Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

Title: Neutral Carbon by AXS – 35.5 MW Decentralized Solar Power Projects in Brazil
Version 2.0
Date: 11/11/2025
First CoU Issuance Period: 01 years, 07 months, 06 days
Monitoring Period: 25/05/2023 to 31/12/2024

Monitoring Report (MR)
CARBON OFFSET UNIT (CoU) PROJECT

Monitoring Report	
Title of the project activity	Neutral Carbon by AXS – 35.5 MW Decentralized Solar Power Projects in Brazil
UCR Project Registration Number	572
Version	02
Completion date of the MR	11/11/2025
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 01 Duration of this monitoring Period: (first and last days included (25/05/2023 to 31/12/2024)
Project participants	Project Owner: AXS ENERGIAS S/A Project Aggregator: Kosher Climate India Private Limited
Host Party	BRAZIL
Applied methodologies and standardized baselines	Applied Baseline Methodology: ACM0002.: “Grid connected electricity generation from renewable sources”, version 22.0
Sectoral scopes	01 Energy industries (Renewable/Non-Renewable Sources)
Actual amount of GHG emission reductions for this monitoring period in the registered PCN	2023: 2845 CoUs (2845 tCO2eq)
	2024: 23,736 CoUs (23,736 tCO2eq)
Total:	26,580 CoUs (26,580 tCO2eq)

SECTION A. Description of project activity

A.1. Purpose and general description of project activity >>

The project "Neutral Carbon by AXS – 35.5 MW Decentralized Solar Power Projects in Brazil" in Brazil consist of several project activities installed across different states including Sao Paulo, Parana, Minas Gerais and Mato Grosso. The promoter of the project is AXS ENERGIA.S/A, a company which has the full ownership of the project activity.

The details of the registered project are as follows:

Purpose of the project activity:

The purpose of the project activity is to generate electricity by harnessing the solar energy, making use of solar photovoltaic technology. The project activity involves installation of Solar photovoltaic power generation projects at different locations, with a total capacity of 35.5 MW.

Project Activity	Power Plant Name	Village/State	Energy Source	Installed capacity in MW	Annual generation in MWh/year	Commissioning date
1	Macatuba	Sao Paulo	Solar	4	7,574	25/05/23
2	Miguelópolis	Sao Paulo	Solar	1	2,306	30/09/23
3	Frei Inocêncio I	Minas Gerais	Solar	2.5	4,730	17/10/23
4	Guaraci	Parana	Solar	2.5	5,489	15/09/23
5	Torrezan	Sao Paulo	Solar	3	6,369	25/09/23
6	Guaxupé	Parana	Solar	2.5	5,103	21/11/23
7	Santa Luzia I	Parana	Solar	5	11,529	09/10/23
8	Campo Verde I	Mato Grosso	Solar	2.5	5,275	11/09/23
9	Claudia I	Mato Grosso	Solar	2.5	5,544	20/10/23
10	Palotina I	Parana	Solar	2.5	4,550	26/12/23
11	Alto Paraná I	Parana	Solar	2.5	4,628	24/01/24
12	Cidade Gaúcha I	Parana	Solar	2.5	4,775	14/12/23
13	Limeira	Sao Paulo	Solar	2.5	5,231	15/01/24

The Brazilian Distributed Generation (DG) scheme is regulated by the Brazilian National Electric

Energy Agency (ANEEL) and was firstly introduced in 2012, by the regulation ANEEL REN 482/2012[1]. After that the scheme was updated in 2015 by the regulation ANEEL REN 687/2015[2], and then once again updated and solidified in 2022 by the federal law 14.300/2022[3] and the consequent ANEEL REN 1.059/2023[4]. The main aspects of the DG are:
It is a mechanism for allowing Captive Market consumers to generate energy; Captive Market: different from the Free Market, the Captive Market is the automatic and mandatory option for consumers that are not considered large scale (supplied in 2,3 kV or higher voltage), and in it the consumers are fully supplied by the local energy utility company, which is responsible for the energy supply and also for the energy metering & billing.

- It is restricted to renewable energy sources;
- It is size restricted to up to 3 MW per power plant (as per the update of the federal law 14.300/2022);
- It creates the Compensation System, which allows the energy grid injection and the subsequent compensation in the energy bills, including compensation in facilities other than the one where the generation system is installed;
- It doesn't allow the direct sale of energy; nevertheless, other alternative arrangements have been developed to allow commercial operation

By installing solar plants to offset the consumption of businesses, Project Owner is able to provide them with energy from the Solar Plants within the energy compensation scheme: the generated electricity is injected into the national grid, whereas customers receive credits that are offset in their monthly energy bill. Therefore, the project activity has the purpose of contributing to the transformation of the Brazilian energy matrix through the economic incentives of a clean, renewable, and also cheaper energy source.

Emission reduction and impact of the project activity:

It is expected that the project activity displaces 77,844 **MWh** from the combined generation of 13 power plants. The, project activity will inject **77,844 MWh** of renewable and clean energy into the Brazilian grid, mitigating the total GHG emission reductions of **26,580 tCO_2e**. Project activity, thus, contributes to climate change mitigation efforts.

Being a clean renewable energy source, solar power plants cause no negative impact on the environment. The project activity is thus promoting sustainable development, as defined by the United Nations, since economic advancement and progress have been fostered "without compromising the ability of future generations to meet their own needs" (United Nations General Assembly, 1987, p. 43).

b) Brief description of the installed technology and equipment>>

Project Activity	**Name of Plant**	Number of **PV Modules**	Capacity of **PV Modules**	Manufacturer/Model of **PV Modules**	Number of **Inverters**	Capacity of **Inverters**	Manufacturer/Model of **Inverters**

[1] https://www2.aneel.gov.br/cedoc/ren2012482.pdf
[2] https://www2.aneel.gov.br/cedoc/ren2015687.pdf
[3] https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2022/lei/l14300.htm
[4] https://www2.aneel.gov.br/cedoc/ren20231059.pdf

			(Wp)				
1	Macatuba	8960	590	CS7L-590MB-AG	32	125kw	SUNGROW-SG125HV
2	Miguelópolis	1984	660	Canadian Solar CS7L-660MB-AG 1500V	8	125kw	SUNGROW-SG125HV
3	Frei Inocêncio I	4960	660	Canadian Solar	20	125kW	SUNGROW-SG125HV
4	Guaraci	5542	585	Canadian CS7L-585 MB-AG	20	125kW	SUNGROW-SG125HV
5	Torrezan	5952	660	Canadian Solar CS7L-660MB-AG 1500V	24	125kW	SUNGROW-SG125HV
6	Guaxupé	4960	660	Canadian Solar CS7N-655/660MB-AG 1500V	20	125kW	SUNGROW-SG125HV
7	Santa Luzia I	9792	595	Canadian Solar CS7L-590/595MB-AG 1500V	40	125kW	SUNGROW-SG125HV
8	Campo Verde I	4960	660	Canadian Solar CS7L-660MB-AG 1500V	20	125kW	SUNGROW-SG125HV
9	Claudia I	4960	660	Canadian Solar CS7N-660MB-AG 1500V	20	125kW	SUNGROW-SG125HV
10	Palotina I	1984	660	Canadian Solar CS7L-660MB-AG 1500V	20	125kW	SUNGROW-SG125HV
11	Alto Paraná I	4960	655	Canadian Solar CS7N-655MB-AG 1500V	20	125kW	SUNGROW-SG125HV
12	Cidade Gaúcha I	4960	660	Canadian Solar CS7N-655/660MB-AG 1500V	20	125kW	SUNGROW-SG125HV
13	Limeira	4960	660	Canadian Solar CS7L-660MB-AG 1500V	20	125kW	SUNGROW-SG125HV

c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation

periods, etc.)>>

UCR Project ID or Date of Authorization: 572
Start Date of Crediting Period: 25/05/2023 to 31/12/2024 (01 year, 07 months, 06 days)
Project Commissioned:

Project Activity	Power Plant Name	Village/State	Commissioning date
1	Macatuba	Sao Paulo	25/05/23
2	Miguelópolis	Sao Paulo	30/09/23
3	Frei Inocêncio I	Minas Gerais	17/10/23
4	Guaraci	Parana	15/09/23
5	Torrezan	Sao Paulo	25/09/23
6	Guaxupé	Parana	21/11/23
7	Santa Luzia I	Parana	09/10/23
8	Campo Verde I	Mato Grosso	11/09/23
9	Claudia I	Mato Grosso	20/10/23
10	Palotina I	Parana	26/12/23
11	Alto Paraná I	Parana	24/01/24
12	Cidade Gaúcha I	Parana	14/12/23
13	Limeira	Sao Paulo	15/01/24

d) Total GHG emission reductions achieved or net anthropogenic GHG removals by sinks achieved in this monitoring period>>

The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	25/05/2023
Carbon credits claimed up to	31/12/2024
Total ERs generated (tCO_{2eq})	26,580 tCO2eq
Leakage	0

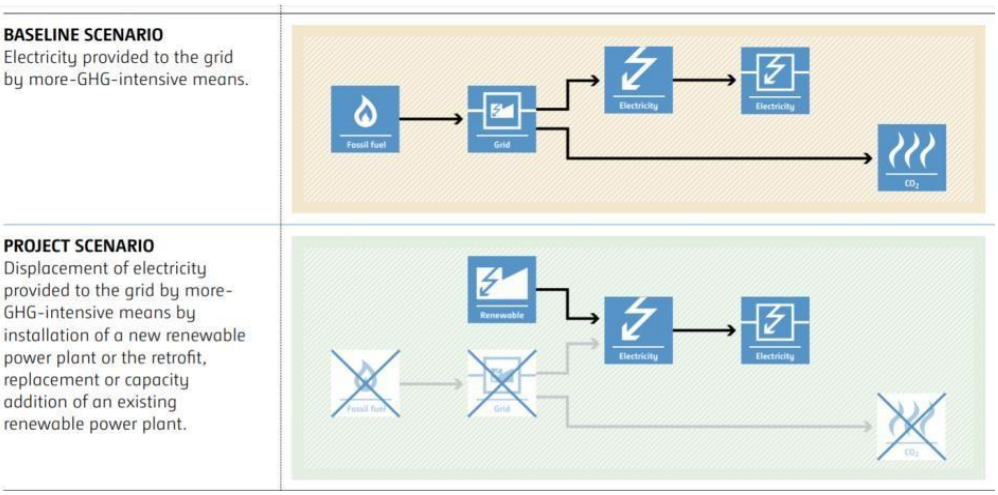
e) Baseline Scenario>>

The baseline scenario identified at the PCN stage of the project activity is:

As per the approved consolidated methodology ACM0002, version 22.0, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants".

The project activity involves setting up a solar power generation cluster to harness the power of solar, producing electricity and supplying it to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the operation of grid-connected power plants. Therefore, the baseline scenario for the project activity is the equivalent amount of electricity generated from the Brazilian National grid.



A.2. Location of project activity>>

Project activity consists of 13 Solar photovoltaic power generation plants installed at different locations:

Project Activity	Power Plant	Country	State	Latitude (S)	Longitude (W)
1.	Macatuba	Brazil	Sao Paulo	-22.503974°S	-48.720347°W
2.	Miguelópolis	Brazil	Sao Paulo	-20.158022° S	-48.025764°W
3.	Frei Inocêncio I	Brazil	Minas Gerais	-18.522476° S	-41.933340°W
4.	Guaraci	Brazil	Parana	-22.984287°S	-51.632214°W
5.	Torrezan	Brazil	Sao Paulo	-20.097357°S	-47.788079°W
6.	Guaxupé	Brazil	Parana	-21.284957°S	-46.679464°W
7.	Santa Luzia I	Brazil	Parana	-22.964774°S	-51.479576°W
8.	Campo Verde I	Brazil	Mato Grosso	- -15.536310°S	-55.201234°W
9.	Claudia I	Brazil	Mato Grosso	-11.511011°S	-54.839966°W
10.	Palotina I	Brazil	Parana	-24.305847°S	-53.852611°W
11.	Alto Paraná I	Brazil	Parana	-23.174143°S	-52.321452°W

12.	Cidade Gaúcha I	Brazil	Parana	-23.398029°S	-52.966297°W
13.	Limeira	Brazil	Sao Paulo	-22.534568°S	-47.353057°W


Frei Inocêncio I
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Guaraci
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Alto Parana I
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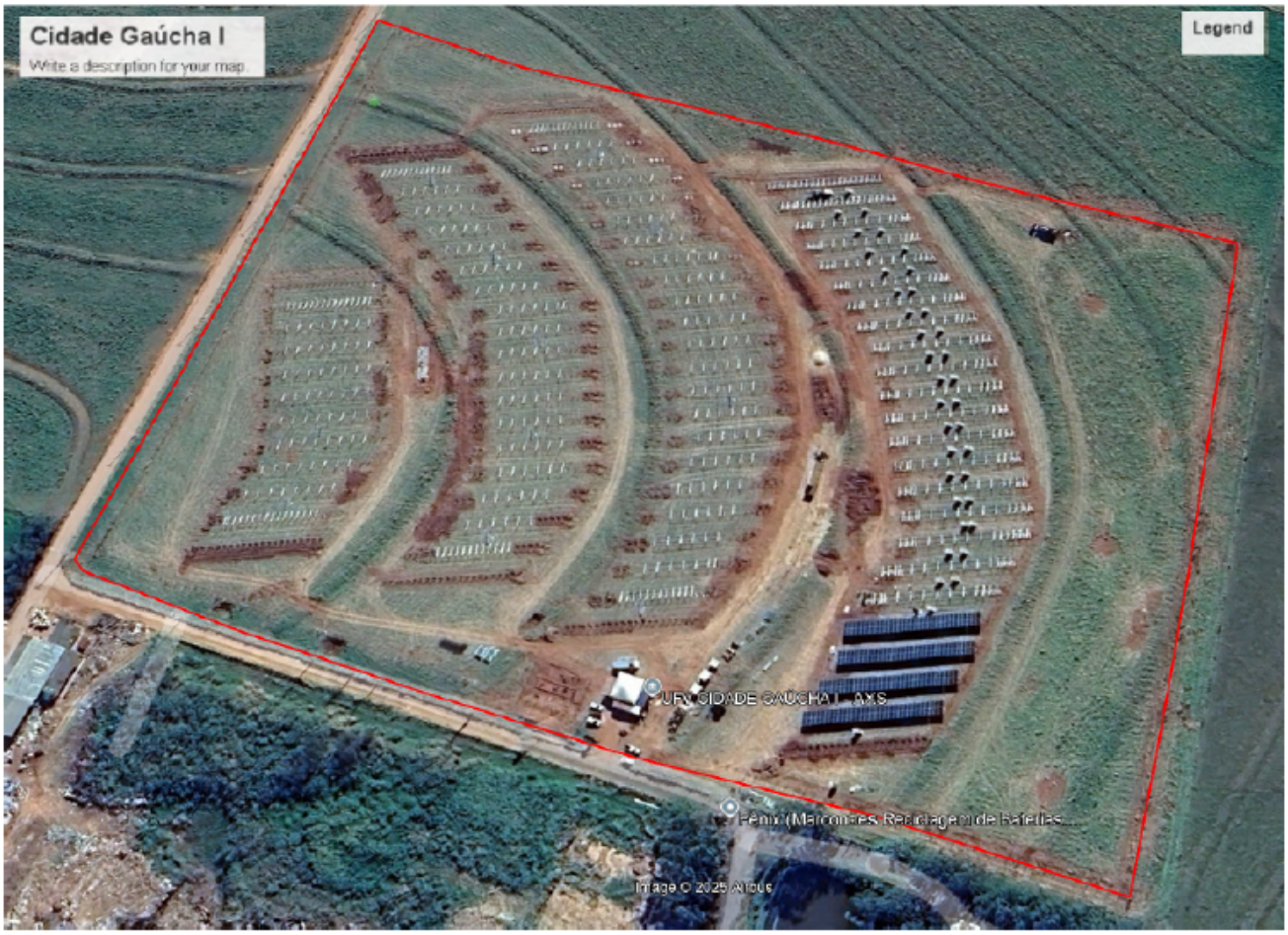
Cidade Gaúcha I
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URU CIDADE GAÚCHA I - AXS
Image © 2025 Airbus


Limeira
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A.3. Parties and project participants >>

Party (Host)	Participants
Brazil	**Project Owner:** BULBE ENERGIAS RENOVÁVEIS S.A. Address: Street Araguari, 1156, room 803 - Santo Agostinho, Belo Horizonte - MG, Brazil, code 30.190-111
India	**Project Aggregator:** KOSHER CLIMATE INDIA (P) LTD. Address: Zee Plaza, No. 1678, 27th Main Rd Bangalore, Karnataka, India Code 560102 Email: narendra@kosherclimate.com

A.4. References to methodologies and standardized baselines >>

SECTORAL SCOPE – 01, Energy industries (Renewable/Non-renewable sources)

TYPE – I - Renewable Energy Projects

CATEGORY – ACM0002: "Grid-connected electricity generation from renewable sources", Version 22.

A.5. Crediting period of project activity >>

Length of the crediting period corresponding to this monitoring period: 01 years, 07 months, 06 days- 25/05/2023 to 31/12/2024

A.6. Contact information of responsible persons/entities >>

UCR ID – 572
Kosher Climate India Private Limited
Name: Narendra Kumar
Email ID – narendra@kosherclimate.com

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity >>

a) Provide information on the implementation status of the project activity during this monitoring period in accordance with UCR PCN>>

The project activity involves installation of Solar photovoltaic power generation projects at different locations, with a total capacity of 35.5 MW.
All the units under the project activity are commissioned and will evacuate power to the Brazilian grid.

Project Activity	**Name of Plant**	Number of **PV Modules**	Capacity of **PV Modules (Wp)**	Manufacturer/Model of **PV Modules**	Number of **Inverters**	Capacity of **Inverters**	Manufacturer/Model of **Inverters**
1	Macatuba	8960	590	CS7L-590MB-AG	32	125kw	SUNGROW-SG125HV
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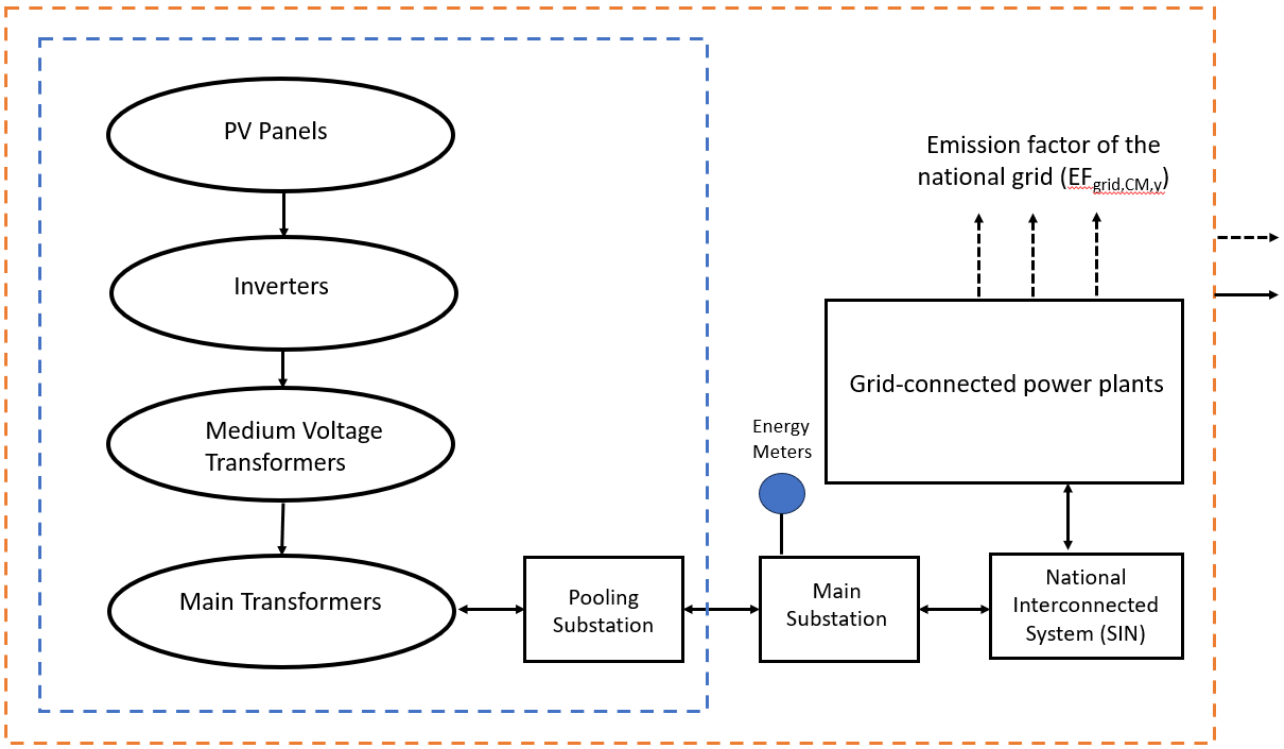
13	Limeira	4960	660	Canadian Solar CS7L-660MB-AG 1500V	20	125kW	SUNGROW-SG125HV

b) For the description of the installed technology(ies), technical process and equipment, include diagrams, where appropriate>>



B.2 Do no harm or Impact test of the project activity>>

There is no harm associated with project activity, and hence an environmental impact assessment study is not required by Brazilian regulations: according to the National Environment Council's (CONAMA) Resolution nº 1/1986[5] Electricity generation plants under 10 MW are exempted from preparing an environmental impact study to be submitted for approval by the competent state body. Thus, no mitigation measures are applicable.

With regards to the Local Stakeholder Consultation (LSC), consulting the local population is foreseen by the environmental licensing process: it is decided by the competent local environmental bodies whether a project shall conduct an LSC or not. However, since the individual project activities are small-scale plants with no harm associated with its activity, all 6 project activities were dismissed from the environmental licensing process - which means that, as per the local environmental body, the project activities are not subjected to environmental licensing. And hence, no consultation with local stakeholders took place.

Instead, there are social, environmental, economic and technological benefits which contribute to sustainable development, as described:

Social benefits:

- Employment opportunities created for the local workforce during project's construction and implementation phases;
- Employment opportunities to be created throughout the lifetime of the project activity;
- Development of rural and remote regions around project activity.

Environmental benefits:

- Use of solar energy - a clean energy source - for generating electricity;
- Power generation with zero emission of GHG gases or specific pollutants like SOx, NOx, and SPM;
- Effort to minimize the dependence of the Brazilian energy matrix on fossil fuels;
- Use of solar energy, which is also a renewable energy source, contributes to the conservation of natural resources;
- Minimum impact on land, water and soil at project surroundings.

Economic benefits:

- It fosters clean technology and clean energy investments in Brazil;
- It fosters the business development of local service providers in Brazil;
- Project activity can also provide new opportunities for industries and economic activities to be set in the area around the projects, developing rural and remote regions;
- It promotes energy cost reduction to consumers;
- Success of these kinds of projects will pave the way for the expansion of the shared distribution generation model in the national scenario, and therefore the consolidation of solar photovoltaic energy generation as one of the main sources in Brazil.

In addition to the social, environmental and economic benefits, the project activity also contributes to to the sustainable development though supporting the local community and local economy thereby claiming SDGs 7, 8 and 13.

[5] Reference:
https://www2.ima.al.gov.br/wizard/docs/RESOLU%c3%87%c3%83O%20CONAMA%20N%c2%ba001.1986.pdf

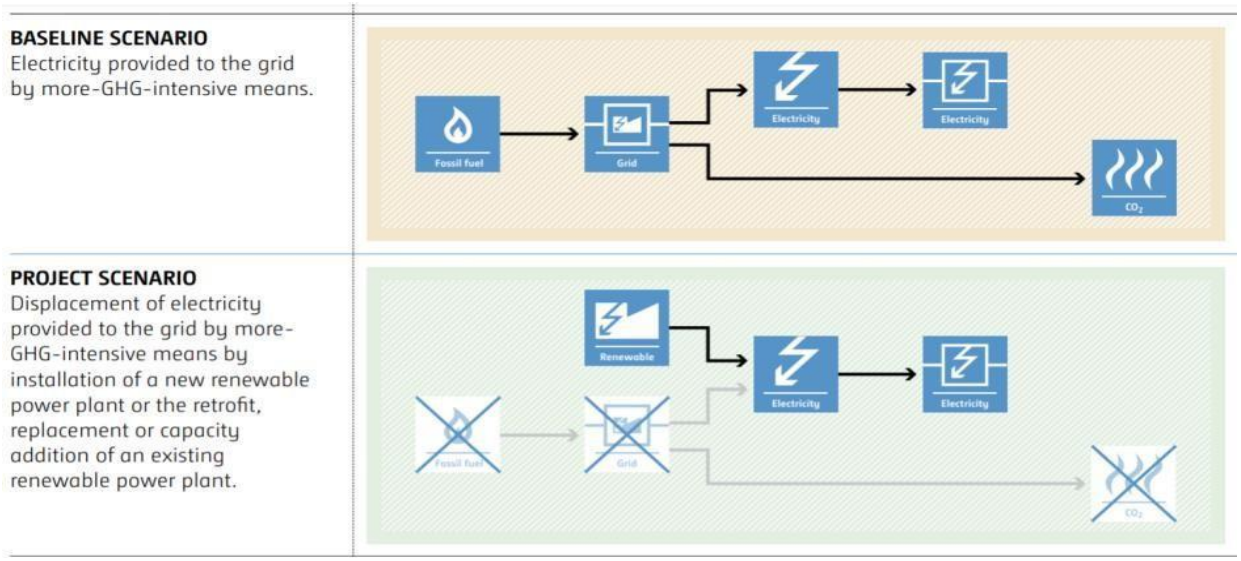
UN-level SDGs	UN-level Target	KPI for the project activity
Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all	Increase global percentage of renewable energy.	Amount of renewable energy supplied to grid for consumption.
Goal 8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all	full employment and decent work with equal pay.	Average earning of females and male employees engaged in the project and segregated by age and persons with disabilities.
SDG 13: Take urgent action to combat climate change and its impacts	Integrate climate change measures into national policies, strategies and planning	Amount of emission reductions achieved by project

B.3. Baseline Emissions>>

The baseline scenario identified at the PCN stage of the project activity is:

"*Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants".*

The project activity involves setting up a solar power generation cluster to harness the power of solar, producing electricity and supplying it to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the operation of grid-connected power plants. Therefore, the baseline scenario for the project activity is the equivalent amount of electricity generated from the Brazilian National grid.



B.4. Debundling>>

Project activity is not de-bundled component of any larger project.

SECTION C. Application of methodologies and standardized baselines

C.1. References to methodologies and standardized baselines >>

SECTORAL SCOPE – 01, Energy industries (Renewable/Non-renewable sources)

TYPE – I - Renewable Energy Projects

CATEGORY – ACM0002: "Grid-connected electricity generation from renewable sources", Version 22.0

C.2. Applicability of methodologies and standardized baselines >>

Applicability Criteria	Applicability status
This methodology is applicable to grid-connected renewable power generation project activities that: (a) install Greenfield power plant; (b) involve a capacity addition to (an) existing plant(s); (c) involve a retrofit of (an) existing plant(s)/unit(s); (d) involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) involve a replacement of (an) existing plant(s)/unit(s).	The project activities are newly installed green field solar energy-based electricity generation projects connected to the national grid. Therefore, it confirms to the said criteria.
In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: (a)Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic1 or solar power plant(s)/unit(s); (c) Integrate a BESS to (an) existing solar photovoltaic or solar power plant(s)/unit(s) without implementing any other changes to the existing plant(s); (d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or solar power plant(s)/unit(s).	The project activity involves the installation of a new grid connected renewable solar power projects and does not involve the integration of a Battery Energy Storage System (BESS). This condition is not applicable for the project activities.
The methodology is applicable under the following conditions: (a) Hydro power plant/unit with or without reservoir, solar power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for solar, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity; (c) In case of Greenfield project activities applicable under paragraph 5 (a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g., by referring to feasibility studies or investment decision documents); (d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during	The project activities involve the installation of solar power plant/unit without BESS integration. Therefore, the said criteria is not applicable.

exigencies 2 may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g., week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.	
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or (b) The project activity is implemented in an existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3) is greater than 4 W/m2; or (c) The project activity results in new single or multiple reservoirs and the power density calculate equation (3), is greater than 4 W/m2. (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density of any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m2, all of the following conditions shall apply. (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4) is greater than 4W/m2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2shall be: (a) Lower than or equal to 15 MW; and Less than 10% of the total installed capacity of integrated hydro power project.	The project activities involve the installation of a solar power plant/unit. Therefore, the said criteria is not applicable.
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability indifferent seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The project activities involve the installation of a solar power plant/unit. Therefore, the said criteria is not applicable.

The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site. (b) Biomass fired power plants;	a) The project activities involve the installation of new solar power plant/unit. Which does not involve switching of grid-connected power plant. b) The project activities involve the installation of new solar power plant and not Biomass fired power plant. Therefore, the said criteria is not applicable.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project activities involve the installation of new solar power plant/unit that does not involve retrofits, rehabilitations, replacements, or capacity additions. Therefore, the said criteria is not applicable

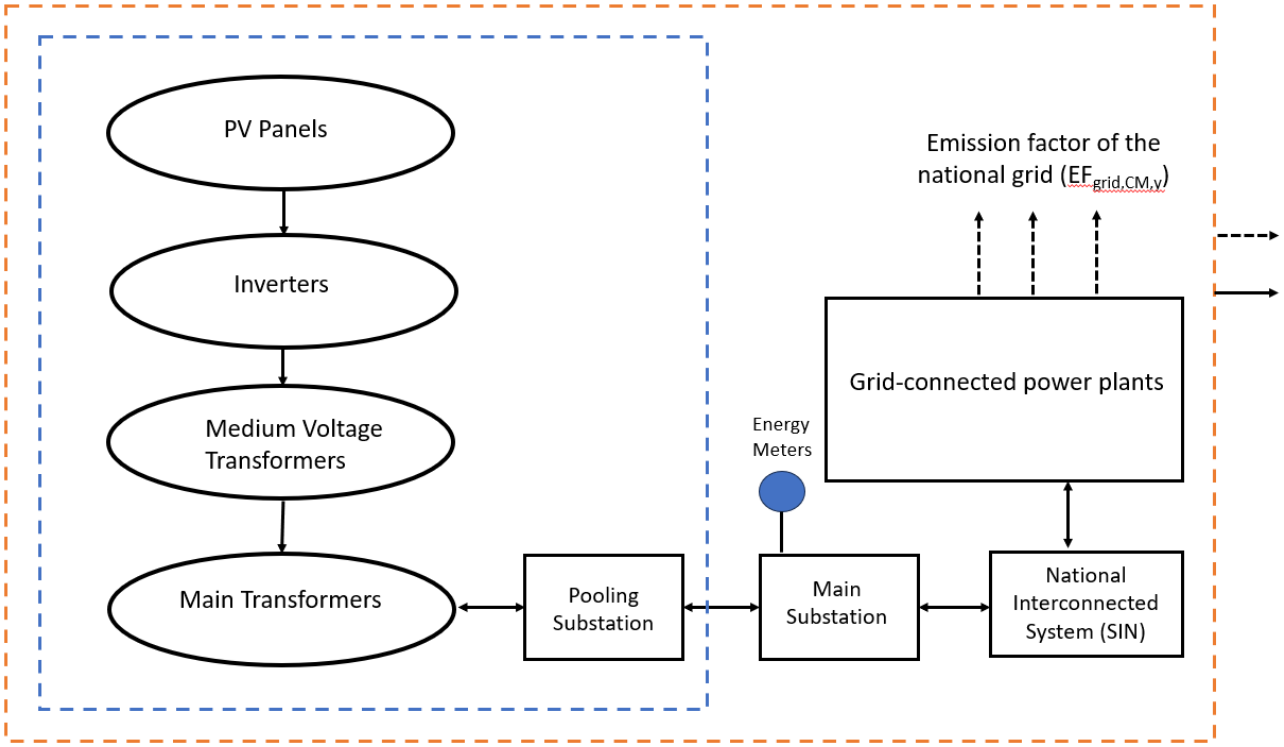
C.3 Applicability of double counting emission reductions >>

There is no double counting of emission reductions for the project activities due to the following reasons:

- Installations are uniquely identifiable based on its location coordinates;
- Project has dedicated commissioning certificates and connection points;
- Project is associated with energy meters which are dedicated to the consumption point for project developers;

C.4. Project boundary, sources and greenhouse gases (GHGs)>>

The project boundary includes the solar project, sub-stations, grid and all power plants connected to grid. The bundled project will evacuate power to the Brazilian grid. Therefore, the entire Brazilian grid and all connected power plants have been considered in the project boundary for the bundled project.



Scenario	Source	GHG	Included?	Justification/Explanation
Baseline	Electricity generation in fossil fuel fired power that is dispatched due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Not identified in the baseline methodology
		N_2O	No	Not identified in the baseline methodology
Project Activity	Electricity generation in the project activity	CO_2	No	Zero-emissions grid connected electricity generation from renewable energy
		CH_4	No	Zero-emissions grid connected electricity generation from renewable energy
		N_2O	No	Zero-emissions grid connected electricity generation from renewable energy

C.5. Establishment and description of baseline scenario (UCR Protocol) >>

As per the methodology ACM0002, Version 22.0, if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

"*The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.*"

The project activity involves setting up new solar power plants to harness the power of solar energy and inject electricity into the Brazilian regional grid. In the absence of the project activity, the equivalent amount of power would have been generated by the operation and/or insertion of more- GHG-intensive grid-connected power plants. Hence, the baseline for the project activity is the equivalent amount of power produced at the Brazilian grid.

Net GHG Emission Reductions and Removals:

$$ERy = BEy - PEy$$

Where,

ERy = Emission reductions in year *y* (t CO_2e/yr)

BEy =Baseline emissions in year *y* (t CO_2/yr)

PEy =Project emissions in year y (t CO_2/yr)

Baseline Emissions

As per the approved consolidated Methodology ACM0002 version 22.0, Baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid- connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

Where,

BE_y = Baseline emissions in year y (t CO_2/yr)

$EG_{PJ,y}$ = 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/yr)

$EF_{grid,CM,y}$ = Combined margin CO_2 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 CO_2/MWh)

As per para 59of ACM0002, version 22.0, when the project activity is installation of Greenfield power plant, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where,

EGPJ,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/yr)

EGfacility, y = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

The combined margin of the Brazil grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,CM,y}$	As given below	Combined margin CO_2 emission factor for the project electricity system in year y.	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Ministry of Science and Technology "CO_2 emission factors for electricity generation in the National Interconnected System of Brazil.
$EF_{grid,OM,y}$	As given below	Operating margin CO_2 emission factor for the	Calculated from the monthly average emission, sourced from Ministry of Science and Technology "CO_2 emission

		project electricity system in year y.	factors for electricity generation in the National Interconnected System of Brazil.
$EF_{grid,BM,y}$	As given below	Build margin CO_2 emission factor for the project electricity system in year y.	The built margin value has been sourced from Ministry of Science and Technology "CO_2 emission factors for electricity generation in the National Interconnected System of Brazil.

Year	Operating Margin Emission Factor	Build Margin Emission Factor	Combined Margin Emission Factor
2023	0.3785	0.0326	0.2921
2024	0.4473	0.0523	0.349

Project Emissions:

As the project activity consists of the installation of a new grid-connected solar power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore, project emissions are:

$$PEy = 0.$$

Where,

PE_y = Project emissions in year y (t CO_2e/yr)

Leakage Emissions:

No other leakage emissions are considered. The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g.extraction, processing, transport etc.) are neglected.

Hence Emission reductions will be calculated as per the below equation:

$$ERy = BEy = EG_{PJ,y} \times EF_{grid,CM,y}$$

The actual emission reduction achieved during the crediting period has been demonstrated below as a part of first monitoring and verification.

The following table summarizes the yearly actual net generation and its respective yearly actual emission reduction, as per the given yearly emission factor:

Crediting period	Net Generation (MWh/year)	Emission Factor (tCO_2/MWh)	Emission Reduction (tCO_2/year)
25-05-2023 to 31-12-2023	9,739.69	0.292	15,725
01-01-2024 to 31-12-2024	68,104.89	0.349	23,080
Total	77,844		26,580

C.6. Prior History>>

Not Applicable

C.7. Monitoring period number and duration>>

First Issuance Period: 25/05/2023-31/12/2024 (01 year, 07 months,06 days)

C.8. Changes to start date of crediting period >>

There is no change in the start date of crediting period.

C.9. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

The present document is the Monitoring Report version 1.0, which presents no changes from the PCN monitoring plan, applied methodology or applied standardized baseline.

C.10. Monitoring plan>>

Data and Parameters available at validation (ex-ante values):

Data/Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh
Description	Combined Margin CO_2 emission factor in year y of Brazilian Grid
Source of data	Designated National Authority (DNA) "Ministry of Science and Technology" CO2 emission factors for electricity generation in the National Interconnected System of Brazil[6]"
Value(s) applied	Year: 2023 — Value ($t CO_2$): 0.2921; Year: 2024 — Value ($t CO_2$): 0.349
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	Calculation of Emission Factor of the grid

Data/Parameter	$EF_{grid,OM,y}$
Data unit	tCO_2/MWh
Description	Operating Margin CO_2 emission factor in year y of Brazilian Grid
Source of data	Designated National Authority (DNA) "Ministry of Science and Technology" CO2 emission factors for electricity generation in the National Interconnected System of Brazil[7]"
Value(s) applied	Year: 2023 — Value ($t CO_2$): 0.3785; Year: 2024 — Value ($t CO_2$): 0.4473
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	Calculation of Emission Factor of the grid

Data/Parameter	$EF_{grid,BM,y}$
Data unit	tCO_2/MWh

[6] https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao
[7] https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao

Description	Build Margin CO_2 emission factor in year y of Brazilian Grid
Source of data	Designated National Authority (DNA) "Ministry of Science and Technology" CO2 emission factors for electricity generation in the National Interconnected System of Brazil[8]"
Value(s) applied	Year: 2023 — Value ($t\ CO_2$): 0.0326; Year: 2024 — Value ($t\ CO_2$): 0.0523
Measurement methods and procedures	-
Monitoring frequency	Ex-ante fixed parameter
Purpose of data	Calculation of Emission Factor of the grid

Data and Parameters to be monitored (ex-post monitoring values):

Data / Parameter:	$EG_{PJ,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of this project activity in year y (MWh)
Source of data:	Monthly Joint Meter Readings (JMRs)
Value(s) applied	77,844
Measurement procedures (if any):	The Net electricity generation by the Solar power plant is recorded by the project proponent in the record logs. At the end of every month, Energy bill is generated based on the total monthly electricity exported to the grid.
Monitoring frequency:	Monthly
QA/QC procedures:	Cross Checking: Quantity of net electricity supplied to the grid will be cross checked from the invoices raised by the project participant to the grid.
Any comment:	-

Small scale renewable energy generation in Brazil:

Small scale grid connected renewable energy generation was introduced in Brazil in 2012, by the regulation REN 482/2012[9], issued by the National Agency of Electrical Energy (ANEEL). It allowed the consumer from the Captive Market to become also an energy supplier to the grid and, with that, to benefit itself and other affiliates by reducing the energy consumed from the DisCo. The regulation comprised renewable energy generation systems installed close to the load centers, usually even at the same site of the loads (e.g. rooftop photovoltaic systems), thus using only the distribution grid (lower voltage and shorter distances) instead of the transmission grid (higher voltage and longer distances). Those systems are categorized as Distributed Generation (DG) and the maximum installed capacity per system is 5 MW.

There are currently 1.419.624 DG systems in operation, summing over 15 GW of installed capacity. About 99% of those systems are from the Solar Photovoltaic source and have installed capacities lower than 100kW, which are mainly represented by solar rooftop grid-tie systems for local self-consumption. Less than 1% of the systems have installed capacity over 1 MW, which are mainly solar farms for energy grid export (ANEEL GD data from 11/2022).

[8] https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/sirene/dados-e-ferramentas/fatores-de-emissao
[9] https://www2.aneel.gov.br/cedoc/ren2012482.pdf

Within the DG, the energy generated has to firstly fulfil the consumption of the site where it is installed, so only the surplus can be virtually either exported to other consumption affiliated site or stored in form of credits valid for up to 60 months. The DG energy generators are not like Independent Power Producers (IPP), but "Prosumers", which means a consumer that is additionally a producer for its own and affiliates. It is a much more simplified scheme than the IPPs one.

Metering in small scale renewable energy generation in Brazil:
As explained, the DG systems are installed in the consumer units supplied (in energy) by the DisCos within the Captive Market scheme. Therefore, the meters are installed, operated and maintained by the DisCos. The basic functioning of the metering procedure works as following: the meters measure both the energy that comes from the grid (consumption) and the energy that goes into the grid (surplus export). The DisCo meter is therefore capable of accounting for the energy generation in systems that generates energy for grid exporting purposes. On the other hand, it is not capable of accounting for the energy generation in systems that generates energy for local self-consumption, as a large portion of the energy generated is instantaneously consumed, without going to the grid and consequently without being registered by the DisCo meter. Due to this functioning and to the existence of these 2 different profiles of the DG units, 2 different energy metering situations can be identified.

The applicable scenario for the Project Activities is the following:

DG profile that generates energy exclusively for grid export: this is the case of the **Solar Farms**.
As the energy generation is exclusively for grid export, the only energy that is not exported (thus not accounted as export by the meter) is a very low portion that refers to the power plant self-consumption. Therefore, for this profile, the energy generation is well reflected by the DisCo meter (and by the DisCo monthly invoice data). In these cases, in arrangements similar to Power Purchase Agreements, the DisCo meter data (and DisCo monthly invoice data) are the source of data used for billing purposes; no meters calibration certificates are usually required as the providing and O&M of the meters are a legal responsibility of the DisCo with the national government, thus access to it is restricted to the DisCo.