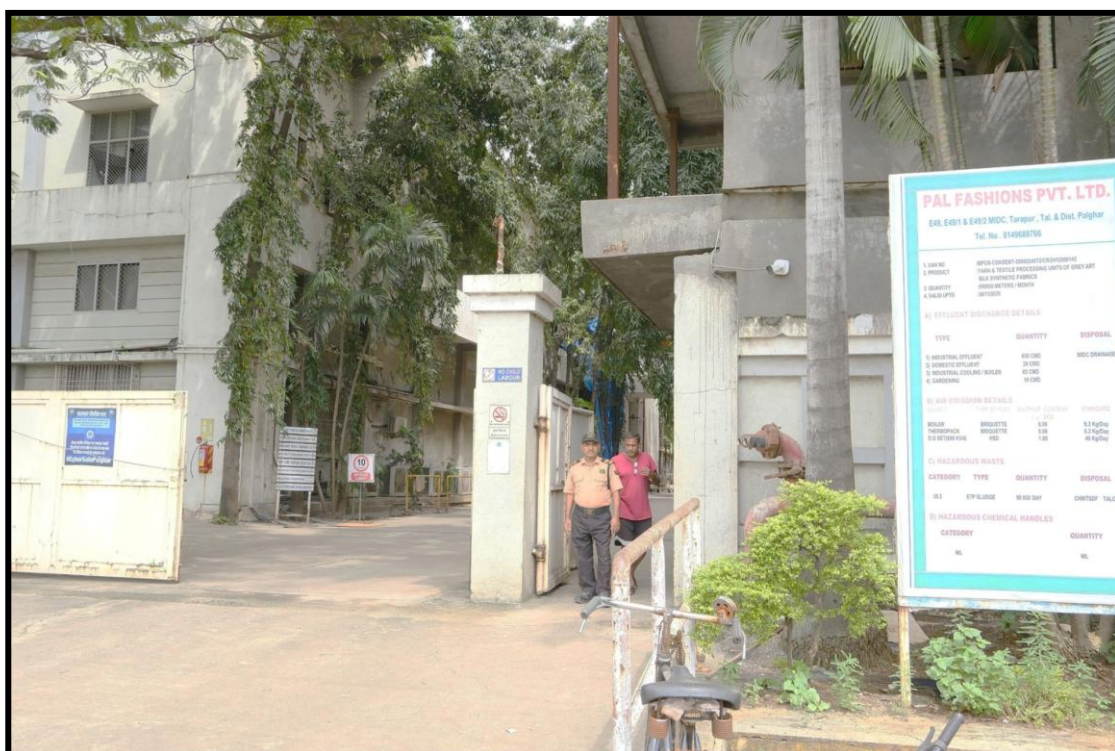


PROJECT CONCEPT NOTE
CARBON OFFSET UNIT (CoU) PROJECT



Title: Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India.

Version 2.0

Date: 05/03/2026

First CoU Issuance Period: 10 years, 00 months, 00 days

Date: 01/01/2013 to 31/12/2022

Project Activity meets the following UN SDGs





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

BASIC INFORMATION	
Title of the project activity	Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India.
Scale of the project activity	Small Scale
Completion date of the PCN	05/03/2026
Project participants	Project Owner: Pal Fashions Private Limited UCR ID: 891792674
Host Party	India
Applied methodologies and standardized baselines	Type I (Renewable Energy Projects) UNFCCC Methodology Category AMS-I.C.: Thermal energy production with or without electricity - Version 22.0 UCR Protocol Standard Baseline Emission Factor
Sectoral scopes	01 Energy industries (Renewable / Non-renewable Sources)
Estimated amount of total GHG emission reductions	76,282 CoUs (76,282 tCO₂e)

SECTION A. Description of project activity

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

The Carbon Offset Unit (CoU) project titled “**Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India**” is a small-scale renewable energy project implemented at the manufacturing facility of Pal Fashions Private Limited located at Plot No. E-49, E-49/1 & E-49/2, MIDC Tarapur Industrial Area, District Palghar, Maharashtra, India.

The project activity involves generation of thermal energy in the form of steam using renewable biomass briquettes, replacing fossil fuel-based thermal energy that would otherwise have been generated using coal.

Purpose of the Project Activity

The purpose of the project activity is to generate thermal energy in the form of steam using renewable biomass briquettes as fuel and thereby displace fossil fuel-based thermal energy, specifically coal, which would otherwise have been used to meet the process heat requirements of the textile manufacturing operations. By replacing coal with renewable biomass, the project avoids carbon dioxide (CO₂) emissions associated with fossil fuel combustion and contributes to climate change mitigation.

Pal Fashions Private Limited (hereinafter referred to as the Project Proponent or PP) is engaged in textile processing activities that require continuous and reliable steam supply for dyeing, washing, finishing, and other thermal processes. Steam is an essential utility for uninterrupted plant operation.

To meet its process heat demand in a sustainable manner, the PP implemented renewable biomass-based thermal energy systems comprising:

- One **4 TPH biomass-fired steam boiler (Stack ID S-1)**, and
- One **biomass-based Thermopac unit (Stack ID S-2)**,

Both systems utilize renewable biomass briquettes as fuel.

The 4 TPH biomass-fired boiler was originally commissioned in 2008 and has been in regular operation as part of the plant’s thermal infrastructure. The Thermopac unit operates alongside the boiler to support process heat requirements within the facility.

All thermal energy generated under the project activity is used exclusively for captive consumption within the factory premises. No export of steam, thermal energy, or electricity occurs.

The renewable biomass briquettes used in the project are manufactured from agricultural and agro-industrial residues such as crop waste, soya residue, corn residue, and similar biomass materials. These materials are renewable in nature and would otherwise have limited economic value or may be subject to open burning or uncontrolled disposal practices.

By utilizing biomass residues for energy generation, the project:

- Promotes productive utilization of agricultural waste
- Prevents open burning of crop residues
- Supports rural biomass supply chains
- Encourages circular economy practices
- Reduces dependence on fossil fuels

Under the applied methodology, biomass combustion is considered carbon neutral, as the CO₂ released during combustion is offset by the CO₂ absorbed during the growth phase of the biomass through photosynthesis.

Project Boundary and Crediting Scope

The overall crediting period under the Universal Carbon Registry (UCR) is:

01 January 2013 to 31 December 2022

The inclusion of systems within the UCR crediting boundary is defined as follows:

- The **4 TPH Biomass-fired Boiler (Stack ID S-1)** is included for emission reduction claims from **01 January 2013 to 31 December 2022**.
- The **Thermopac unit (Stack ID S-2)** is also included for emission reduction claims from **01 January 2013 to 31 December 2022**.

This clearly defined boundary ensures transparent accounting and full avoidance of double counting of emission reductions.

Baseline Scenario

In the absence of the project activity, thermal energy required for textile processing operations would have continued to be generated using coal-based systems. Coal combustion results in significant CO₂ emissions and represents the baseline fossil fuel scenario under the applied methodology.

The project therefore represents a fuel switch from coal to renewable biomass briquettes for captive thermal energy generation, consistent with UNFCCC small-scale methodology **AMS-I.C: Thermal energy production with or without electricity (Version 22.0)**.

Becoming Carbon-negative with Biomass

The story of Pal Fashions' socio-environmental impact does not end here. For the past 14 years, Pal Fashions has been completely off fossil fuels. They are currently carbon-negative and have qualified to receive carbon credits. In 2008, as crude oil prices shot up, many industries shifted to coal as the cheapest alternative. But Pal Fashions walked a different path and chose biomass briquettes to power their boilers and thermic fluid heaters.

“For the last 14 years, we have been sourcing agri-waste briquettes the conventional way. Now with BiofuelCircle's online platform, we are able to source briquettes at optimal rates with much ease. We want to take our journey to the next level by replacing fossil fuel in many more industrial units of Palghar and Thane districts.

Arvinder Singh Ahuja
Chairman, Pal Fashions



Operational Characteristics

The plant operates for approximately 300 days per year, aligned with production schedules and planned maintenance shutdowns. Biomass briquettes are procured from third-party suppliers and stored within the plant premises under controlled conditions.

The biomass-fired boiler and Thermopac system are equipped with appropriate air pollution control systems such as dust collectors and scrubbers to ensure compliance with applicable environmental regulations issued by statutory authorities. The project facility holds valid Consent to Operate issued by Maharashtra Pollution Control Board.

Operational parameters such as biomass consumption, steam generation, operating pressure, and working days are systematically recorded and maintained by the Project Proponent. These records form the basis for quantification and verification of emission reductions.

Based on verified operational records for the crediting period, the project activity consumes an **average of approximately 5.5 million kilograms of biomass briquettes per year** for steam generation through the 4 TPH boiler and thermopac systems. The facility operates for an **average of approximately 300 operational days per year**, reflecting continuous industrial operation aligned with production schedules and planned maintenance shutdowns. Detailed records of biomass consumption, steam generation, boiler operation, and operational days are maintained by the PP and form the basis for quantification, monitoring, and verification of emission reductions generated under the project.

The greenhouse gas emission reductions achieved by the project activity have been estimated in

accordance with UNFCCC small-scale methodology AMS-I.C.: Thermal energy production with or without electricity (Version 22.0), using coal as the baseline fossil fuel. Project emissions associated with biomass combustion are considered zero under AMS-I.C methodology, as biomass is treated as carbon neutral. However, in accordance with the latest Universal Carbon Registry guidance, emissions associated with transportation of biomass briquettes are conservatively included as project emissions. Baseline emissions are calculated based on fossil fuel displacement using monitored biomass consumption data, the net calorific value of biomass, and the applicable IPCC default emission factor for coal.

By implementing this renewable biomass-based thermal energy generation project, Pal Fashions Private Limited demonstrates its commitment to sustainable industrial practices, reduction of fossil fuel dependency, and mitigation of climate change. The project results in **real, measurable, and long-term GHG emission reductions**, contributing positively to environmental sustainability within the textile processing sector.



Estimated Emission Reductions

Emission reductions are quantified based on monitored biomass consumption and displacement of coal using the applicable IPCC default emission factor for coal, in accordance with AMS-I.C methodology.

Based on final monitored data:

- **Boiler (2013–2022): 47,927 tCO₂e**
- **Thermopac (2013–2022): 28,355 tCO₂e**

Total emission reductions (2013–2022): 76,282 tCO₂e

These emission reductions are real, measurable, and verifiable and are eligible for issuance as Carbon Offset Units (CoUs) under the Universal Carbon Registry.

The project demonstrates the Project Proponent's commitment to sustainable industrial practices, reduced fossil fuel dependency, and long-term greenhouse gas emission mitigation within the textile processing sector.

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

The project activity has been evaluated for potential **social, environmental, economic, and technological impacts** in accordance with the Universal Carbon Registry (UCR) requirements. The assessment confirms that the project activity does **not cause any adverse impacts** and instead contributes positively to sustainable development.

Project's Contribution to Sustainable Development:

Social benefits

- The project activity supports **local employment generation**, including jobs related to boiler operation, biomass handling, storage, and transportation of biomass briquettes.
- Use of biomass briquettes sourced from agricultural and agro-industrial residues provides **additional income opportunities to local farmers and biomass suppliers**, thereby supporting rural livelihoods.
- Replacement of coal with biomass briquettes significantly reduces fugitive dust, smoke, and odour, leading to **improved workplace health and safety conditions** for employees working in and around the boiler and thermopac areas.
- Reduced dependence on coal handling and storage lowers occupational health risks associated with coal dust inhalation.
- The project contributes to improved **community well-being** by reducing local air pollution compared to conventional coal-based thermal energy generation.

Environmental benefits

- The project activity results in substantial **reduction of greenhouse gas emissions** by displacing coal-based thermal energy with renewable biomass-based thermal energy.
- The project leads to a significant reduction in **local air pollutants**, such as particulate matter (PM), sulphur dioxide (SO₂), and ash generation, compared to coal combustion.
- Utilisation of agricultural and agro-industrial residues prevents **open burning or uncontrolled disposal of biomass waste**, thereby avoiding additional air pollution and methane emissions.
- The project supports **sustainable waste management practices** by promoting productive use of biomass residues.
- No adverse impacts on land, water resources, biodiversity, or ecosystems have been identified, as the project activity is confined within the existing industrial premises.

Economic benefits

- The project reduces the Project Proponent's exposure to **volatile fossil fuel prices**, thereby improving long-term cost stability for thermal energy generation.
- Use of locally available biomass briquettes contributes to **energy security** and reduces dependence on imported or long-distance fossil fuels.
- The project enhances the **competitiveness of the textile manufacturing operations** by stabilizing energy costs and reducing regulatory risks associated with fossil fuel use.
- Revenue generated through issuance of Carbon Offset Units (CoUs) provides **additional financial support**, improving the financial sustainability of the project activity.
- The project contributes indirectly to the **local economy** through procurement of biomass, transportation services, and maintenance activities.

Technological benefits

- The project promotes the adoption of **clean and proven renewable thermal energy technology** within the textile processing sector.
- Deployment of a biomass-fired boiler and thermopac system demonstrates **efficient and reliable fuel-switch technology** suitable for continuous industrial applications.
- The project encourages **technology replication** by demonstrating the technical feasibility of replacing coal with renewable biomass in similar industrial settings.
- Implementation of calibrated monitoring systems for fuel consumption and steam generation strengthens **operational efficiency and data reliability**.
- The project supports gradual **transition towards low-carbon industrial processes**, aligned with national and global climate change mitigation objectives.

Conclusion of Impact Test

The assessment confirms that the project activity **does not result in any negative social, environmental, economic, or technological impacts**. On the contrary, it delivers multiple co-benefits while achieving real, measurable, and long-term greenhouse gas emission reductions.

Therefore, the project activity successfully satisfies the “Do No Harm” requirement under the Universal Carbon Registry.

MAHARASHTRA POLLUTION CONTROL BOARD
 Tel: 24010706/24010437
 Fax: 24044532/4024068/4023516
 Website: <http://mpcb.gov.in>
 Email: jdwater@mpcb.gov.in

Kalpataru Point, 2nd and 4th floor, Opp. Cine Planet Cinema, Near Sion Circle, Sion (E), Mumbai-400022

RED/M.S.I (R40)
 No:- Format1.0/JD (WPC)/UAN
 No.0000125038/CR/2203000354
 Date: 07/03/2022

To,
 M/s. Pal Fashions Private Limited
 Plot No E-49, E-49/1 & E-49/2 MIDC Tarapur,
 Tal & Dist :Palghar.

Sub: Renewal of Consent to operate Yarm & Textile Processing Unit granted under red category.

Ref: Consent to Operate granted vide no. RO-Thane/Consent/1702001068/TR-I/535129 dtd. 20.02.2017 valid up to: 30/11/2021

Your application No.MPCB-CONSENT-0000125038 Dated 03.11.2021
 For: grant of Consent to Operate under Section 26 of the Water (Prevention & Control of Pollution) Act, 1974 & under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule 6 of the Hazardous & Other Wastes (Management & Transboundary Movement) Rules 2016 is considered and the consent is hereby granted subject to the following terms and conditions and as detailed in the schedule I, II, III & IV annexed to this order:

- The Renewal of Consent to Operate is granted for period valid up to: 30/11/2024
- The capital investment of the project is Rs.17.66 Crs. (As per C.A Certificate submitted by industry Existing CI is-Rs. 6.20 Crs + Expansion/Increase in C.I. - Rs. 11.46 Crs)
- Consent is valid for the manufacture of:

Sr No	Product	Maximum Quantity	UOM
1	Grey Art Silk Synthetics Fabrics	800000	Mtrs/M

- Conditions under Water (P&C), 1974 Act for discharge of effluent:

Sr No	Description	Permitted (in CMD)	Standards to	Disposal Path
1.	Trade effluent	500	As per Schedule-I	40 % Recycle/ reuse in process & 60 % CETP through MIDC drainage line
2.	Domestic effluent	18	As per Schedule-I	On land for gardening

Pal Fashions Private Limited/CR/UAN No.MPCB-CONSENT-0000125038 (07-03-2022 01:10:18 pm)
 /QMS.P06 F02/00 Page 1 of 10

5. Conditions under Air (P& CP) Act, 1981 for air emissions:

Sr No.	Stack No.	Description of stack / source	Number of Stack	Standards to be achieved
1	S-1	BOILER (4 TPH)	1	As per Schedule -II
2	S-2	THERMOPACK	1	As per Schedule -II
3	S-3	D.G SET (600 KVA)	1	As per Schedule -II

6. Non-Hazardous Wastes:

Sr No	Type of Waste	Quantity	UoM	Treatment	Disposal
1	N.A	0	--NA--	N.A	N.A

7. Conditions under Hazardous & Other Wastes (M & T M) Rules 2016 for treatment and disposal of hazardous waste:

Sr No	Category No./ Type	Quantity	UoM	Treatment	Disposal
1	35.3 Chemical sludge from waste water treatment	25	Kg/Day	NA	CHWTSDF

8. The Board reserves the right to review, amend, suspend, revoke this consent and the same shall be binding on the industry.

9. This consent should not be construed as exemption from obtaining necessary NOC/ permission from any other Government authorities.

10. The applicant shall make an application for renewal of consent 60 days prior to date of expiry of the consent. (Operate/Renewal)

Signed by: Dr. Y.B.Santak
 Joint Director (WPC)
 For and on behalf of
 Maharashtra Pollution Control Board
jdwater@mpcb.gov.in
 2022-03-07 13:10:42 IST

Received Consent fee of -

Sr.No	Amount(Rs.)	Transaction/DR.No.	Date	Transaction Type
1	250000.00	TXN2111000268	03/11/2021	Online Payment
2	50000.00	TXN2202001552	11/02/2022	Online Payment

Industry has submitted Consent fees of Rs. 2,50,000/- (Rs. Two Lakhs Fifty Thousand Rupees) Out of with Rs. 1,50,000/- (Rs. One Lakhs Fifty thousand Rupees) has been considered for grant of Renewal of Consent to Operate vide UAN no: 125038 & now Consent fees of Rs. 1,00,000/- (Rs. One Lakhs Rupees) has been Balanced with MPC Board, & same will be consider at the time of next Renewal of Consent to Operate.

Copy to:

Pal Fashions Private Limited/CR/UAN No.MPCB-CONSENT-0000125038 (07-03-2022 01:10:18 pm)
 /QMS.P06 F02/00 Page 2 of 10

THERMAX LIMITED DHANRAJ MAHAL, 2ND FLOOR, CHH. SHIVAJI MAHARAJ MARG
NEAR GATEWAY OF INDIA, MUMBAI 400 001 INDIA. ☐ TEL: (022) 67542222, 22045391,
FAX: (022) 22040859 ☐ Website: www.thermaxindia.com ☐ IT PAN - AAAC13910D

TF
THERMAX

CERTIFICATE

This is to certify that the fuel consumption of COMBIPAC BOILER MODEL CPD-40/10.54kg/cm2 Sr. no 17 supplied to M/S PAL FASHIONS PVT LIMITED.
Plot No E/49, MIDC Inds Area, Tarapur, Boisar Dist Thane, Maharashtra
401501, vide Invoice no. 201267, 201265, 201260, 201262, 201252, 201251 & 201250 dated. August 2008 is 600 kgs/hr when
fired on Baggase of Net.cal val. 2700 cal/kg. and has an efficiency of 76%
and hence the same is classified as an energy saving equipment and is subject
to 100% depreciation as per Income tax rules.
The above machine is entitled for 100% depreciation under Section No 111 3(d)
Rule 5, appendix 1 of Income Tax Act.

for THERMAX LIMITED

AUTHORISED OFFICIAL

REGD. OFFICE : D-13, MIDC INDUSTRIAL AREA, R. D. AGA ROAD, CHURCHAND, PUNE - 411 019, INDIA

Date 12.09.2008

TO WHOMSOEVER IT MAY CONCERN

We hereby certify that the Thermax Make Husk fire 4Tph cap. Steam Boiler
Machine put to use on dated 06.09.2008 for commercial production.

For Pal Fashions Pvt. Ltd.


Authorised Signatory.
Name: P. P. Kudu.
Designation: Engineer

United Nations Sustainable Development Goals:

The project activity contributes positively to multiple **United Nations Sustainable Development Goals (UN SDGs)** by promoting renewable energy use, reducing greenhouse gas emissions, improving local environmental quality, and supporting sustainable industrial practices. By replacing coal-based thermal energy generation with renewable biomass briquettes, the project advances climate change mitigation, resource efficiency, and sustainable industrial development.

UN SDG Goal	SDG Title	Relevance to the Project	Description of Contribution
SDG 7 7 AFFORDABLE AND CLEAN ENERGY 	Affordable and Clean Energy	High	The project promotes the use of renewable biomass energy for industrial thermal applications by replacing coal with biomass briquettes, supporting clean, reliable, and sustainable energy use in the textile sector.
SDG 8 8 DECENT WORK AND ECONOMIC GROWTH 	Decent Work and Economic Growth	Medium	The project supports local employment generation across biomass supply, transportation, boiler operation, and maintenance activities, contributing to inclusive economic growth.

SDG 9 	Industry, Innovation and Infrastructure	High	Adoption of biomass-based thermal energy technology demonstrates sustainable industrialization and encourages replication of clean fuel-switch solutions in energy-intensive industries.
SDG 12 	Responsible Consumption and Production	High	The project promotes responsible resource utilization by using agricultural and agro-industrial residues as fuel, preventing waste burning and supporting circular economy principles.
SDG 13 	Climate Action	Very High	The project directly contributes to climate change mitigation by avoiding CO ₂ emissions from coal combustion, achieving significant and verifiable greenhouse gas emission reductions through the displacement of coal-based thermal energy
SDG 15 	Life on Land	Medium	Reduced dependence on coal mining and productive use of biomass residues indirectly support land conservation and reduction of environmental degradation associated with fossil fuel extraction.

A.3. Location of project activity >>

The project activity is implemented at the manufacturing facility of **Pal Fashions Private Limited**, located within an established industrial area in the State of Maharashtra, India. The project site is situated in the MIDC Tarapur Industrial Area, which is a designated industrial zone with access to supporting infrastructure such as roads, utilities, and regulatory oversight.

The renewable biomass-based thermal energy generation system, comprising a 4 TPH biomass-fired boiler and a biomass-based thermopac system, is installed entirely within the existing factory premises. No additional land acquisition or land-use change has been undertaken for implementation of the project activity.

Geographical details of the project location

- **Country:** India
- **State:** Maharashtra
- **District:** Palghar
- **Taluka:** Palghar
- **Industrial Area:** MIDC Tarapur Industrial Area
- **Latitude:** 19.79° N
- **Longitude:** 72.76° E
- **Project Site Address:**

Plot No. E-49, E-49/1 & E-49/2, MIDC Tarapur,

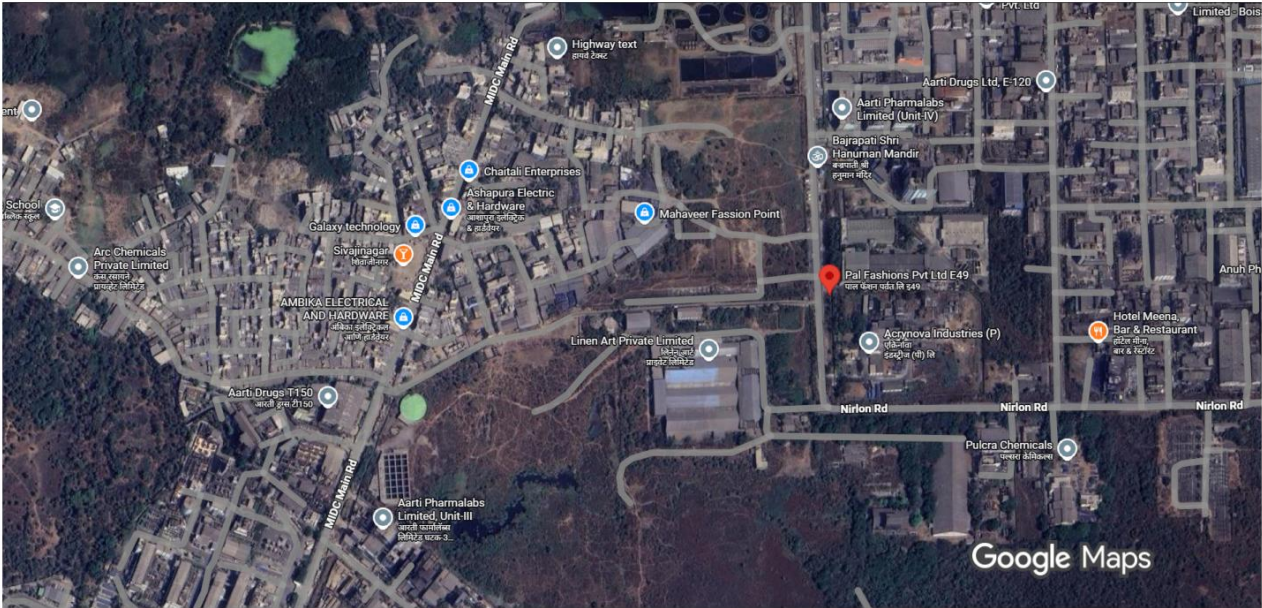
Taluka & District Palghar, Maharashtra, India

The project location falls within an industrial cluster notified by the Maharashtra Industrial Development Corporation (MIDC) and is governed by applicable environmental, industrial, and safety regulations issued by statutory authorities.

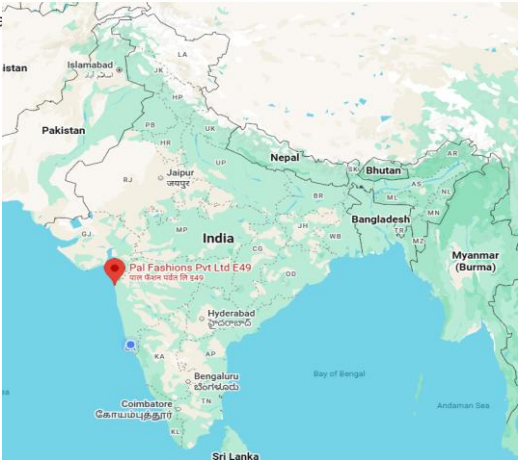
Pal Fashions Pvt Ltd E49



Satellite Map Image



Imagery ©2026 Airbus, Maxar



A.4. Technologies/measures

The project activity involves the generation of thermal energy in the form of steam and process heat using renewable biomass briquettes as fuel. The thermal energy systems installed at the manufacturing facility of Pal Fashions Private Limited comprise:

- One **4 TPH biomass-fired steam boiler (Stack ID S-1)**
- One **biomass-based Thermopac unit (Stack ID S-2)**

Both systems are designed for continuous industrial operation and are integrated into the textile processing operations of the facility.

Description of the Biomass-Fired Boiler (4 TPH)

The 4 TPH boiler is a steam-generating unit designed to produce saturated steam suitable for textile processing applications. The boiler operates at an average working pressure of approximately 5 kg/cm² (g) and supplies steam through insulated pipelines to various process units within the plant. The boiler was originally commissioned in 2008 and has been operating as part of the plant's thermal infrastructure. Under the UCR project activity, emission reductions from this unit are claimed for the period from 01 January 2013 to 31 December 2022.

The boiler uses renewable biomass briquettes as fuel, replacing coal that would otherwise have been used in the baseline scenario.

Description of the Thermopac System

The Thermopac unit is a biomass-based thermal fluid heater used to generate process heat required for specific textile operations. It operates using the same renewable biomass briquettes as fuel and functions alongside the steam boiler to meet overall thermal demand within the facility.

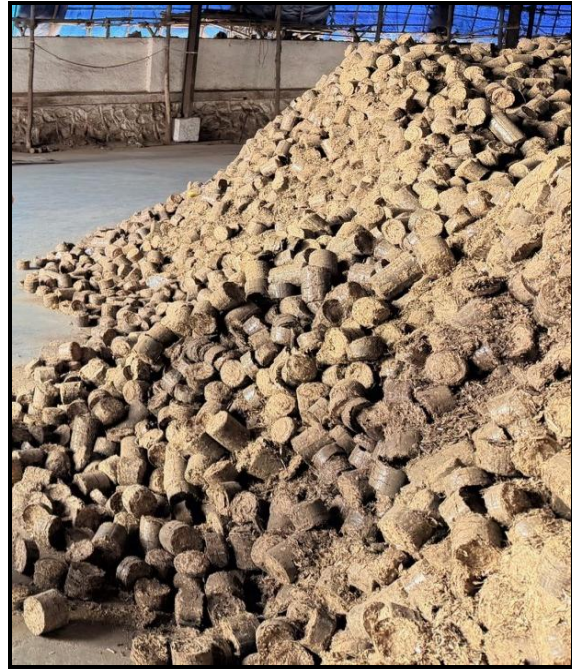
The Thermopac unit remains included in the UCR crediting boundary for the period from 01 January 2013 to 31 December 2022.

Fuel Characteristics and Handling System

The primary fuel used under the project activity is renewable biomass briquettes derived from agricultural and agro-industrial residues such as soya residue, corn residue, and similar biomass materials.

Fuel management under the project activity includes:

- Procurement of briquettes from independent third-party suppliers
- Covered storage within the factory premises
- Controlled and measured feeding of briquettes into the combustion systems
- Periodic quality checks and maintenance of fuel storage areas



The biomass briquettes used are renewable in nature and consistent with the applicability requirements of AMS-I.C methodology.

Combustion and Emission Control Systems

Both the biomass-fired boiler and Thermopac unit are equipped with appropriate air pollution control systems, including:

- Dust collectors
- Scrubber systems
- Adequate stack height as per regulatory requirements

These systems ensure compliance with emission norms prescribed by statutory environmental authorities.

Ash generated from biomass combustion is collected and disposed of in accordance with applicable environmental regulations.



Operational and Monitoring Framework

Operational parameters such as biomass consumption, operational days, and system performance are recorded and maintained by trained plant personnel.

For the purpose of emission reduction calculation under AMS-I.C (Version 22.0), the project applies the **fuel input approach**, wherein emission reductions are calculated based on:

- Quantity of biomass briquettes consumed
- Net calorific value of biomass
- Applicable baseline emission factor for coal

Steam pressure, temperature, and enthalpy parameters are monitored for operational control and system efficiency but are not directly used for emission reduction calculation.

All relevant monitoring equipment is calibrated periodically to ensure data accuracy and reliability.

Description	Project-Specific Value
Capacity of Current Boiler	4 TPH (Tonnes of steam per hour)
Pressure	5 kg/cm ² (g)
Feed Material	Biomass briquettes
Enthalpy of Steam (saturated steam at operating pressure ~5 kg/cm ² (g))	2,740 kJ/kg
Operation days / annum	≈ 300 days per year
Enthalpy of water @ 100 °C	≈ 419 kJ/kg
Boiler Rating	2.6 MWth
NCV of Biomass	14.5 MJ/kg

Technology Classification and Applicability

The installed biomass-fired boiler and Thermopac system represent proven and commercially established renewable thermal energy technologies suitable for industrial applications.

The total installed thermal capacity of the project activity remains within the small-scale threshold limits specified under UNFCCC methodology AMS-I.C for Type I renewable energy project activities.

The project constitutes a fuel-switch measure from fossil fuel (coal) to renewable biomass for captive thermal energy generation, resulting in measurable and verifiable greenhouse gas emission reductions.



A.5. Parties and project participants >>

Party (Host)	Participants
India	Project Proponent / Owner: Pal Fashions Private Limited E49, E49/1, E49/2 MIDC Tarapur, District Palghar, Maharashtra 401506 Contact Person: Mr. Charanpreet Singh Ahuja Email id: charan@palfashions.com UCR ID: 891792674

A.6. Baseline Emissions>>

In the absence of the project activity, thermal energy required for textile processing operations at the facility of Pal Fashions Private Limited would have been generated using coal-fired thermal systems to meet process heat demand.

Coal is a fossil fuel, and its combustion results in significant emissions of carbon dioxide (CO₂). Therefore, continued use of coal for steam and process heat generation represents the most plausible baseline scenario under the applied methodology.

The project activity involves a fuel switch from coal to renewable biomass briquettes for captive thermal energy generation through the thermal systems included within the defined project boundary. By replacing coal with renewable biomass, the project avoids CO₂ emissions associated with fossil fuel combustion.

Baseline emissions are estimated in accordance with UNFCCC small-scale methodology **AMS-I.C: Thermal energy production with or without electricity (Version 22.0)**.

Under the applied methodology:

- **Baseline fuel:** Coal
- **Baseline emission factor:** IPCC default CO₂ emission factor for coal (94.6 tCO₂/TJ)
- **Project fuel:** Renewable biomass briquettes
- **Project emission factor:** 0.0142 tCO₂ per tonne of biomass briquettes transported (explained in next page)

Baseline emissions for each year are calculated based on the quantity of renewable biomass consumed under the project activity and the equivalent fossil fuel-based thermal energy that would have been required in the absence of the project.

Project emissions associated with biomass combustion are considered zero under AMS-I.C methodology, as biomass is treated as carbon neutral.

However, in accordance with the latest Universal Carbon Registry guidance for biomass-based thermal energy projects, upstream emissions associated with transportation of biomass briquettes are conservatively considered under project emissions.

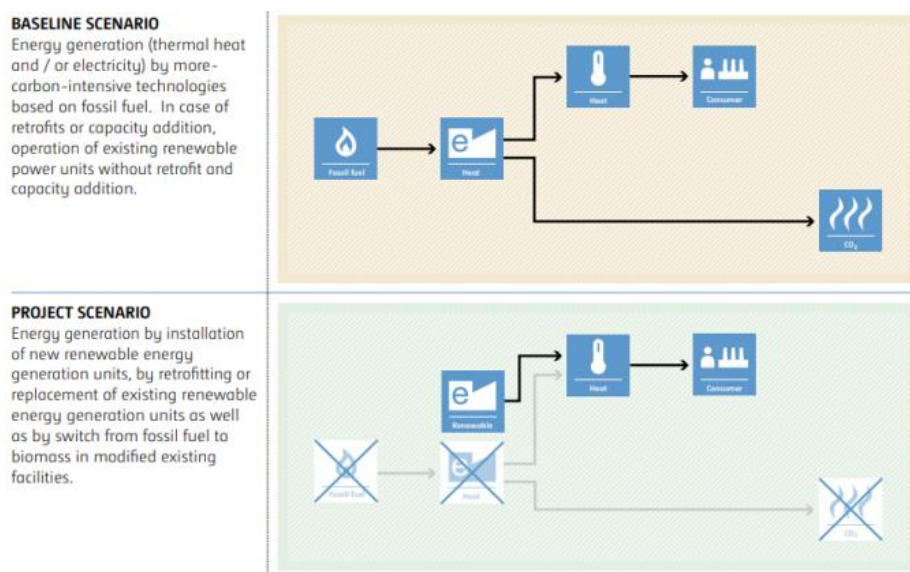
A default emission factor of 0.0142 tCO₂ per tonne of biomass briquettes transported is applied to account for transportation-related emissions.

These emissions are included as project emissions when determining the net emission reductions of the project activity.

In line with the defined crediting boundary:

- Baseline emissions associated with the **4 TPH Biomass-fired Boiler (Stack ID S-1)** are considered up to **31 December 2022**.
- Baseline emissions associated with the **Thermopac unit (Stack ID S-2)** are considered up to **31 December 2022**.

This approach ensures transparent, consistent, and boundary-aligned accounting of emission reductions under the Universal Carbon Registry.



(The diagram has been sourced from the CDM Methodology Booklet; with reference to AMS-I.C. Methodology)

A.7. Debundling>>

The project activity “**Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India**” is **not** a debundled component of a larger project activity.

The project has been implemented as a **single, independent renewable biomass–based thermal**

energy generation system at the manufacturing facility of Pal Fashions Private Limited. The project activity has not been artificially divided into smaller components for the purpose of qualifying under the small-scale project category.

There are no other registered, under-validation, or planned project activities implemented by the Project Proponent at the same location or under similar circumstances that would constitute a debundling scenario as defined under the applicable UNFCCC methodology and the Universal Carbon Registry requirements.

Accordingly, the project activity fully complies with the **debundling provisions** of **AMS-I.C.: Thermal energy production with or without electricity (Version 22.0)**.

SECTION B. Application of methodologies and standardized baselines

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

The project activity “**Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India**” is a renewable energy-based thermal energy generation project involving a fuel switch from fossil fuel (coal) to renewable biomass briquettes for captive steam generation.

The project activity is implemented in accordance with the following **approved UNFCCC methodology and UCR requirements**:

- Applied UNFCCC Methodology:
AMS-I.C.: Thermal energy production with or without electricity (Version 22.0)
- Project Type:
Type I – Renewable Energy Project Activity
- Sectoral Scope:
01 – Energy industries (Renewable / Non-renewable sources)

The selected methodology AMS-I.C. is applicable to the project activity, as the project involves the generation of thermal energy from renewable biomass for captive industrial use and results in the displacement of fossil fuel-based thermal energy that would otherwise have been generated using coal.

Baseline emissions, project emissions, and emission reductions under the project activity are quantified in accordance with the methodological procedures and default emission factors prescribed under the applied methodology and relevant IPCC guidelines, as adopted by the Universal Carbon Registry.

The project activity does not apply any additional standardized baseline other than the default emission factors and parameters referenced under the applied UNFCCC methodology.

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

The project activity satisfies the applicability conditions of UNFCCC small-scale methodology AMS-I.C: Thermal energy production with or without electricity (Version 22.0) as described below:

The project activity involves the generation of thermal energy in the form of steam and process heat using a renewable energy source, namely biomass briquettes, for captive industrial use.
The project comprises: • One 4 TPH biomass-fired steam boiler (Stack ID S-1), and • One biomass-based Thermopac unit (Stack ID S-2), both utilizing renewable biomass briquettes as fuel.
The thermal energy generated under the project activity is used entirely within the project boundary for textile processing operations such as dyeing, washing, finishing, and other thermal applications. No export of electricity or thermal energy occurs.
The project represents a fuel switch from fossil fuel (coal) to renewable biomass briquettes for thermal energy generation at the project site.
The renewable biomass used under the project activity is derived from agricultural and agro-industrial residues and qualifies as renewable biomass under the provisions of AMS-I.C methodology.
The project does not involve electricity generation or grid interaction and therefore falls within the scope of thermal energy production without electricity as defined under AMS-I.C.
The total installed thermal capacity of the project activity remains within the small-scale threshold limits specified for Type I renewable energy project activities under the applied methodology.
For emission reduction purposes: • The 4 TPH Biomass-fired Boiler (Stack ID S-1) is included from 01 January 2013 to 31 December 2022. • The Thermopac unit (Stack ID S-2) is included from 01 January 2013 to 31 December 2022.
Project emissions associated with transportation of biomass briquettes are conservatively considered under the project boundary. In accordance with the latest Universal Carbon Registry guidance, a default emission factor of 0.0142 tCO ₂ per tonne of biomass briquettes transported is applied when determining project emissions. Emissions from biomass combustion remain zero under AMS-I.C methodology.
No significant leakage emissions are identified, as biomass briquettes are sourced from residues

and their utilization does not result in displacement of other energy services.

Accordingly, the project activity fully complies with the applicability conditions of AMS-I.C (Version 22.0) and the requirements of the Universal Carbon Registry.

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

The emission reductions generated by the project activity “**Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India**” are **not double counted** under any other greenhouse gas mechanism, programme, or registry.

The project proponent confirms that emission reductions from the 4 TPH Boiler (Stack ID S-1) are claimed under UCR only up to 31 December 2022, and no emission reductions from this unit post 31 December 2022 are included in this project.

The project activity is implemented for **captive thermal energy generation**, and the renewable thermal energy produced is used exclusively within the project boundary. The project does not involve electricity generation, grid export, or participation in any renewable energy certificate, energy attribute certificate, or similar scheme.

The Project Proponent has not applied for, nor received, carbon credits or emission reduction units for the same project activity under any other voluntary or compliance carbon market for the stated crediting period.

Unique identification of the project activity, along with monitored biomass consumption and operational data, ensures that the emission reductions claimed under this project activity are **real, measurable, verifiable, and uniquely attributable** to the Universal Carbon Registry.

Accordingly, the project activity complies with the **double counting avoidance requirements** of the Universal Carbon Registry.

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

The project boundary encompasses the physical and geographical site where renewable biomass-based thermal energy generation systems are installed and operated within the manufacturing facility of Pal Fashions Private Limited, located at MIDC Tarapur Industrial Area, Maharashtra, India.

The project boundary includes:

- Biomass briquette receipt, storage, and handling systems
- One 4 TPH biomass-fired steam boiler (Stack ID S-1)
- One biomass-based Thermopac unit (Stack ID S-2)
- Associated combustion systems and stacks

- Steam and process heat distribution systems within the plant premises

All thermal energy generated under the project activity is used exclusively for captive consumption within the facility. The project does not involve electricity generation or grid interaction.

Temporal Crediting Boundary

In line with the defined UCR crediting scope:

- The **4 TPH Biomass-fired Boiler (Stack ID S-1)** is included within the crediting boundary from **01 January 2013 to 31 December 2022** only.
- The **Thermopac unit (Stack ID S-2)** remains included within the project boundary from **01 January 2013 to 31 December 2022**.

This structured boundary definition ensures transparent accounting and prevents double counting of emission reductions.

Sources and Greenhouse Gases Included in the Project Boundary

Under AMS-I.C methodology, only carbon dioxide (CO₂) emissions from fossil fuel combustion in the baseline scenario are considered significant.

The following table summarizes the included and excluded greenhouse gases:

Source	GHG	Included?	Justification
Baseline Scenario – Coal combustion for thermal energy generation	CO ₂	Included	Major source of baseline emissions under AMS-I.C
	CH ₄	Excluded	Minor and conservatively excluded
	N ₂ O	Excluded	Minor and conservatively excluded
Project Activity – Biomass combustion (Boiler & Thermopac)	CO ₂	Excluded	Biomass considered carbon neutral under methodology
	CH ₄	Excluded	Conservatively excluded
	N ₂ O	Excluded	Conservatively excluded

Boundary Justification

Baseline emissions arise from the hypothetical combustion of coal that would have occurred in the absence of the project activity.

Project emissions associated with biomass combustion are considered zero under AMS-I.C methodology, as biomass is treated as carbon neutral.

However, in accordance with the latest Universal Carbon Registry guidance for biomass-based thermal energy projects, upstream emissions associated with transportation of biomass briquettes are conservatively considered under project emissions.

A default emission factor of 0.0142 tCO₂ per tonne of biomass briquettes transported is applied to account for transportation-related emissions.

These emissions are included as project emissions when determining the net emission reductions of the project activity.

No significant leakage emissions are identified, as the biomass briquettes are sourced from agricultural and agro-industrial residues and their use does not displace other energy services.

Accordingly:

Emission Reductions (ER_y) = Baseline Emissions (BE_y) – Project Emissions (PE_y)

for the systems included within the defined crediting boundary during each respective year.

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

The baseline scenario for the project activity has been established in accordance with UNFCCC small-scale methodology **AMS-I.C: Thermal energy production with or without electricity (Version 22.0)**.

In the absence of the project activity, thermal energy required for textile processing operations at the facility of Pal Fashions Private Limited would have been generated using coal-based thermal systems. The combustion of coal results in emissions of carbon dioxide (CO₂), which constitute baseline emissions under the applied methodology.

The project activity involves a fuel switch from coal to renewable biomass briquettes for captive thermal energy generation through the biomass-fired boiler and Thermopac systems included within the defined project boundary.

Biomass briquettes are derived from agricultural and agro-industrial residues and are considered carbon neutral under AMS-I.C. Accordingly, project emissions associated with biomass combustion are considered zero, however emissions associated with transportation of biomass briquettes are conservatively considered as project emissions.

Baseline Emissions (BE_y)

Baseline emissions represent the CO₂ emissions that would have occurred from coal combustion to generate an equivalent amount of thermal energy in the absence of the project activity.

Baseline emissions for year y are calculated as:

$$BE_y = FC_{bio,y} \times NCV_{bio} \times 10^{-6} \times EF_{coal}$$

Where:

- BE_y = Baseline emissions in year y (tCO₂e)
- $FC_{bio,y}$ = Quantity of biomass briquettes consumed in year y (Kg)
- NCV_{bio} = Net Calorific Value of biomass briquettes (MJ/kg)
- 10^{-6} = Conversion factor from MJ to TJ
- EF_{coal} = CO₂ emission factor of coal (94.6 tCO₂/TJ, IPCC default)

The monitored biomass consumption under the project activity is used as a proxy to determine the equivalent fossil fuel-based thermal energy displaced.

Project Emissions (PE_y)

Project emissions under the project activity include emissions associated with transportation of biomass briquettes used as fuel.

While emissions from biomass combustion are considered zero under AMS-I.C methodology, transportation emissions are conservatively accounted for using the default emission factor prescribed by the Universal Carbon Registry.

Project emissions are calculated as:

$$PE_y = FC_{bio,y} \times 10^{-3} \times EF_{transport}$$

Where:

PE_y = Project emissions from biomass transport in year y (tCO₂)

$FC_{bio,y}$ = Quantity of biomass briquettes consumed in year y (kg)

10^{-3} = Conversion factor from kilograms to tonnes

$EF_{transport}$ = 0.0142 tCO₂ per tonne biomass

Leakage Emissions (LE_y)

No significant leakage emissions are identified, as biomass briquettes are sourced from agricultural and agro-industrial residues and their use does not result in displacement of other energy services.

Emission Reductions (ER_y)

Since:

- $LE_y = 0$

Annual emission reductions are equal to the baseline emissions minus transportation emissions:

$$ER_y = BE_y - PE_y$$

In accordance with the defined project boundary:

- Emission reductions from the 4 TPH Biomass-fired Boiler (Stack ID S-1) are considered for the period **01 January 2013 to 31 December 2022**.
- Emission reductions from the Thermopac unit (Stack ID S-2) are considered for the period

01 January 2013 to 31 December 2022.

Accordingly:

Total ER = ER Boiler (2013–2022) + ER Thermopac (2013–2022)

Estimated Emission Reductions

Based on the application of UNFCCC AMS-I.C methodology, final monitored biomass consumption data, a net calorific value of biomass of 14.5 MJ/kg, and the IPCC default emission factor for coal of 94.6 tCO₂/TJ, the project activity is estimated to achieve:

- **Boiler (2013–2022): 47,927 tCO₂e**
- **Thermopac (2013–2022): 28,355 tCO₂e**

Total emission reductions (2013–2022): 76,282 tCO₂e

Parameter	Unit	Value used	Basis / Source
Quantity of biomass consumed (average)	kg/year	~ 5,500,000	Operational records
Net Calorific Value (NCV) of biomass	MJ/kg	14.5	Derived from biomass test reports / conservative
Baseline fuel	–	Coal	Historical baseline
CO ₂ emission factor of coal	tCO ₂ /TJ	94.6	IPCC default
Project emission factor per tonne of biomass briquettes transported	tCO ₂ / tonne biomass	0.0142 tCO ₂	Default emission factor prescribed by the Universal Carbon Registry.
Leakage emissions	tCO ₂ e	0	As per AMS-I.C.

B.6. Prior History>>>

The project activity “Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India” has not applied to any other greenhouse gas (GHG) programme, registry, or mechanism for the generation or issuance of carbon offsets or credits for the stated crediting period.

The Project Proponent confirms that the emission reductions claimed under this project activity have not been previously registered, issued, or claimed under any other voluntary or compliance carbon market.

Accordingly, there is no prior history of the project activity under any other GHG programme that would result in double registration or double issuance of emission reductions.

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

There is no change in the start date of the crediting period for the project activity titled “Renewable Biomass Based Thermal Energy Generation by Pal Fashions, Palghar, Maharashtra, India.”

The overall crediting period under the Universal Carbon Registry (UCR) remains:

01 January 2013 to 31 December 2022

The crediting period commences on 01 January 2013, as stated in this Project Concept Note, and remains unchanged.

For clarity, in line with the defined project boundary:

- Emission reductions from the 4 TPH Biomass-fired Boiler (Stack ID S-1) are considered only up to 31 December 2022.
- Emission reductions from the Thermopac unit (Stack ID S-2) are considered up to 31 December 2022.

This reflects the defined system-wise inclusion within the crediting boundary and does not constitute a change in the project crediting start date.

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

There are no permanent changes from the monitoring plan, applied methodology, or applied standardized baseline as described in this Project Concept Note.

The project activity continues to be implemented in accordance with UNFCCC small-scale methodology AMS-I.C.: Thermal energy production with or without electricity (Version 22.0) and the applicable requirements of the Universal Carbon Registry.

Any refinements or clarifications to data parameters, if required, will be addressed during the preparation of the Monitoring Report and will not result in any permanent deviation from the registered Project Concept Note, applied methodology, or standardized baseline.

B.9. Monitoring period number and duration>>

First Issuance Period: 01/01/2013 to 31/12/2022 (inclusive of both dates)

First Monitoring Period: 01/01/2013 to 31/12/2022

First Crediting Period: 10 years, 00 months

The monitoring period corresponds to the overall crediting period of the project activity under UCR. Emission reductions from the 4 TPH Biomass-fired Boiler (Stack ID S-1) are considered up to 31/12/2022, while emission reductions from the Thermopac unit (Stack ID S-2) are considered up to 31/12/2022, in accordance with the defined project boundary.

B.10. Monitoring plan>>

In accordance with UNFCCC small-scale methodology **AMS-I.C: Thermal energy production with or without electricity (Version 22.0)**, emission reductions under the project activity are calculated using the **fuel input approach**.

Under this approach, baseline emissions are determined based on the monitored quantity of renewable biomass briquettes consumed in the biomass-fired boiler and Thermopac systems. Accordingly, the primary activity data required for emission reduction calculation is the quantity of renewable biomass briquettes consumed during each year of the crediting period.

Data/Parameter	Date of commissioning of biomass boiler
Data unit	Date as per boiler test report
Description	Actual date of commissioning of the project device
Source of data Value(s) applied	Monitoring Report As and when commissioned
Measurement methods and procedures	The commissioning and installation records of the biomass-fired boiler and thermopac unit are maintained and recorded in the monitoring report.
Monitoring frequency	As and when commissioned and fixed and recorded in the monitoring report.
Purpose of data	To establish the operational start date of the project devices within the defined crediting boundary

Data / Parameter:	FC _{bio,y}
Data unit:	Kg/year
Description:	Net quantity of renewable biomass briquettes consumed during year y in the biomass-fired boiler (Stack ID S-1) and Thermopac unit (Stack ID S-2), within the defined project boundary.
Source of data:	Plant records and log books receipts
Measurement methods and procedures:	• Biomass briquettes received at the plant are weighed using calibrated weighing systems. • Daily biomass consumption is recorded in plant operational logbooks. • Monthly and annual summaries are prepared based on verified consumption data. • Cross-verification is conducted between purchase records, stock records, and consumption logs.
Monitoring frequency:	Daily recording; aggregated monthly and annually for

QA/QC:	reporting.
	• Periodic reconciliation between procurement records and consumption logs. • Cross-check with physical stock verification. • Internal review by plant management on a monthly basis. • Independent verification during Monitoring Report preparation.

Data / Parameter:	Net Calorific Value (NCV _{bio})
Data unit:	MJ/kg
Description:	Net Calorific Value of renewable biomass briquettes used under the project activity.
Source of data:	• Biomass test reports • Supplier specifications • Laboratory test certificates
Measurement methods and procedures:	Gross Calorific Value (GCV) of biomass briquettes is determined through laboratory analysis. A conservative NCV value of 14.5 MJ/kg is derived and applied consistently across the crediting period to avoid overestimation of emission reductions.
Monitoring frequency:	As per fuel batch change or at least once per year; conservative value applied consistently.
QA/QC:	Conservative NCV value (14.5 MJ/kg) applied consistently across the crediting period, ensuring that emission reductions are not overestimated relative to laboratory-tested calorific values.

Data / Parameter:	EF _{transport}
Data unit:	tCO ₂ /tonne biomass
Description:	Default emission factor for transportation emissions associated with biomass briquettes used under the project activity.
Value used:	0.0142 tCO ₂ per tonne biomass
Source of data:	Universal Carbon Registry guidance for biomass-based thermal energy projects.
Measurement methods and procedures:	Default conservative value applied as per UCR methodology guidance.
Monitoring frequency:	Fixed default value; no monitoring required.
QA/QC:	Conservative default parameter applied consistently across the crediting period.

Data / Parameter:	Baseline Emission Factor (EF _{coal})
Data unit:	tCO ₂ /TJ
Value Used:	94.6 tCO ₂ /TJ
Source of data:	IPCC default emission factor for coal as referenced under AMS-I.C methodology.
Monitoring frequency:	Fixed default value; no monitoring required.