# Monitoring Report

CARBON OFFSET UNIT (CoU) PROJECT

**Title: 0.27 MW Captive Solar Power Project ZIPL, Gujarat, India.**

**UCR PROJECT ID: 415**
**MR Version** 1.0
**MR Date**: 27/02/2024
**First CoU Issuance Period**: 01/03/2019 to 31/12/2023 (04 years, 09 months)
**First Monitoring Period**: 01/03/2019 to 31/12/2023 (04 years, 09 months)

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

| Monitoring Report | |
|---|---|
| Title of the project activity | 0.27 MW Captive Solar Power Project ZIPL, Gujarat, India. |
| UCR Project Registration Number | 415 |
| MR Version | 1.0 |
| Scale of the project activity | Small Scale |
| Completion date of the MR | 27/02/2024 |
| Project participants | Project Proponent: Zydus Infrastructure Pvt. Ltd. (ZIPL), Ahmedabad, Gujarat. |
| Host Party | India |
| SDGs | SDG 7: Affordable and Clean Energy<br>SDG 8: Decent Work and Economic Growth<br>SDG 13: Climate Action |
| Applied methodologies and standardized baselines | Type I (Renewable Energy Projects)<br><br>**UNFCCC CDM Methodology Category**<br><br>**AMS-I.F.** Small-scale Methodology, *Renewable electricity generation for captive use and mini-grid Ver 05*<br><br>UCR Protocol Standard Baseline EF |
| Sectoral scopes | 01 Energy industries (Renewable / Non-renewable Sources) |
| Estimated amount of GHG emission reductions for the crediting period per year. | **01/03/2019-31/12/2019**: **283** CoUs (**283** $tCO_2eq$) |
| | **01/01/2020-31/12/2020**: **346** CoUs (**346** $tCO_2eq$) |
| | **01/01/2021-31/12/2021**: **308** CoUs (**308** $tCO_2eq$) |
| | **01/01/2022-31/12/2022**: **312** CoUs (**312** $tCO_2eq$) |
| | **01/01/2023-31/12/2023**: **291** CoUs (**291** $tCO_2eq$)<br><br>**Total for period 01/03/2019-31/12/2023**: **1540** CoUs (**1540** $tCO_2eq$) |

## SECTION A. Description of project activity

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

The project activity titled, 0.27 MW Captive Solar Power Project ZIPL, Gujarat, India is located in Village Matoda, Taluka Sanand, District Ahmedabad, State Gujarat, Country India.

This is a single project activity of total installed capacity 0.27 MW, which is a ground mounted captive solar power generation activity for captive use by M/s Zydus Infrastructure Pvt. Ltd. (ZIPL, Project Proponent or PP). Zydus Cadila, group of companies, is a fully integrated global healthcare and pharmaceutical provider, which has set up a Pharmaceutical Special Economy Zone (SEZ) called "Pharmez", about 25 kilometers from Ahmedabad, Gujarat. The Zydus group has undertaken focused efforts towards solar energy, water and wastewater recycling and reuse across all of its operations in India.

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.

There is a growing consensus that urgent action is needed on a global scale to ramp up the adoption of clean technology by 2030 in order to prevent irreversible climate catastrophe. In this endeavour, policies promoting carbon incentives, such as those seen in initiatives like the UCR CoU, will be instrumental. India has set ambitious targets, aiming for 450 GW of renewable energy capacity and 500 GW of non-fossil fuel capacity by 2030. Currently, with 110 GW of capacity already in operation (as of 2021-22), the nation needs to add 340 GW of new renewable energy capacity over the next eight years, averaging 42.5 GW annually. This significant expansion is critical for combating climate change and inspiring hope globally. To meet these targets, India must increase its solar capacity fivefold, reaching 280 GW from the current 54 GW. This requires an average annual addition of 29 GW of new solar capacity until the end of the decade – a pace notably faster than the nation's previous achievement of 15 GW renewable energy (including 14 GW of solar and 1 GW of wind) added in fiscal year 2021-22.

### a) Purpose of the project activity:

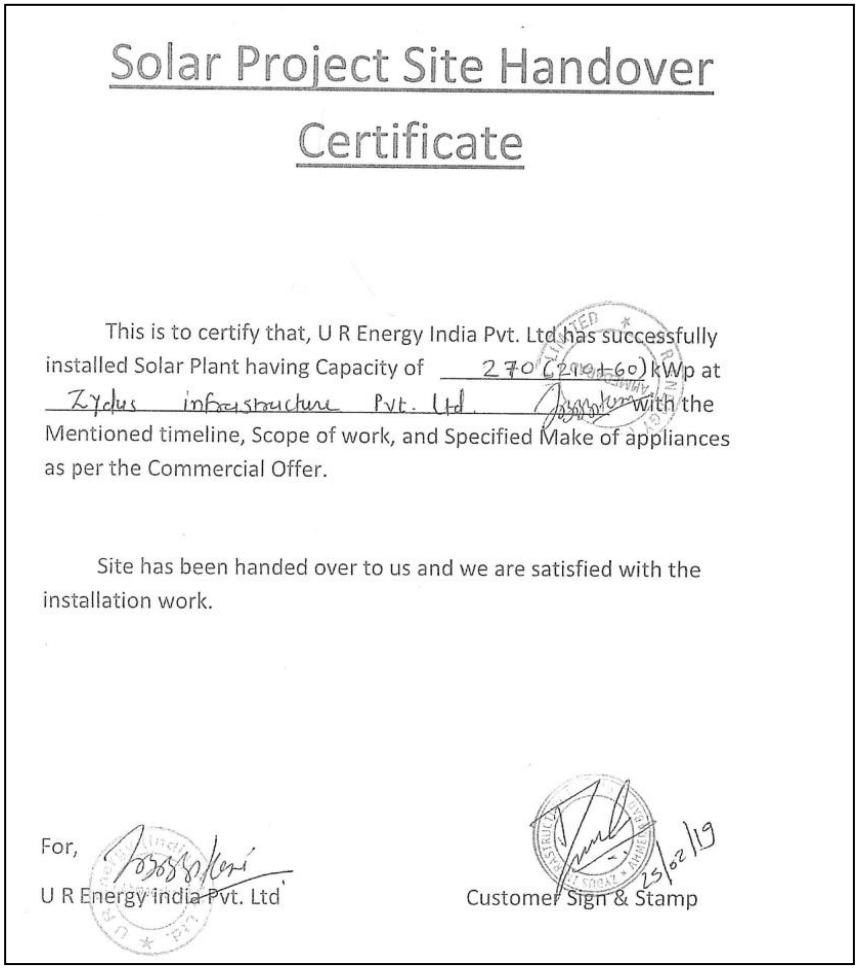
The objective of the proposed project is to produce electricity through a sustainable and renewable energy source: solar radiation. Specifically, the project involves setting up and operating a 0.27 MW solar power plant in Sanand Taluka, located in the state of Gujarat:

| Village | Taluka | Type | Total installed capacity KW | Commissioning date |
|---|---|---|---|---|
| Matoda | Sanand | ground mounted - Captive | 270 | 20.01.2019 |

As per the ex-post calculations, this project activity generated approximately **1713.8** MWh of renewable electricity over the entire monitored period. The project employs Polycrystalline solar photovoltaic technology to generate environmentally friendly energy.

Solar photovoltaic power generation is inherently environmentally friendly, given its avoidance of fossil fuel combustion and greenhouse gas (GHG) emissions. A photovoltaic module consists of interconnected photovoltaic cells enveloped in an environmentally protective laminate. These modules act as the basic components of a complete PV (photovoltaic) generating unit. When several PV panels are assembled on a frame, they constitute a PV Array. By replacing fossil fuel-based electricity generation within the regional grid, this project aids in curbing GHG emissions.

**Commissioning Certificate**



Solar Project Site Handover Certificate

This is to certify that, U R Energy India Pvt. Ltd has successfully installed Solar Plant having Capacity of 270 (270+60) kWp at Zydus Infrastructure Pvt. Ltd. with the Mentioned timeline, Scope of work, and Specified Make of appliances as per the Commercial Offer.

Site has been handed over to us and we are satisfied with the installation work.

For,
U R Energy india Pvt. Ltd

25/02/19
Customer Sign & Stamp

URenergy
USA | UK | AFRICA | DUBAI | INDIA | CHINA | AUSTRALIA
Energy for All

Toll Free No : 1800 120 4011
Website : www.urenergyglobal.com
Email : india@urenergyglobal.com

# INSTALLATION REPORT

| Component | Observation |
|---|---|
| Customer Name | Zydus Infrastructure Pvt. Ltd. |
| Project No. | URE-18-19-ds-C-B-094 |
| Site/Location with Complete Address | Zydus Towers, Satellite Cross Road, Matoda, Ta- Sanand. |
| Capacity of system installation (kWp) | 60.16 KWp |
| Tilt Angle (Degree) | 20 ° |
| Azimuth Angle (Degree) | 0 ° If grater than 10° then inform the customer for lower generation effect. |
| Specification of the Modules Type of modules (multi) | Polycristalline |
| Make of Module | Seraphim |
| Wattage and no of modules | 320 Wp, 188 |
| No of series & Parallel | 18P5Nos, 24P1No, 20P2Nos, 17P2No. |
| Inverter : Make & Rating | Solis-50K, Solis-10K |
| AC Output | 415V A.C |
| Input Voltage to Inverter | 1000V D.C |
| Date of Installation | 28/01/2019 |
| Technical Person Trained to maintain system Name with Mobile no. | |

**ON GRID SYSTEM :**

| | | PV1 | | PV2 | | PV3 | |
|---|---|---|---|---|---|---|---|
| DC | Voltage | 727V dc | 749V dc | 750V dc | 691V dc | 814V dc | |
| | Amp. | | | | | | |

| Grid | R | Y | B | N |
|---|---|---|---|---|
| Voltage | | | | |
| Amp. | | | | |

**DC, AC & Earthing Cables**

| Sr No | Cable Details (From – To) | Cable Type | Size | Length |
|---|---|---|---|---|
| 1 | Inv. to ACDB | A.C. | 25Sq x4C., 4Sq x4C., | 7m, 10m |
| 2 | Panel to DCDB | D.C. | 6Sq x1C | 700m |
| 3 | ACDB to AC Panel | A.C. | 400Sq x3.5C | 450m |
| 4 | Structure to Earthing pit | Earthing | 6Sq x1C | 250m |
| 5 | L.A. to E.P. | Earthing | 16Sq x1C | 30m |

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

The project employs clean renewable solar energy to generate electricity. The utilized technology is regarded as one of the most environmentally friendly options available, as the operation of Solar photovoltaic systems does not emit any greenhouse gases (GHGs) or other harmful substances, unlike conventional power plants.

A Photovoltaic module comprises numerous photovoltaic cells connected by circuits and enclosed in an environmentally protective laminate. These modules serve as the fundamental components of the complete PV generating unit. Multiple PV panels mounted on a frame are collectively referred to as a PV Array. The project has adopted a reliable and well-established technology to ensure that only environmentally safe and sustainable practices are employed, thereby contributing to the reduction of GHG emissions.

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

- ✓ Solar Photovoltaic modules
- ✓ Inverters
- ✓ Transformers
- ✓ Circuit breakers
- ✓ Mounting structures
- ✓ Cables and hardware.
- ✓ Junction box and distribution boxes.
- ✓ Earthing kit.
- ✓ Control room equipment.
- ✓ System for control and monitoring.
- ✓ Evacuation system

In contrast to fossil fuel-fired power plants, the technology utilized in this project poses no environmental threat. It is a proven and reliable technology, ensuring safety and soundness in its application. Importantly, the project does not entail the transfer of technology from any Annex 1 country, nor does it receive any public funding from Official Development Assistance (ODA) or Annex I countries.

| Parameter | Description |
|---|---|
| Total number of Photovoltaic Modules | 842 |
| Rating of Photovoltaic Module | 0.320 KWP- Kilo watt peak / 320 WP- watt peak |
| Technology | Poly Crystalline Silicon |
| Solar Panel Maker | Seraphim |
| Meter Maker | Secure |
| Commissioning Date | 20.01.2019 |
| Inverter Make | Solis |
| Total no. of inverters | 6 |

# OFFICE OF THE CHIEF ELECTRICAL INSPECTOR

Office of the Chief Electrical InspectorUdyog Bhavan, 6th Floor, Block No.18, Sector-11, Gandhinagar.

| | | |
|---|---|---|
| No/CEI/Gan/Certi/13741/2019<br>Date : 5/2/2019 | E-mail :<br>cei-epd@gujarat.gov.in | ph no : (079) 23256642 to 44<br>fax no : (079) 232 566 51 |


**To**
**Zydus Infrastructure Pvt Ltd.**
**Zydus Infrastructure Pvt. Ltd, Zydus Tower , Satellite Cross Road**
**Matoda, Ta- Sanand.**
**Vi.Matoda**
**Ta.Sanand**
**Dist.Ahmedabad, 382213**

**Subject** **Initial inspection for the electrical installation of 269.44 KW Grid Connected Solar Power Plant along with associated equipments at Zydus Infrastructure Pvt Ltd., Zydus Infrastructure Pvt. Ltd, Zydus Tower , Satellite Cross Road, Matoda, Ta- Sanand., Vi.Matoda, Ta.Sanand, Dist.Ahmedabad, Gujarat, 382213 (Consumer No. 18415).**

**Sir,**

Initial Inspection of the Electrical Installation of 269.44 KW Grid Connected Solar Power Plant at Zydus Infrastructure Pvt. Ltd, Zydus Tower , Satellite Cross Road, Matoda, Ta- Sanand., Vi.Matoda, Sanand, Ahmedabad, Gujarat, 382213 for Zydus Infrastructure Pvt Ltd. has been carried out by EI, Ahmedabad on 02/02/2019 and the same is found in order in accordance with the drawing approved vide this office letter No: No/CEI/Gan/Plan/13177/2019, Date: 24/01/2019. The details of the same are as following.

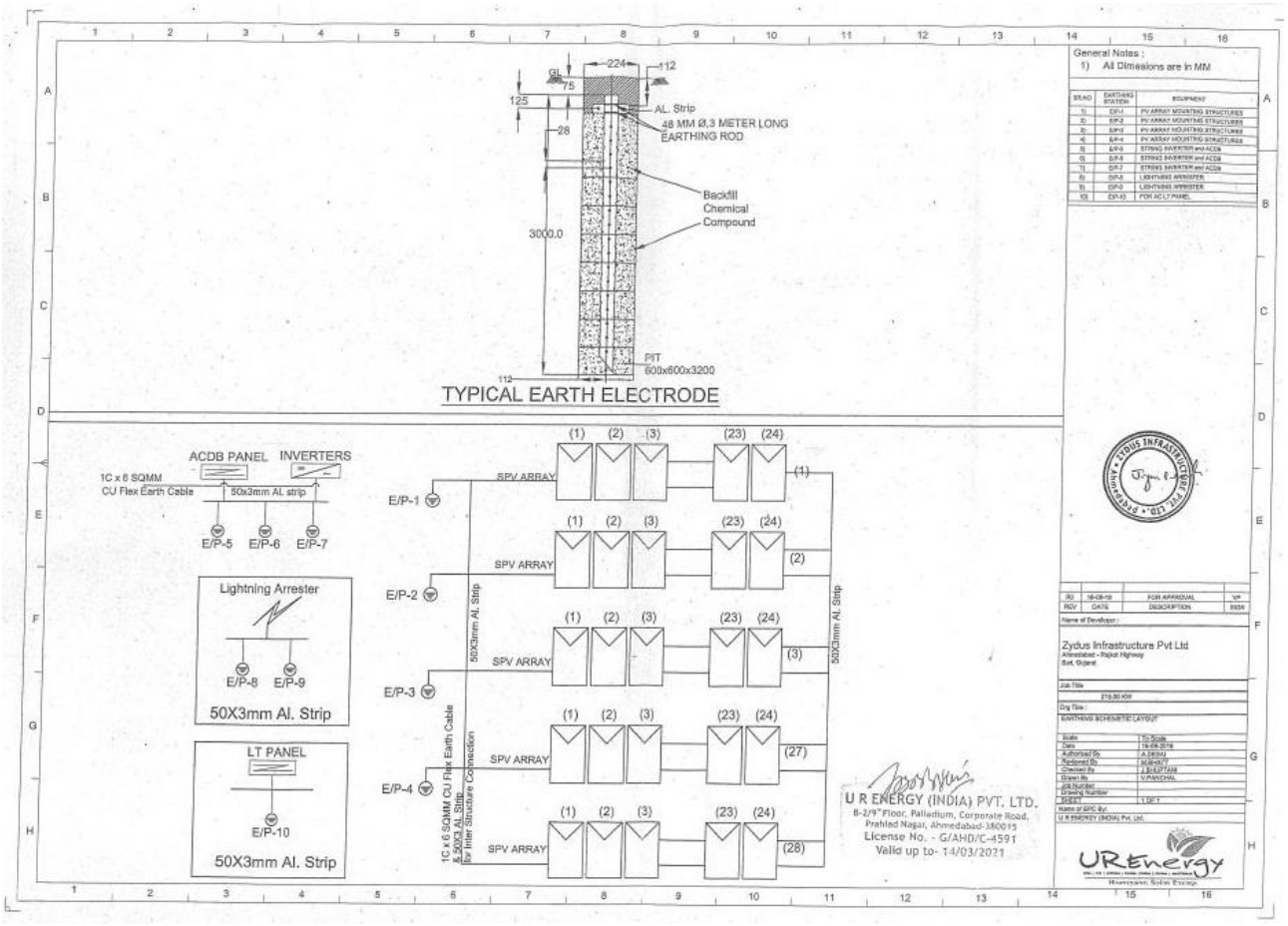
## Details of Installation

| No. | Particular | Solar PV Cells (Modules) |
|---|---|---|
| 1 | Make | Seraphim |
| 2 | Capacity (Wp) | 320 |
| 3 | Total No. of Modules | 842 |
| 4 | Total Capacity (KWp) | 269.44 |
| **Total (KWp)** | | **269.44** |

| No. | Particular | Inverters |
|---|---|---|
| 1 | Make | Solis,Solis |
| 2 | Capacity in KW/KVA | 50KW,10KW |
| 3 | No. Of Inverters | 5,1 |
| 4 | Output Voltage in AC(V) | 415,415 |
| 5 | Sr.No. | 110610185160176, 110610185260180, 110610185260112, 110610185260178, 110610185260155 ,110420185260022 |

As provided under the Regulation 32 of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010 permission is hereby granted to energize the above installation along with the associated equipments.

**Your's Faithfully**




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

**UCR Project ID**: 415
**Commissioning Date**: 20/01/2019
**1st CoU Issuance Period:** 01/03/2019 to 31/12/2023 (04 years 09 months)
**1st Monitoring Period**: 01/03/2019 to 31/12/2023 (04 years 09 months)

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

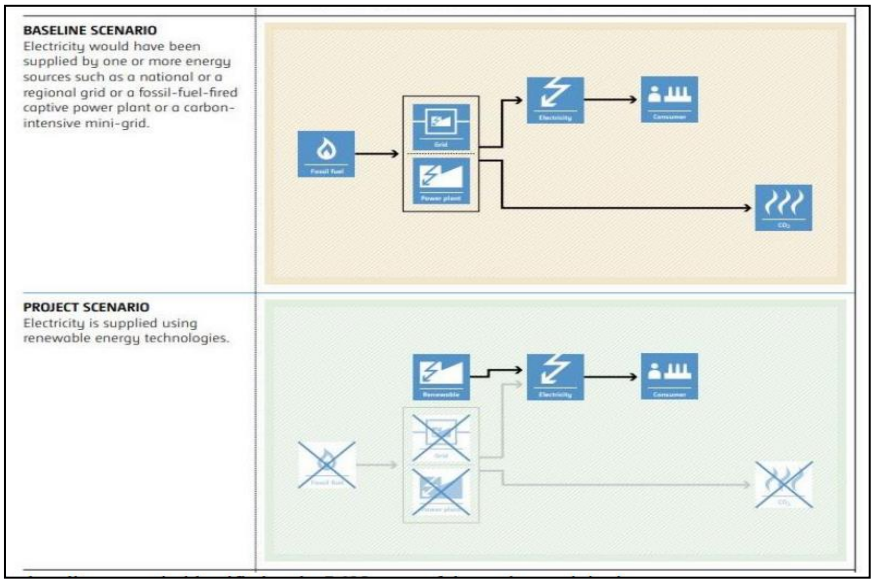
The total GHG emission reductions achieved in this monitoring period is as follows:

| **Summary of the Project Activity and ERs Generated for the Monitoring Period** | |
|---|---|
| Start date of this Monitoring Period | 01/03/2019 |
| Carbon credits claimed up to | 31/12/2023 |
| Total ERs generated ($tCO_2eq$) | 1540 $tCO_2eq$ |
| 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:<br>Displacement of electricity that would be provided to the user(s) by more-GH-intensive means. |




As per the adapted 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 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. |
| District | : Ahmedabad |
| Village | : Matoda |
| Taluka | : Sanand |
| State | : Gujarat |
| Pincode | : 382213 |
| Latitude | : 22°52'51.6"N & 22°52'55.8"N |
| Longitude | : 72°24'24.5"E & 72°24'28.5"E |
| Project Commissioning Year | : 20.01.2019.5 |

The representative location map is included below:



## A.3. Parties and project participants >>

| Party (Host) | Participants |
|---|---|
| India | Project Proponent: PHARMEZ Special Economic Zone, Zydus Infrastructure Pvt. Ltd., Village: Matoda, Taluka: Sanand, District: Ahmedabad, Gujarat.<br>Contact: Mr. Kapil Acharya - GM Operations<br>Email: kapilacharya@zydusinfra.com |

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

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

TYPE I - 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 >>

**First CoU Issuance Period:** 01/03/2019 to 31/12/2023 (04 years, 09 months)
**First Crediting Period:** 01/03/2019 to 31/12/2023 (04 years, 09 months)

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

UCR Aggregator: Kapil Acharya
UCR ID: 623322759
Email Address: kapilacharya@zydusinfra.com
Company Name: Zydus Infrastructure Pvt. Ltd. (PP)
Company Website: https://www. zydusinfra.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.

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.

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 | 842 |
| Rating of Photovoltaic Module | 0.320 KWP- Kilo watt peak / 320 WP- watt peak |
| Technology | Poly Crystalline Silicon |
| Solar Panel Maker | Seraphim |
| Meter Maker | Secure |
| Commissioning Date | 20.01.2019 |
| Inverter Make | Solis |
| Total no. of inverters | 6 |

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(ies), 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:

- Solar Photovoltaic modules
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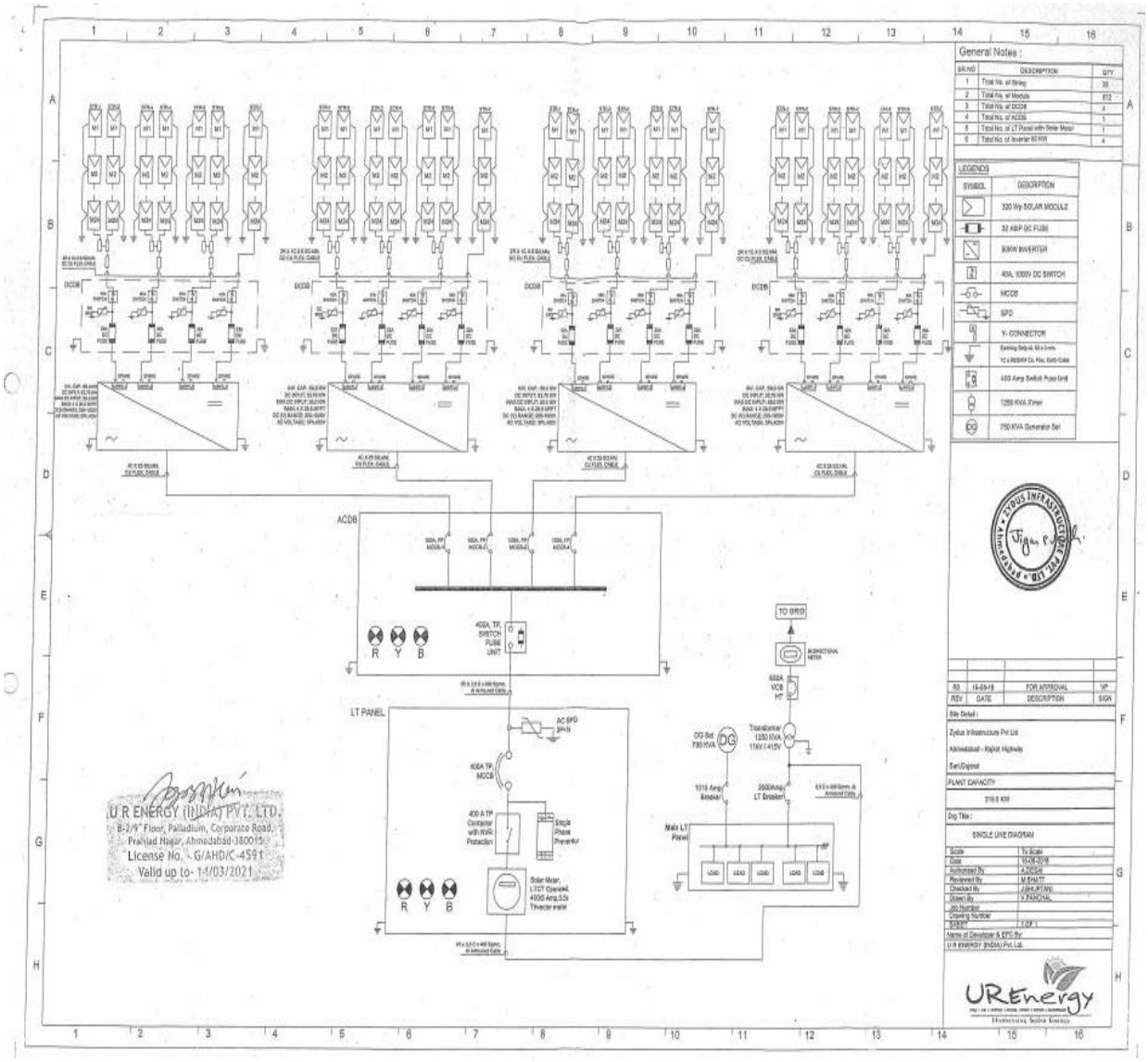
- Mounting structures
- Cables and hardware.
- Junction box and distribution boxes.
- Earthing kit.
- Control room equipment.
- System for control and monitoring.
- Evacuation system

| | | |
|---|---|---|
| Net Meter/ABT Meter details | Meter manufacture name | HPL |
| | Meter Serial No. | 000408 |
| Solar Meter details | Meter manufacture name | HPL |
| | Meter Serial No. | L554585, L554060 |
| GEDA Registration No. and Date | GMSPVIND21072018-23901<br>Date: 21/07/2018 | |
| Consumer No. | 18415 | |
| End use of Electricity | Captive Consumption | |
| Capacity of Module (Wp) , | 320 Wp | |
| Make of each photovoltaic modules | Seraphim | |
| Total number of photovoltaic modules | 842 Nos | |
| Type of Inverter | String Inverter | |
| Inverter Serial No. | 50KW-<br>110610185160176,110610185260180,110610185260112,<br>110610185260178,110610185260155<br>10KW-110420185260022 | |




| Sr. | Meter Sr. No: | Make | Type | Mfg. Year: | Imp/Kwh | Class: | Current |
|---|---|---|---|---|---|---|---|
| 1 | GHBD1348 | SCHNEIDER | ER300P | APR 2023 | 100 | 0.5s | -/5A, Ib=5A, Imax=10A |
| 2 | GHBD1356 | SCHNEIDER | ER300P | APR 2023 | 100 | 0.5s | -/5A, Ib=5A, Imax=10A |

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

The Indian economy heavily relies on coal as a primary fuel for energy generation and production processes. Thermal power plants, being the major consumers of coal in India, struggle to meet the basic electricity needs of a significant portion of the population. Consequently, there is a surge in electricity demand, placing substantial strain on the environment.

Addressing the issue of coal consumption entails adopting a multifaceted approach. This includes strategies aimed at reducing demand, minimizing energy wastage, and maximizing the utilization of renewable energy sources (RE). The current project, being a greenfield initiative, operates within the framework of grid power as the baseline. While renewable power generation gradually increases its contribution to the grid, the grid emission factor remains relatively high, delineating the grid as a distinct baseline.

The Government of India, recognizing the importance of sustainable development, has outlined specific indicators in the interim approval guidelines for projects involved in GHG mitigation efforts. These indicators encompass economic, social, environmental, and technological well-being. It is envisioned that the project will foster sustainable development through various means:

- Compliance: The solar project falls under the "White category" as per the Central Pollution Control Board, indicating minimal environmental impact and exempting it from the need for Environmental Clearance or Consent to Operate from the Pollution Control Board.

- Regulatory Exemptions: Small-scale Solar Projects are not subject to Environmental and Social Impact Assessment requirements according to Indian regulations, as discussed in the preceding section.

- Community Engagement: The project offers employment opportunities to local communities through both construction and maintenance activities, thereby contributing to local economic development and empowerment.

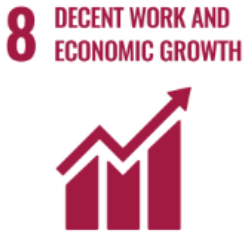
## United Nations Sustainable Development Goals:

The project generates electrical power by harnessing solar energy through photovoltaic cells, effectively replacing non-renewable fossil resources. This transition contributes to sustainable economic and environmental development. Without the project, the equivalent power generation would have relied on fossil fuel-dominated power stations.

Consequently, the renewable energy generation from the project leads to a reduction in greenhouse gas emissions. Positive contribution of the project to the following Sustainable Development Goals:

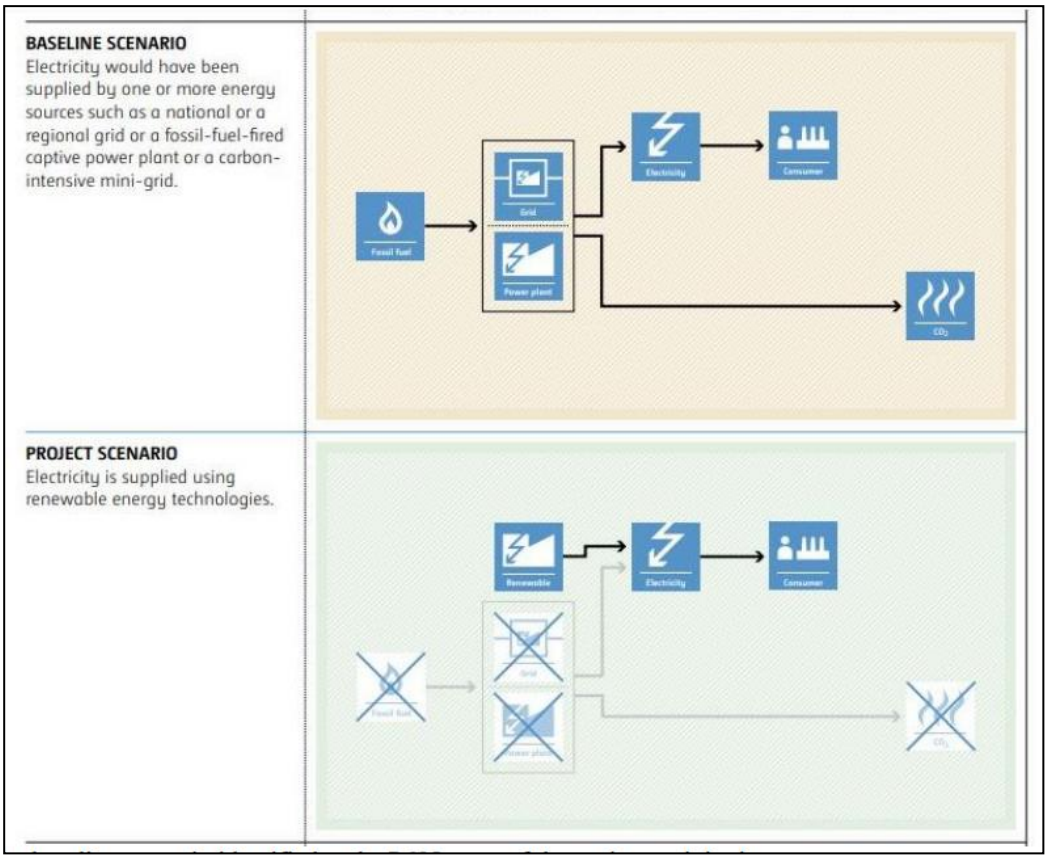
- SDG13: Climate Action
- SDG 7: Affordable and Clean Energy
- SDG 8: Decent Work and Economic Growth

| Development Goals | Targeted SDG | Target Indicator (SDG Indicator) |
|---|---|---|
|  SDG 13: Climate Action | 13.2: Integrate climate change measures into national policies, strategies and planning<br><br>Target: **1540 $tCO_2$** 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) |

| | | |
|---|---|---|
|  <br>SDG 7: Affordable and Clean Energy | 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix<br><br>Target: **1713 MWh** renewable power supplied for the Monitored Period 01 | 7.2.1: Renewable energy share in the total final energy consumption |
|  <br>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<br><br>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>>

If the project activity were absent, the equivalent amount of electricity would have been sourced from the regional grid, which is connected to the unified Indian Grid system. This grid predominantly relies on fossil fuel-based power plants, making it carbon-intensive. Therefore, this project activity represents a voluntary investment, replacing an equivalent amount of electricity sourced from the Indian grid. The project proponent was under no obligation to undertake this investment, as it was not mandated by national or sectoral policies. Consequently, the ongoing operation of the project will continue to displace fossil fuel-based power plants, contributing to the mitigation of climate change impacts. The Project Proponent anticipates that carbon incentives offered by the UCR program under the CoU from 2019-2023 vintage years, accrued through generated carbon credits, will assist in repaying project costs, expanding project capacity, and ensuring ongoing maintenance.




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 debundled component of a larger carbon or GHG registered 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

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 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:<br>Displacement of electricity that would be provided to the user(s) by more-GH-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 0.27 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:<br>• Technology Specification provided by the technology supplier.<br>• Purchase order copies<br>• EPC contracts<br>• Power purchase agreement<br>• Project commissioning certificates, etc |
| The project activity is a voluntary coordinated action.<br>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 >>

Renewable electricity units are meticulously monitored through digital means, utilizing distinct energy meters positioned within the project activity boundary. It's essential to note that the project activity will not participate in India's NDC carbon ecosystem/market and has not been enlisted under any other GHG mechanism for carbon offsets/credits previously.

## 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 and encompasses the physical, geographical site of the solar power plant and the energy metering equipment.

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, $ER_y = BE_y – PE_y – LE_y$

Where:
$ER_y$ = Emission reductions in year y ($tCO_2/y$)
$BE_y$ = Baseline Emissions in year y ($t\ CO_2/y$)
$PE_y$ = Project emissions in year y ($tCO_2/y$)

According to AMS-I.F, project emissions ($PE_y$) 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. non condensable gases, electricity/fossil fuel consumption);
- Emissions from water reservoirs of hydro power plants.
- For the other types of renewable energy projects, $PE_y = 0$

| Year/Month/KWh | Jan | Feb | Mar | Apr | May | Jun | Jul |
|---|---|---|---|---|---|---|---|
| 2019 | 0 | 0 | 37184 | 42939 | 42738 | 31186 | 22500 |
| 2020 | 30908 | 32929 | 39300 | 39360 | 38020 | 31640 | 31280 |
| 2021 | 28940 | 29160 | 36160 | 38040 | 35000 | 27860 | 23680 |
| 2022 | 28820 | 31740 | 36760 | 37280 | 28020 | 26100 | 21380 |
| 2023 | 27460 | 30820 | 31920 | 33180 | 35880 | 22160 | 21840 |

| Year/Month/KWh | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|
| 2019 | 23379 | 25034 | 36162 | 28529 | 25882 |
| 2020 | 21300 | 32300 | 32000 | 28200 | 27300 |
| 2021 | 24040 | 19140 | 31680 | 25300 | 23420 |
| 2022 | 24380 | 25040 | 32320 | 28280 | 27440 |
| 2023 | 23540 | 27860 | 28260 | 24400 | 16420 |

**Hence $PE_y$ = 0 since the project is a solar power project.**

$LE_y$ = Leakage emissions in year y ($tCO_2/y$)

Commissioning Date of first installation: 20/01/2019

## 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 Indian grid in year y (t $CO_2$/MWh) as determined by the UCR CoU Standard.

$EF_{Grid,y}$ = UCR recommended conservative Indian grid emission factor of 0.9 $tCO_2$/MWh has been considered, this is conservative as compared to the current combined margin Indian grid emission factor of **0.9185 $tCO_2$/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.

Net GHG Emission Reductions and Removals

Thus, $ER_y = BE_y - PE_y - LE_y$

Where:
$ER_y$ = Emission reductions in year y ($tCO_2/y$)

$BE_y$ = Baseline Emissions in year y (t $CO_2$/y)
$PE_y$ = Project emissions in year y (t$CO_2$/y)
$LE_y$ = Leakage emissions in year y (t$CO_2$/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 ($tCO_2$) |
|---|---|---|---|
| **2019** | 315533 | 315.533 | 283 |
| **2020** | 384537 | 384.537 | 346 |
| **2021** | 342420 | 342.42 | 308 |
| **2022** | 347560 | 347.56 | 312 |
| **2023** | 323740 | 323.74 | 291 |
| **Total** | | **1713.8** | **1540** |

## 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: 01/03/2019 – 31/12/2023

## 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>>

PP, as the project implementer, oversees and monitors the electricity generated by the project activity. Data pertaining to this is electronically archived and has been stored since 01/03/ 2019.

To uphold reliability and transparency in the data, PP has instituted Quality Assurance and Quality Control (QA&QC) measures. These measures are designed to efficiently manage and oversee data reading, recording, auditing, as well as the archiving of data and associated documents. Data is monitored on a daily basis and submitted to PP accordingly.

PP has also implemented QA&QC measures to calibrate and ensure the accuracy of metering devices, as well as the safety aspects of project operation. Metering devices are calibrated and inspected regularly and in accordance state electricity board's specifications and requirements to ensure accuracy in 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>2019</td><td>315533</td><td>315.533</td></tr>
<tr><td>2020</td><td>384537</td><td>384.537</td></tr>
<tr><td>2021</td><td>342420</td><td>342.42</td></tr>
<tr><td>2022</td><td>347560</td><td>347.56</td></tr>
<tr><td>2023</td><td>323740</td><td>323.74</td></tr>
<tr><td colspan="2">Total</td><td>1713.8</td></tr>
</table></td></tr>
<tr><td>Description</td><td>Quantity of net electricity displaced in year y</td></tr>
<tr><td>Source of data Value(s) applied</td><td>Main Meter Unit Readings, Direct measurement.</td></tr>
<tr><td>Measurement methods and procedures</td><td>Daily: Direct measurement using electricity meters</td></tr>
<tr><td>Monitoring frequency</td><td>Continuously, aggregated at least annually.<br>Calibration Frequency: The calibration is done following the relevant applicable National Guidelines updated from time to time during the operation of the project activity.<br>Entity responsible: Aggregator<br><br>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<br>Measurement frequency: Hourly<br>Recording frequency: Monthly</td></tr>
<tr><td>Purpose of data</td><td>Calculation of baseline emissions</td></tr>
</table>

**HI-TECH METER LABORATORY**

Near Torrent Power railway crossing, Sabarmati, Ahmedabad-380 005

PHONE: (079) 27506435, E-MAIL: hitechlab@ugvcl.com

TC-5914

**TEST REPORT**

Test Report No: HML/T/23-09/8358 Issue Date: 08/09/2023 Page 1 of 2

ULR – TC591423000001247F

Discipline: Electrical Group: Electrical Indicating & Recording Instruments

**NAME & CONTACT INFORMATION OF CUSTOMER:**

To,
M/s. Zydus Infrastructure Pvt Ltd.
Pharmez, N.H. – 8A,
Sarkhej – Bavla Road,
Vi. Matoda,
Ta. Sanand,
Dist. Ahmedabad – 382213.

| Reference SRF No: 8358/2023[T] | Date of receipt: 06/09/2023 | Date of testing: 08/09/2023 |
|---|---|---|

**Consumer Reference:**

**TEST ITEM DESCRIPTION & IDENTIFICATION:** 3P4W Bidirectional Energy Meter (KWh Meter)

| | | | |
|---|---|---|---|
| Voltage | 11KV/110V, Vref- 3*63.5V | Current | -/5A, Ib=5A, Imax=10A |
| Applicable Standard | IS 14697 | Condition of sample | GOOD |

| Sr. | Meter Sr. No: | Job No: | Make | Type | Mfg. Year: | Imp/Kwh | Class: | Current |
|---|---|---|---|---|---|---|---|---|
| 1 | GHBD1348 | HML/T/8358/23-09-01 | SCHNEIDER | ER300P | APR 2023 | 100 | 0.5s | -/5A, Ib=5A, Imax=10A |
| 2 | GHBD1356 | HML/T/8358/23-09-02 | SCHNEIDER | ER300P | APR 2023 | 100 | 0.5s | -/5A, Ib=5A, Imax=10A |

**Test Details:** As mentioned in page no 2, Results: As per enclosed pages,
**Temperature:** 27°C±2°C,**Relative Humidity**: between 45 % to 75%
**Test methods used: As Per IS 14697**
**Addition or deviation from method used:** No, **Results from external provider:** Not applicable.
**Test witnessed by:**

**Major Equipments used for testing:**

| Sr. No. | Description | Make/ Model | Sr. no. | Range of Measurement | Measurement Uncertainty |
|---|---|---|---|---|---|
| 1 | Reference Standard Meter | Applied Precision | 1207020594 | Voltage –3x40 to 300VAC(P-N) Current 3x10 mA..120A(cl.0.02) | CMC FOR ENERGY: ±0.028 to ±0.055 |

NOTE:
1. This report relates only to the particular sample received in good condition for testing at Hi-Tech Meter Laboratory, UGVCL, Sabarmati.
2. The results mentioned are in % error with respect to unit of measurement.
3. This report cannot be reproduced in part under any circumstances.
4. Publication of this report requires prior permission in writing from at Hi-Tech Meter Laboratory, Sabarmati.
5. All the tests within the scope of Hi-Tech Meter Laboratory are carried out.
6. The decision rule applied as per contract with customer.
7. The test item details are provided by the customer and on the name plate of test item.
8. Sample provided by customer, no sampling done at Hi-Tech Meter Laboratory, Sabarmati
9. Any Anomaly/discrepancy in this report should be brought to our notice within 45days from issue of this report.

HI-TECH METER LABORATORY UGVCL SABARMATI, AHMEDABAD

PREPARED BY
S K KARAMATA
DEPUTY QUALITY MANAGER

REVIEWED, APPROVED & AUTHORIZED BY
A N DIWAN
TECHNICAL MANAGER

**Calibration Certificate**

## Solar Generation data for the month 01/10/2019

| Date | SOLAR PLANT 210 KW | | | | SOLAR PLANT 60 KW | | Total Generated Unit (KW) | 210 KW ongrid Meter reading (80) | 60 KW ongrid Meter reading (40) |
|---|---|---|---|---|---|---|---|---|---|
| | Inverter -1 (50KW) | Inverter -2 (50KW) | Inverter -3 (50 KW) | Inverter -4 (50 KW) | Inverter -5 (50 KW) | Inverter -6 (10 KW) | | | |
| 1 | 235 | 237 | 209 | 240 | 221 | 46 | 1188 | | |
| 2 | 244 | 244 | 209 | 248 | 226 | 49 | 1220 | | |
| 3 | 268 | 270 | 231 | 273 | 252 | 54 | 1348 | | |
| 4 | 254 | 257 | 220 | 260 | 242 | 52 | 1285 | | |
| 5 | 242 | 245 | 214 | 248 | 231 | 52 | 1232 | | |
| 6 | 261 | 260 | 227 | 264 | 242 | 53 | 1307 | | |
| 7 | 246 | 246 | 216 | 248 | 230 | 50 | 1236 | | |
| 8 | 212. | 210 | 190 | 213 | 195 | 43 | 1063 | | |
| 9 | 266 | 267 | 230 | 270 | 251 | 54 | 1338 | | |
| 10 | 239 | 239 | 213 | 243 | 221 | 48 | 1203 | | |
| 11 | 281 | 280 | 240 | 283 | 259 | 54 | 1397 | | |
| 12 | 281 | 279 | 241 | 282 | 258 | 54 | 1395 | | |
| 13 | 266 | 261 | 227 | 264 | 248 | 52 | 1318 | | |
| 14 | 239 | 236 | 205 | 239 | 222 | 48 | 1189 | | |
| 15 | 234 | 232 | 202 | 238 | 220 | 48 | 1174 | | |
| 16 | 238 | 237 | 206 | 240 | 222 | 49 | 1192 | | |
| 17 | 226 | 224 | 196 | 230 | 210 | 46 | 1132 | | |
| 18 | 217 | 217 | 205 | 230 | 211 | 51 | 1131 | | |
| 19 | 248 | 240 | 218 | 251 | 214 | 48 | 1219 | | |
| 20 | 231 | 233 | 201 | 233 | 198 | 43 | 1139 | | |
| 21 | 221 | 223 | 195 | 223 | 189 | 41 | 1092 | | |
| 22 | 220 | 222 | 193 | 223 | 189 | 41 | 1088 | | |
| 23 | 246 | 246 | 213 | 246 | 232 | 50 | 1233 | | |
| 24 | 240 | 241 | 209 | 241 | 231 | 50 | 1212 | | |
| 25 | 208 | 209 | 184 | 209 | 199 | 43 | 1052 | | |
| 26 | 177 | 179 | 159 | 179 | 170 | 37 | 901 | | |
| 27 | 126 | 127 | 113 | 129 | 118 | 27 | 650 | | |
| 28 | 168 | 168 | 152 | 170 | 156 | 34 | 848 | | |
| 29 | 199 | 199 | 170 | 201 | 186 | 39 | 994 | | |
| 30 | 243 | 242 | 230 | 245 | 241 | 52 | 1252 | | |
| 31 | 230 | 226 | 196 | 230 | 208 | 44 | 1134 | | |
| Total | | | | | | | 36162 | | |

**Sample data meter reading sheet on file**

| | |
|---|---|
| Data / Parameter: | EF, $_{CO2, GRID, y}$ |
| Data unit: | $tCO_2$ /MWh |
| Value of data applied | 0.9 UCR Standard Protocol as per Standard |
| Description: | Fixed |
| Measurement procedures: | A "grid emission factor" refers to a $CO_2$ emission factor ($tCO_2$/MWh) which will be associated with unit of electricity provided by an electricity system. The UCR recommends an emission factor of 0.9 $tCO_2$/MWh for the 2019 - 2023 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. |