MONITORING REPORT (MR)

CARBON OFFSET UNIT (CoU) PROJECT

Title: 2.7MW Captive Solar Power Project GARL, Gujarat

UCR PROJECT ID: 363

MR Version: 3.0

MR Date: 10/10/2023

1st CoU Issuance Period: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**

1st Monitoring Period: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**

MONITORING REPORT (MR)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION	
Title of the project activity	2.7MW Captive Solar Power Project GARL, Gujarat
UCR Project ID	363
Scale of the project activity	Small Scale
Completion date of the MR	10/10/2023
Project participants	**Project Proponent**: Gokul Agro Resources Limited (GARL)
Host Party	India
SDGs	SDG 7: Affordable and Clean Energy SDG 8: Decent Work and Economic Growth SDG 13: Climate Action
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) **UNFCCC CDM Methodology Category** **AMS-I.F**. Small-scale Methodology, *Renewable electricity generation for captive use and mini-grid* Ver 05 UCR Protocol Standard Baseline EF
Sectoral scopes	01 Energy industries (Renewable/NonRenewable Sources)
Estimated amount of total GHG emission reductions for the crediting period per year	**2020: 521 CoUs (521 tCO2eq)** **2021: 3776 CoUs (3776 tCO2eq)** **2022: 3822 CoUs (3822 tCO2eq)** **Total: 8119** CoUs (**8119** tCO_{2eq}/yr)

SECTION A. Description of project activity

a). Purpose and general description of Carbon offset Unit (CoU) project activity >>

The project activity titled, **2.7 MW Captive Solar Power Project GARL, Gujarat,** is located at Survey No: 76/01/P-1, 80, 89 and 91, Village: Meghpar Borichi, Taluka: Anjar, District: Bhuj, State: Gujarat (370110), Country: India.

This is a single project activity of total installed capacity 2.7 MW, which is a ground mounted captive solar power generation activity by **M/s Gokul Agro Resources Limited** (GARL, Project Proponent or PP). The PP is one of the leading FMCG companies in India with international presence in the edible and non-edible oils industry. GARL is engaged in the manufacturing and exports of industrial products viz. castor oil of various grades and its derivatives.

The PP has the full ownership of the project activity. This project is an operational activity with continuous reduction of GHGs, currently being applied under "Universal Carbon Registry" (UCR), which rewards solar programs with carbon credits as an incentive for positive climate action in the Global South, as opposed to carbon finance in other international voluntary carbon programs. It's now widely accepted that the world needs to ramp up clean technologies by 2030 to prevent permanent climate disaster, and carbon incentive policies, such as the UCR CoU program, will be key to such efforts. India is aiming for 450 GW of renewables and 500 GW of non-fossil capacity by 2030. With 110 GW already installed (as of 2021-22), the nation needs to deploy 340 GW of new renewable energy capacity (on average, 42.5 GW of renewable energy per year for the next eight years) to meet the 2030 target and offer the world some hope in combating climate change. That would require the country's solar capacity to rise fivefold to 280 GW from 54 GW during this period. This translates to 29 GW of new solar capacity additions every year on average until the end of this decade – a far faster pace than the nation's record annual addition of 15 GW renewable energy (14 GW of solar and 1 GW wind) in fiscal 2021-22.

Purpose of the project activity:
The purpose of the proposed project activity is to generate electricity using a clean and renewable source of energy i.e., solar radiation, for captive use. The project activity of 2.7 MW is the installation and operation of a solar power plant in Bhuj district in the state of Gujarat are per the details listed below:

Village	District	Type	Total installed capacity kW	Commissioning date
Meghpar Borichi	Bhuj	Ground mounted-Captive	2700 kWp (DC)/ 2200 KVA	25/11/2020

As per the ex-post calculations, this project activity generated approximately **9023 MWh** of renewable electricity over the entire monitored period. The project activity uses Poly Crystalline solar photovoltaic technology to generate clean energy.

The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array. Thus, project activity leads to reduce the GHG emissions as it displaces power from fossil fuel-based electricity generation in the regional grid.

b). Purpose of the project activity:

The purpose of the proposed project activity is to generate electricity for captive usage using a clean and renewable source of energy i.e., solar radiation.

The generation of power from solar photovoltaic is a clean technology as there is no fossil fuel fired or no GHG gases are emitted during the process. Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array.

The average life time of the Photovoltaic Panel is around 20 years as per the equipment supplier specification. Solar radiation is converted directly into electricity by solar cells (photovoltaic cells). In such cells, a small electric voltage is generated when light strikes the junction between a metal and a semiconductor (such as silicon) or the junction between two different semiconductors. Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array

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

Village	District	Type	Total installed capacity kW	Commissioning date
Meghpar Borichi	Bhuj	Ground mounted-Captive	2700 kWp (DC)/ 2200 KVA	25/11/2020

UCR Project ID: 363
Commissioning Date: 25/11/2020
1st CoU Issuance Period: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**
1st Monitoring Period: 25/11/2020-31/12/2022 (**02 years 01 months 05 days)**

COMPLETION CERTIFICATE

2700 kWp (DC) CAPTIVE SOLAR PV POWER PLANT AT

GOKUL AGRO RESOURCES LTD

Survey No: 76/01/P-1, 80,89 and 91, Village – Meghpar Borichi, Ta – Anjar, Dist: Bhuj
Gujarat - 370110

Date: 25th Nov 2020

To Whomsoever It May Concern:

1. Purchase Order no: GARL/G'dham/S-P/0709 dated 09/07/2020 was placed to SolarSquare Energy Private Limited for supply of material and service 2700 kWp (DC)/ 2200 KVA Captive Ground mount Solar PV Power Plant.

2. The project has been installed at GOKUL AGRO RESOURCE LTD. with system spread cross 8.413 Acre land within the premises.

3. It is certified that 2700 kWp (DC)/ 2200 KVA Captive Ground mount Solar PV Power Plant was Installed on 30th Oct 2020 with pre-commissioning test conducted on 31th Oct 2020 and Final commissioning was done on 25st Nov 2020 and is performing well.

Regards,
Yours Sincerely,
For SOLARSQUARE ENERGY PVT LTD.

Authorised Signatory

SolarSquare Energy Pvt Ltd
G-3, B wing, Het Kunj, VP Road, Fidai Baugh Lane, Andheri (W), Mumbai: 400 058, Maharashtra, India
Email: info@solarsquare.in | Web: www.solarsquare.in
CIN: U40104MH2015PTC264250 | GSTIN: 27AAVCS8269F1ZI

Commissioning Certificate

Gokul
AGRO RESOURCES LTD.

INSTOLATION AND CHARGING CERTIFICATE

2700kWp (DC) CAPTIVE SOLAR PV POWER PLANT AT

GOKUL AGRO RESOURCES LTD

Survey No: 76/01/P-1, 80,89 and 91, Village – MeghparBorichi, Ta – Anjar, Dist: Bhuj
Gujarat - 370110

Date: 25thNov 2020

To Whomsoever It May Concern:

1. Purchase Order no.: GARL/G'dham/S-P/1224 dated 24/12/2020 was placed to Solar Square Energy Private Limited for supply of material and service 2700kWp (DC)/ 2200 KVA Captive Ground mount Solar PV Power Plant.

2. It is certified that 2700kWp (DC)/ 2200 KVA Captive Ground mount Solar PV Power Plant was Installed, tested and Final charging of complete system was done on25st Nov 2020.

Regards,
Yours Sincerely,
For GOKUL AGRO RESOURCES LTD.

Authorised Signatory

Signature Not Verified
Digitally signed by HITESHKUMAR TARACHAND THAKKAR
Date: 2020.12.18 19:11:58 +05:30

1-805, Dwarkesh Business Hub, Survey No. 126/1, Opp. Visamo Society, B/H. Atishay Bellaview,
ra, Ahmedabad - 380 005. Gujarat (India)
079-67123502; CIN : L15142GJ2014PLC080010
No. 76/1/P-1, 80, 89 & 91, Near Sharma Resort, Galpadar Road, Meghpar – Borichi, Tal. – Anjar 370110,
Kutch, Gujarat (India).
www.gokulagro.com

Commissioning Certificate

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

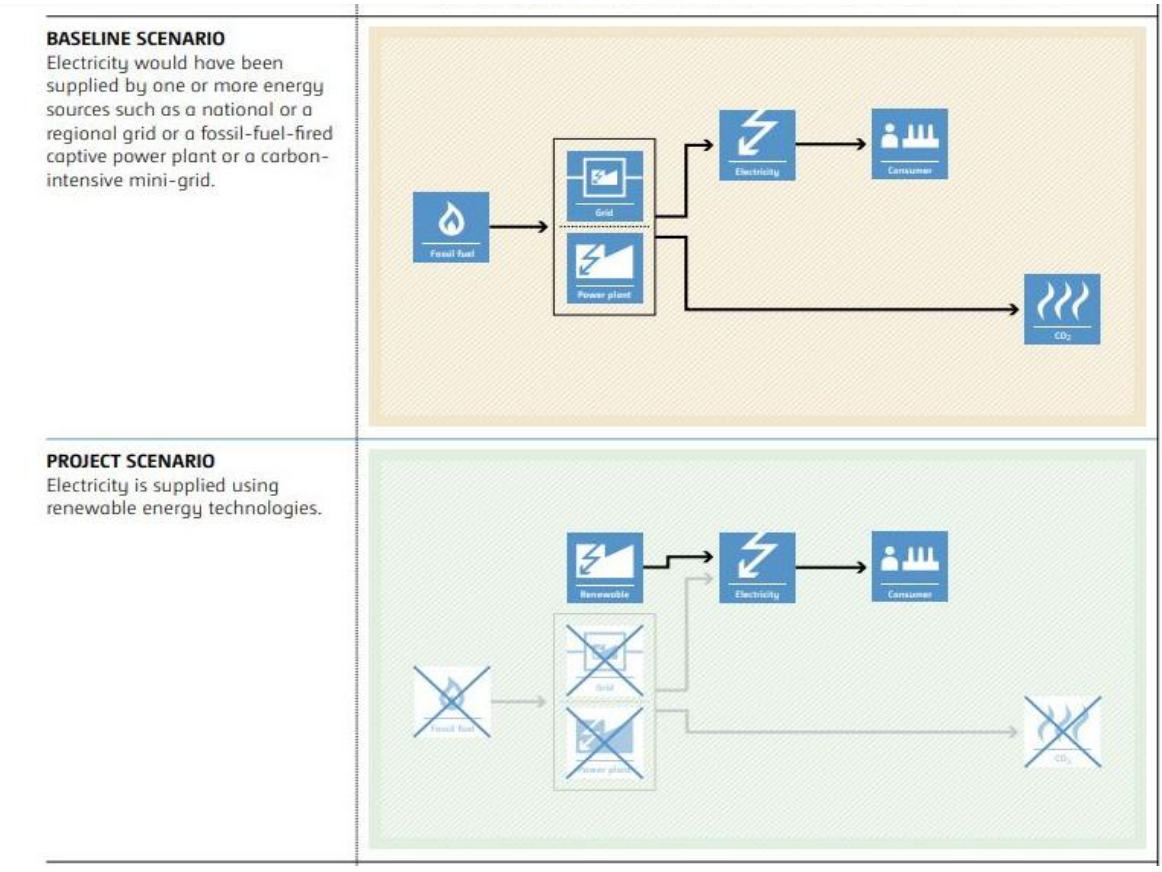
The total GHG emission reductions achieved in this monitoring period is as follows:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	25/11/2020
CoUs claimed up to	31/12/2022
Total ERs generated in this crediting period (tCO2eq)	8119 tCO2eq
Leakage	0
Project Emissions	0

e). Baseline Scenario>>As per the approved consolidated methodology AMS-I.F. Version 05

Methodology key elements

Typical project(s)	Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s)
Type of GHG emissions mitigation action	Renewable energy: Displacement of electricity that would be provided to the user(s) by more-GHG-intensive means



As per the UNFCCC Methodology, eligible projects comprise of renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply

electricity to user(s).

The project activity displaces electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit, i.e. in the absence of the project activity, the users would have been supplied electricity from:

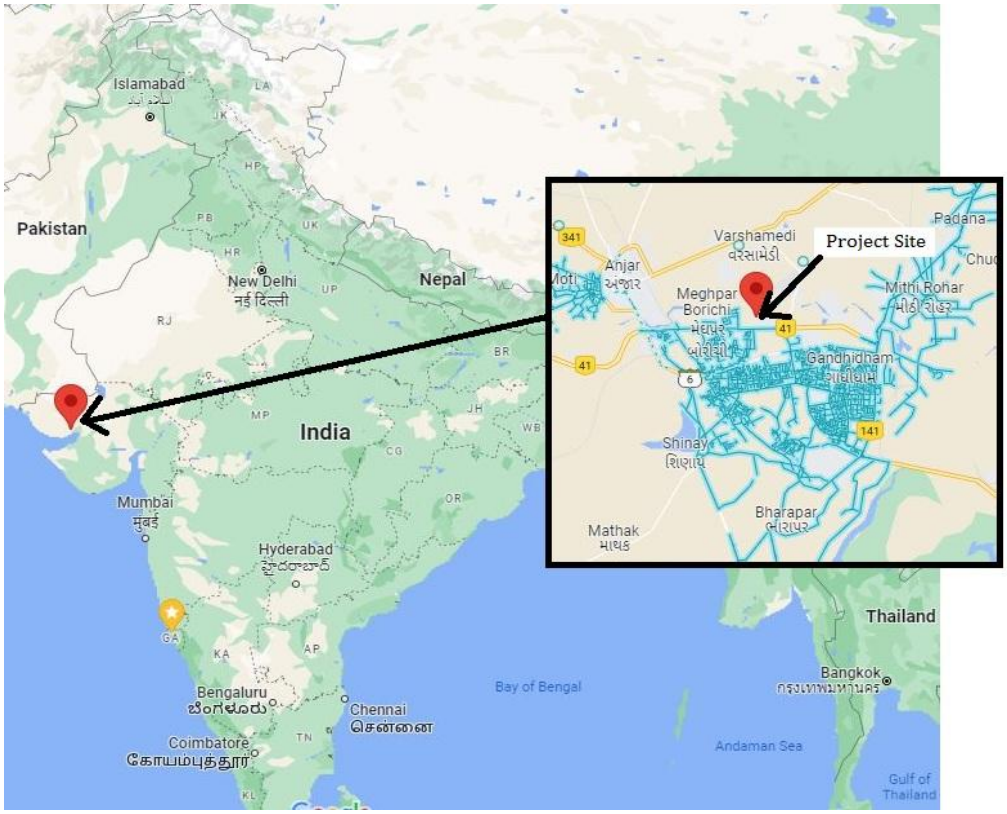
(a) A national or a regional grid (grid hereafter)

The baseline scenario identified at the PCN (ver 2.0) stage and this MR of the project activity is:
the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor

A.2. Location of project activity>>

Country: India
Survey No: 76/01/P-1, 80, 89 and 91,
Village: Meghpar Borichi,
Taluka: Anjar,
District: Bhuj
State: Gujarat - 370110
Latitude: 23.10
Longitude: 70.09

The representative location map is included below:



A.3. Parties and project participants >>

Party (Host)	Participants
India	**Project Proponent**: GOKUL AGRO RESOURCES LTD (GARL), Survey No: 76/01/P-1, 80,89 and 91, Village – Meghpar Borichi, Ta – Anjar, Dist: Bhuj Gujarat - 370110 Contact: Hemal S. Sonigra, ISO Coordinator, Gokul Agro Resources Limited

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

SECTORAL SCOPE - 01 Energy industries (Renewable/Non-Renewable Sources)
TYPE - Renewable Energy Projects
CATEGORY - ***AMS-I.F. – Renewable electricity generation for captive use and mini-grid,*** **ver 05**

This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit, i.e. in the absence of the project activity, the users would have been supplied electricity from:

(a) A national or a regional grid (grid hereafter)

A.5. Crediting period of project activity >>

1st CoU Issuance Period: 25/11/2020 to 31/12/2022 (**02 years 01 months 05 days)**
1st Crediting Period: 25/11/2020-31/12/2022 (**02 years 01 months 05 days)**

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

UCR Aggregator: Hemal S. Sonigra
UCR ID: 341368293
Email Address: iso@gokulagro.com
Company Name: Gokul Agro Resources Limited (PP)
Company Website: https://www.gokulagro.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 is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the most environment friendly technologies available as the operation of the Solar photovoltaic does not emit any GHGs or any other harmful gases unlike the operation of conventional power plants.

The technology used does not pose any threat to the environment in comparison to the fossil fuel-fired power plants. The technology to be applied in the project activity is proven technology and can hence be considered safe and sound technology. The project does not involve any transfer of technology from any Annex 1 country. There is no Public funding (ODA and/ or Annex I countries) for the project activity.

Parameter	Description
Total number of Photovoltaic Modules	6836
Rating of Photovoltaic Module	0.395 KWP- Kilo watt peak / 395WP- watt peak
Technology	Poly Crystalline Silicon
Solar Panel Maker	WAAREE ENERGIES LIMITED
Meter Maker	Secure
Commissioning Date	25/11/2020

This MR uses the methodology which comprises renewable energy generation units, such as photovoltaic, that supplies renewable electricity to user(s). The project activity displaces electricity from an electricity distribution system that is supplied by at least one fossil fuel fired generating unit, i.e. in the absence of the project activity, the users would have been supplied electricity from:
A national or a regional grid (grid hereafter)

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

Photovoltaic module consists of several photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array. The project activity has used the reliable and proven technology from supplier to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction. The technical arrangement of the project activity is as provided below:

The project activity is using clean renewable solar energy to produce electricity. The applied technology is considered to be one of the most environment friendly technologies available as the operation of the Solar photovoltaic does not emit any GHGs or any other harmful gases unlike the operation of conventional power plants.

Photovoltaic module consists of a number of photovoltaic cells connected by circuits and sealed in an environmentally protective laminate, which forms the fundamental building blocks of the

complete PV generating unit. Several PV panels mounted on a frame are termed as PV Array. The project activity has used the reliable and proven technology to ensure that an environmentally safe and sound technology is only being implemented in the proposed project activity leading to the GHG reduction.

Each power production unit will in general constitute the following equipment:

1. Solar Photovoltaic modules
2. Inverters
3. Transformers
4. Circuit breakers
5. Mounting structures
6. Cables and hardware.
7. Junction box and distribution boxes.
8. Earthing kit.
9. Control room equipment.
10. System for control and monitoring.
11. Evacuation system

	Type	Serial Number	Manufacturer	Panel Name / Manufacturer
Meter make and details	Multifunction Meter	X1313197	SECURE	VCB / Siemens
	Multifunction Meter	X1050917	SECURE	LBS / Siemens
	Multifunction Meter	X1300279	SECURE	ACDB / SRR
	Multifunction Meter	X1926301	SECURE	ACDB2 / SRR

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

The Indian economy is highly dependent on "Coal" as fuel to generate energy and for production processes. Thermal power plants are the major consumers of coal in India and yet the basic electricity needs of a large section of population are not being met. This results in excessive demands for electricity and places immense stress on the environment.

Changing coal consumption patterns will require a multi-pronged strategy focusing on demand, reducing wastage of energy and the optimum use of renewable energy (RE) sources. This project is a greenfield activity where grid power is the baseline. The renewable power generation is gradually contributing to the share of clean & green power in the grid; however, grid emission factor is still on higher side which defines grid as distinct baseline.

The Government of India has stipulated following indicators for sustainable development in the interim approval guide lines for such projects which are contributing to GHG mitigations. The Ministry of Environment, Forests & Climate Change, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. It has been envisaged that the project shall contribute to sustainable development using the following ways: Rational: As per 'Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India)', final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (07/03/2016), it has been declared that solar project activity falls under the "White category". White Category projects/industries do not require any Environmental Clearance such as 'Consent to Operate' from PCB as such project does not lead to any negative environmental impacts.

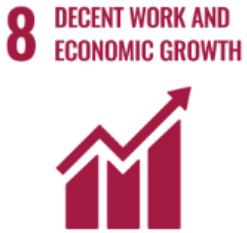
Additionally, as per Indian Regulation, Environmental and Social Impact Assessment is not required for small-scale Solar Projects. The key details have been discussed in the previous section. Provides employment to local communities through construction and maintenance of units.

United Nations Sustainable Development Goals:

The project activity generates electrical power using solar energy which is generated from photovoltaic cells, there by displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. In the absence of the project activity equivalent amount of power generation would have taken place through fossil fuel dominated power generating stations.

Thus, the renewable energy generation from project activity will result in reduction of the greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

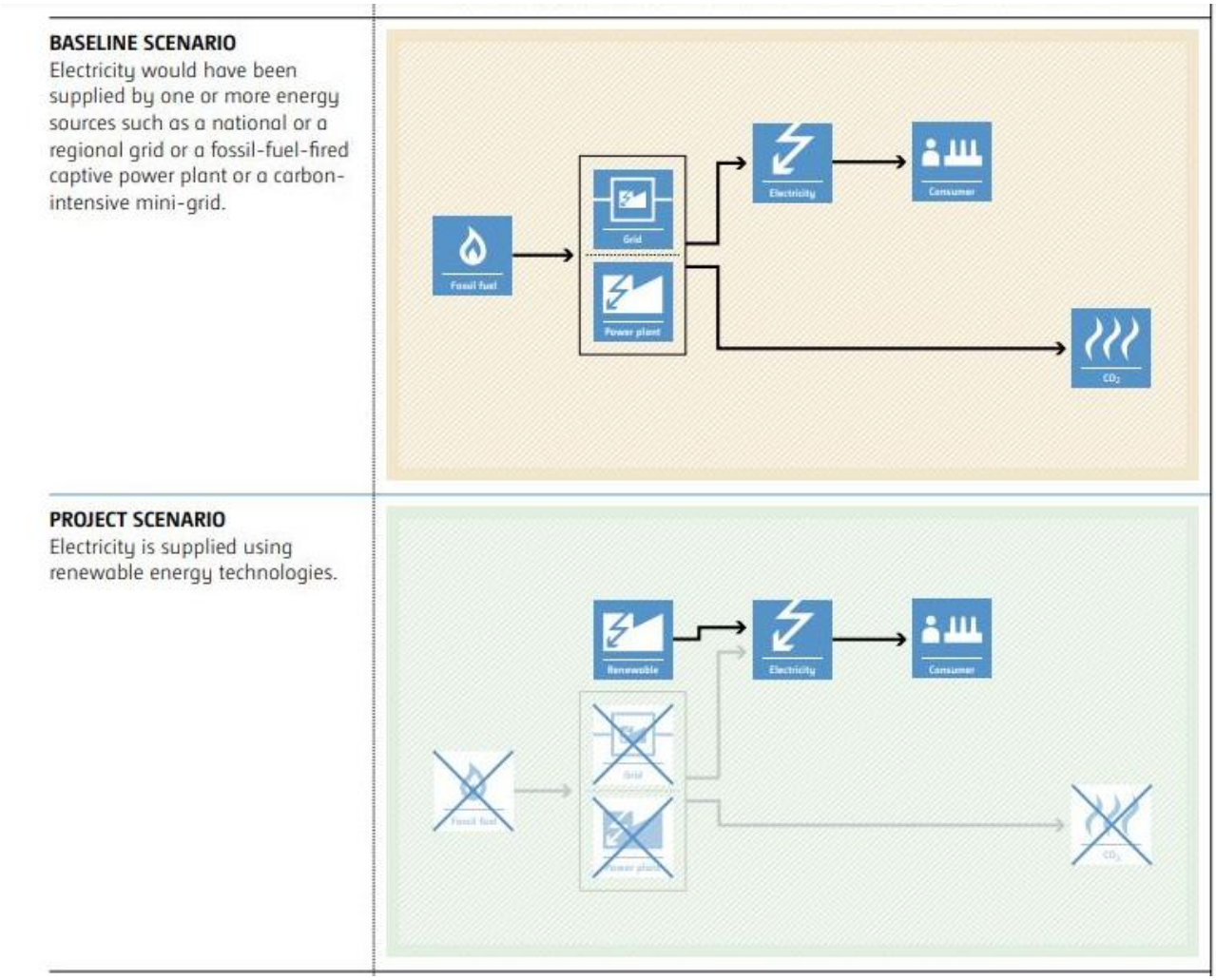
- SDG13: Climate Action
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth

Development Goals	Targeted SDG	Target Indicator (SDG Indicator)
 SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning Target: 8119 tCO_2 avoided for the Monitored Period 01	13.2.1: Number of countries that have communicated establishment or operationalization of an integrated policy/ strategy/ plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
 SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix Target: 9023 MWh renewable power supplied for the Monitored Period 01	7.2.1: Renewable energy share in the total final energy consumption
 SDG 8: Decent Work and Economic Growth	8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value Target: Training, O&M staff	8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

B.3. Baseline Emissions>>

In the absence of the project activity, the equivalent amount of electricity would have been imported

from the regional grid (which is connected to the unified Indian Grid system), which is carbon intensive due to predominantly sourced from fossil fuel-based power plants.



Thus, this project activity was a voluntary investment which replaced equivalent amount of electricity from the Indian grid. The project proponent was not bound to incur this investment as it was not mandatory by national and sectoral policies. Thus, the continued operation of the project activity would continue to replace fossil fuel-based power plants and help fight against the impacts of climate change. The Project Proponent hopes that UCR carbon incentives under the CoU program from 2013-2022 vintage years accumulated as a result of carbon credits generated will help repay the project costs, scale up the project capacity and help in the continued maintenance of this project activity. The baseline scenario identified at the MR stage of the project activity is:

- *The product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.*

B.4. Debundling>>

This project activity is not a de-bundled component of a larger project activity.

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

VALIDITY: Valid from 08 Sep 2022 onwards

Applied UNFCCC CDM Modified Baseline Methodology: ***AMS-I.F. – Renewable electricity generation for captive use and mini-grid*, ver 05**

This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit, i.e. in the absence of the project activity, the users would have been supplied electricity from:

(a) A national or a regional grid (grid hereafter)

Methodology key elements

Typical project(s)	Production of electricity using renewable energy technologies such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s)
Type of GHG emissions mitigation action	Renewable energy: Displacement of electricity that would be provided to the user(s) by more-GHG-intensive means

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

The project status is corresponding to the methodology AMS-I.F., version 05 and applicability of methodology is discussed below:

Table 2. Applicability of AMS-I.D, AMS-I.F and AMS-I.A based on project types

	Project type	AMS-I.A	AMS-I.D	AMS-I.F
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
4	Project supplies electricity to a mini grid[5] system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	√		

This project is included within the UCR Standard Positive List of technologies and are within the small-scale CDM thresholds (e.g. installed capacity up to 15 MW). The positive list comprises of: (a) renewable electricity generation technologies of installed capacity up to 15 MW, (b) Solar technologies (photovoltaic and solar thermal electricity generation);
Project activity involves installation of captive use solar photovoltaic power generation with capacity 2.7 MW which is less than 15MW.
The project activity involves installation of Solar PV (SPV). Hence, the activity is not a hydro power project or combined heat and power (co-generation) systems.
Project displaces grid electricity consumption (e.g. grid import).
The project activity is a new installation, it does not involve any retrofit measures nor any replacement.
Landfill gas, waste gas, wastewater treatment and agro-industries projects are not relevant to the project activity. No biomass is involved, the project is only a solar power project.
The technology/measure allowed under the grid connected Solar PV based generation systems displace equivalent quantity of electricity from the regional grid in India. The testing/certifications; all the equipment of the solar project activity will be complying with applicable national/ international standards. The above details may be verified from one or more of the following documents: □ Technology Specification provided by the technology supplier □ Purchase order copies □ EPC contracts □ Power purchase agreement □ Project commissioning certificates
The project activity is a voluntary coordinated action
As per the Ministry of Environment and Forest (MoEF), Govt. of India Office Memorandum dated 13/05/2011, it had received specific clarification regarding the applicability of EIA Notification, 2006 in respect of Solar Photo Voltaic (PV) Power plants. It was further clarified in the above memorandum that both Solar PV power projects are not covered under the ambit of EIA Notification, 2006 and no environment clearance is required for such projects under provisions thereof.
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). Hence this methodology is applicable and fulfilled for the solar project activity.
The project activity involves installation of new power plants at listed sites where there was no renewable energy power plant operating prior to implementation of project.
Project and leakage emissions from biomass are not applicable.

C.3 Applicability of double counting emission reductions >>

The renewable electricity units are monitored with a unique energy meter/s located within the project activity boundary. The project activity will not apply to India's NDC carbon ecosystem/market and has not been registered under any other GHG mechanism for carbon offsets/credits in the past.

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

The spatial extent of the project boundary includes industrial, commercial facilities consuming energy generated by the system. In the case of electricity generated and supplied to distributed users (e.g. residential users) via mini/isolated grid(s) the project boundary may be confined to physical, geographical site of renewable generating units. The boundary also extends to the project power plant and all power plants connected physically to the electricity system as per the requirements provided in TOOL07 to which the project power plant is connected.

	Source	GHG	Included?	Justification/Explanation
Baseline	Grid-connected electricity	CO_2	**Included**	Major source of emission
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
Project Activity	Greenfield solar power project	CO_2	Excluded	Excluded for simplification. This is conservative
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative

Net GHG Emission Reductions and Removals

Thus, ERy = BEy – PEy – LEy Where:

ERy = Emission reductions in year y (tCO2/y)

BEy = Baseline Emissions in year y (t CO2/y)

PEy = Project emissions in year y (tCO2/y)

According to AMS-I.F, project emissions (PEy) for the following categories of project activities, including relevant definitions, shall be considered following the procedure described in the ACM0002:

- Emissions related to the operation of geothermal power plants (e.g. noncondensable gases, electricity/fossil fuel consumption);
- Emissions from water reservoirs of hydro power plants.
- For the other types of renewable energy projects, PEy = 0

Hence PEy = 0 since the project is a solar power project.

LEy = Leakage emissions in year y (tCO2/y)

Commissioning Date of first installation: 25/11/2020

Estimated Annual Emission Reductions: $BE_y = EG_{BL,yl} \times EF_{,CO2,GRID,y}$

BE_y = Emission reductions in a year y.

where:

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

$EF_{Grid,CO2,y}$ = CO_2 emission factor of the Indian grid in year y (t CO_2/MWh) as determined by the UCR CoU Standard.

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

Baseline emissions are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor

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

- *The product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.*

Estimated Annual Emission Reductions: $BE_y = EG_{BL,yl} \times EF_{,CO2,GRID,y}$

BE_y = Emission reductions in a year y.

where:

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

$EF_{Grid,CO2,y}$ = CO_2 emission factor of the grid in year y (t CO_2/MWh) as determined by the UCR Standard.

$EF_{grid,y}$ = UCR recommended conservative Indian grid emission factor of 0.9 tCO2/MWh has been considered, this is conservative as compared to the current combined margin Indian grid emission factor of **0.9185 tCO2/MWh** (assuming 50% equal distribution between OM and BM) which can be derived from Database of Central Electricity Authority (CEA), India. (Reference: General Project Eligibility Criteria and Guidance, UCR Standard, page 4), and higher still if considered as an intermittent form of energy. Hence, the same emission factor has been considered to calculate the emission reduction.

For the other types of renewable energy projects, such as solar energy, PEy = 0

Net GHG Emission Reductions and Removals

Thus, ERy = BEy – PEy – LEy

Where:

ERy = Emission reductions in year y (tCO2/y)

BE_y = Baseline Emissions in year y (t CO2/y)

PE_y = Project emissions in year y (tCO2/y)

LE_y = Leakage emissions in year y (tCO2/y)

Project Emissions

PE_y = 0

Leakage Emissions
All projects other than Biomass projects have zero leakage.

Hence, $LE_y = 0$

Total Emission Reduction (ER) by the project activity for the current monitoring period is calculated as below:

Year	KWh	MWh	ER (tCO2)
2020	579803.79	579.803793	521
2021	4196439.00	4196.439	3776
2022	4247396.00	4247.396	3822
	Total	**9023.638793**	**8119**

C.6. Prior History>>

The project was not applied under any other GHG mechanism. Hence project will not cause double accounting of carbon credits (i.e., COUs).

C.7. Monitoring period number and duration>>

Monitoring Period No: 01
1st Monitoring Period: 25/11/2020 to 31/12/2022

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

There is no changes applicable.

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

There is no changes applicable.

C.10. Monitoring plan>>

The project activity essentially involves generation of electricity from Solar Radiation, the employed SPV can only convert solar energy into electrical energy and cannot use any other input fuel for electricity generation, thus no special ways and means are required to monitor leakage from the project activity.

PP is the project implementer and monitors the electricity generated by the project activity. The data is already archived electronically and is stored since 25/11/2020.

To ensure that the data is reliable and transparent, the PP has established Quality Assurance and Quality Control (QA&QC) measures to effectively control and manage data reading, recording, auditing as well as archiving data and all relevant documents. The data is monitored on a daily basis and is submitted to PP on a daily basis.

PP has implemented QA&QC measures to calibrate and ensure the accuracy of metering and safety aspects of the project operation. The metering devices are calibrated and inspected properly and periodically, according to state electricity board's specifications and requirements to ensure

accuracy in the readings.

<table>
<tr><td>Data / Parameter:</td><td>EGy</td></tr>
<tr><td>Data unit:</td><td>MWh

<table><tr><th>Year</th><th>KWh</th><th>MWh</th></tr><tr><td>2020</td><td>579803.79</td><td>579.803793</td></tr><tr><td>2021</td><td>4196439.00</td><td>4196.439</td></tr><tr><td>2022</td><td>4247396.00</td><td>4247.396</td></tr><tr><td></td><td>Total</td><td>9023.638793</td></tr></table></td></tr>
<tr><td>Description:</td><td>Quantity of net electricity generated by the Project Activity in year y</td></tr>
<tr><td>Source of data:</td><td>Main Meter Unit Readings, Direct measurement</td></tr>
<tr><td>Measurement procedures (if any):</td><td>Daily : Direct measurement using electricity meters</td></tr>
<tr><td>Monitoring frequency:</td><td>Continuously, aggregated at least annually
Calibration Frequency: The calibration is done following the relevant applicable National Guidelines updated from time to time during the operation of the project activity.

Entity responsible: Aggregator

The electricity meter is subject to regular maintenance and testing in accordance with the stipulation of the meter supplier or national requirements. The calibration of meters, including the frequency of calibration, is done in accordance with national standards or requirements set by the meter supplier. The accuracy class of the meters is in accordance with the stipulation of the meter supplier or national requirements. The PP calibrates the meters every 3 years and uses the meters with at least 0.5 accuracy class (e.g. a meter with 0.2 accuracy class is more accurate and thus it is accepted).</td></tr>
<tr><td>QA/QC procedures:</td><td>Monitoring frequency: Continuous
Measurement frequency: Hourly
Recording frequency: Monthly</td></tr>
<tr><td>Purpose of Data</td><td>-Calculation of baseline emissions</td></tr>
</table>

SECURE

METER TEST CERTIFICATE

Serial number : X1926301

Accuracy Class : 0.5s Ref. Standard : IEC:62053-22

1.	AC VOLTAGE TEST	:- PASS
2.	TEST OF NO LOAD CONDITION	:- PASS
3.	POWER CONSUMPTION	:- PASS
4.	STARTING CURRENT	:- PASS
5.	TEST OF METER CONSTANT	:- PASS
6.	LIMITS OF ERROR	

6(a) Conditions-Vref = 57.7-240V Ib = 1-5A Amb. Temp. = 23°C +/- 2°C Relative Humidity < 70%.
6(b) Errors shown in the tables are given after accounting the error of reference meter.
6(c) Reference meter serial no. MET00010 class 0.2S traceable to national standards.
6(d) Errors shown in the tables are taken at Ib = 1A(100%)

IMPORT MODE ERRORS

%Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.15	-0.14	-0.14
100	-0.07	-0.09	-0.07
10	0.01	-0.02	-0.01
5			-0.12
2	0.05	-0.24	
1			-0.27

%Reactive Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead
1000	-0.14	-0.14
100	-0.09	-0.07
10	-0.03	-0.01

EXPORT MODE ERRORS

%Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.10	-0.07	-0.08
100	-0.02	-0.07	-0.05
10	0.06	-0.06	-0.03
5			-0.03
2	0.17	-0.08	
1			0.00

Date :- 25/03/2023

This is a computer generated test certificate.No signature required.

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SECURE

METER TEST CERTIFICATE

Serial number : X1300279

Accuracy Class : 0.5s Ref. Standard : IEC : 62053-22

1.	AC VOLTAGE TEST	:- PASS
2.	TEST OF NO LOAD CONDITION	:- PASS
3.	TESTING OF STARTING CURRENT CONDITION	:- PASS
4.	INSULATION RESISTANCE TEST	:- PASS
5.	POWER CONSUMPTION TEST	:- PASS
6.	TEST OF METER CONSTANT	:- PASS

7. LIMITS OF ERROR
7(a) Conditions-Vref = 57.7-240V Ib = 1-5A Amb. Temp. = 23°C +/- 2°C Relative Humidity < 70%.
7(b) Errors shown in the tables are given after accounting the error of reference meter.
7(c) Reference meter serial no. METD0016 class 0.2s traceable to national standards.
7(d) Errors shown in the tables are taken at Ib = 1A(100%)

IMPORT MODE ERRORS

(e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.03	0.01	0.02
500	-0.04	0.01	0.00
100	-0.02	-0.01	0.01
50	0.06	0.07	0.05
10	-0.02	-0.01	0.03
5			-0.05
2	-0.21	-0.14	
1			-0.14

(f) %Reactive Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead
1000	0.09	0.02
500	-0.06	0.00
100	-0.02	-0.07
50	0.03	0.09
10	0.05	-0.03

EXPORT MODE ERRORS

(e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.01	0.01	0.02
500	-0.04	0.00	-0.01
100	0.01	-0.04	-0.01
50	0.00	0.08	0.04
10	0.04	-0.06	0.01
5			0.01
2	0.18	-0.17	
1			-0.12

Date :- 15/01/2020

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SECURE

METER TEST CERTIFICATE

Serial number : X1313197

Accuracy Class : 0.2s Ref. Standard : IEC : 62053-22

1.	AC VOLTAGE TEST	:- PASS
2.	TEST OF NO LOAD CONDITION	:- PASS
3.	TESTING OF STARTING CURRENT CONDITION	:- PASS
4.	INSULATION RESISTANCE TEST	:- PASS
5.	POWER CONSUMPTION TEST	:- PASS
6.	TEST OF METER CONSTANT	:- PASS
7.	LIMITS OF ERROR	

7(a) Conditions-Vref = 57.7-240V Ib = 1-5A Amb. Temp. = 23°C +/- 2°C Relative Humidity < 70%.
7(b) Errors shown in the tables are given after accounting the error of reference meter.
7(c) Reference meter serial no. 050048407 class 0.02S traceable to national & international standards.
7(d) Errors shown in the tables are taken at Ib = 1A(100%)

IMPORT MODE ERRORS

'e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.05	0.03	0.01
500	0.01	0.02	0.02
100	0.01	0.00	0.05
50	0.06	0.01	0.01
10	0.07	-0.01	0.02
5			0.00
2	0.02	-0.06	
1			-0.16

(f) %Inactive Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead
1000	0.00	-0.04
500	0.00	0.02
100	0.02	0.01
50	0.01	0.06
10	0.00	0.08

EXPORT MODE ERRORS

(e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	0.00	0.03	0.02
500	0.01	0.02	0.02
100	0.03	0.02	0.03
50	0.05	0.02	0.02
10	0.11	0.02	0.04
5			0.05
2	0.25	0.06	
1			0.00

Date :- 04/02/2020

This is a computer generated test certificate.No signature required.

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SECURE

METER TEST CERTIFICATE

serial number : X1050917

Accuracy Class : 0.2s Ref. Standard : IEC : 62053-22

1.	AC VOLTAGE TEST	:- PASS
2.	TEST OF NO LOAD CONDITION	:- PASS
3.	TESTING OF STARTING CURRENT CONDITION	:- PASS
4.	INSULATION RESISTANCE TEST	:- PASS
5.	POWER CONSUMPTION TEST	:- PASS
6.	TEST OF METER CONSTANT	:- PASS
7.	LIMITS OF ERROR	

7(a) Conditions-Vref = 57.7-240V Ib = 1-5A Amb. Temp. = 23°C +/- 2°C Relative Humidity < 70%.
7(b) Errors shown in the tables are given after accounting the error of reference meter.
7(c) Reference meter serial no. 050048407 class 0.02S traceable to national & international standards.
7(d) Errors shown in the tables are taken at Ib = 1A(100%)

IMPORT MODE ERRORS

e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	-0.02	0.04	0.03
500	0.02	0.03	0.03
100	0.02	0.02	0.06
50	0.09	0.02	0.04
10	0.08	0.01	0.03
5			0.01
2	0.05	-0.10	
1			-0.18

(f) %Reactive Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead
1000	0.01	-0.01
500	0.02	0.03
100	0.01	0.02
50	0.01	0.09
10	0.03	0.10

EXPORT MODE ERRORS

(e) %Active Errors(Balance Mode)

Load % Ib	0.5 Lag	0.8 Lead	UPF
1000	0.01	0.05	0.02
500	0.02	0.03	0.03
100	0.05	0.03	0.03
50	0.08	0.02	0.03
10	0.12	0.03	0.05
5			0.05
2	0.26	0.02	
1			-0.03

Date :- 22/04/2019

This is a computer generated test certificate.No signature required.

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Data/Parameter	EF, *CO2, GRID, y*
Data unit	tCO2 /MWh
Description	Fixed
Value of data applied	0.9 UCR Standard Protocol As per Standard
Measurement methods and procedures	A "grid emission factor" refers to a CO2 emission factor (tCO2/MWh) which will be associated with unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 tCO2/MWh for the 2013 - 2022 years as a fairly conservative estimate for Indian projects not previously verified under any GHG program. Hence, the same emission factor has been considered to calculate the emission reduction under conservative approach.
Monitoring frequency	NA
Purpose of data	To estimate baseline emissions
Additional Comment	The combined margin emission factor as per CEA database (current Version 16, Year 2021 and 2022) results into higher emission factor. Hence for 2021-22 vintage UCR default emission factor remains conservative.