.0/EB 81

1.12 Participation under other GHG Programs

Not registered under any other GHG programs.

1.13 Other Forms of Credits

Not applicable

1.14 Sustainable Development

As a renewable energy initiative, the project aligns with the triple bottom line of the sustainability framework by delivering environmental, economic, and social benefits. It contributes to reducing fossil fuel consumption for power generation, thereby minimizing environmental impacts and lowering the outflow of foreign exchange required for fuel imports. Furthermore, the inherent potential of solar energy can be effectively harnessed in a country like Sri Lanka, where solar irradiance remains consistently high throughout the year.

2. Implementation Status

2.1 Implementation Status of the Project Activity

Forbes & Walker Tea Brokers (Pvt) Ltd has developed a 461.7 kW grid-connected rooftop solar power project at the Forbes & Walker Warehouse located in Muthurajawela, Wattala, in the Gampaha District of Sri Lanka. The entire electricity generated from this project is exported to the national grid and sold to the Ceylon Electricity Board under a Power Purchase Agreement (PPA) through the Net Plus Plus scheme.

The estimated annual electricity generation of the solar power plant is 534.38 MWh, which is supplied to the national grid. This renewable energy generation displaces an equivalent amount of fossil fuel-based electricity in the grid. The project is expected to achieve an annual greenhouse gas (GHG) emission reduction of 385 tCO₂e.

The Power Purchase Agreement with the Ceylon Electricity Board was signed on 26th August 2024, and the facility commenced electricity generation and export to the national grid in September 2024.

2.2 Deviations

2.2.1 Methodology Deviations

No change in methodology and Methodology AMS-I.D Version 18.0 is further applicable.

2.2.2 Project Description Deviations

No any changes

3 Safeguards

3.1 Total Impact

As the project has been carried out in already constructed structures and all the structures have been constructed under approvals for all prevailing terms and regulations govern in Sri Lanka, especially for rooftop solar PV project does not require the analysis of environmental impact assessment. Therefore, under prevailing regulations in Sri Lanka, the project has been implemented.

3.2 Local Stakeholder Consultation

Board approval was obtained following the required financial analysis. Approval and consultation for the project were also secured from Ceylon Electricity Board. In addition, the necessary training and awareness sessions were provided to factory staff, supervisors, and managers on all aspects related to solar electricity generation, hazard analysis, maintenance and online meter reading.

3.3 AFOLU-Specific Safeguards

This project is not categorized under AFOLU projects

4. Data and Parameters

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{CM,Grid,y}
Data unit	Kg CO ₂ /kWh
Description	Grid emission factor calculated using methodological tool to calculate the emission factor for an electricity system.
Source of data	Energy Balance – 2022 (Page No. 119)
Value applied	0.6803 kgCO ₂ /kWh
Justification of choice of data or description of measurement methods and procedures applied	Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.
Purpose of Data	Calculate the emission reduction

Comments	
Data / Parameter	Average Energy Output (EG)
Data unit	MWh
Description	Quantity of net electricity export to the grid as a result of the implementation of the proposed project activity in 26 th August 2024 to 31 st December 2025.
Source of data	This parameter was continuously monitored and recorded. Monthly electricity export voucher issued by CEB or available real time monitoring software can use to recheck.
Value applied	0.6803 kgCO ₂ /kWh
Justification of choice of data or description of measurement methods and procedures applied	Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.
Purpose of Data	Calculate the emission reduction
Comments	

Data / Parameter	Fuel density
Data unit	kg/m ³
Description	Density of Diesel & Petrol
Source of data	Ceylon Petroleum Corporation (CEYPETCO)
Value applied	Diesel - 840 kg/m ³ & Petrol – 752.5 kg/m ³
Justification of choice of data or description of measurement methods and procedures applied	CEYPETCO conducts periodic testing of the specifications of Diesel & Petrol, which it supplies itself, and publishes the results on its official website for public access and reference. Procurement-Documents-BK-34-2025-Gas-Oil-0.05-M.S.-0.001-M-2.pdf and TELEX TO : AS PER ATTACHED LIST
Purpose of Data	Calculate the mass of fuel consumed by the on-site diesel generator & vehicles.
Comments	

Data / Parameter	Net calorific Values (NCVs)
Data unit	GJ/kg
Description	Density of Diesel & Petrol
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2020 IPCC Guidelines on National GHG Inventories. The latest update on 7 th August 2024.
Value applied	Diesel - 0.043 GJ/kg & Petrol – 44.3 GJ/kg.
Justification of choice of data or description of measurement methods and procedures applied	IPCC is an organization attached to UNFCCC publishing periodic reports on climate change and guidelines on national inventory development.
Purpose of Data	Calculate the energy content of fuels.
Comments	

Data / Parameter	Fuel Emission factors
Data unit	tCO ₂ e/GJ
Description	Weighted average CO ₂ emission factor of fuel type (diesel & petrol)
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2020 IPCC Guidelines on National GHG Inventories. The latest update on 7 th August 2024.
Value applied	Diesel – 0.0742 tCO ₂ e/GJ & Petrol – 0.0693 tCO ₂ e/GJ
Justification of choice of data or description of measurement methods and procedures applied	IPCC is an organization attached to UNFCCC publishing periodic reports on climate change and guidelines on national inventory development.
Purpose of Data	Calculate the GHG emission from different fuels.
Comments	
Data / Parameter	Grid emission (grid emission factor), Transmission & Distribution loss

Data unit	Grid emission factor - tCO ₂ e/MWh. T & D loss - %
Description	Grid emission (grid emission factor), Transmission & Distribution loss
Source of data	Energy Balance – 2022 & Statistical Digest 2024 published by Sustainable Energy Authority and Ceylon Electricity Board respectively.
Value applied	Grid emission factor - 0.4173 tCO ₂ e/MWh. T & D Loss – 9.50%
Justification of choice of data or description of measurement methods and procedures applied	The Sustainable Energy Authority of Sri Lanka and the Ceylon Electricity Board are the only authorized entities responsible for calculating and declaring the annual grid emission factor and transmission and distribution (T&D) losses.
Purpose of Data	Calculate the GHG emission from electricity consumption from national grid.
Comments	

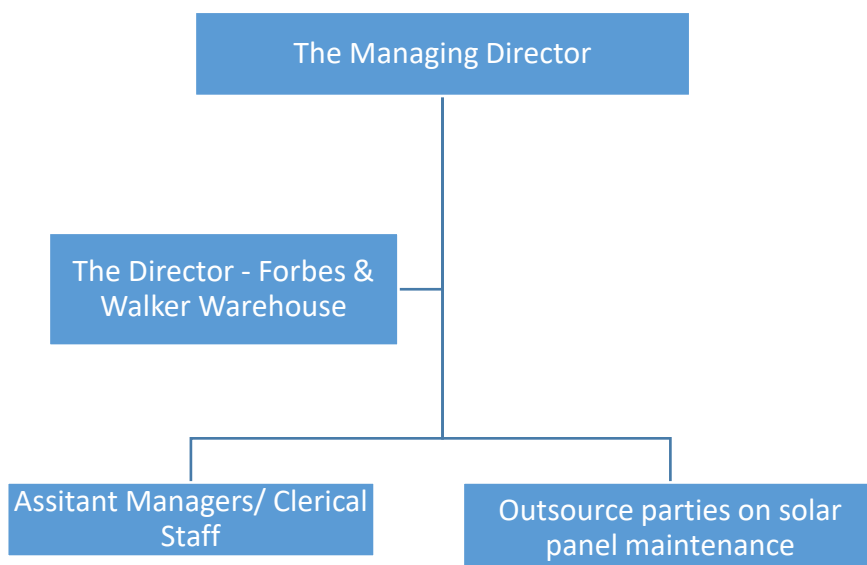
4.2 Data and Parameters Monitored

Data / Parameter	Electricity Generation
Data unit	kWh
Description	Quantity of electricity exported to the CEB grid
Source of data	Monthly CEB bills / vouchers
Description of measurement methods and procedures to be applied	This parameter was continuously monitored by the project participants using an electronic energy meter supplied by the Ceylon Electricity Board.
Frequency of monitoring/recording	Daily & Monthly
Value applied	712,512 kwh (From August 2024 – December 2025)
Monitoring equipment	Energy meters Accuracy class of the meters- class 01
QA/QC procedures to be applied	The meter was properly calibrated and maintained to ensure accuracy. Testing and calibration are conducted annually by the Ceylon Electricity Board.

Purpose of data	Calculate baseline emission reduction.
Calculation method	Net exported electricity to national grid is calculated.
Comments	

4.3 Description of the Monitoring Plan

The authority and responsibility for registration and overall monitoring rests with the Board of Directors of the Company. There is no designated plant manager for the facility; however, clerical staff are responsible for maintaining operational records and calculating monthly electricity generation. These records are reported to the Director of Forbes & Walker Warehouse, who in turn coordinates the required maintenance activities and engages appropriate service providers as needed.



5. Quantification of GHG Emission Reductions and Removals

5.1 Baseline Emissions

The baseline reduction of GHG emission for a particular period is calculated by multiplying net electricity units exported to national grid and combined margin grid emission factor extracted by Table 9.5 and Figure 9.1: Grid Emission Factors of Sri Lanka by Energy balance 2022 published by Sri Lanka Sustainable Energy Authority.

$$BE_y = EG_y \times EF$$

Where,

BE_y = Baseline Emissions in year y (tCO₂e)

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

EF_y = CO₂ Emission factor of the grid in the year 2022 (tCO₂/ MWh)

5.2 Project Emissions

Project emissions may include emissions associated with project installation, operation, and maintenance activities. During the monitoring period, project emissions were identified from the import of grid electricity when the system was operating off-grid. These emissions were quantified and amounted to 0.0116 tCO₂e.

As this value is significantly below the materiality threshold of 0.5 tCO₂e specified under the applied methodology, the emissions are considered insignificant and have a negligible impact on the overall greenhouse gas emission reductions of the project. Therefore, in accordance with the methodology requirements, project emissions are conservatively reported as zero (0 tCO₂e) for the monitoring period.

$$PE_y = 0$$

5.3 Leakage

Leakage may occur if equipment installed under the project activity is transferred from another existing activity, resulting in increased emissions outside the project boundary. However, all equipment installed under the project activity was newly procured and was not transferred from any other activity or facility. Therefore, no leakage emissions have been identified, and leakage is reported as zero (0 tCO₂e).

$$LE_y = 0$$

5.4 Net of GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO ₂ e)	Operational emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2024/2025	484	0.0116 (negligible impact)	Not applicable	484

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) 26/08/2024 to 31/12/2025	513	484

5.6 Remarks on difference from estimated value in the CMA

The actual emission reduction has not exceeded the ex-ante emission reduction calculation provided in the approved CMA. Therefore, providing a justification is not required.

6. Annextures

9.1.1 Operating Margin

The Operating Margin (OM) is a concept which includes all power plants which can have reduced outputs due to a project. It specifically excludes 'low cost, must run' power plants, implying that with or without the project, such generation will continue. Table 9.3 gives the Simple Operating Margin (OM).

Table 9.3 – Operating Margin

	2019	2020	2021	2022
Emissions from Power Plants (t-CO ₂)	3,552,816.2	2,960,912	1,908,745	1,642,648
Net Electricity Generation (GWh) excluding low-cost must run power plants	5,006.7	4,179.3	2,498.4	2,464.5
Operating margin CO ₂ emission factor (kg-CO ₂ /kWh)				
Three-year generation based weighted average	0.7084	0.7084	0.7208	0.7123

9.1.2 Build Margin

The Build Margin (BM) is a concept which attempts to foretell the happenings of a generation system in future, during the crediting period of a project, considering the recent additions to a generation system.

Table 9.4 – Build Margin

	Unit	2019	2020	2021	2022
Emissions of power plants considered for the BM	tonnes of CO ₂	4,266,621.5	4,111,940.3	3,922,524.3	3,290,087.8
Generation of power plants considered for the BM	GWh	5,101.3	5,381.3	5,863.0	5,632.3
Build margin emission factor	kg-CO ₂ /kWh	0.8364	0.7641	0.6690	0.5841

9.1.3 Combined Margin

The Combined Margin (CM) is a weighted average of OM and BM and is commonly known as the Grid Emission Factor [Table 9.5].

Table 9.5 – Combined Margin (kg-CO₂/kWh)

	2019	2020	2021	2022
For solar, wind Projects	0.7404	0.7224	0.7079	0.6803
All other Projects; 1 st crediting period	0.7724	0.7363	0.6949	0.6482
All other Projects; 2 nd - 3 rd crediting period	0.8044	0.7502	0.6820	0.6162

The OM, BM and CM are required for the assessment of CO₂ emission reductions for projects claiming carbon credits under UNFCC guidelines. The GEF is indicated in Figure 9.1.