Universal Carbon Registry

PROJECT CONCEPT NOTE

CARBON OFFSET UNIT (CoU) PROJECT

Title: 7.1 MW Captive Power Plant At M/S Prakash Sponge Iron & Private Ltd. (PSIPL)

Version 2.0

Date: 14/11/2023

First CoU Issuance Period: 01 year, 00 months

(01.01.2022 to 31.12.2022)

Crediting Period: 01/01/2022 to 30/11/2046[1]

Crediting Period is considered referring to UCR CoU Standard August 2022, Version 6.0, Page no.6

Project Concept Note (PCN)
CARBON OFFSET UNIT (CoU) PROJECT

BASIC INFORMATION X333	
Title of the project activity	7.1 MW Captive Power Plant At M/S Prakash Sponge Iron & Private Ltd. (PSIPL)
Scale of the project activity	Small scale
Completion date of the PCN	14/11/2023
Project participants	M/S Prakash Sponge Iron & Private Ltd. (PSIPL)
Host Party	India
Applied methodologies and standardized baselines	CDM UNFCCC Methodology AMS-III.Q : Waste Energy Recovery,version 06.1 Standardized baselines: Not applicable
Sectoral scopes	04 Manufacturing Industries
Estimated amount of total GHG emission reductions per year	30,741 CoUs (30,741 tCO_2e)
Estimated total amount of average GHG emission reductions for the entire monitoring period (2022-2046)	1,259,450 CoUs (1,259,450 tCO_2e)

SECTION A. Description of project activity

A.1. Purpose and general description of Carbon offset Unit (CoU) project activity >>

7.1 MW Captive Power Plant At M/S Prakash Sponge Iron & Private Ltd. (PSIPL) is located in Heggere Village of Chitradurga District in the state of Karnataka, India. PSIPL has installed a 7.1 MW waste heat recovery boiler (WHRB) captive power plant (CPP). The project was commissioned on 01/01/2022.

The details of the project are as follows:

Purpose of the project activity:

Power is the basic infrastructure required for growth of any developing economy. Consumption of electrical energy is a universally accepted indicator of progress in the agricultural, industrial and commercial sectors, as also of the wellbeing of the people of the state. No major economic activity can be sustained without adequate and reliable supply of power. It plays a critical role in employment generation, regional development and poverty eradication.

But there is a raising power crisis due to the increased use of power by different sections of the society and it becomes difficult to draw power from the grid and depend on the supply. Due to the above crisis, industries need to be self-contained by producing their own power required to run the industry and other auxiliary requirements.

The primary purpose of the project is to recover the sensible heat content of the waste gases generated from Rotary Kilns using Waste Heat Recovery Boiler (WHRB) to generate cleaner power and thus contribute to the energy security of the nation by conserving natural resources. The generated power substitutes grid power to meet the requirements of the power consumed inside the plant by Sponge iron kilns and Induction furnace.
The project activity results in greenhouse gas emission reductions by generating cleaner power.
The CPP will operate in isolation from grid (standalone mode) and supply power to the PSIPL's facility (sponge iron kilns and induction furnace). All the power produced in the CPP will be consumed internally.

The project activity will also achieve,

- Improvement of local environment through particulate emission reduction
- Technological up - gradation
- Fulfilling power requirement without adding to the transmission and distribution losses of the grid, as the power will be consumed at the place where it will be generated and PSIPL will not import power from the grid.
- Reducing the difference between demand and supply of power locally.
- Sustainable –economic growth

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

There are social, environmental, economic and technological benefits which contribute to sustainable development.

Social benefits:

- The project activity contributes to employment generation in the local area for both skilled & unskilled people for operation and maintenance of the equipments.
- It has created steady higher value jobs and skilled workers at the facility. The project activity is contributing to the national energy security by reducing consumption of fossil fuels.

- The technology being used in the project is proven and safe for power generation. An increase in such kind of projects shall enable all the technology suppliers to continuously innovate and modernize on the technology front. The local people will know the technological advancementand will help in capacity building.

Environmental benefits:

- The project activity is a renewable energy project, which utilizes waste heat as a fuel for power generation, a move that is voluntary and not mandated under current environmental laws of India. Since this project activity generates green energy in the form of power, it has positively contributed towards the reduction in (demand) use of finite natural resources like coal and oil, minimizing depletion and in turn increasing its availability to other important purposes. Therefore, this project activity helps to environment sustainability by reducing GHG emission in the atmosphere.
- Avoids global and local environmental pollution, leading to reduction of GHG emissions.
- Enabling local electricity grid to divert the electricity displaced by the project activity to the nearby needy areas.
- Indirect capacity building by providing a case example to other sponge iron plants in the region for switching to high capacity cogeneration configuration, for electricity generation. In addition to the reduction in carbon dioxide (CO_2) emissions the project implementation will result in reduction of other harmful gases (NO_x and SO_x) that arise from the combustion of coal used in power generation. The project will also mitigate air and land pollution by avoiding ash generation from coal based power generation in grid and disposal of ash for land filling.

Economic benefits:

- The project activity creates employment opportunities during the project stage and operation and maintenance of the boiler and turbines.
- The project activity helps in conservation of fast depleting natural resources like coal and oil thereby contributing to the economic well being of country as a whole.
- The various other benefits due to the project activity ensure that the project is contributing to the sustainable development of the region by bringing in green technologies and processes to a backward region. The technology is indigenous and by implementing such projects the country is showcasing its GHG mitigation actions in its efforts to combat climate change.

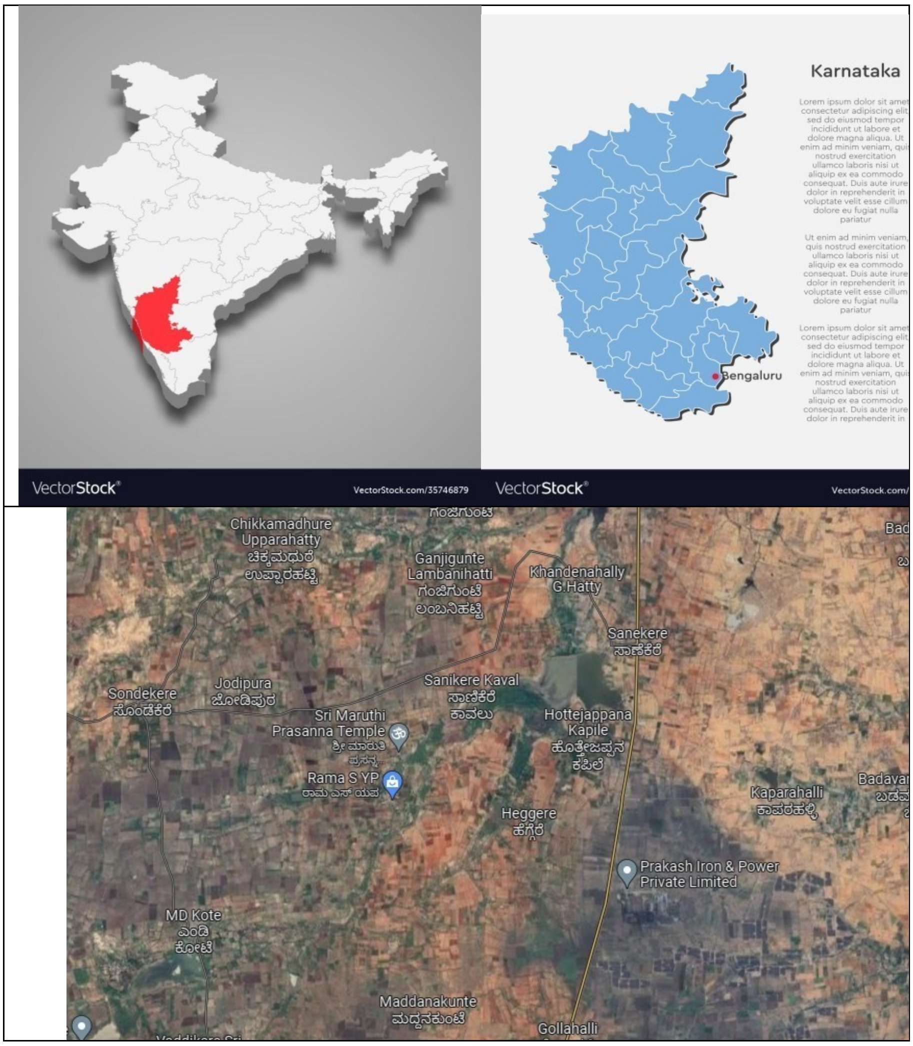
A.3. Location of project activity >>

Country: India
District: Chitradurga
Village: Heggere
State: Karnataka
Code: 577522

The project is located at Heggere village and is located in Chitradurga district of Karnataka state, India. The project location is well connected by road and rail. The nearest railway station is Challakere, the nearest airport is Bangalore International Airport and seaport is Mangalore.

The geographical coordinates of the project site are 76.66818°E and 14.15321°N that is 76°40’5.448” E and 14°09’11.556” N. The location of the site is shown in the following maps.

Physical location address of the project:
M/S Prakash Sponge Iron & Private Limited
Village: Heggere – 577522, Chintradurga, Karanataka



A.4. Technologies/measures >>

PSIPL has installed three nos. each of 11.5 TPH WHRB to utilize sensible heat of flue gases emitting from Rotary Kiln along with one 7.1 MW turbo generator to fulfil the captive requirement of the plant.

The proposed 7.1MW Captive Power Plant (CPP) will be of 3 boilers – one steam turbine arrangement. The condenser shall be Air cooled condenser. Power generated from the generator at 11kV will be connected to the Iron & Steel plant, after drawl for the CPP's auxiliary power requirements.

The plant will have three numbers of 11.5TPH WHR boiler and one 7.1MW turbo generator. Besides the above, the plant will have Air cooled condenser, Ash handling system, auxiliary Cooling tower, Pumps, Water treatment plant, Fire protection system, Air compressors, Air conditioning and Ventilationsystem, Electrical system. and instrumentation & controls.

Waste Heat Recovery Boiler
The Waste Heat Recovery (WHR) based Captive Power Plant is installed at PSIPL site to utilize the heat content of flue gases coming out of Rotary Kiln. There are three 11.5 TPH WHR Boiler for 7.1 MW power generation. Each boiler will be a vertical, 3 pass, natural circulation, fully drainable, gas tight membrane casing, water tube boiler for continuous operation and out-door installation.

The details of WHR boiler are:

Description	Technical Particulars
Fuel to be burned/utilised	Flue gas from Rotary Kiln
Steam pressure at super-heater outlet	67 kg/cm2
Steam temperature at super-heater outlet	490oC
Steaming capacity	11.5 TPH
Gas outlet temperature	169oC

Steam Turbine

The proposed CPP will have one no. 7.1MW turbo generator. The turbine will be a bleed cum condensing type and running at high speed. The generator speed will be 1500 rpm. Hence, the turbine will be coupled with the generator through a reduction gear unit.

Steam is admitted into the turbine through an emergency stop valve actuated by hydraulic cylinders. The turbine speed is controlled by an electronic governing system. The bleed pressures are arrived at based on the regenerative feed water requirements. Accordingly, bleeds will be provided for Deaerator. All the bleeds will be uncontrolled. The turbine exhaust pressure will be 0.18 kg/cm^2 (a).

The turbine will be preferably single cylinder, single exhaust, single bleed, condensing type. All casing will be horizontally split and the design will be such as to permit examination of the blades without disturbing shaft alignment or causing damage to the blades. The design of the casing and the supports will be such as to permit free thermal expansion in all directions.

The glands will preferably be of labyrinth type and sealed with steam. A vacuum system required by the design will be provided. All piping and components of shaft seal and vacuum system will be sized for 300 percent of the calculated leakage. Steam leaving the glands will be condensed in gland steam condenser.

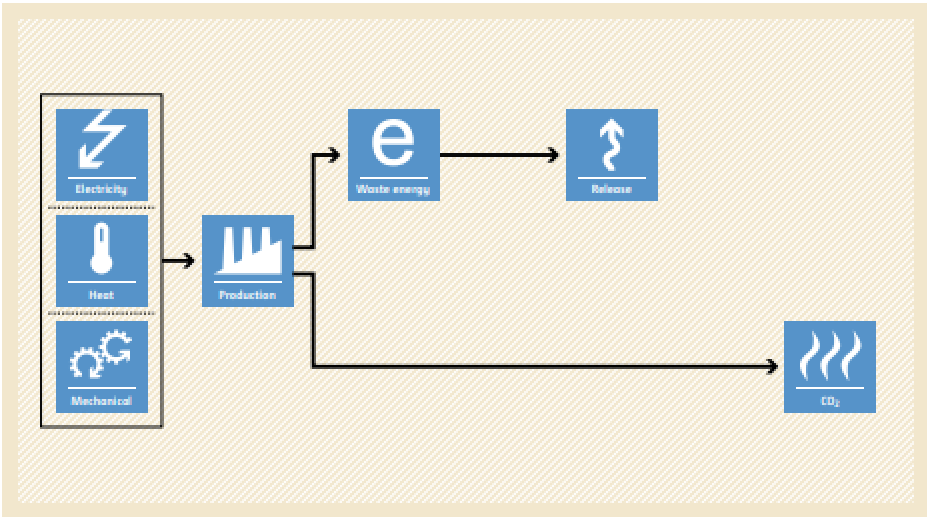
A.5. Parties and project participants >>

Party (Host)	Participants
India	M/S Prakash Sponge Iron & Private Ltd. Village Heggere – 577522 District Chitradurga State – Karnataka, India

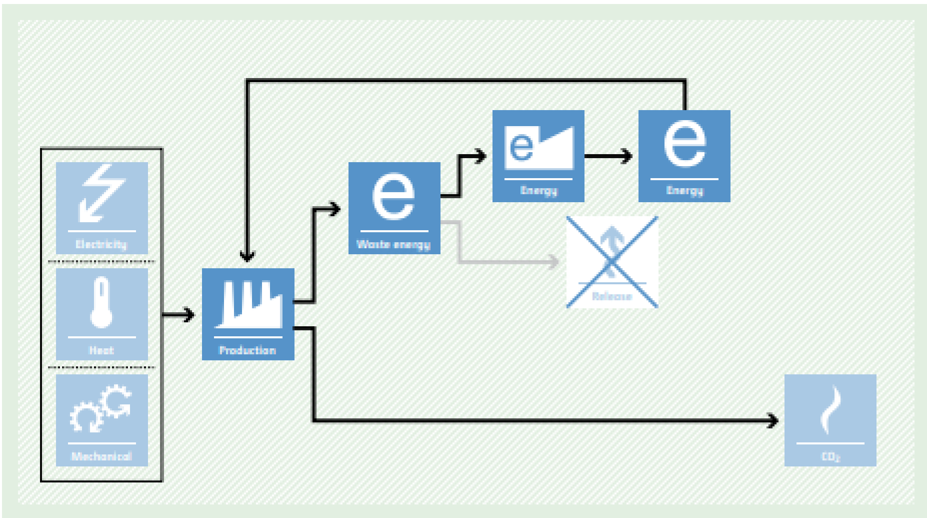
A.6. Baseline Emissions>>

AMS-III.Q. Waste energy recovery

BASELINE SCENARIO
Energy is obtained from GHG-intensive energy sources (e.g. electricity is obtained from a specific existing power plant or from the grid, mechanical energy is obtained by electric motors and heat from a fossil-fuel-based element process) and some energy is wasted in the production process and released.



PROJECT SCENARIO
Waste energy is utilized to produce electrical/thermal/ mechanical energy to displace GHG-intensive energy sources.



The approved baseline methodology has been referred from the indicative simplified baseline and monitoring methodologies for selected small scale UNFCCC CDM project activities that involves utilization of waste energy for generation of electricity at the existing site.

Typical activities under AMS III.Q are utilization of waste energy at existing facilities which may be for cogeneration, generation of electricity, direct use as process heat, generation of heat in an element process or generation of mechanical energy

A.7. Debundling>>

This “7.1 MW Captive Power Plant At M/S Prakash Sponge Iron & Private Ltd. (PSIPL).” Project is not a debundled component of a larger registered carbon offset project activity.

SECTION B. Application of methodologies and standardized baselines

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

SECTORAL SCOPE – 04, Manufacturing Industries

TYPE I - Renewable Energy Projects (Small Scale)

CATEGORY- AMS-III.Q : Waste Energy Recovery,version 06.1

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

The chosen methodology 'AMS-III.Q , version 06.1' is applicable to project activities that utilize waste gas and/or waste heat as an energy source for:

- Generation of electricity;
- Cogeneration;
- Direct use as process heat source in as unit process/chemical reactor;
- Generation of heat in element process;
- Generation of mechanical energy; or

The project activity under consideration will utilize the heat content of waste gases emitted from the Rotary kilns in WHRBs to produce steam which will be further used to generate electricity. Hence, the methodology is applicable to the project activity.

The methodology is applicable under the following conditions:

	The recovery of waste energy shall be a new initiative (i.e. WECM was flared, vented or released into the atmosphere in the absence of the project activity). The DOEs during on-site visit as part of their validation activities shall confirm that no equipment for waste energy recovery and utilisation had been installed on the specific WECM stream(s) (that is recovered under the project activity) prior to the implementation of the project activity by using one of the following options: By direct measurements of energy content and amount of the waste energy for at least three years prior to the start of the project activity; Energy balance of relevant sections of the plant to prove that the waste energy was not a source of energy before the implementation of the project activity. For the energy balance representative process parameters are required. The energy balance shall demonstrate that the waste energy was not used and also provide conservative estimations of the energy content and amount of waste energy released; Energy bills (electricity, fossil fuel) to demonstrate that all the energy required for the process (e.g. based on specific energy consumption specified by the manufacturer) has been procured commercially. Project participants are required to demonstrate through the financial documents (e.g. balance sheets, profit and loss statement) that no energy was generated by waste energy and sold to other facilities and/or the grid. The bills and financial statements should be audited by competent authorities; Process plant manufacturer's original specification/information, schemes and diagrams from the construction of the facility could be used as an estimate of quantity and energy content of waste energy produced for rated plant capacity per unit of product produced; PSIPL uses waste heat from Rotary kilns to generate electricity which is a new initiative. Prior to the installation of the project activity PSIPL was not generating waste gas. Hence, this methodology is applicable.
	Regulations do not require the project facility to recover and/or utilize the waste energy prior to the implementation of the project activity; Prior to the implementation of the project activity PSIPL was not generating waste gas in their industrial facility as it's a new industry which is set-up. There are no such regulations which constrain the industrial facility to generate waste gas from using the fossil fuels.
	Energy (i.e. electricity or thermal heat) produced in the project activity may be exported to a grid or other industrial facilities (included in the project boundary), a contractual agreement exists between the owners of the WEG facility and the recipient facility(ies) to avoid the potential double counting of

	emission reductions. These procedures shall be described in the CDM Project Design Document; The project activity is a captive power plant. Hence, no electricity is exported.
	Waste energy that is released under abnormal operation (for example, emergencies, shut down) of the project facility shall not be included in the emission reduction calculations. The waste gas that will be released under abnormal operation of the plant (emergencies) will not be accounted as emission.
	For project activities that use waste pressure to generate electricity the electricity generated from waste pressure shall be measurable. The project activity will utilise the sensible heat content of the waste gas to generate electricity.
	For a project activity that recovers waste energy for power generation from multiple sources (e.g. a kiln and a single-cycle power plant), this methodology should be used in combination with AMS-III.AL. provided that: It is possible to distinguish two distinct waste energy sources within the project activity such that: Waste energy source-I (e.g. the kiln) belongs to waste heat sources which are eligible under AMS-III.Q.; Waste energy source-II (e.g. the single-cycle power unit) belongs to waste heat sources which are eligible under AMS-III.AL.; For waste energy source-II eligible under AMS-III.AL., all requirements under "AMS-III.AL.: Conversion from single cycle to combined cycle power generation" that relate to baseline, project emissions and monitoring shall apply; It is possible to determine the baseline for each waste energy source, according to the specific methodology being used; It is possible to objectively allocate the electricity produced in the project activity to each waste energy source, by means of one of the following methods: Through separate measurements of the electricity produced by utilizing waste energy from each waste energy source; or Through separate measurements of the energy content of the WECM streams used for electricity production; or Through separate measurements of the energy content of the WECM streams that are associated with each waste energy source and used for electricity production or for the WECM generation in a common waste heat recovery system (e.g. if steam is generated by waste heat from a kiln and waste heat from an internal combustion engine in a common waste heat recovery boiler). The waste energy source in the project activity is rotary kiln.
	The methodology is not applicable to project activities implemented in a single-cycle power plant (e.g. gas turbine or diesel generator) where waste energy generated on-site is not utilizable for any other purposes on-site except to generate electricity. Such project activities shall consider "AMS-III.AL.: Conversion from single cycle to combined cycle power generation". However project activities recovering waste energy from such power plants for the purpose of generation of heat can apply this methodology. The project activity uses waste gas and produces more heat and utilises waste heat for generation of electricity.
	Emission reductions cannot be claimed at and beyond the end of the lifetime of the waste energy generation equipment at the WEG facility or on-site captive unit at the recipient facility. The end of the lifetime of the equipment shall be determined as per the requirements mentioned in "Tool to determine remaining lifetime of equipment". As per guidelines of the UCR emission reductions are calculated till end of the equipment lifetime.

The project activity shall result in emission reductions less than or equal to 60 kt CO2 equivalent annually. The project activity's emission reduction is less than 60 kt CO2 equivalent annually.

Hence, it is concluded that the project activity satisfies all the above-mentioned conditions of the selected Approved Consolidated Methodology AMS-III.Q. / Version 06.1 under Sectoral scope: 04.

B.3. Applicability of double counting emission reductions >>

The waste heat recovery boiler and turbine are within the project boundary i.e., PSIPL plant. The waste heat recovery-based boiler and turbine have unique serial numbers which are visible on the units. The generated electricity is measured using energy meters who also has unique serial numbers. The Monitoring Report will have the details of the same and will be provided to the UCR verifier during the verification process.

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

According to the baseline methodology AMS-III.Q., Version 06.1, the geographical extent of the project boundary shall comprise of

- The industrial facility where waste gas/ heat/ pressure is generated (generator of waste energy),
- The facility where process heat in element process/steam/electricity are generated (generator of process heat/steam/electricity).
- The facility/s where the process heat in element process/steam/electricity is used (the recipient plant(s)) and/or grid where electricity is exported, if applicable.

As per the methodology, the project boundary encompasses Rotary Kiln, where the waste gas is generated, waste heat recovery boiler and other related accessories, captive power generating equipment such as turbine, generator etc, auxiliary equipment, power synchronizing system, steam flow piping, fluegas ducts, etc and the unit where generated electricity will be consumed.

Following table illustrates gases and emissions sources which will be included in the project boundary:

	Source	**Gas**	**Included?**	**Justification/Explanation**
	Electricity generation, grid or captive source	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative

		N_2O	Excluded	Excluded for simplification. This is conservative
	Fossil fuel consumption in element process for thermal energy	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
	Fossil fuel consumption in cogeneration plant	CO_2	Included	Main emission source.
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
	Generation of steam used in the flaring process, if any	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative
	Fossil fuel consumption for supply of process heat and/or reaction heat	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification. This is conservative
		N_2O	Excluded	Excluded for simplification. This is conservative

	Source	Gas	Included?	Justification/Explanation
project	Supplemental fossil fuel consumption at the project plant	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	Supplemental electricity consumption	CO_2	Included	Main emission source
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	Electricity imports to replace captive electricity, which was generated using waste energy in absence of project activity[4]	CO_2	Included	Only if captive electricity in the baseline is replaced by import electricity
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
	Energy consumption			Only if waste gas cleaning is

	for gas cleaning	CO_2	Included	required and leads to emissions related to the energy requirement of the cleaning
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification

B.5. Establishment and description of baseline scenario (UCR Standard or Methodology) >>

As per applied approved methodology, the baseline scenario is identified as the most plausible scenario among all realistic and credible alternative(s) and shall be identified for, both, the fate of thewaste energy at the WEG facility and the generation of energy consumed by the recipient facility(ies)in the absence of the project activity.

The baseline scenario for the project activity is identified through the following steps as described in the methodology AMS-III.Q. ,Version 06.1:

The methodology requires the realistic and credible baseline scenarios to be determined for:

- The project activity is an existing recipient facility, so as per para 23, page no.8 of AMS-III.Q. version 06.1, the baseline scenario shall be based on relevant operational data from immediately prior three years to the start date of the project activity (or the start date of validation with due justification). For existing facilities, which has three years of operation history but do not have sufficient operational data for the purpose of determining baseline, all historic information shall be available (a minimum of one year operational data is required).
- As per para 24, page no.8 of AMS-III.Q. version 06.1, all options for demonstrating the use of waste energy in the absence of a CDM project activity shall be based on historic information and not on a hypothetical scenario.
- The project activity is a greenfield WEG facility, so as per para 25, page no.8 of AMS-III.Q. version 06.1, the baseline scenario shall be determined in accordance with the procedure prescribed in most recent version of "ACM0012: Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects" or as per the relevant requirements related to determination of baseline scenario provided in the "General guidelines for SSC CDM methodologies" for Type-II and Type-III Greenfield/capacity expansion project activities.

The generation and recipient facility are same in this case, also neither heat generation nor mechanical energy generation is involved in the project activity, so in this section, realistic and credible alternatives will only be determined for:
Waste energy use in the absence of the project activity; and Power generation in the absence of the project activity for each recipient facility if the project activity involves electricity generation for that recipient facility;

The project activity involves generation of electricity from waste gas. As per para 28, page no. 10 of AMS-III.Q. version 06.1, baseline emissions of electricity are as follows:

Electricity is obtained from an identified existing plant or from the grid. The baseline emissions can be calculated as follows:

$$BE_{elec,y} = f_{cap} \times f_{wcm} \times \sum_{j}\sum_{i}(EG_{i,j,y} \times EF_{Elec,i,j,y}) \qquad \text{Equation (1)}$$

Where:

$BE_{elec,y}$	=	Baseline emissions due to displacement of electricity during the year y in tons of CO_2
f_{cap}	=	The ratio of waste energy generated at a historical level, expressed as a fraction of the total waste energy used in the project activity for producing useful energy in year y. The ratio is 1 if the waste energy generated in project year y is the same or less than that generated at a historical level. Capping factor is to exclude increased waste energy utilization in the project year y due to increased level of activity of the plant, relative to the level of activity in the base years before project start. The value of f_{cap} shall be estimated using one of the applicable methods that applies to the situation of the project activity prescribed in the most recent version of "ACM0012: Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects". Where the method requires historical data, the project proponents shall follow the requirement stipulated in paragraph 23 above (Here, value of f_{cap} is 0)
f_{wcm}	=	Fraction of total electricity generated by the project activity using waste energy. This fraction is 1 if the electricity generation is purely from use of waste energy. The value of f_{wcm} shall be estimated using applicable procedures that apply to the situation of the project activity prescribed in the most recent version of "ACM0012: Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects". Where the method requires historical information, the project proponents shall follow the requirement stipulated in paragraph 23 above. In cases where auxiliary fossil fuel is used to supplement the waste energy directly in the waste heat recovery combustion systems and the energy output cannot be demonstrably apportioned due to technical constraints (e.g. waste gas measurement and its quality) between fossil fuels and the waste energy, a value of 1 for fwcm can be used and consider the emissions resulting from the combustion of fossil fuel as project emissions using "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". Note: for a project activity using waste pressure to generate electricity this fraction is 1
$EG_{i,j,y}$	=	The quantity of electricity supplied to the recipient j by generator, that in the absence of the project activity would have been sourced from i^{th} source (i can be either grid or identified existing source) during the year y in MWh.

$EF_{Elec,i,j,y}$ = The CO_2 emission factor for the electricity source i (grid or identified existing source), displaced due to the project activity, during the year y in tons CO_2/MWh.

In this project activity, the emission factor is considered as 0.9000 which is the UCR conservative emission factor. The entire project activity is for captive use. In the absence of this project activity PSIPL was dependent on state electricity grid for the need of power. As the project does not sell any electricity generated, the emission factor is considered in line with the state electricity grid.

The combined margin (EFCO2, y) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 75%) and build margin (BM) (having weightage 25%). Calculations for this combined margin must be based on data from an official source of CEA database (where available) and made publicly available.

The combined margin of the Indian National Grid used for the project activity is as follows:

Parameter	**Value**	**Nomenclature**	**Source**
EFgrid,CM,y	0.9310tCO2/MWh	Combined margin CO2 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 Baseline CO2 Emission Database, Version 18.0 December - 2022 published by Central Electricity Authority (CEA), Government of India

EFgrid,OM,y	0.9518tCO2/MWh	Operating margin CO2 emission factor for the project electricity system in year y	Calculated as the last 3-year (2019-20, 2020-21, 2021-22) generation-weighted average, sourced from Baseline CO2 Emission Database, Version 18.0 December - 2022 published by Central Electricity Authority
EFgrid,BM,y	0.8687tCO2/MWh	Build margin CO2 emission factor for the project electricity system in year y	Baseline CO2 Emission Database, Version 18.0 December - 2022 published by Central Electricity Authority (CEA), Government of India

Project emissions:

As per para 38, page no. 15 of AMS-III.Q., version 06.1

Project emissions due to the project activity (PE_y) include emissions due to:
(i) Combustion of auxiliary fuel to supplement waste gas/heat ($PE_{AF,y}$); and

(ii) Emissions due to consumption of electricity for cleaning of gas before being used for generation of electricity or other supplementary electricity consumption by the project activity ($PE_{EL,y}$).

$$PE_y = PE_{AF,y} + PE_{EL,y} \qquad \text{Equation (7)}$$

As per para 39, page no. 15 of AMS-III.Q., version 06.1

$PE_{AF,y}$ and $PE_{EL,y}$ shall be estimated following the procedure provided in the relevant section of the most recent version of “ACM0012: Consolidated baseline methodology for GHG emission reductions from waste energy recovery projects”.

According to ACM0012, Project Emissions include emissions due to (1) combustion of auxiliary fuel to supplement waste gas/heat and (2) electricity emissions due to consumption of electricity for cleaning of gas before being used for generation of energy or other supplementary electricity consumption.

Since no auxiliary fuels will be fired in the proposed project activity, project activity emissions arenot applicable. Also, there is no additional cleaning of gas for the project activity.

Further, the electricity consumption of the project activity will be accounted for in EGj and hence no separate calculation of project emissions due to electricity consumption is required.

Leakage:
No leakage is applicable under this methodology.

Emission Reductions:
The emission reduction ERy by the project activity during a given year y is the difference between the baseline emissions through substitution of electricity generation by captive coal based thermal power plant (BEy) and project emissions (PEy), as follows:

ERy = BEy – PEy

Where:
ERy = emission reductions of the project activity during the year y in tonnes of CO2
BEy = baseline emissions due to the displacement of electricity during the year y in tonnesof CO2

PEy = project emissions during the year y in tonnes of CO2

Since the project emissions are non-existent in the project activity so the emission reductions (ERy)is equal to the baseline emissions due to the displacement of electricity (BEy)
ERy = BEy

The actual emission reduction achieved during the first crediting period shall be submitted as a part of first monitoring and verification. However, for the purpose of an ex-ante estimation, followingcalculation has been submitted:

Estimated annual baseline emission reductions (BEy) = 34,156.66 MWh/year *0.90000 tCO2/MWh = 50,378 tCO2e/year (i.e. 30,741 CoUs /year)

B.6. Prior History>>

The project activity has not applied to any other GHG program for generation or issuance of carbon offsets or credits for the current crediting period.

B.7. Changes to start date of crediting period >>

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

B.8. Permanent changes from PCN monitoring plan, applied methodology or applied standardized baseline >>

There are changes from registered PCN monitoring plan and applied methodology from ACM 0012 to AMS IIIQ

B.9. Monitoring period number and duration>>

First Issuance Period: 01 year, 00 months (01.01.2022 to 31.12.2022)

B.8. Monitoring plan>>

All data collected as part of monitoring plan should be archived electronically and be kept at least for 2 years after the end of the last crediting period. 100% of the data should be monitored if not indicated otherwise in the comments in the tables below. The following main data shall be monitored.

Project emissions:

- Quantity of fossil fuels used as supplementary fuel;
- Net calorific value of fossil fuel;
- CO2 emission factor of the fossil fuel;
- Quantity of electricity consumed by the project operations;
- CO2 emissions factor of electricity consumed by the project operations.
- Abnormal operation of the plant.

While the quantities of fossil fuels fired are measured using calibrated flow meters, other data items are only factors obtained from reliable local or national data. If local data is not available, the project participant may usedefault factors published by IPCC.

Baseline emissions:
Depending on the baseline scenario, the following data items need monitoring:
The heat/power/mechanical energy supplied by the project facility to recipient facility(ies) by recovering wasteenergy from WECM stream(s);

- Energy generation using WECM, in absence of project activity;
- Quantity and energy content of WECM;
- CO2 emission factor of electricity or heat that would have been consumed by the recipient facility(ies) in the absence of the project activity;
- Properties of heat (e.g., pressure and temperature of the inlet and outlet of the streams, concentrations of the reactant/product mix etc.) supplied to the recipient facility(s);
- Properties of heat return to the element process (e.g., pressure and temperature of the condensate return) supplied by the recipient facility(s) to the project facility;
- Efficiencies of element process, power plant, cogeneration plant or mechanical conversion equipment that would have been used in the absence of the project activity.

In addition, the relevant variables of applicable tools shall be included in the monitoring plan by the projectparticipants.

Data and parameters monitored

Data / Parameter:	$EG_{i,,j,y}$
Data unit:	MWh
Description:	Quantity of electricity supplied to the recipient *j* by the generator,which in the absence of the project activity would have sourced from i^{th} source (*i* can be eithergrid or identified source) during theyear *y* in MWh
Source ofdata:	Recipient facility(ies) and generation plant measurement records
Measurement procedures (if any):	
Monitoring frequency:	Monthly
QA/QC procedures:	The energy meters will undergo maintenance/calibration to the industry standards. Sales records and purchase receipts are used toensure the consistency
Any comment:	Data shall be measured at the recipient facility(ies) and at the project facility for cross check. Sales receipts shall be used for verification. DOEs shall verify thattotal energy supplied by thegenerator is equal to total electricity received by recipient facility(ies)

United Nations Sustainable Development Goals:

The project activity generates electrical power from Waste Heat Recovery Boiler, there by displacing non-renewable fossil resources resulting to sustainable, economic and environmental development. In the absence ofthe 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: The project would lead to reduction of approx. 30,741 tCO_2 per annum due to implementation of project activity.

SDG 7: Affordable and Clean Energy: The project is generating approx. 55,976 MWh of clean energy per annum.

SDG 8: Decent Work and Economic Growth: The project is providing direct employment to around 05 persons.The project leads to Trainings & workshops which are conducted for the O&M staff of the PP.

Sustainable Development Goals (SDG) outcomes

Development Goals Targeted	**SDG Target**	**Indicator (SDG Indicator)**
SDG 7: Affordable and Clean Energy	7.2: By 2030, increase substantially the share of renewable energy in the global energy mix Target: 55,976 MWh per annum	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 withdisabilities, and equal pay for work of equal value Target: Training: 1 no. annually Employment of 05 staff	8.5.1: Average hourly earnings of female and male employees, by occupation, age and persons with disabilities

SDG 13: Climate Action	13.2: Integrate climate change measures into national policies, strategies and planning Target: 30,741 tCO_2 per annum	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 fosterclimate resilience and lowgreenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determinedcontribution, national communication, biennial update report or other)