Project Design Document Form

Project Information	
Project Title	Biomass based Boiler Project by Falcon Agrifriz Foods Pvt. Ltd.
Name of the non-obligated entity (legal entity name)	Falcon Agrifriz Foods Pvt. Ltd. (FAFPL)
PDD version number	01
PDD completion date	13/7/2026
Sectoral Scope	1-Energy
Applied methodologies and tools	BM EN01.003- Electricity and Heat Generation from Biomass BM-T-010- Project and leakage emissions from biomass BM-T-001- Combined tool to identify the baseline scenario and demonstrate additionality BM-T-006- Tool to determine the baseline efficiency of thermal and electricity systems BM-T-003 - Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation
Estimated annual emission reductions or net removals over the crediting period (tCO_2e/year)	47,497 tCO_{2e}/year
Date of PDD Submission	20/7/2026

Section 1 : Project Description

A.1. Title of Project Activity

The title of the project activity is “Biomass based Boiler project by Falcon Agrifriz Foods Pvt. Ltd.”.

A.2. Compliance with minimum project eligibility

A.2.1. Regulatory Compliance

Falcon Agrifriz Foods Pvt. Ltd. Confirms that the project activity complies with all applicable national, state and local regulatory requirements including environmental laws, permits and approvals issued by the competent authorities.

A.2.2. Project Start Date

The project start date is 02/05/2025, corresponding to the date of Consolidated Consent and Authorization issued by Gujarat Pollution Control Board.

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A.2.3. Sector Scope (s)

01-Energy

A.2.4. Exclusivity

The project activity is not registered with any other carbon market or market-based mechanism including renewable energy mechanisms where the mitigation outcome or reduction is traded in the form of credits or certificates.

A.2.5. Prevention of Double Counting

The project activity has not been registered under any other GHG/non-GHG programs, ensuring that no double counting of emission reductions or mitigation outcomes occurs.

A.3. Non-obligated entity

A.3.1. Ownership of Project

Falcon Agrifriz Pvt. Ltd. is the sole owner and operator of the project activity and holds exclusive ownership of all assets and carbon rights, including the mitigation outcomes and carbon credits generated under the project.

A.3.2. Non-obligated entity

Falcon A Falcon Agrifriz Foods Pvt. Ltd. (FAFPL) is a non-obligated entity under the Offset Mechanism of the Carbon Credit Trading Scheme (CCTS) notified by the Bureau of Energy Efficiency (BEE), Government of India. Accordingly, FAFPL is eligible to participate in the voluntary crediting mechanism under the CCTS.

A.3.3. Managing Entity

FAFPL is the managing entity responsible for the overall implementation, operation, monitoring of the project activity in accordance with the requirements of the Offset mechanism under the CCTS administered by the BEE.

A.3.4. Roles and Responsibilities of Participants

FAFPL is the project owner of the project activity and responsible for the following:

- Overall ownership, management, and operation of the project activity
- Implementation of the project in accordance with the approved design and methodology
- Collection, maintenance, and archiving of monitoring data and supporting documentation
- Preparation and submission of project documentation, monitoring reports, and verification responses

A.4. Detailed Description of Project Activity

A.4.1 Title

The title of the project activity is "Biomass based Boiler project by Falcon Agrifriz Foods Pvt. Ltd.".

A.4.2. Objective and Purpose

Objective- The objective of the project activity is to reduce greenhouse gas (GHG) emissions by replacing fossil fuel–based thermal energy with renewable biomass-based thermal energy through the installation and operation of a 26 TPH biomass-based boiler at the agro-based food processing facility of Falcon Agrifriz Foods Pvt. Ltd. The project aims to generate measurable, reportable, and verifiable emission reductions by utilizing sustainably sourced biomass briquettes for captive steam generation, in line with the requirements of the Offset mechanism of Indian Carbon Credit Trading Scheme administered by the Bureau of Energy Efficiency (BEE), Government of India.

Purpose- The purpose of the project activity is to meet the captive thermal energy demand of the food processing facility in an environmentally sustainable

manner while reducing reliance on coal-based boilers and associated GHG emissions. By utilizing biomass briquettes derived from agricultural residues such as groundnut shells and sawdust, the project promotes the use of carbon-neutral renewable energy, mitigates emissions from fossil fuel combustion, and avoids environmental impacts associated with uncontrolled biomass decay and open burning. Additionally, the project supports voluntary participation in the Offsetting mechanism framework by generating carbon credits and contributing to national climate change mitigation objectives.

A.4.3. Project Location

A.4.3.1. State

Gujarat

A.4.3.2. City/Town

Village- Sadra

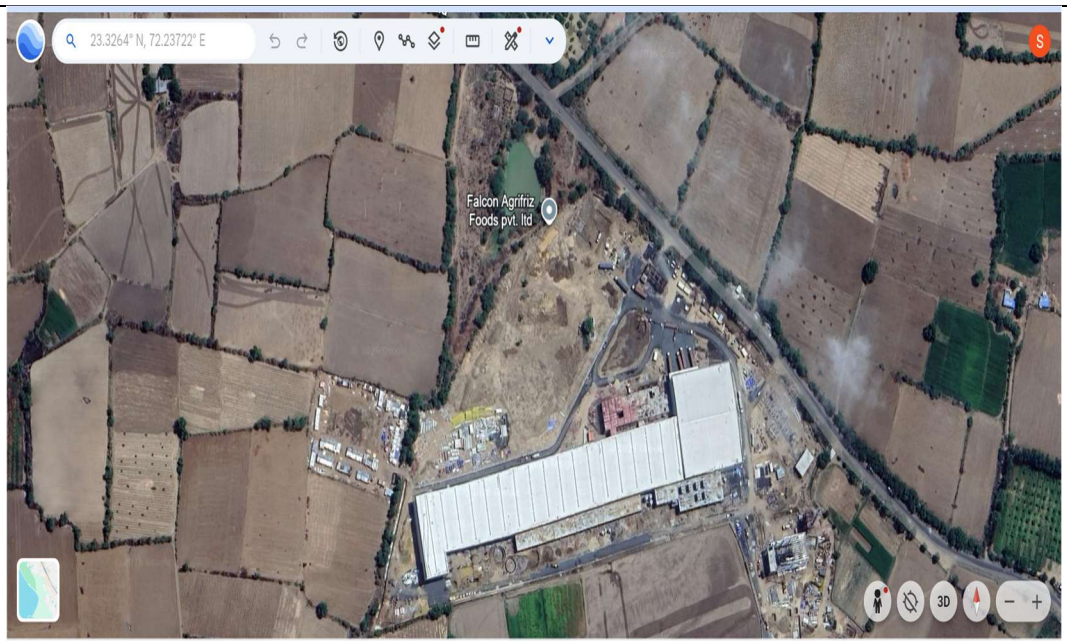
A.4.3.3. District

Mehsana

A.4.3.4. Geographical Coordinates

Physical Address	Latitude	Longitude
Survey No. 740, Village- Sadra, Taluka- Kadi, District- Mehsana, Gujarat	23.3264° N (23°19'37"N)	72.23722° E (72°14'14"E)

A.4.3.5. Local Map



A.4.4 Technologies/measures to be employed and/or implemented

The project consists of 26 TPH biomass-based boiler for steam generation. The technical details are provided below:

Boiler		
Parameters	Unit	Values/Information
Make		Thermax
Boiler type		Lambion grate
Boiler design capacity	TPH	26 TPH
Steam Pressure at main steam stop valve outlet	Kg/cm^2	24.5
Steam Temperature at main stop valve outlet	°C	Saturated
Design pressure	Kg/cm^2	28
Design code		IBR 1950 with latest amendments
Steam dryness	%	98%

Feedwater inlet temperature at De-aerator inlet	°C	40
Feedwater temperature at De-aerator inlet	°C	70
Thermal efficiency (NCV basis)	%	83±2%
Fuel type		Biomass briquettes
Firing type		Screw feeder
Turn down ratio		30% to 100%

This is a greenfield project activity generating steam energy from the project activity would have been otherwise generated from the fossil fuel fired boiler and the heater. There is no technology transfer occurred in the proposed project activity.

A.4.5. Technologies/measures existing prior to the implementation of the project (if applicable)

Prior to the implementation of the project activity, there was no biomass-based boiler installed or operated at the project site. Steam generation using biomass briquettes was not practiced at the facility. The project activity involves the installation and operation of a 26 TPH biomass briquette-based boiler for steam generation at Falcon Agrifriz Foods Pvt. Ltd., Village Sadra, Mehsana. Therefore, the use of biomass briquettes as a fuel for steam generation has been introduced for the first time on the site.

A.4.6. Description of how the project activity will achieve GHG emission reductions and/or removals.

The project activity involves installation and operation of 26 TPH biomass-based boiler at Village Sadra, Taluka Kadi in the District of Mehsana, Gujarat. It utilizes biomass briquettes made from groundnut shells and saw dust as the primary fuel source. The boiler will generate steam for the Agro-based food processing unit with capacity of 10 MT/hour of French fry and 2MT/Hour of other Potato Based RTC products. The use

of biomass briquettes reduces the reliance on fossil fuels and decreasing the greenhouse gas emissions.

In the absence of the project activity, equivalent amount of energy would have been generated from coal-based boiler which would emit comparable amount of greenhouse gas emissions into the atmosphere. Hence, the implementation of the project activity leads to reduction of the greenhouse gas emissions from fossil fuel combustion.

The usage of biomass as fuel is considered as carbon neutral in nature, the thermal energy generated from the project activity is considered as a clean form of energy. The project activity uses the thermal generated for captive consumption within the plant, thereby reduces the equivalent number of emissions into the atmosphere.

The project activity aims to utilize the biomass in a controlled and sustainable manner and it will help to mitigate environmental harm caused by traditional practices of biomass decay and uncontrolled burning, thereby preserving the local environment and reduces air pollution.

The project is supposed to generate an average estimated emission reduction of about 47,497 tCO2/yr. Total estimated emission reduction for the entire crediting period is 474,966 tCO2e.

A.4.7. GHG Reduction

A.4.7.1. Explanation on GHG reduction and

The project activity involves the installation and operation of a 26 TPH biomass briquette-based boiler for steam generation at Falcon Agrifriz Foods Pvt. Ltd., located in Village Sadra, Mehsana, Gujarat. Prior to the implementation of the project activity, there was no biomass-based steam generation system at the project site, and biomass briquettes were not used as a fuel for steam generation.

In the absence of the project activity, the steam demand would have been met through conventional fossil fuel-based boilers such as coal, furnace oil, or natural gas-based systems, which result in significant greenhouse gas (GHG) emissions due to fossil fuel combustion.

The project activity replaces fossil fuel-based heat generation with renewable biomass briquettes derived from agricultural residues. Since biomass is

considered a carbon-neutral fuel under the applicable methodology, the combustion of biomass briquettes results in significantly lower net GHG emissions compared to fossil fuel alternatives.

Therefore, the project activity leads to GHG emission reductions by avoiding emissions associated with fossil fuel combustion for steam generation and replacing them with renewable biomass-based heat generation.

A.4.7.2. Justification on how reduction are above Business as usual Scenario.

In the absence of the project activity, the business-as-usual (BAU) scenario for Falcon Agrifriz Foods Pvt. Ltd. would involve the generation of equivalent thermal energy using a conventional **coal-based boiler**, which is the prevailing and economically established technology for meeting high-temperature steam requirements in agro-based food processing industries in the region. Coal-fired boilers are widely used due to their established supply chains, lower upfront capital costs, and operational familiarity.

The installation and operation of a 26 TPH biomass-based boiler is not a continuation of the BAU scenario, as it involves a deliberate shift from fossil fuel-based thermal energy to renewable biomass-based energy. The project requires higher capital investment, dedicated fuel handling and storage infrastructure, and long-term biomass procurement arrangements, which are not standard practice under BAU conditions.

Under the BAU scenario, the combustion of coal would result in significant greenhouse gas emissions associated with fossil fuel use. In contrast, the project activity utilizes biomass briquettes derived from agricultural residues such as groundnut shells and sawdust, which are considered carbon-neutral under Offset mechanism–BEE guidelines. As a result, the thermal energy generated under the project activity leads to substantially lower net GHG emissions compared to the BAU scenario.

A.4.7.2. Estimated Annual GHG Reduction

The estimated annual GHG reduction for the project activity is 47,497 tCO_{2e}/yr.

A.4.7.3. Estimated GHG reduction over crediting period

The crediting period for the project activity is of 10 years. Therefore, the estimated GHG reduction over the entire crediting period is 474,966 tCO_2.

A.4.8. Project Implementation Timeline

Sr.No.	Milestone	Date
1.	Certificate of Incorporation of Falcon Agrifriz Foods Private Limited	20/07/2023
2.	Detailed Project Report	01/05/2024
3.	Consent & Authorization by Gujarat Pollution Control Board	02/05/2025

A.4.9. Details of Project Funding

The project activity is funded through a combination of debt and equity with approximately 56% debt and 44% equity.

A.4.10. Project Bundling (if applicable)

Not applicable.

Section II : Project – Crediting Period

B.1.Project Development Cycle

B.1.1. Date on Decision on implementation of Project.

B.1.2. Project Start Date

The project start date is 02/05/2025 which is the Consolidated Consent Authorization (CC& A) by the Gujarat Pollution Control Board.

B.1.3. Expected Lifetime of the project

Based on the manufacturer's specifications and industry practice, the expected operational lifetime of the project is 20-25 years.

B.2. Crediting Period

B.2.1. Type of Crediting period opted

The project activity has opted for a fixed crediting period of 10 years under the Offset mechanism of CCTS.

B.2.2. Fixed Crediting Period

B.2.2.1. Start date of Crediting Period

02/05/2025

B.2.2.2. End Date of Crediting Period

01/05/2035

B.3.3. Renewable Crediting Period

B.3.3.1. Start date of Crediting Period

Not applicable.

B.3.3.2. End Date of Crediting Period

Not applicable.

B.3.3.3. Length of Crediting Period

Not applicable.

Section III : Methodology

C.1. Selection of Methodology

C.1.1. Details on approved methodology applied.

The project activity applies BM EN01.003- Electricity and Heat Generation from Biomass, Version 1.0.

C.1.2. Justification of application of methodology

The above methodology is applicable to this project activity as it covers projects that generate electricity and/or heat from renewable biomass sources and displace fossil fuel-based energy generation. The project utilizes biomass briquettes manufactured from agricultural residues, specifically groundnut shells and sawdust, which qualify as eligible biomass fuels under the methodology.

C.2. Application of Methodology

C.2.1. Details on application of methodology

Applicability conditions	Justification

The heat generated in the heat generation equipment is either not used for power generation or, if power is generated using the heat generated by the heat generation equipment, it is not increased as a result of the project activity, i.e.: i. The power generation capacity installed remains unchanged due to the implementation of the project activity and is maintained at the pre-project level throughout the crediting period; and ii. The annual power generation during the crediting period is not more than 10% larger than the highest annual power generation in the most recent three years prior to the implementation of the project activity.	The project activity involves the generation of thermal energy (steam) for captive process use only within the agro-based food processing facility. No electricity is generated from the heat produced by the biomass-based boiler. As no power generation facility is installed or operated, there is no power generation capacity associated with the project activity. Therefore, the condition of maintaining pre-project capacity is not applicable by design. Since the project does not involve electricity generation, annual power generation during the crediting period remains zero, and hence cannot exceed the historical maximum. Therefore, the project activity meets the criterions.	
The use of biomass residues or increasing the use of biomass residues beyond historical levels is technically not possible at the project site without a significant capital investment in: i. Either the retrofit or replacement of existing heat generation equipment or the installation of new heat generation equipment; or	The project activity involves installation of a new 26 TPH biomass boiler for steam generation using biomass briquettes as fuel. The installation of this new biomass-based heat generation equipment requires substantial capital investment in the boiler system and associated infrastructure.	

ii. Establishing a new dedicated biomass supply chain for the purpose of the project activity (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes).	The project activity also involves procurement of biomass residues from various suppliers to ensure a continuous supply of biomass fuel. The supply chain includes supplier identification, procurement planning, transportation, storage and quality management of the biomass fuel. This all requires significant investment. Therefore, this criterion is applicable.	
The methodology is applicable under the following conditions: (a) Biomass used by the project plant is limited to biomass residues, biogas, RDF[1] and/or biomass from dedicated plantations; Refuse Plastic Fuel (RPF) can also be co-fired in the equipment, but for the purpose of this methodology RDF and RPF shall be considered as fossil fuels; (b) Fossil fuels may be co-fired in the project plant. Additionality criteria corresponding to regulatory surplus shall need to be considered while applying the same. In case of new biomass-based plant, the proportion of fossil fuels co-fired may not exceed 20%.	a) The project uses biomass briquettes manufactured exclusively from agricultural residues, namely groundnut shells and sawdust. No dedicated plantations, RDF, or RPF are used in the project activity. b) The project activity is designed to operate primarily on biomass. No fossil fuels are used during normal operation nor considered for the project activity. c) Biomass residues are sourced externally from agricultural and wood-processing waste streams. The project does not rely on residues generated from an in-house production process, and therefore does not influence raw material processing capacity or product output.	

[1] Refuse Derived Fuel (RDF) may be used in the project plant but all carbon in the fuel, including carbon from biogenic sources, shall be considered as fossil fuel.

(c) For projects that use biomass residues from a production process (e.g. production of sugar or wood panel boards), the implementation of the project does not result in an increase of the processing capacity of (the industrial facility generating the residues) raw input (e.g. sugar, rice, logs, etc.) or in other substantial changes (e.g. product change) in this process; (d) The biomass used by the project plant is not stored for more than one year; (e) The biomass used by the project plant is not processed chemically or biologically (e.g. through esterification, fermentation, hydrolysis, pyrolysis, bio- or chemical degradation, etc.) prior to combustion. Drying and mechanical processing, such as shredding and pelletisation, are allowed. (f) No power and heat plant operates at the project site during the crediting period; (g) If any heat is generated for purposes other than power generation (e.g. heat which is produced in boilers or extracted from the header to feed thermal	d) Biomass briquettes are procured on a regular and continuous basis and stored onsite only for short durations, significantly less than one year, in accordance with operational and safety practices. e) The biomass undergoes only mechanical processing (shredding and briquetting). No chemical or biological processing such as fermentation, hydrolysis, or pyrolysis is involved. f) The project site does not have any electricity generation plant. The biomass boiler is used solely for steam generation for captive process heat. g) (i)The biomass boiler operates independently and does not affect the operation of any other heat generation equipment, which would continue to operate in the same manner in the absence of the project activity. (ii) There is no diversion of fuels between any other heat generation equipment and the project plant. Dedicated fuel systems are maintained. (iii) Biomass fuel consumption for the project activity is separately metered and recorded through weighbridge	

	loads in the process) during the crediting period or was generated prior to the implementation of the project activity, by any on-site or off-site heat generation equipment connected to the project site, the following conditions should apply: i. The implementation of the project activity does not influence directly or indirectly the operation of the heat generation equipment, i.e. the heat generation equipment would operate in the same manner in the absence of the project activity; ii. The heat generation equipment does not influence directly or indirectly the operation of the project plant (e.g. no fuels are diverted from the heat generation equipment to the project plant); and iii. The amount of fuel used in the heat generation equipment can be monitored and clearly differentiated from any	records, stock registers, and boiler logs, allowing clear differentiation from any other fuel use. Therefore, the project activity meets the criterions.	

fuel used in the project activity;	
In the case of fuel switch project activities, the use of biomass or the increase in the use of biomass as compared to the baseline scenario is technically not possible at the project site without a capital investment in: (a) The retrofit or replacement of existing heat generators/boilers; or (b) The installation of new heat generators/boilers; or (c) A new dedicated supply chain of biomass established for the purpose of the project (e.g. collecting and cleaning contaminated new sources of biomass residues that could otherwise not be used for energy purposes); or (d) Equipment for preparation and feeding of biomass.	In the baseline scenario, thermal energy would be generated using a coal-based boiler. The project activity involves installation of new biomass based boiler which uses biomass briquettes as the primary fuel. A new 26 TPH biomass-based boiler was installed, including auxiliary systems such as fuel feeding, ash handling, and emission control equipment. This represents a significant capital investment. The project required the development of a dedicated biomass briquette supply chain, including sourcing agricultural residues (groundnut shells and sawdust), transportation, storage, and quality control mechanisms. Therefore, the project activity meets the criterions.
If biogas is used for power and heat generation, the biogas must be generated by anaerobic digestion of wastewater, and: a) If the wastewater generation source is registered as an ICM project activity, the details of the wastewater project shall be included in the PDD, and	This criterion is not applicable as the project activity does not generate biogas.

emission reductions from biogas energy generation are claimed using this methodology b) If the wastewater source is not an ICM project, the amount of biogas does not exceed 50% of the total fuel fired on energy basis.	
In the case biomass from dedicated plantations is used, the "BM-T-010: Project and leakage emissions from biomass" shall apply to determine the relevant project and leakage emissions from cultivation of biomass and from the utilization of biomass residues.	The project activity uses biomass briquettes produced exclusively from agricultural and wood-processing residues, namely groundnut shells and sawdust. No biomass from dedicated plantations is used. Accordingly, the tool is applied solely for accounting of project emissions associated with the project activity. As biomass from dedicated plantations is not used and no leakage emissions have been identified, the application of BM-T-010 for accounting project emissions from biomass cultivation and leakage emissions is not applicable to this project activity.
The methodology is only applicable if the baseline scenario, as identified per the "Selection of the baseline scenario and demonstration of additionality" section hereunder, is: (a) For power generation: scenarios P2 to P7, or a combination of any of those scenarios; and	In the absence of the project, equivalent thermal energy would have been generated using a coal-based boiler, which falls under heat generation baseline scenarios H2–H7 (fossil fuel-based heat generation). The project utilizes biomass residues sourced externally from agricultural

(b) For heat generation: scenarios H2 to H7, or a combination of any of those scenarios; (c) If some of the heat generated by the ICM project activity is converted to mechanical power through steam turbines, for mechanical power generation: scenarios M2 to M5: i. In cases M2 and M3, if the steam turbine(s) are used for mechanical power in the project, the turbine(s) used in the baseline shall be at least as efficient as the steam turbine(s) used for mechanical power in the project; ii. In cases M4 and M5, steam turbine(s) generating mechanical power to be used for the same purpose as in the baseline are not allowed; (d) For the use of biomass residues: scenarios B1 to B5, or a combination of any of those scenarios; (e) For the use of biogas: scenarios BG1 to BG3, or a combination of any of those scenarios.	and wood-processing waste streams. These residues would otherwise be unused, decay naturally, or be disposed of through uncontrolled practices, consistent with B1–B5 scenarios.	

The methodology is not applicable if the baseline scenario involves the cultivation of biomass in dedicated plantations.	The identified baseline scenario for the project activity is fossil fuel–based (coal) heat generation. The project does not involve cultivation of biomass in dedicated plantations, either in the baseline or project scenario. Biomass used in the project consists solely of agricultural and wood-processing residues (groundnut shells and sawdust) sourced externally.	
In case of project activities that involve the replacement or retrofit of existing heat generation equipment, emission reductions may only be accounted until the time when the existing equipment would have reached the end of its technical time in the crediting period, i.e. after the point in time when the existing equipment would have to be replaced due to the expiry of its technical lifetime in the baseline scenario, emission reductions cannot be accounted. For the purpose of demonstrating this applicability condition, non-obligated entities should determine and document the remaining lifetime of each unit of the existing heat generation equipment in accordance with BM-T-015. In the case of several existing units with a different remaining lifetime, the shortest lifetime among the units should be used to determine the	The project activity does not involve the replacement or retrofit of existing heat generation equipment. Instead, it entails the installation of a new biomass-based boiler. Accordingly, the applicability condition related to the determination of remaining technical lifetime of existing equipment under BM-T-015 does not apply, and emission reductions will be accounted for the full crediting period and beyond as per the Offset mechanism under CCTS.	

point in time until which CCCs can be claimed.	

C.2.2 Description of baseline scenario

In the absence of the project activity, the baseline scenario for the proposed project would be the generation of equivalent thermal energy using a fossil fuel–based (coal-fired) boiler at the project site. Coal-fired boilers represent the most commonly deployed and economically established technology for meeting high-pressure steam and process heat requirements in agro-based food processing industries in the region.

Under the baseline scenario, thermal energy required for the production of French fries and other potato-based ready-to-cook (RTC) products would continue to be met through the combustion of coal, resulting in the emission of greenhouse gases associated with fossil fuel use. The baseline technology would operate in accordance with prevailing industry practices, without any obligation to switch to renewable or low-carbon alternatives.

The baseline scenario does not involve the use of biomass residues, renewable energy sources, or energy-efficient technologies beyond standard practice. No regulatory or policy requirements mandate the replacement of coal-based heat generation with biomass-based systems for the project proponent, who is a non-obligated entity under the offsetting mechanism of Indian Carbon Credit Trading Scheme.

Accordingly, the baseline scenario corresponds to eligible heat generation baseline scenarios (H2–H7) as defined under BM EN01.003, version 1.0, where thermal energy is produced from fossil fuels. The project activity deviates from this baseline by introducing a renewable biomass-based boiler, thereby achieving emission reductions that would not occur under the baseline scenario.

C.2.3. Justification of selection of baseline scenario

The baseline scenario selected for the project activity is the continued generation of thermal energy using a coal-based boiler to meet the process heat and steam requirements of the agro-based food processing facility of Falcon Agrifriz Foods Pvt. Ltd.

This baseline scenario has been selected based on the identification and evaluation of all realistic and credible alternatives available in the absence of the project activity, in accordance with the "Selection of the baseline scenario and demonstration of additionality" provisions under BM EN01.003 (version 1.0). Coal-fired boilers are the most commonly used and economically viable technology for industrial steam generation in the region and represent standard industry practice for similar food processing units.

Alternative scenarios such as the use of renewable thermal energy sources (including biomass-based boilers) were not considered part of the baseline due to higher capital costs, the need for specialized fuel handling infrastructure, and the absence of regulatory requirements mandating the use of biomass or other renewable fuels for the project activity. Therefore, these alternatives do not represent the most likely course of action in the absence of the project activity.

Furthermore, the baseline scenario does not involve the use of biomass residues, biogas, or other renewable energy sources, nor does it include significant efficiency improvements beyond standard operational practices. The continued use of coal-based heat generation would result in ongoing greenhouse gas emissions from fossil fuel combustion.

Accordingly, the selected baseline scenario corresponds to eligible heat generation baseline scenarios (H2–H7) under BM EN01.003(v1.0) and represents the most plausible business-as-usual scenario. The project activity deviates from this baseline by replacing fossil fuel-based heat generation with renewable biomass-based thermal energy, thereby achieving emission reductions that would not occur under the baseline scenario.

C.2.4. Description of how emission in project scenario is reduced as compared to baseline

Under the baseline scenario, the thermal energy required for the operation of the agro-based food processing facility of Falcon Agrifriz Foods Pvt. Ltd. would be generated using a coal-based boiler, resulting in the emission of greenhouse gases associated with the combustion of fossil fuels. These emissions would occur continuously over the operating life of the facility and represent the business-as-usual scenario.

In the project scenario, the baseline coal-based heat generation is replaced by a 26 TPH biomass-based boiler that generates steam for captive process use. The project utilizes biomass briquettes derived from agricultural and wood-processing residues, specifically groundnut shells and sawdust, as the primary fuel. In accordance with the BM EN01.003 methodology and Offset mechanism guidelines, carbon dioxide emissions from the combustion of biomass residues are considered biogenic and therefore treated as carbon neutral.

As a result, the project scenario avoids the combustion of coal and the associated fossil CO_2 emissions that would have occurred under the baseline scenario. The emission reductions are quantified as the difference between the baseline emissions from fossil fuel-based heat generation and the project emissions, which are considered negligible. Leakage emissions associated with biomass sourcing are also assessed to be insignificant, as the biomass is sourced from waste residues and used within a controlled supply chain.

Additionally, the project promotes the productive utilization of biomass residues that might otherwise undergo uncontrolled decay or open burning, thereby contributing to improved local environmental conditions and reduced air pollution. The thermal energy generated under the project is used entirely for captive consumption, ensuring that all emission reductions are attributable to the displacement of fossil fuel-based heat generation at the project site.

Therefore, the project scenario achieves measurable and verifiable greenhouse gas emission reductions compared to the baseline scenario by replacing fossil fuel-based thermal energy with renewable biomass-based energy, in line with the requirements of the Offset mechanism under Carbon Credit Trading Scheme (CCTS) administered by the Bureau of Energy Efficiency (BEE), Government of India.

C.2.5. Description of Project Boundary

As per para 21, the spatial extent of the project boundary encompasses:

(a) All plants generating power and/or heat located at the project site, whether fired with biomass, fossil fuels or a combination of both4;

(b) All power plants connected physically to the electricity system (grid) that the project plant is connected to;

(c) If applicable, all off-site heat sources that supply heat to the site where the ICM project activity is located (either directly or via a district heating system);

(d) The means of transportation of biomass to the project site;

(e) If the feedstock is biomass residues, the site where the biomass residues would have been left for decay or dumped;

(f) If the feedstock is biomass produced in dedicated plantations the geographic boundaries of the dedicated plantations;

(g) The wastewater treatment facilities used to treat the wastewater produced from the treatment of biomass;

(h) If biogas is included, the site of the anaerobic digester.

(i) The project activity power-only plant(s);

(j) All other on-site power-only plants, whether fired with biomass, fossil fuels or a combination of both;

(k) If the biomass involves any type of processing prior to combustion such as drying, pelletisation, shredding, briquetting, etc., two options can be considered:

a) The biomass processing plant can be included in the project boundary and the primary source of the biomass is assessed according to the procedures described in the following section; or else

b) The biomass processing plant is not included in the project boundary and then the processed biomass obtained from that plant should be considered as alternative B4 following the guidance in BM-T-016.

(l) The heat generation equipment and related equipment at the project site;

(m) The site where the biomass residues would have been left for decay under anaerobic conditions. This is applicable only to cases where the biomass residues would in the absence of the project activity be dumped and left to decay under anaerobic conditions;

The project boundary of this project activity includes (a), (b), (c) and (d) as per the above given components

C.3 Demonstration of Additionality

In accordance with the provisions of the BM-T-001 Combined Tool to Identify the Baseline Scenario and Demonstrate Additionality, the additionality of the project

activity has been established by applying the mandatory steps and relevant analyses described under the tool.

The Mandatory steps are:

1. **Regulatory analysis**

   The project activity involves the installation and operation of a 26 TPH biomass briquette-based boiler for steam generation to meet the process steam requirements of the facility.

   As per the relevant regulatory framework in India, including policies applicable in Gujarat, indicates that there is no mandatory legal requirements obligating industrial facilities to replace fossil fuel-based boilers with biomass briquette-based systems for process steam generation.

   The regulatory environment related to industrial energy use of primarily focuses on:

   - Compliance with emission standards under the Central Pollution control board and the Gujarat Pollution control board.
   - Adherence to air pollution norms for particulate matter and stack emissions
   - General energy efficiency guidelines under the BEE.
   - These regulations set emission limits and environmental performance standards, but they do not prescribe a specific fuel type or require the use of biomass fuels for industrial steam generation.

Industries are free to select among several commercially available technologies for steam production, including:

- Coal fired boilers
- Furnace oil boilers
- Natural gas boilers
- Biomass boilers

Among these options, fossil fuel-based boilers remain the most widely adopted technology due to their established supply chains, operational familiarity and comparatively low capital investment.

Therefore, the installation of a biomass briquette-based boiler is not mandated by any applicable law or regulation. The project activity represents a voluntary initiative undertaken by the project proponent to reduce greenhouse gas emissions by substituting fossil fuels with renewable biomass fuels.
Therefore. It satisfies the regulatory analysis requirement under the applied tool.

2. Analysis of Lock in Risk

The analysis of lock-in risk assesses whether the project activity could result in the long-term continuation of a carbon intensive technology that would hinder the transition to lower emission alternatives.
In the baseline scenario, the steam demand of the facility would be met through the installation and operation of a conventional fossil fuel-fired boiler, most likely using coal of furnace oil. Such systems typically have an operational lifetime of 20-25 years, during which significant quantities of greenhouse gases would be emitted.

If a fossil fuel boiler were installed under the baseline scenario, the project proponent would likely continue operating this carbon-intensive technology for its entire economic lifetime due to the high capital investment associated with boiler systems. This would result in a long-term technological lock-in to fossil fuel-based steam generation, thereby perpetuating high greenhouse gas emissions.
The proposed project activity avoids this lock-in by installing a biomass briquette fired boiler that utilizes renewable biomass residues as fuel. Biomass briquettes are produced from agricultural residues such as crop husk, shells, and stalks which are renewable and part of the short-term carbon cycle.
By adopting biomass fuel instead of fossil fuels, the project activity significantly reduces greenhouse gas emissions associated with steam generation and promotes the use of renewable energy resources.
Furthermore, the biomass boiler technology provides operational flexibility, allowing the facility to continue utilizing the renewable biomass fuels over the long term. This supports a low-carbon energy pathway for industrial heat generation and aligns with national climate mitigation objectives.
Therefore, the proposed project activity does not create a lock-in to carbon intensive infrastructure.

Technological barriers:

The implementation of biomass-briquette based boiler systems for industrial steam generation faces several technological barriers that may limit their widespread adoption. This is due to the difference in fuel characteristics, boiler operation requirements and technological limitations associated with biomass combustion systems.

- Fuel feeding and handling challenges-Biomass briquettes differ from conventional fossil fuels such as coal, in terms of size, density, combustion behaviour. Their larger and irregular shape often makes them incompatible with standard coal feeding systems requiring modification or replacement of fuel feeding mechanisms, increasing technical complexity and capital costs.
- Combustion Stability and Fuel Quality Variability- Biomass briquettes are produced from agricultural residues, and their calorific value, density, and moisture content can vary depending on the feedstock used. Such variability can affect combustion stability and boiler efficiency. Industries may experience difficulties maintaining consistent steam generation because changes in fuel quality influence combustion temperature and air–fuel mixing.
- Limited Availability of Advanced Briquetting and Combustion Technologies-In developing regions, including parts of India, many biomass briquette production units rely on older or less efficient briquetting technologies, resulting in inconsistent product quality and reduced reliability of the fuel supply chain. Limited access to advanced equipment and technical expertise restricts large-scale adoption of biomass briquette systems.

  This technological gap can affect the confidence of industrial users in adopting biomass fuels for critical process applications such as steam generation.

Financial and Economic Barriers

The implementation of biomass briquette-based boiler systems involves significant upfront capital investment compared to conventional fossil fuel boilers. Installation of such systems requires additional expenditure on specialized combustion systems, fuel feeding equipment, biomass storage infrastructure, and ash handling systems. In many cases, existing boiler infrastructure designed for coal or furnace oil must also

be retrofitted to accommodate biomass fuels, which further increases the initial investment requirement.

In addition to higher capital costs, biomass-based projects involve additional expenditures related to fuel procurement, storage facilities, and logistics management, since biomass residues are geographically dispersed and require aggregation, transportation, and preprocessing before use. Establishing such supply chains requires additional financial resources and coordination.

Consequently, the higher upfront investment, additional infrastructure needs, and uncertainties related to biomass fuel supply can create financial risks and may discourage industries from adopting biomass-based steam generation technologies.

C.4 Addressing non-permanence and risks of reversals

C.4.1 Identification of risk or reversal

Not applicable

C.4.2 Reversal risk assessment

Not applicable

C.4.3 Reversals risk mitigation plan

Not applicable

C.4.4 Remediation of reversals

Not applicable

Section IV : Estimation of GHG Emission Reduction

D.1. GHG Emission from Baseline and Project Activity

D.1.1. Estimate of GHG emissions

The GHG emission reductions of the project activity are calculated as follows

$$ER_y = BE_y – PE_y - LE_y$$

Where:

ER_y = Emission reductions in year y (tCO_2)

BE_y = Baseline emissions in year y (tCO_2)

PE_y = Project emissions in year y (tCO_2)

LE_y = Leakage emissions in year y (tCO_2)

According to the para 4.3.3 of BM EN01.003- Electricity and heat generation from biomass, version 1.0. Baseline emissions include CO2 emissions from fossil fuel combustion in the heat generation equipment in the absence of the project activity and if included in the project boundary.

$$BE_y = BE_{HG,y} + BE_{BR,y}$$

Where:

BE_y = Baseline emissions during the year y (tCO_{2e}/yr)

$BE_{HG,y}$ = Baseline emissions from fossil fuel combustion for heat generation in the heat generation equipment in year y (tCO_2/yr)

$BE_{BR,y}$ = Baseline emissions due to uncontrolled burning or decay of the biomass results in year y (tCO_{2e}/yr)

- Baseline emissions from fossil fuel combustion for heat generation in the heat generation equipment are determined as equation 37 of the methodology:

$$BE_{HG,y} = \frac{HG_{PJ,biomass,y} \times EF_{FF,CO2,y}}{\eta_{heat,FF}}$$

Where:

Parameter		**Unit**	**Value**	**Reference**
$HG_{PJ,Biomass,y}$	Incremental heat generated with biomass used as a result of the project activity during the year y (GJ/yr)	GJ/yr	483246.47	Calculated
$EF_{FF,CO2,y}$	CO2 emission factor of the fossil fuel type displaced by biomass for the year y	(tCO_2/GJ)	0.0946	Other bituminous coal, IPCCC 2006, Volume 2, Emission factors
$\eta_{heat,FF}$	Average net efficiency of the heat generation	Ratio	90%	BM-T-006,Tool to determine

	equipment if fired with fossil fuels in the baseline			baseline efficiency of thermal and electricity systems, version 1
$BE_{HG,y}$	Baseline emissions from fossil fuel combustion for heat generation	tCO_{2e}/yr	50795	Calculated

- Baseline emissions due to uncontrolled decay or burning of biomass residues, $BE_{BR,y}$ is considered zero.

Therefore, the baseline emissions i.e. **BE_y = 50795 tCO2e/yr**

Project Emissions

According to para 195 of the methodology, for the purpose of determining GHG emissions of the ICM project activity, non-obligated Project Proponent has included the following project emissions sources by using equation 45:

$$PE_y = PE_{biomass,y} + PE_{FF,y} + PE_{EC,y} + PE_{CBR,y} + PE_{BG,y}$$

Wherein –

PE_y = Project emissions during the year y (tCO_2/yr)

$PE_{biomass,y}$ = Emissions associated with the biomass and biomass residues in year y (tCO_2)

$PE_{FF,y}$ = Emissions from on-site fossil fuel combustion at the project site in year y (tCO_2/yr)

$PE_{EC,y}$ = Emissions from on-site electricity consumption at the project site in year y (tCO_2/yr)

$PE_{CBR,y}$ = Emissions from combustion of biomass in the heat generation equipment in year y (tCO_{2e}/yr)

$PE_{BG,y}$ = Emissions from the production of biogas in year y (tCO_{2e}/yr)

Parameter		Unit	Value	Reference
$PE_{biomass,y}$	Emissions associated with biomass and biomass residues - Project emission from transportation of biomass - Project emissions resulting from process of biomass residues	tCO_2	1895	Calculated as per Tool BM-T-002
$PE_{FF,y}$	Emissions from fossil fuel consumption at the project site related to the generation of heat	tCO_2/yr	0	
$PE_{EC,y}$	Emissions from grid-connected fossil fuel power plants in the electricity systems for any electricity that is imported from the grid	tCO_2/yr	1403	Calculated as per Tool BM-T-002
$PE_{CBR,y}$	If applicable, CH_4 emission from combustion of biomass residues for heat generation at the project site	tCO_{2e}/yr	Not applicable	
$PE_{B-G,y}$	Emission from production of biogas	tCO_{2e}/yr	Not applicable	
PE_y	**Project emissions during the year**	**tCO_2/yr**	**3298**	

D.1.2. Estimated leakage emissions

According to the para 205 of 4.5.3 of the methodology which states that, "For project activities utilizing biomass and/or biomass residues, the BM-T-010 shall be applied to determine the leakage".

As per Tool BM-T-010 (Project and Leakage Emissions from Biomass), leakage emissions are estimated based on the processing of biomass residues occurring outside the project boundary. For the proposed project activity, the processing of the biomass residues into biomass briquettes is done at the project site which is within the project boundary. The emissions from onsite consumption of electricity due to processing of biomass residues is considered as a part of project emissions withing the project boundary.

Therefore, leakage emissions for the project activity are considered zero.

D.1.3. Estimated Project emissions

As per the methodology, the project emissions are calculated as mentioned in equation 50:

$$PE_y = PE_{biomass,y} + PE_{FF,y} + PE_{EC,y} + PE_{CBR,y} + PE_{BG,y}$$

As mentioned in Section D.1.1, the project emissions considered for the project activity are the emissions associated with biomass or biomass residues and emissions associated with onsite electricity consumption at the project site for biomass briquettes processing.

The project emissions associated with biomass or biomass residues is calculated in accordance with Tool, BM-T-007, version 1 which is Project and Leakage emissions from transportation of freight.

$PE_{biomass,y} = PE_{TR}$

$$\left.\begin{matrix} PE_{TR,m} \\ LE_{TR,m} \end{matrix}\right\} = \sum_f D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6}$$

Where:

Parameter		Unit	Value	Reference
$D_{f,m}$	Return trip distance between the origin and destination of freight transportation activity	Km	200	Approved vendors

$FR_{f,m}$	Total Mass of Frieght Transportation	Tonnes/yr	38672.86	Calculated
EF_{CO2}	Default emission factor for emissions from the transportation (Heavy vehicles)	gCO2t/ km	129	As per Tool 12 section 5.3
EF_{CO2}	Default emission factor for emissions from the transportation (Light vehicles)	gCO2t/ km	245	As per Tool 12 section 5.3
$PE_{TR,y}$	Project emissions resulting from transportation of biomass	tCO2	**1895**	

The project emissions from onsite electricity consumption include the power used for processing biomass residues into biomass briquettes within the project boundary; therefore, these emissions are accounted for as project emissions.

$$PE_{EC,y} = \Sigma EC_{PJ,j,y} \times EF_{EF,j,y} \times (1+TDL_{j,y})j$$

Where:

Parameter		Unit	Value	Reference
$EC_{PJ,j,y}$	Quantity of electricity consumed by the project electricity consumption source	MWh/yr	1584	Calculated
$EF_{FF,j,y}$	Emission factor for electricity generation source	tCO2/MWh	0.738	CEA CO2 database, version 21
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source	%	20	BM-T-003, pg 12
$PE_{EC,y}$	Project emission resulting from onsite electricity consumption at the project site	tCO_2	1403	

Therefore PEy= 1895 + 1403 = **3298 tCO_2/year**

D.1.4. Estimate of GHG emissions in baseline.

Year	**Baseline emissions**
Year 1	50795
Year 2	50795
Year 3	50795
Year 4	50795
Year 5	50795
Year 6	50795
Year 7	50795
Year 8	50795
Year 9	50795
Year 10	50795

D.1.5. Estimate GHG reduction

The emission reductions are calculated as:

$$ER_y = BE_y – PE_y - LE_y$$

Year	**Baseline emissions (tCO_{2e})**	**Project emissions (tCO_{2e})**	**Leakage emissions (tCO_{2e})**	**Emission reductions (tCO_{2e})**
Year 1	50,795	3298	0	47,497
Year 2	50,795	3298	0	47,497
Year 3	50,795	3298	0	47,497
Year 4	50,795	3298	0	47,497
Year 5	50,795	3298	0	47,497
Year 6	50,795	3298	0	47,497
Year 7	50,795	3298	0	47,497
Year 8	50,795	3298	0	47,497
Year 9	50,795	3298	0	47,497
Year 10	50,795	3298	0	47,497

Total	507946	32980	0	474966

Section V : Data Parameters Monitoring

E.1. Data and parameters fixed ex ante

E.1.1	**Parameter**	**$EF_{FF,CO2,y}$**
E.1.2	Description	CO2 emission factor of other bituminous coal that would be used at the project site in the baseline
E.1.3	Data unit	tCO_2/GJ
E.1.4	Equation(s) referred	37
E.1.5	Purpose of data	CO2 emission calculation
E.1.5.1	Baseline emissions	For baseline emission calculation
E.1.5.2	Project emissions	-
E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	0.0946
E.1.5.5	Source of data	IPCC 2006 default emission factor
E.1.5.6	Choice of data or measurement methods and procedures	The emission factor is based on default values given in Chapter 1, volume 2, page 23.
E.1.5.7	Comments/remarks if any	The lowest emission factor is considered for the baseline emission from the IPCC 2006 default values.

E.1.1	**Parameter**	**$\eta_{heat,FF}$**
E.1.2	Description	Efficiency of the fossil fuel power plant(s) at the project site in the baseline
E.1.3	Data unit	Ratio

E.1.4	Equation(s) referred	37
E.1.5	Purpose of data	To calculate the baseline emission from fossil fuel combustion for heat generation
E.1.5.1	Baseline emissions	For baseline emission calculation
E.1.5.2	Project emissions	-
E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	90%
E.1.5.5	Source of data	Default efficiency factor, BM-T-006, Tool to determine baseline efficiency of thermal and electricity systems, version 1.
E.1.5.6	Choice of data or measurement methods and procedures	A default value of the efficiency factor is considered for thermal energy application.
E.1.5.7	Comments/remarks if any	

E.1.1	**Parameter**	**$EF_{CO2(heavy\ vehicles)}$**
E.1.2	Description	Emission factor for emissions from transportation by heavy vehicles
E.1.3	Data unit	gCO_2t/ km
E.1.4	Equation(s) referred	45
E.1.5	Purpose of data	To calculate the project emission associated with biomass residues
E.1.5.1	Baseline emissions	-
E.1.5.2	Project emissions	To calculate the project emissions by the transportation of biomass residues by heavy vehicles

E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	129
E.1.5.5	Source of data	Calculated as per the tool, BM-T-007
E.1.5.6	Choice of data or measurement methods and procedures	The biomass residues are transported to the project site within 100km of the project boundary. The total mass in the transportation will be monitored.
E.1.5.7	Comments/remarks if any	

E.1.1	**Parameter**	**$EF_{CO2(light\ vehicles)}$**
E.1.2	Description	Emission factor for emissions from transportation by light vehicles
E.1.3	Data unit	gCO_2t/ km
E.1.4	Equation(s) referred	45
E.1.5	Purpose of data	To calculate the project emission associated with biomass residues
E.1.5.1	Baseline emissions	-
E.1.5.2	Project emissions	To calculate the project emissions by the transportation of biomass residues by light vehicles
E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	245
E.1.5.5	Source of data	Calculated as per the tool, BM-T-007
E.1.5.6	Choice of data or measurement methods and procedures	The biomass residues are transported to the project site within 100km of the project

		boundary. The total mass in the transportation will be monitored.
E.1.5.7	Comments/remarks if any	

E.1.1	**Parameter**	**$EF_{grid,CM,y}$**
E.1.2	Description	Combined margin grid emission factor applicable to the electricity grid supplying the project
E.1.3	Data unit	tCO2/MWh
E.1.4	Equation(s) referred	BM-T-003 tool
E.1.5	Purpose of data	To calculate the project emissions from on-site consumption of electricity at the project site
E.1.5.1	Baseline emissions	-
E.1.5.2	Project emissions	Project
E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	0.7380
E.1.5.5	Source of data	Combined margin emission factor as per the latest CO2 baseline database, version 21 published by Central Electricity Authority[2]
E.1.5.6	Choice of data or measurement methods and procedures	The combined margin grid emission factor is selected based on the latest available values published by Central Electricity Authority(CEA). The value is

[2] https://cea.nic.in/wp-content/uploads/baseline/2025/12/User_Guide_V_21.0.pdf

		fixed ex-ante and applied throughout the crediting period.
E.1.5.7	Comments/remarks if any	

E.1.1	**Parameter**	**TDL**
E.1.2	Description	Average technical transmission and distribution losses for providing electricity to source
E.1.3	Data unit	%
E.1.4	Equation(s) referred	BM-T-003 tool
E.1.5	Purpose of data	Adjustment of grid electricity consumption to account for transmission and distribution losses when calculating project emissions
E.1.5.1	Baseline emissions	-
E.1.5.2	Project emissions	To calculate the project emissions from onsite electricity consumption at the project site
E.1.5.3	Leakage emissions	-
E.1.5.4	Values applied	20%
E.1.5.5	Source of data	Default value from BM-T-003 Tool
E.1.5.6	Choice of data or measurement methods and procedures	The transmission and distribution loss factor is applied as a fixed default value in accordance with BM-T-003 and is not monitored during the crediting period.
E.1.5.7	Comments/remarks if any	-

E.2. Data and parameters to be monitored

E.2.1 Data/parameter

E.2.1	**Parameter**	**$HG_{biomass}$**
E.2.2	Description	Net quantity of heat generated in the boiler in a year
E.2.3	Data unit	GJ
E.2.4	Equation(s) referred	37
E.2.5	Purpose of data	It is used to calculate emission reduction.
E.2.5.1	Baseline emissions	Baseline emissions
E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	483246.47 (estimated)
E.2.5	Source of data	Plant records
E.2.6	Measurement/calculation methods and procedures	Continuously measured. This parameter is determined by calculating the net enthalpy of steam which is the difference of enthalpy of the steam and boiler feed water enthalpy. The respective enthalpies are determined based on the mass or volume flows, the temperatures, the steam tables are used to calculate the enthalpy.
E.2.7	Entity/person responsible for the measurement	Plant Head

E.2.8	Measuring Instrument(s)	-
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	Every 6 months
E.2.8.4	Location	Plant end
E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$Pressure_{steam}$**
E.2.2	Description	Operational Steam pressure
E.2.3	Data unit	Kg/cm^2
E.2.4	Equation(s) referred	-
E.2.5	Purpose of data	Not used for emission reduction calculation
E.2.5.1	Baseline emissions	-
E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	12
E.2.5	Source of data	SCADA
E.2.6	Measurement/calculation methods and procedures	Continuously monitored
E.2.7	Entity/person responsible for the measurement	Plant operator
E.2.8	Measuring Instrument(s)	Pressure gauge
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	Annual
E.2.8.4	Location	Plant end

E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**Temperature** **steam process**
E.2.2	Description	Operational Steam temperature
E.2.3	Data unit	°C
E.2.4	Equation(s) referred	-
E.2.5	Purpose of data	Not used for emission reduction calculation
E.2.5.1	Baseline emissions	Required for calculation in baseline emissions.
E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	191.66
E.2.5	Source of data	Plant records/SCADA
E.2.6	Measurement/calculation methods and procedures	Calculated The steam supplied by the project activities is saturated steam. The temperature of the steam is calculated using the steam table (https://www.tlv.com/global/TI/calculator/steam-table-pressure.html) by using the pressure of the steam.
E.2.7	Entity/person responsible for the measurement	Plant operator
E.2.8	Measuring Instrument(s)	Steam tables

E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	-
E.2.8.4	Location	Plant end
E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**Temperature** $_{\textbf{feedwater}}$
E.2.2	Description	Boiler feed water temperature
E.2.3	Data unit	°C
E.2.4	Equation(s) referred	-
E.2.5	Purpose of data	Not used for emission reduction calculation
E.2.5.1	Baseline emissions	Required for calculation in baseline emissions.
E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	105
E.2.5	Source of data	Plant records/SCADA
E.2.6	Measurement/calculation methods and procedures	Calculated The steam supplied by the project activities is saturated steam. The temperature of the steam is calculated using the steam table

		(https://www.tlv.com/global/TI/calculator/steam-table-pressure.html) by using the pressure of the steam.
E.2.7	Entity/person responsible for the measurement	Plant operator
E.2.8	Measuring Instrument(s)	Steam tables
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	-
E.2.8.4	Location	Plant end
E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$D_{f,m}$**
E.2.2	Description	Return trip distance between the origin and destination of freight transportation activity
E.2.3	Data unit	km
E.2.4	Equation(s) referred	BN-T-007 Tool
E.2.5	Purpose of data	It is used for emission reduction calculation
E.2.5.1	Baseline emissions	-

E.2.5.2	Project emissions	It is used to calculate project emissions.
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	200
E.2.5	Source of data	Records by vehicle operator or plant records by PP
E.2.6	Measurement/calculation methods and procedures	Truck trips distances would be monitored continuously and aggregated monthly
E.2.7	Entity/person responsible for the measurement	Plant
E.2.8	Measuring Instrument(s)	No measuring equipment is used for this parameter.
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	-
E.2.8.4	Location	Plant
E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$Q_{biomass\ residue}$**
E.2.2	Description	Quantity of biomass residue
E.2.3	Data unit	Tonnes/year
E.2.4	Equation(s) referred	
E.2.5	Purpose of data	It is not used for emission reduction calculation
E.2.5.1	Baseline emissions	-

E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	38673(estimated)
E.2.5	Source of data	Plant log books
E.2.6	Measurement/calculation methods and procedures	The quantity of biomass will be measured by using the weigh bridge. Fuel quantity will be measured and recorded in the logbook for each batch and is monitored separately.
E.2.7	Entity/person responsible for the measurement	Plant head
E.2.8	Measuring Instrument(s)	Weigh bridge
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	-
E.2.8.4	Location	Plant
E.2.9	QA/QC Procedures applied	-
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$EC_{PJ,j,y}$**
E.2.2	Description	Quantity of electricity consumed by the project activity for biomass residue processing into biomass briquettes
E.2.3	Data unit	MWh
E.2.4	Equation(s) referred	BM-T-003

	E.2.5	Purpose of data	It is used for emission reduction calculation
	E.2.5.1	Baseline emissions	-
	E.2.5.2	Project emissions	To calculate the project emissions associated with onsite consumption of electricity
	E.2.5.3	Leakage emissions	-
	E.2.4	Values applied	1584 (estimated)
	E.2.5	Source of data	Electricity invoices to State Electricity Board
	E.2.6	Measurement/calculation methods and procedures	It is continuously measured. The invoices are raised based on the monthly recordings.
	E.2.7	Entity/person responsible for the measurement	Plant head
	E.2.8	Measuring Instrument(s)	Energy meter
	E.2.8.1	Type	-
	E.2.8.2	Accuracy	-
	E.2.8.3	Calibration requirements	Once in 5 years[3]
	E.2.8.4	Location	Plant
	E.2.9	QA/QC Procedures applied	The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity

[3] http://www.aegcl.co.in/Metering_Regulations_Of_CEA_17_03_2006.pdf

		board and PP do not have any control on it. PP is getting value of electricity consumed from the grid and the same is considered the monitoring parameter.
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$FR_{f,m}$**
E.2.2	Description	Quantity of biomass residue received in the project activity in year
E.2.3	Data unit	Tonnes/year
E.2.4	Equation(s) referred	BM-T-007
E.2.5	Purpose of data	It is used for emission reduction calculation
E.2.5.1	Baseline emissions	-
E.2.5.2	Project emissions	To calculate the project emissions associated with transportation of the biomass residue to the project site within 100 kms radius
E.2.5.3	Leakage emissions	-
E.2.4	Values applied	40000 (estimated)
E.2.5	Source of data	Records of vehicle operator or Plant records by project participants

E.2.6	Measurement/calculation methods and procedures	Received biomass shall be measured using a weigh-bridge located at the project site and recorded truck-wise as is received. The data shall be collated daily and monthly basis for the biomass residue utilized.
E.2.7	Entity/person responsible for the measurement	Plant operator
E.2.8	Measuring Instrument(s)	Weigh bridge
E.2.8.1	Type	
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	Quarterly
E.2.8.4	Location	At the gate of the project site.
E.2.9	QA/QC Procedures applied	NA
E.2.10	Comments/remarks if any	-

E.2.1	**Parameter**	**$NCV_{biomass\ briquette}$**
E.2.2	Description	Net calorific value of the biomass briquette used for heat generation in the boiler
E.2.3	Data unit	TJ/tonne
E.2.4	Equation(s) referred	
E.2.5	Purpose of data	Not used for emission reduction calculation
E.2.5.1	Baseline emissions	-
E.2.5.2	Project emissions	-
E.2.5.3	Leakage emissions	-

E.2.4	Values applied	15.05
E.2.5	Source of data	Periodic fuel calorific value test reports
E.2.6	Measurement/calculation methods and procedures	It is measured.
E.2.7	Entity/person responsible for the measurement	
E.2.8	Measuring Instrument(s)	Measurements shall be carried out at reputed laboratories.
E.2.8.1	Type	-
E.2.8.2	Accuracy	-
E.2.8.3	Calibration requirements	Quarterly
E.2.8.4	Location	-
E.2.9	QA/QC Procedures applied	Consistency of the measurements would be checked by comparing the measurement results with measurement from previous years.
E.2.10	Comments/remarks if any	-

E.3 Sampling Plan

Not applicable.

Section VI : Sustainable Development

F.1. Environment and Social Safeguards

Environmental Safeguard	***Element***	***Assessment***
	1. Climate and Energy	The project reduces GHG emissions by replacing

		fossil fuels with biomass briquettes. It promotes renewable energy use.
	2. Air, Land & water	The project does not release any harmful particulate matter which would contribute to air pollution. The project activity does not release any wastewater so no harm is caused to land or water bodies.
	3. Ecology and natural resources	Biomass residues are used, avoiding deforestation and promoting sustainable waste utilization.
Social	4.Human rights	The project does not violate any human rights and operates within existing industrial premises.
	5.Labour	Employment opportunities are generated for local workers in biomass handling and operations. Labour laws are complied with.
	6. Health and Safety	Adequate safety measures, PPE, and training are provided to

		workers handling biomass and operating the boiler.
	7. Gender Equality	Equal employment opportunities are encouraged without discrimination.
	8. Land Acquisition and Involuntary Resettlement	No land acquisition required; project is within existing facility boundary and it is owned by the project proponent.
	9.Local communities	Positive impact through reduced pollution and additional income for local biomass suppliers.
	10.Corruption	Transparent procurement and operational practices are followed.
	11.Cultural Heritage	No impact on cultural or historical sites as project is located in an industrial area.

F.2. Quantification of Impact due to Project Activity

SDG	**SDG Goal Description**	**SDG Indicator**	**Quantified Impact**	**Unit/Products**
SDG 7	Ensure access to affordable,	7.3.1-Energy intensity	The project activity	megajoules

	reliable, sustainable and modern energy for all	measured in terms of primary energy and GDP (in mega joules)	generates 483,246,470 Mega joules.	
SDG 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.3.4-Number of MSME registered under the online Udyam Registration Portal	FAFPL is registered under the Udyam Registration Portal	
SDG 13	Take urgent action to combat climate change and its impacts	13.2.3-Percentage of industries complying with environmental standards	Annual compilation with environmental standards for consent to operate	CPCB

Section VII : Local Stakeholder Consultation

G.1. Local Stakeholder Consultation

G.1.1. Stakeholder Mapping

The stakeholder mapping for the proposed biomass-based steam generation project was done to identify all the relevant parties who may be affected or interested in the project. The project which involves installing and operating a

biomass-briquette-based boiler, mainly impact the stakeholders involved in the biomass supply chain, plant operation and regulatory authorities in Gujarat.

Key stakeholders

- Project Proponent
- Project workers- Personnel involved in the construction and operation of the plant
- Biomass suppliers and local farmers
- Local community- locals living nearby the project site
- Transporters- People involved in the biomass collection and transporting it to the project site

G.1.2. Mode of conducting stakeholder consultation

Stakeholders were informed and engaged through emails, verbal communication, and direct interactions to ensure wide participation and transparency.

- Formal invitations were sent to the stakeholders via email, providing the details of the project activity, objectives, consultation and venue.
- Local stakeholders like nearby workers, biomass suppliers were informed through direct verbal communication. This also included one-on one discussions and community level intimation to ensure their participation in the scheduled meeting.
- A stakeholder consultation meeting was conducted at the project site, where the project details were presented. Participants were encouraged to share their views, concerns, and suggestions openly.

G.1.3. Details on Consultation

The stakeholder consultation was held on 18/07/2025 at the project site office of FAFPL in Mehsana, with participation from more than 25 stakeholders. During the meeting, stakeholders were informed about the project activity, including its economic, environmental, and social benefits, as well as potential impacts. It was also communicated that the boiler does not use fossil fuels such as coal. Additionally, the benefits of using biomass were explained, particularly in terms of supporting the local community and creating additional income opportunities through biomass supply.

G.1.4. Summary of comments

The feedback received from the stakeholders was positive. They expressed their support for the project, particularly highlighting its environmental benefits, effective utilization of the biomass residues, and potential for local economic development. No significant concerns or objections were raised during the consultation process.

G.1.5. Summary on how comments are addressed.

The comments received for the project was generally positive. However, Project Proponent is committed to maintain communication and address any concerns in a timely and transparent manner.